ENVIRONMENTAL IMPACT STATEMENT

FOR

SAM 8888 PTY LTD

Trading as:

Terara Shoalhaven Sand

FOR

EXTENSION OF DREDGE AREA, TO WESTERN END AND NORTHERN SIDE OF PIG ISLAND, ON THE BED OF THE SHOALHAVEN RIVER, ADJACENT TO LOT 1 & 2 DP 1184790 BELOW MHWM.

7th May 2021

Prepared by

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1.0 Certification

SUBMISSION OF ENVIRONMENTAL ASSESSMENT Under Part 3 section 6 of the Environmental Planning and Assessment Regulations 2000		
Name of Author:	Ernest A Panucci	
Qualifications of Author:	Bachelor of Surveying UNSW Graduate Diploma Urban Regional Planning UNE Graduate Diploma Natural Resource Law UoW	
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Applicant Name:	Sam 8888 Pty Ltd t/a Terara Shoalhaven Sand Pty Limited	
Applicant Address:	125 Terara Road TERARA NSW 2541	
Address of Land to be Developed	Bed of the Shoalhaven River adjacent to the western end and northern side of Pig Island near Lot 97 DP 755922.	
Description of Proposed Development	Extension of the dredge area on the bed of the Shoalhaven River where sediment is won from.	
An Environmental Assessment is Attached		
Declaration by Author	I declare that I have prepared this Environmental Assessment and to the best of my knowledge: • It has been prepared in accordance with Schedule 2 of the Environmental Planning and Assessment Regulation 2000; • contains all available information that is relevant to the environmental assessment of the proposal to which this statement relates; and • The information which it contains is neither false or misleading.	
Signature		
Name	Ernest A Panucci	Kristin Holt
Date	15/01/2021	15/01/2021

2.0 Glossary and Abbreviations

AEP – Annual Exceedance Probability

ANZG – Australian and New Zealand Guidelines for Fresh and Marine Water Quality

BC – Biodiversity Conservation

BDAR – Biodiversity Development Assessment Report

CM SEPP – SEPP (Coastal Management) 2018

DA – Development Application

DCP – Development Control Plan

EA – Environmental Assessment

EIS – Environmental Impact Statement

EPA – Environmental Protection Authority

EPAA – Environmental Planning and Assessment Act

EPAR – Environmental Planning and Assessment Regulation

EPBC – Environmental Protection and Biodiversity Conservation

ESD – Ecologically Sustainable Development

FMA – Fisheries Management Act 1994

ISRP – Illawarra-Shoalhaven Regional Plan

LEP – Local Environmental Plan

MA – Mining Act 1992

MHWM – Mean High Water Mark

MNES – Matter of National Environmental Significance

PMF – Probable Maximum Flood

PO – Permissive Occupancy

POEO Act – Protection of the Environment Operations Act

RMS – Roads and Maritime Services

S & R SEPP – SEPP (State and Regional Development) 2011

SDCP – Shoalhaven Development Control Plan 2014

SEARs – Planning Secretaries Environmental Assessment Requirements

SEPP – State Environmental Planning Policy

SEPP (*Mining et al.*) – State Environmental Planning Policy (Mining, Petroleum, Production and Extractive Industries) 2007

SEPP 33 – State Environmental Planning Policy – Hazardous and Offensive Development

SEPP 55 – State Environmental Planning Policy – Remediation of Land

SIS – Species Impact Statement

SLEP – Shoalhaven Local Environmental Plan 2014

SSTV – Site Specific Trigger Values

TSS – Terara Shoalhaven Sands

WA – Water Act 1912

WMA – Water Management Act 2000

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3.0 Executive Summary

3.1 Introduction

SAM 8888 Pty Limited, a Nowra based company trading as Terara Shoalhaven Sand ("TSS"), is proposing to extend the area on the bed of the Shoalhaven River, adjacent to the western end and northern side of Pig Island, where it wins material for processing into coarse river sand.

This Environmental Impact Statement (EIS) has been prepared in accordance with the requirements of the *Environmental Planning & Assessment Act 1979* (NSW) *(EPAA) and the Environmental Planning and Assessment Regulation 2000* (NSW) *(EPAR)*. This EIS will be submitted to Shoalhaven City Council and form part of the Development Application (DA) seeking development consent to the proposal. The EIS also addresses the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) *(EPBC Act)* in accordance with the Commonwealth Department of Environment and Energy requirements.

3.2 Proponent

SAM 8888 Pty Limited is a small local company with two directors, Stephen Mc Cormac, and Keith Gibson. Both Stephen and Keith are long-time local residents. SAM 8888 Pty Limited was established in 2011 after some of the directors of the former company; Terara Sand Pty Ltd, which ran the sand dredging operations from 1989-2011; retired. Stephen Mc Cormac the major shareholder in SAM 8888 Pty Limited was a former and founding director of Terara Sand Pty Ltd.

TSS currently employs 6 full time workers and contributes some $100,000 per month directly and indirectly into the local community. Royalties are also paid by Terara Shoalhaven Sand (SAM 8888 Pty Limited) to the NSW State Government in addition to licence renewal fees.

3.3 Background History

The proposed extension of the dredge/extraction area, on the bed of the Shoalhaven River, was the subject of an application made to Shoalhaven City Council in June 2012 (RA12/1001). The 2012 application was presented to the Joint Regional Planning Panel on 18th June 2013 and approved 28th August 2014.

The current dredge area approved under RA12/1001 is approaching exhaustion. TSS now wishes to extend the area on the bed of the Shoalhaven River, from which it wins sediment. The extended area sought is basically the same area as originally requested in 2011, save for a new extended buffer zone being implemented to protect the existing sea grasses and foreshore vegetation. This application, if approved, will allow the existing operation to continue operating for another 19-30 years (depending on extraction volumes).

3.4 Current Operations

Terara Shoalhaven Sand currently extracts material from the bed of the Shoalhaven River and processes it into coarse river sand at 125 Terara Road Terara. The current operation was granted approval in August 2014, by the Joint Regional Planning Panel, under reference RA12/1001. Since August 2014 two minor modifications, DS15/1020 and DS 15/1297, have been applied for and granted by Shoalhaven City Council.

The current extraction activities have on average, over the last 7 years, produced 60,000 tonnes of coarse river sand per year. RA12/1001 and EPA conditions limit the extraction and production of coarse river sand to a maximum of 100,000 tonnes per annum.

3.5 Proposal

The proposal seeks to extend the area on the bed of the Shoalhaven River where sediment can be dredged and won to process into coarse river sand.

Calculations have been made, based on the last 7 years' extraction rate, and reveal that the supply of coarse river sand for this dredging operation can be extended by 19-40 years (dependent on extraction volumes).

It should be noted that this proposal does not seek to increase the licensed and approved extraction rate, the hours of operation, the method of operation, vehicle movements or alter the sedimentation control devices in place. The existing method of extraction and processing will not alter. The conditions of consent, stated in RA12/1001, will be maintained including the relevant licences associated with the operations.

3.6 Site

The area on the bed of the river, where it is proposed to dredge and win the sediment from, is located at the western end and northern side of Pig Island. Figure 1 shows the dredge area approved in RA12/1001 highlighted in red and the proposed extension to that area denoted by a black broken dotted line.

Figure 1: Aerial photograph showing location of existing and proposed dredge areas.

The proposed extension area (denoted by black broken dotted line) is exposed to the air at low tides and inundated by up to a metre of water at high tides.

There are various land uses on the surrounding banks of the Shoalhaven River. These range from agricultural on the island to agricultural, commercial, residential and rural residential on the southern banks of the Shoalhaven River, save for the sand dredging processing plant (industrial), to mainly industrial land uses on the northern banks of the river.

3.7 Land Resource

Martens Consulting Engineers ("Martens") have prepared a Land Resource Assessment report which assessed the volume and quality of sand deposits at the site and provide a geological site summary, including land capability and potential contamination as well as justifying the proposed expansion.

Calculated volumes indicate a possible resource volume of 1,140,000 m^3, weighing approximately 1,940,000 tonnes. This extraction volume has been based on a maximum resource extraction depth of -6.7m AHD. Considering the current extraction licence, which allows a total of 100,000 tonnes of sand to be extracted annually, the mine life expectancy is approximately 19 years at a minimum. Based on actual average annual extraction volumes the life of the proposed area could be 30-40 years.

The assessment also concludes that the processed material produced, coarse river sand, is free of contamination and suitable for its end use in construction and landscaping.

3.8 Environmental Assessment Process

The proposed development is classified as *Designated Development* under Part 4 of the EPAA and Schedule 3 of the EPAR and as such an EIS is required to accompany the application to Council for determination. Prior to preparation of the EIS the NSW Department of Planning and Environment Secretary's Environmental Assessment Requirements (SEARs) were sought and obtained on 22 June 2018.

The SEARs noted a number of key issues to be addressed and required consultations with government departments, council and the local community.

A copy of the SEARs is attached as Volume 2 Appendix 1 to this report. The environmental assessments undertaken to inform this EIS are contained within Volume 2.

3.8.1 Water – Licence

The proposed development does not require a licence under the *Water Act 1912* (NSW) or the *Water Management Act 2000* (NSW). The proposal does not require the extraction of water from any underground water table nor is it located on *land* within 40 metres of the mean high water mark.

3.8.2 Water – River Stability

Martens have prepared a River Stability Assessment which concludes that the flow velocity changes within the Shoalhaven River, resulting from extraction works, would be insignificant and unlikely to lead to a change in sedimentation/erosion processes along the riverbank.

Historical extraction of sediments does not appear to have contributed to erosion/sedimentation or bank instability. The proposed buffer of 25 metres to marine vegetation (seaweed and sea grasses) will ensure the stability of the banks along the Shoalhaven River and Pig Island.

3.8.3 Water - Flooding Impact

Martens have prepared a Flood Assessment and investigated the adjacent banks and areas near to the proposed dredge expansion area. Martens have also prepared a separate report with respect to the proposed stock refuge mounds on Pig Island and flood impacts. These assessments reviewed a number of flooding events, 10% annual exceedance probability (AEP) flood, 1% AEP flood, 0.5% AEP flood, 0.2% AEP flood, and probable maximum flood (PMF) events, using the TUFLOW hydraulic model.

The modelling concluded that the proposed development would not have unacceptable offsite flood impacts and is compatible with the existing floodplain environment.

The proposal will not have an adverse impact on the normal flow of the river or during flood events.

3.8.4 Water – Estuarine Water Quality

Martens have completed an Estuarine Water Quality Impact Assessment which included the collection of water samples, historical analysis of water sampling and modelling the estuarine processes using the TUFLOW AD program.

The investigations and assessment found that the existing Shoalhaven River water quality within and near to the proposed extraction area, including the present extraction area, is generally of a high quality and broadly consistent with ANZG guidelines for fresh and marine water quality.

The assessment recommended ongoing water sampling be undertaken with monthly and annual reports prepared.

The conclusions reached within the assessment show that the proposed expanded dredge area operations are not likely to detrimentally impact on Shoalhaven River or estuarine water quality. No cumulative impacts are expected as any impacts represent < 0.2% change and are very short lived, being in the order of few hours after cessation of daily operation.

3.8.5 Noise

An Environmental Noise Impact assessment was prepared and completed by Harwood Acoustics, Acoustical Consulting to assess the noise emissions from the floating dredge at neighbouring receptor locations.

The assessment made recommendations and concluded that provided these recommendations are implemented and adhered to, the level of noise emission will not exceed the EPA's Noise Policy for Industry 2017 project noise trigger levels at any of the assessed sensitive receptor locations.

The recommendations made were administrative and include restricting the operation of the dredge to daytime hours only, as defined by the EPAA and ensuring the dredge does not operate less than 120 metres from any residential receptor.

3.8.6 Air

Air quality impacts of the proposal will be limited to the exhaust emitted by the current dredge. The dredge is fitted with a factory standard Cummins KTA19 diesel motor, 500 horsepower, and has not been modified. The motor and exhaust meet Australian Standards for noise and air quality.

The dredge has been, and will continue to be, serviced at predetermined regular intervals as nominated by the manufacturer.

The current standard of air quality associated with the floating dredge will not be altered by the proposed development.

3.8.7 Biodiversity

A Flora and Fauna Assessment has been prepared by Peter Dalmazzo. The assessment reviews existing habitat and vegetation, including subtidal, inter tidal and terrestrial habitats, benthic invertebrates and shallow water fish, recreational and commercially important fish, amphibians, reptiles and mammals as well as birds.

The report concludes that provided the environmental safeguards listed in the report and in the Martens reports (2019a, 2019b, 2019c & 2019d) are employed, the proposed extension of the sand extraction area is not likely to significantly affect threatened species, populations or ecological communities, or their habitats, listed in the *Fisheries Management Act 1994* (NSW) or the *Biodiversity Conservation Act 2016* (NSW) and therefore neither a species impact statement nor a biodiversity development assessment report is required.

The report also noted that the proposed development is not likely to have a significant impact on a matter of national environmental significance and will not be undertaken on or have an effect on Commonwealth land. The proposed action therefore does not need to be referred to the Australian Minister for the Environment.

3.8.8 Heritage

The Due Diligence Aboriginal Heritage report prepared by Biosis in 2012 recommended that a cultural heritage induction package be prepared and implemented for all workers on site. TSS has prepared such an induction program which includes information on visual identification of Aboriginal cultural material, particularly stone and wooden artefacts.

All workers employed by TSS have been inducted into the cultural heritage induction plan. This will continue to be implemented for all staff employed in conjunction with the expanded dredge area.

3.8.9 Waste

The proposed extension of the dredge area on the bed of the Shoalhaven River will not generate waste in its own right. The current conditions which stipulate the way waste is processed, as per RA12/1001, will be maintained.

One additional disposal opportunity for waste fines is proposed through retention on Pig Island as three stock refuge mounds and for use in routine agricultural activities. This would allow for a

quantity of waste fines to be retained on the island, though is not intended to replace existing waste management activities (such as offsite export of waste fines) as detailed in RA12/1001. It is requested that the retention of fines on Pig Island be covered by a separate construction certificate.

3.8.10 Hazards

The floating dredge is licenced (Certificate of Operation) by the Roads and Maritime Services (RMS). The operational licence stipulates Limits and Conditions that have regard to navigational requirements, pollution and substance discharge, mooring details and ensuring safety of movement in proximity to the dredge. Reference is made to the matters specified in *NSW Marine Safety (General) Regulation 2009* (NSW)*, Protection of the Environment Operations Act 1997* (NSW) *and Marine Pollution Act 1987* (NSW) within the limits and conditions.

The dredge complies with the various legislative requirements within the terms of the licence. This compliance is evidenced by the recent granting of a renewed registration and licence. These requirements will continue to be adhered to within the proposed extended dredge area.

3.8.11 Visual

The proposal does not seek to change nor alter the size, shape or colour of the existing floating dredge currently used by TSS. The dredge does not look out of place as a nautical structure and the neutral colour does not contrast it with it surrounds.

Visual impact for the residents along the Terara foreshore will be lessened and, in some cases removed, as the majority of the proposed dredge area will be located on the northern, opposite side, of Pig Island.

The proposed dredge area is largely located further east from the Nowra Bridge than the existing dredge area. The dredge already forms only a minor component of the River visual field. The increased separation of public viewing areas from the dredge will only further reduce the perceived scale in relation to the landform backdrop of Coolangatta Mountain, the boats moored in the river, industrial development on the northern banks of the River and Pig Island itself.

The northern bank of the river, opposite the proposed dredge area, is not accessible to the public and accommodates the industrial complexes of Manildra and other metal fabricating buildings. There are no visual amenity issues associated with views from this area.

The visual impact the floating dredge will have in its new location will not change in form or scale. It will generally reduce from most public spaces due to the increased separation distances and will be completely removed from some locations within Terara Village.

3.8.12 Social & Economic

It is envisaged that the social and economic outcomes currently enjoyed by the local community will remain unchanged. These outcomes include continuation of local employment, economic inputs into the local community and supply of a valuable resource to the local and regional area. As the current resource area is nearing depletion these benefits will be lost if an expansion, or replacement, of the dredge area is not obtained.

Dredging within the vicinity of Pig Island has been ongoing for the past 50 years. The proposal does not seek to increase the amount of sand produced over and above its licenced condition. The processing plant will remain as is, as an enterprise currently employing 5 full time and 1 part time employee from the local area.

On average Terara Shoalhaven Sand Pty Ltd injects some $100,000 per month into the local economy by using local businesses for its materials, equipment purchases and services.

3.9 Rehabilitation

Martens have prepared a Rehabilitation Management Plan ("RMP") from baseline studies and observations to detail the history of the area and the existing landform of the riverbed.

The following rehabilitation measures are recommended to be implemented,

1. Former dredged area to be left for a minimum of 10 years to allow sediment replenishment;
2. Regular periodic monitoring of water quality and riverbank conditions; and
3. Implement appropriate bank stabilisation and / or bank revegetation works, where required.

Management action schedules, to manage environmental and ecological values of the study area and to implement the RMP, along with timeframes and responsibilities have been provided as part of the plan.

4.0 Introduction

EA Panucci and PDC Lawyers and Town Planners have been commissioned by Sam 8888 Pty Limited, trading as Terara Shoalhaven Sand ("TSS"), to prepare a Development Application and Environmental Impact Statement to extend the area on the bed of the Shoalhaven River used for extraction of sediment by floating dredge. The sediment won is then processed into coarse river sand at an existing processing facility on Terara Road and used predominantly for construction and landscaping purposes.

At present TSS are the only private commercial supplier of coarse river sand to the general public south of Sydney, North of Batemans Bay and east of Braidwood. The coarse river sand processed by TSS is and has been used by the Environmental Protection Authority for environmental works, Kurnell salt water refinery plant, filtering and pipe bedding for the local sewerage treatment plant, roadworks for RMS, filling of playing fields, bedding of pipes, general construction and domestic purposes.

4.1 Project Overview

The proposed development relates to the bed of the Shoalhaven River adjacent to the western and northern shores of Pig Island. Figure 2 below shows Pig Island in relation to the nearby Terara village and townships of Bomaderry and Nowra on the northern and southern banks of the Shoalhaven River respectively.

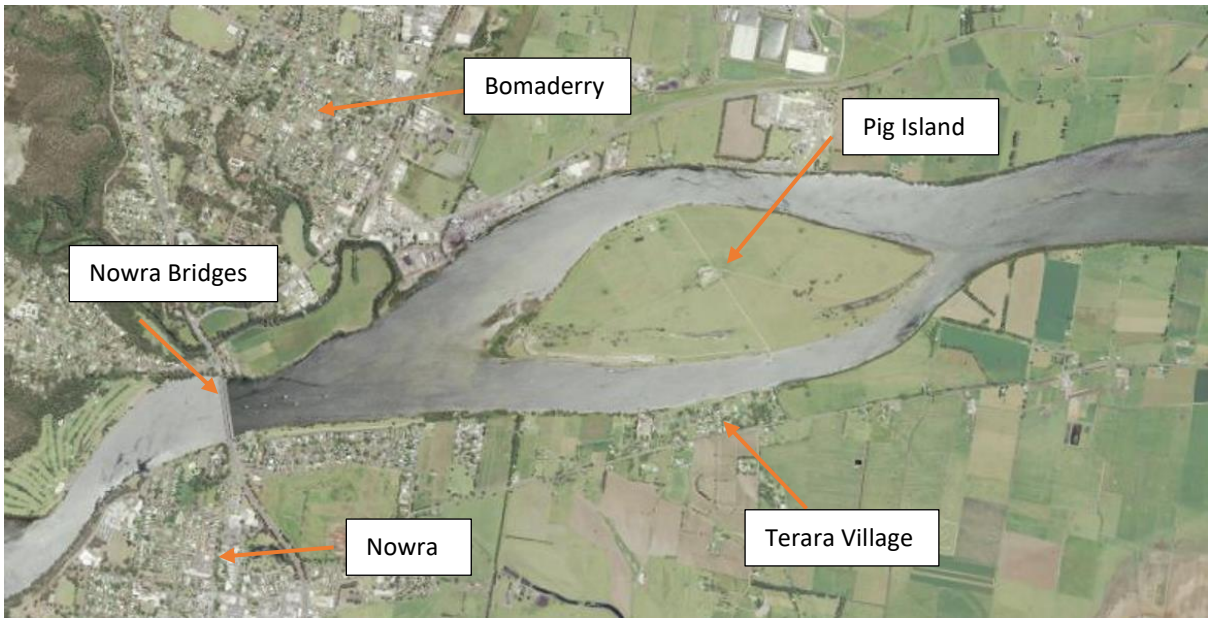

Figure 2: Location image showing Pig Island in relation to Nowra and Terara via LPI SIX Viewer website

The proposed dredge area is located to the west and north of the existing operational dredge area associated with Terara Shoalhaven Sand operations. The expanded dredge area will essentially bring dredging operations around the western end and northern side of Pig Island.

TSS currently dredge sediment from the southern side of Pig Island under licence RI515347. Sediment from current operations is sent to a processing plant at 125 Terara Road, Terara for processing to remove course materials and silts from the Course River Sand.

The proposal at hand does not seek to increase the amount of material won on an annual basis, nor seek to increase traffic movements to and from the Terara processing plant. No change to hours of operation, the current method of processing, the way the fines are controlled and processed, or the way the material is dredged and won from the bed of the Shoalhaven River is proposed.

The proposal only seeks to extend the area over the bed of the Shoalhaven River, adjacent to the western end and northern side of Pig Island, where the sediment is won.

4.2 Project Objectives

The resource within the current approved dredge area is nearing exhaustion. This application seeks development consent for the expansion of the dredge area to an identified sand resource immediately adjacent to existing operations. By extending the dredge area the longevity of TSS can be maintained for the near future (19-40 years). The additional resource will provide course river sand for the local and regional area, as well as construction projects as far afield as Sydney.

4.3 Project History

Course river sand has been dredged and won from within the vicinity of Pig Island in the Shoalhaven River since the late 1960's – early 1970's. The first Permissive Occupancy issued to George Schadel for the purposes of sand mining in this area was granted in 1968. Since this approval several further operational approvals have been granted to allow ongoing extraction of sand from the area, with RA12/1001 being the last and current approval. RA12/1001 was presented to the Regional Planning Panel in June 2013 and granted Consent on the 28th August 2014.

Figure 3 shows the area covered by the 2012 application in relation to the current application. As can be seen the areas are just about identical save for the 2012 buffer to the seagrasses. The buffer proposed in 2012 was 15m, whereas this application proposes a buffer of 25 metres.

The extraction area, subject to this application, was previously investigated in accordance with the then Director General's Requirements in 2011. The various reports prepared to accompany the EIS in 2012 concluded that the proposal would not result in environmental or ecological harm to the river and environs.

When RA12/1001 was lodged it included the majority of the area TSS is currently seeking approval to dredge. During the assessment process, submissions were received by the Joint Regional Planning Panel, in particular one made on behalf of the landowner of Pig Island. As a result of this submission the application was modified to apply for a reduced area, reflecting that approved in 2014.

This current DA and EIS reviews many of the reports and surveys undertaken in 2012 as well as undertaking further investigation where warranted. As some of the issues raised in preparing this application have not changed from the 2012 reports, this document refers to the conclusions and recommendations of certain reports prepared in 2012 and accompanying the EIS prepared by Allen

Price and Associates. In particular, the Due Diligence Advice for Aboriginal Archaeological Heritage prepared by Biosis and the Air Quality assessment prepared by Clearsafe.

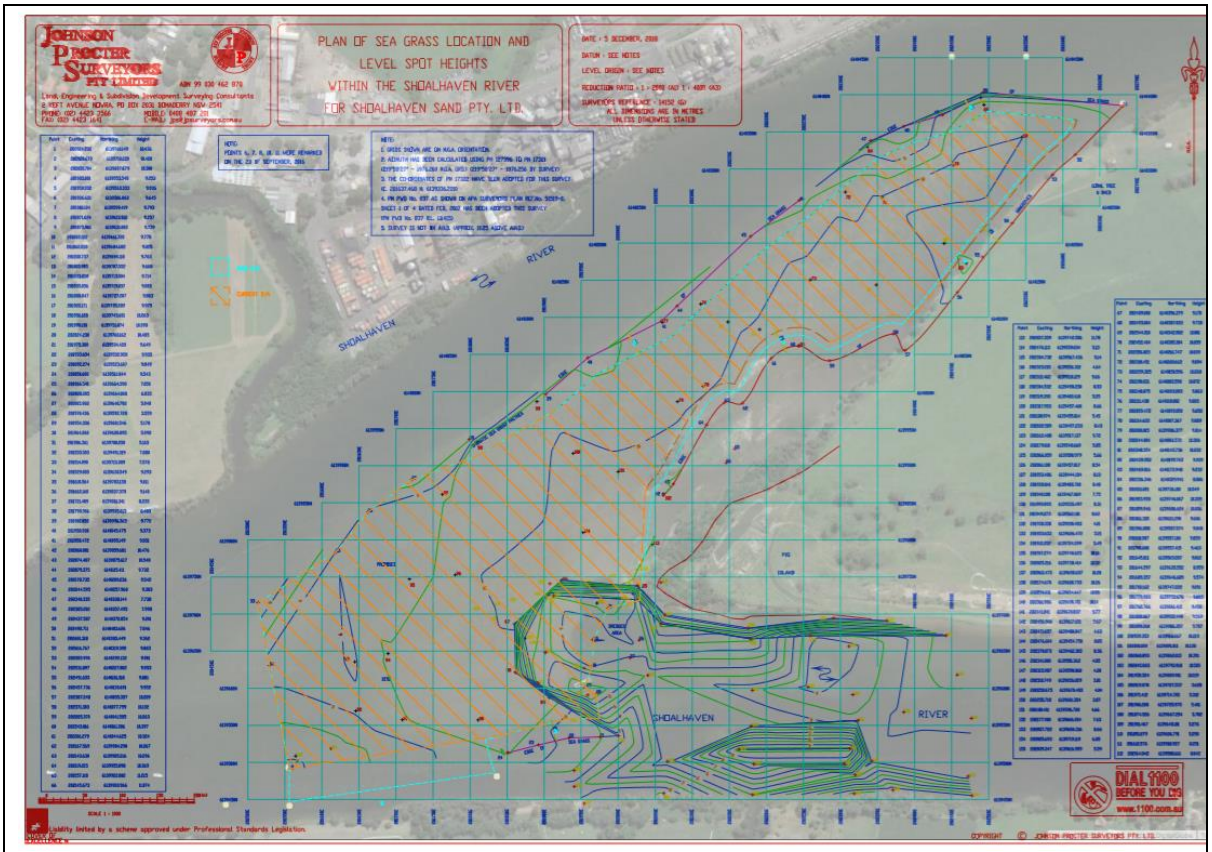

Figure 3: Aerial photo showing investigation area in 2012 (blue dotted line) and current area (yellow hatching)

NSW Department of Lands have issued a licence under the Crown Lands Act 1989 granting approval for the removal of sediment from the *bed of the Shoalhaven River adjoining Lots 1 to 3 DP 1187490 Pig Island* to process into coarse river sand. The licence, RI 515347, outlines conditions including amongst other things royalties to be paid, navigable signage and considerations and reference to any possible claims made under the *Native Title Act 1993* (Cth) and *Aboriginal Land Rights Act 1983* (NSW).

The sand mining operation is continually monitored by the Environment Protection Authority via the Environment Protection Licence over the dredging process (noise, dust, land and water pollution), and the Department of Mines (safety of the working plant and dredge) as to the dredge and land-based processing.

The method and processes used to produce the coarse river sand have been constant over the 50 plus years since sand mining has been undertaken in this vicinity and will be maintained. The sand mining and processing will be in accordance with the conditions stipulated in RA12/1001 and licences issued by the relevant Government authorities.

4.4 Ecologically Sustainable Development

This EIS has been prepared having regard to Ecologically Sustainable Development ("ESD") principles. These principles can be summarised as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

For the purposes of this EIS, Schedule 2 of the EPA Act Regulation 2000 defines the principles of ESD as follows:

a) *the precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*
    i. *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
    ii. *an assessment of the risk-weighted consequences of various options,*

b) *inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*

c) *conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*

d) *improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:*
    i. *polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*
    ii. *the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*
    iii. *environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems*.

The principles of ESD have been embodied within this EIS.

4.5 Consultants

To assist in the preparation of the EIS specialist consultants were commissioned to provide reports based on their expertise**.** The table below outlines the consultants used in preparing and compiling this EIS.

Consultant	**Report**
Martens - Consulting Engineers	River Impact Assessment • Flood Assessment – Dredge Activities • River Stability Assessment • Estuarine Water Quality Impact Assessment • Land Resource assessment • Contamination Assessment

	• Acid Sulfate Soils Assessment • Rehabilitation Management Plan • Estuarine Water Quality Impact Assessment • Food Assessment - Livestock Refuge Mounds on Pig Island
Peter Dalmazzo - Environmental Consultant	Aquatic Habitat, Flora and Fauna Assessment
Harwood Consulting – Acoustical Consulting	Environmental Noise Impact
Biosis Research – Indigenous Archaeology	Aboriginal Due Diligence Report
Clearsafe Environmental Solutions -	Air quality assessment
Johnson Procter Surveyors	Survey and site plans

Table 1: Consultants involved in preparing supporting documentation

4.6 Analysis of Feasible Alternatives

In analysing feasible alternatives, it should be noted that the product produced is coarse grained river sand which has consistent grain size, above average filtering qualities and due to its chemical properties is suitable for use where body contact is involved (playing fields and landscaping).

Coarse grained sand can be produced by various means, including sandstone blasting and crushing as well as dry deposit formations; but as the name suggests coarse river sand is won by processing sediment deposits within river systems either by wet extraction or dry bank excavation.

Most river sand deposits in proximity to Pig Island, are owned by large companies which use the sand in the production of their own products - typically concrete, asphalt and filter systems. By comparison TSS is a relatively small-scale commercial operator. However, unlike the larger competitors within the marketplace, TSS sells to the general market and is the only supplier of this particular product north of Batemans Bay, South of Sydney and east of the Southern Highlands.

To place the proposal into perspective the following table of various alternatives, which is included in Chapter 4.10 on Social and Economic Impacts, shows how it compares to other options to produce coarse river sand and coarse sand in general.

Alternatives	**Advantages**	**Disadvantages**
Not proceeding – the *do-nothing* option	There are no discernible advantages.	The sediment won will be exhausted over time. The current operations will be reduced to dredging of the current lease area after a fresh accretion or flood has occurred and filled the existing dredged area. The location of the dredge will be limited to its current position as per RA12/1001. Navigation around the western end and northern side of Pig Island will be

		restricted to high tides, particularly as further accretion events occur. The volume of fines generated from the process will increase due to the quality of the sediment won. Due to the poorer quality the quantity of material won would increase to produce the same amount of coarse river sand. Importing of similar grained sand into the Shoalhaven area will mean increased truck movements and a larger environmental footprint.
Seek alternative suppliers for a similar product.	Certainty of supply to the local construction industry.	Loss of employment through reduced dredge and processing quantities. Loss of economic flow on effect generated by employee and company spending in the local economy. Reduction in royalty payments made to the State Government. Increased cost of supplying coarse river sand to the local area. River will continue to silt up around Pig Island and limit navigation around the island to high tides and minimise the width of navigation channels.
Seek other sediment deposits within the Shoalhaven River System containing coarse river sand	Certainty of supply of coarse river sand to the local and near-by areas including the Sydney Basin. Improving the navigation of vessels within the river. Economic flow on benefits for the local business community.	Development Application required from first principles including preparation of an EIS and seeking of subsequent licences and approvals. New environmental, amenity and social impacts associated with the new locality and replication of equipment (new dredge, new processing plant, new vehicle movements etc). Processing plant required in close proximity to the dredge area. Stockpiling and transport of sand from the site to be resolved. River will continue to silt up around Pig Island and limit navigation around the island to high tides and minimise the width of navigation channels.
Expand the area on the bed of the river where sediment can be won from.	Certainty of supply of a quality product to the local construction industry and area. Future security to a local business both in supply of the product and long term viability.	The longevity of the sand dredging operation will be extended. The economic benefits currently enjoyed by the local economy will be maintained. Payment of royalties to the State Government, based on the quantity of

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	Increase the navigational potential around the western end of Pig Island across all tides. The visibility of the dredge from the southern shores of the Shoalhaven River will be reduced once it starts on the northern side of the island.	sand produced, will continue to be made. No new environmental, amenity and social impacts associated with relocating the activity to a new area and replicating equipment etc. Navigation around Pig Island is improved by removal of accreting sand.

Table 2: Assessment of alternative to the proposed development

4.7 Secretary's Environmental Assessment Requirements

Due to the type of development (resource extraction) and processing quantities proposed, the development is classified as "*Designated Development*" under Schedule 3 of the EPAR. Accordingly, an Environmental Impact Statement is required to accompany any Development Application made to extend the dredge area over the bed of the Shoalhaven River.

Prior to the preparation of the EIS the NSW Department of Planning and Environment SEARs, were sought and issued on the 22 June 2018. The SEARs were reviewed on the 29 June 2018. A full copy of the SEARs is attached as Appendix 1 in Volume 2 of this report.

The following table outlines how the SEARs have been addressed.

Requirement	**Location in EIS or Supporting Documentation**
Water EIS should outline any water licensing arrangements. Assessment of erosions and sedimentation Detailed flood study	Section 7.1 of this report. Detailed supporting assessments prepared by Maten's Engineers are provided in Volume 2 Appendices 3, 4, 5 and 10.
Noise EIS does not need to address construction or traffic noise, however it should address operational noise	Section 7.2 of this report. The detailed investigative report by Harwood Acoustics is provided Volume 2 Appendix 12.
Air	Section 7.3 of this report. The detailed assessment prepared by Clearsafe is provided in Volume 2 Appendix 14.
Biodiversity • Detailed assessment of threatened species, populations and ecological communities • Targeted aquatic ecological assessment • Description of proposed measures to maintain or improve biodiversity values	Section 7.4 of this report. Detailed assessment report prepared by Peter Dalmazzo and supporting reports are provided in Volume 2 Appendix 11.
Heritage Assessment of potential impacts on Aboriginal heritage and evidence of appropriate consultation with relevant parties Identification of non-Indigenous heritage in the vicinity and any impacts from the proposed development	Section 7.5 of this report. Detailed due diligence report prepared by Biosis is provided in Volume 2 Appendix 13.
Land Resources Assessment of potential impacts on soil and land capability Compatibility of the development with adjoining land uses	Section 7.6 of this report. Detailed assessment of potential resource prepared by Marten's Engineers provided in Volume 2 Appendix 8.
Waste EIS should identify waste streams and their management	No new or additional waste streams are anticipated. Existing waste management controls stipulated in RA12/1001 will be continued. Refer to section 7.7 of this report.

Hazards EIS should address potential contaminants, risks to public safety (including navigation hazards)	Section 7.8 of this report. Detailed assessment reports prepared by Marten's is provided in Volume 2 Appendix 6 and 7.
Visual EIS should assess the impact of the current proposal (expanded dredge area).	Section 7.9 of this report.
Social and Economic Consideration of the social and economic impacts including impacts on recreational and commercial fishing activities, including bait collection	Section 7.10 of this report.
Rehabilitation Detailed description of the proposed rehabilitation measures	Section 7.11 of this report. Detailed rehabilitation plan prepared by Marten's Engineers provided in Volume 2 Appendix 9.
Environmental Planning Instruments Address relevant statutory provisions applying to the site and proposed development	Section 6 .0 of this report.

Table 3: Outline of how the SEAR's have been addressed within the EIS

5.0 Project Description

5.1 Project Proposal

TSS currently extracts sediment from the south western end of Pig Island. This application seeks development consent to extend the area on the bed of the Shoalhaven River where sediment can be dredged and won to process into coarse river sand. The dredge will move throughout the proposed dredge area systematically and is expected to extract to a maximum depth of -6.7m AHD. There is no 'staging' proposed for the development.

The sediment built up around the western end and banks of Pig Island, has been identified as a mineral resource that once processed is suitable for construction, human contact and other land use purposes.

In 1974 The Geological Survey of New South Wales, within the publication, "The Geology and Low Cost Extractive Resources of the Nowra Jervis Bay Area" published by the Department of Mines in March 1975, identified the area near Terara as a source of coarse sand.

Page 74 of the report notes:-

" ... , a few kilometres east of Nowra (see map 4), fluvial sand is dredged from the river, on the southern side of Pig Island by Schadels Concrete Products Pty Limited. A small floating dredge lifts the sand, which is then washed and screened to remove the large shells and organic matter and sold as clean fill sand. The sand is similar lithologically to, but is of finer grainsize and is cleaner and better sorted, than that from Burrier.

... relatively uniform grainsize makes it ideal for use as clean fill in situations where high permeability properties are required, such as, bedding in trenches for laying pipes. Removal of the coarse shell and organic fragments substantially reduces the carbonate and shell content and the sand may be suitable for use as concrete sand."

Page 92 of the same report under the heading, downstream from the Western End of Long Reach, notes that the potential for river sand is greater downstream. The report notes that:-

" … Sand, and muddy sand occur as banks and shoals at various places east of Nowra, such as Pig Island (Staude, 1969) and Numbaa Island. These Sands could be regarded as potential sources of fill sand and in some cases may, after suitable processing to remove silt, organic matter and shell, be suitable for use as concrete sand."

This area was identified some time ago, as an area of potential supply of course river sand.

It should be noted that this proposal does not seek to increase the licensed and approved extraction rate, the hours of operation, the method of operation, number or travel paths of vehicles or alter the sedimentation control devices in place. The existing method of extraction and processing will not alter. The conditions of consent, stated in RA12/1001, will be maintained including the relevant licences associated with the operations.

The proposed dredge area relates directly to the accretion of sediment around the western and northern land form of Pig Island. The boundaries of the proposed dredge area extend to the western

and southern edges of the accretion area and apply a 25 metre offset buffer to existing sea grasses and mangroves in the north, south and eastern edges of the sand flat.

The land uses on the neighbouring banks of the Shoalhaven River and Pig Island vary from agricultural on the island; agricultural, commercial, residential and rural residential on the southern banks of the Shoalhaven River, save for the sand dredging processing plant (industrial); and mainly industrial on the northern banks of the river.

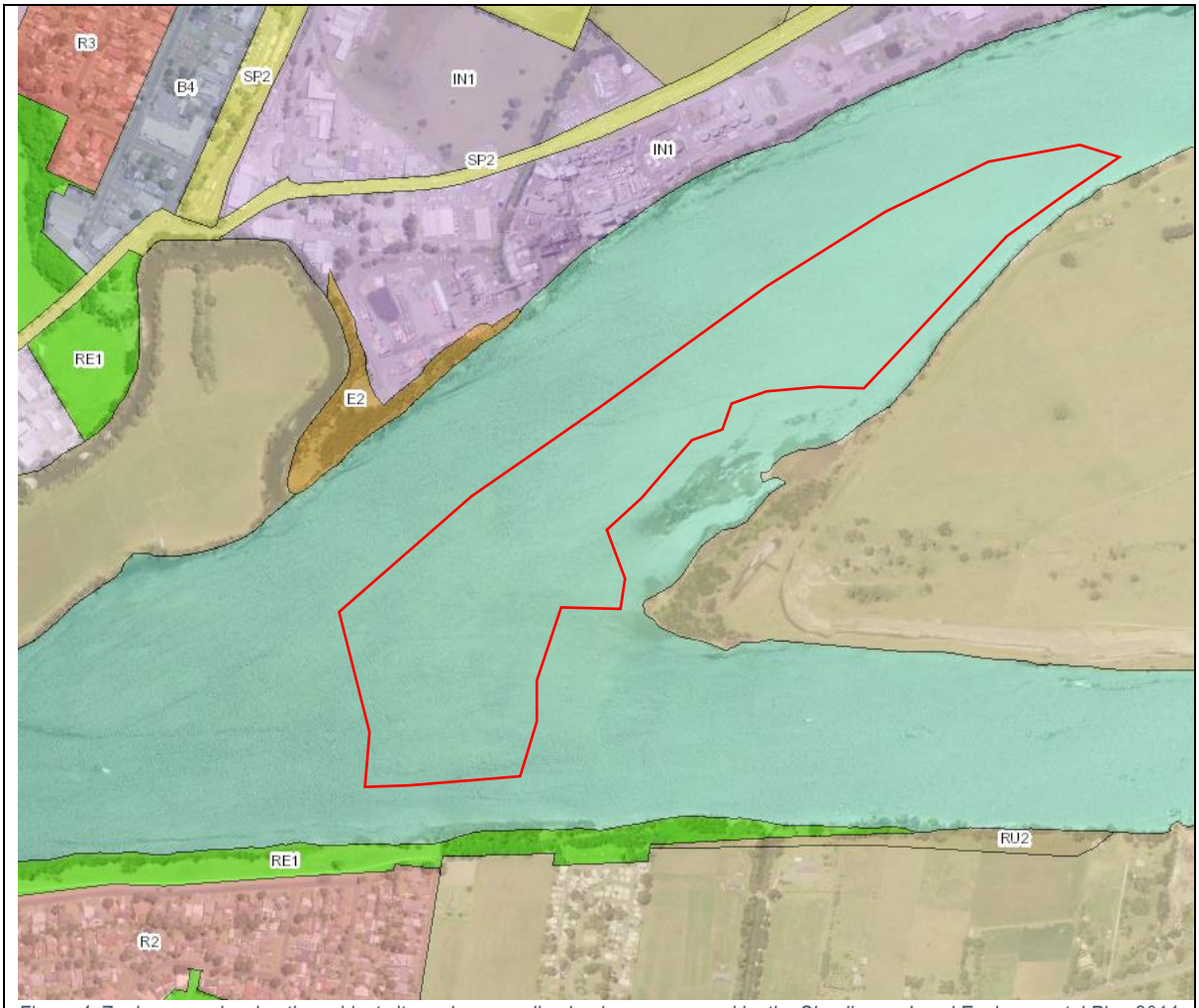

Figure 4: Zoning map showing the subject site and surrounding land uses as zoned by the Shoalhaven Local Environmental Plan 2014

Figure 4 shows the general location of the expanded dredge area outlined red in relation to the surrounding land uses as zoned by the Shoalhaven Local Environmental Plan 2014.

The dredge to be used is already present within the river and operates on the southern side of Pig Island (Figure 5). All processing equipment and transport arrangements are existing and will continue unchanged. No new transport routes, processing methods, waste management methods, staff ratios or service connections are proposed or required.

5.2 Site

Pig Island is located within the Shoalhaven River some 2km east of the Nowra Bridges. The Shoalhaven River anabranches the island and access to it is limited to watercrafts and ferry. A private ferry, which connects the island via Bryant Street Terara, is co-owned and maintained by the owners of the island and TSS. Bryant Street is the eastern most road within Terara village.

The Shoalhaven River is a substantial water body with its head commencing at the base of Middle Mountain, located within the Deua National Park near Moruya, Bodalla and Captains Flat. The River is 330 kilometres in length and drops 860 metres in elevation from Middle Mountain through to the Tasman Sea. The Shoalhaven River system has 34 tributaries which flow into it and comprises some 800 km^2 of runoff producing catchment which consists of bushland, National Park, actively worked farmlands, sandstone cuttings and flood plains in its lower reaches just before it meets the Tasman Sea.

Pig Island sits about 11.5 kilometres west of the coastline at Shoalhaven Heads. It is the most westerly island within the Shoalhaven River system and is located in the lower Shoalhaven floodplains. Pig Island is the first major landform in the river that impedes water and sediment flows from upstream. Over time sediment, which has been transported from upstream land use activities and natural processes, has built up around Pig Island. These accretions have contributed to the increase in size of Pig Island and can limit vessel movement through that part of the River, particularly at low tide. The major navigation channel within the river is to the north of the island, adjacent to the northern banks of the Shoalhaven River. This channel accommodates deep drawing vessels across all tides.

The sediment subject to this application is limited to the northern side of Pig Island, towards its western end. The sediment is identifiable on the aerial photograph (Figure 4) and is more accurately located in the Martens Report (volume 2 Appendix 11).

Figure 5 shows the dredge area approved in RA12/1001 outlined in red and the proposed extension to that area denoted by a black broken dotted line.

Figure 5: Aerial photograph showing location of existing and proposed dredge areas.

The proposed extension area (denoted by black broken dotted line) is exposed to the air at low tides and inundated by up to a metre of water at high tides. It is therefore located below mean high water mark and is considered to form part of the bed of the Shoalhaven River. The area has been described as *intertidal sand and mud flats*.

As the site is below mean high water mark and forms part of the bed of the Shoalhaven River it is not considered 'land' and therefore does not have a lot and DP identifier. The bed of the Shoalhaven River in this area is Crown Land and subject to licensing under the *Crown Land Management Act 2016* (NSW).

At the completion of dredging operations it is intended for the final landform to be consistent with surrounding topography and surrounding environment. The area will be left in a suitable state that future land uses within and adjacent to the site will not be affected. The following measures are recommended in the rehabilitation plan:

1. Former dredged area to be left for a minimum of 10 years to allow sediment replenishment;
2. Regular periodic monitoring of water quality and riverbank conditions; and
3. Implement appropriate bank stabilisation and / or bank revegetation works, where required.

The proposed rehabilitation process is intended to be implemented as part of the business model and plan, in conjunction with ongoing operations. Timing of elements of the rehabilitation plan implementation in conjunction with ongoing excavation works will ensure that financial and material resources are available to fully complete the project.

5.3 Consultations with Shoalhaven City Council and the Local Community

Correspondence with Shoalhaven City Council was received within the SEARs. The issues raised by Council have been addressed within this document.

To garner local resident comments on the proposal a public meeting was organised on Wednesday 12th December 2018 between 7pm and 9pm, at 127 Terara Road Terara, next door to the land-based component of the dredging works, at Riverside Gardens. The meeting was advertised for a period of two (2) weeks in the local newspaper the *South Coast Register* as well as via letter drops and phone calls to Government offices. The meeting was attended by some 18 interested members of the community including 2 representatives from the owners of Pig Island. A copy of the attendees and the public notification is attached as Appendix 15 Volume 2 of this report.

The meeting was addressed by Ernie Panucci where the proposal was explained, and that community consultation was required as part of the application process as the proposal has been identified as *Designated Development*. Documents received from government departments were exhibited along with the SEARs, a base plan sowing the proposed extension area and letters to government.

Questions of a general nature were asked so that those present could obtain further information on the proposal. In general, those in attendance did not have any issues as they appreciated that there would be no physical change to the workings of the dredge and plant and that the location of the dredge would be located away from the Terara Village and at some point not visible from the southern bank of the river, along Riverview Road and the Village.

Some attendees questioned the location of the floating dredge and when informed that it would be located mainly on the northern side of Pig Island, they agreed it would have nil to little impact on them.

The meeting was informed that submissions could be made to Shoalhaven City Council, once the application had been formally lodged. No objections to the proposal were tabled at the meeting by those in attendance.

Notes from the public meeting held are included in the Chapter 4.10, titled Social and Economic Impacts. The issues raised by Council, the SEARs and from the resident briefing have been addressed in the body of the EIS.

6.0 Strategic and Statutory Context

6.1 Permissibility

In accordance with the Shoalhaven Local Environmental Plan 2014 (SLEP) the bed of the Shoalhaven River is zoned W2 – Recreational Waterways.

SLEP does not list "dredging" as a permitted land use within the W2 – Recreational Waterway zone and accordingly is prohibited.

Even though the SLEP prohibits the proposed land use, dredging of the riverbed is permissible by the enaction of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 ("SEPP (Mining *et al*)").

SEPP (Mining *et al*) becomes the legal document which gives carriage for the proposed development to be considered and determined. SEPP (Mining *et al)* is considered in detail within section 6.3.11 (volume 1) of this EIS.

6.2 Commonwealth Environmental Planning Instruments and Guidelines

6.2.1 Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Actions that are likely to have a significant impact on a matter of national environmental significance or are being undertaken on or would have an effect on Commonwealth land, are known as protected matters and may require approval under the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The EPBC Act identifies eight matters of national environmental significance:

- World heritage properties;
- National heritage places;
- Ramsar wetlands of international importance;
- Listed threatened species and ecological communities;
- Listed migratory species;
- Commonwealth marine areas;
- The Great Barrier Reef Marine Park;
- Nuclear actions (including uranium mining).

The provisions of the EPBC Act of relevance to this proposal have been addressed in the report contained within Appendix 11 Volume 2 of this document, prepared by Peter Dalmazzo.

The report concludes that the proposal does not need to be referred to the Commonwealth Government Minister for the Environment for approval under the EPBC Act.

6.3 State Environmental Planning Instruments and Guidelines

6.3.1 Aboriginal Land Rights Act 1983

Pursuant to Part 3 Section 45, any Native Title Claims over the area of operation would require dredging activities to cease. If this were to occur a license from the relevant Aboriginal Land Council would need to be obtained under the Native Title Act 1993.

The heritage assessment prepared by Biosis Consulting (2012) in association with the previous license application assessed the area subject to this application and indicated that the archaeological potential for Aboriginal heritage matters is low.

The recommendations of the 2012 report have been and will continue to be implemented, however it is not considered necessary for a heritage impact permit to be obtained.

6.3.2 Biodiversity Conservation Act 2016

The NSW Biodiversity Conservation Act 2016 commenced on 25 August 2017 and replaced the *Threatened Species Conservation Act 1995.*

The main purpose of the Biodiversity Conservation Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ESD. The Act applies specifically to terrestrial animals and plants.

For the assessment of development applications, the Act requires the consent authority to consider the likely impact of development on biodiversity values. Where a development is likely to have a significant effect on threatened species, the BC Act requires proponents to prepare and submit a Biodiversity Development Assessment Report (BDAR).

This Environmental Impact Statement includes a Flora and Fauna Assessment prepared by Peter Dalmazzo (including a marine ecology assessment). The report makes a thorough assessment of the proposal against the provisions of the Biodiversity Conservation Act. A copy of this report and supporting documentation is provided in Volume 2 Appendix 11 of this report.

The flora and fauna assessment indicates that the proposal is satisfactory with respect to potential impacts upon threatened species and no SIS or BDAR is necessary.

6.3.3 Crown Lands Act 2016

The land subject to dredging in this application is Crown Land, as defined in the Crown Lands Management Act 2016 (NSW). The existing operation has been subject to a permissive occupancy license since 1968. A new lease application will be lodged to cover the expanded dredge area.

6.3.4 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (NSW) ("EPAA") and Environmental Planning and Assessment Regulation 2000 (NSW) ("EPAR") govern the process of planning and development in the state of New South Wales.

The EPA Act contains the following objectives of relevance to this proposal:

- The promotion of social and economic welfare of the community and environment by proper management, development and conservation of the States natural and other resources.
- Facilitate ecologically sustainable development.
- The promotion and co-ordination of the orderly and economic use and development of land.
- To protect the environment, including conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.

The proposed expansion of the mining extraction area requires development consent pursuant to the provisions of section 4.2 of the EPAA. The development proposed is not exempt development nor is it complying development.

Section 4.10 of the EPAA provides that a development is declared to be designated development by either an environmental planning instrument or the EPAR. In this instance, Schedule 3, clause 19, of the EPAR specifies that this proposal is designated development. Schedule 3 specifies the following extractive industries as being designated development:

Extractive industries (being industries that obtain extractive materials by methods including excavating, dredging, tunnelling or quarrying or that store, stockpile or process extractive materials by methods including washing, crushing, sawing or separating):

a. that obtain or process for sale, or reuse, more than 30,000 cubic metres of extractive material per year, or
b. that disturb or will disturb a total surface area of more than 2 hectares of land by:
  i. clearing or excavating, or
  ii. constructing dams, ponds, drains, roads or conveyors, or
  iii. storing or depositing overburden, extractive material or tailings, or
c. that are located:
  i. in or within 40 metres of a natural waterbody, wetland or an environmentally sensitive area, or
  ii. within 200 metres of a coastline, or
  iii. in an area of contaminated soil or acid sulphate soil, or
  iv. on land that slopes at more than 18 degrees to the horizontal, or
  v. if involving blasting, within 1,000 metres of a residential zone or within 500 metres of a dwelling not associated with the development, or
  vi. *within 500 metres of the site of another extractive industry that has operated during the last 5 years*.

The proposal includes extraction of up to 100,000 cubic metres of extractive material per year, it is within a natural water body, and is located on mapped Acid Sulfate Soils; therefore, under Schedule 3 of the EPAR the proposal is *Designated Development*.

Section 4.8 of the EPA Act sets out development of a type that is *integrated development*.

Integrated development seeks to link the development application approval process to other approval processes required by other NSW legislation. The idea of integrated development is to encourage a whole of government approach to the assessment of developments in NSW. Development is integrated if it requires consent and one or more approvals as outlined in the table below.

Act	Provision	Approval	Required for this Project?
Fisheries Management Act 1994	s 144	Aquaculture permit	No
	s 201	Permit to carry out dredging or reclamation work	No
	s 205	Permit to cut, remove, damage or destroy marine vegetation on public water land or an aquaculture lease, or on the foreshore of any such land or lease	Yes
	s 219	Permit to: (a) set a net, netting or other material, or (b) construct or alter a dam, floodgate, causeway or weir, or (c) otherwise create an obstruction, across or within a bay, inlet, river or creek, or across or around a flat	No
Heritage Act 1977	s 58	Approval in respect of the doing or carrying out of an act, matter or thing referred to in s 57 (1)	No
Mine Subsidence Compensation Act 1961	s 15	Approval to alter or erect improvements within a mine subsidence district or to subdivide land therein	No
Mining Act 1992	ss 63, 64	Grant of mining lease	No
National Parks and Wildlife Act 1974	s 90	Grant of Aboriginal heritage impact permit	No
Petroleum (Onshore) Act 1991	s 9	Grant of production lease	No
Protection of the Environment Operations Act 1997	ss 43 (a), 47 and 55	Environment protection licence to authorise carrying out of scheduled development work at any premises.	No
	ss 43 (b), 48 and 55	Environment protection licence to authorise carrying out of scheduled activities at any premises (excluding any activity described as a “waste activity” but including any activity described as a “waste facility”).	No
	ss 43 (d), 55 and 122	Environment protection licences to control carrying out of non-scheduled activities for the purposes of regulating water pollution resulting from the activity.	Yes
Roads Act 1993	s 138	Consent to: (a) erect a structure or carry out a work in, on or over a public road, or (b) dig up or disturb the surface of a public road, or (c) remove or interfere with a structure, work or tree on a public road, or (d) pump water into a public road from any land adjoining the road, or (e) connect a road (whether public or private) to a classified road	No
Rural Fires Act 1997	s 100B	Authorisation under section 100B in respect of bush fire safety of subdivision of land that could lawfully be used for residential or rural residential purposes or development of land for special fire protection purposes	No
Water Management Act 2000	ss 89, 90, 91	Water use approval, water management work approval or activity approval under Part 3 of Chapter 3	No

Table 4: Integrated development approvals

The approvals identified above as being required for this proposal and associated requirements will be discussed in detail within this section of this Environmental Impact Statement.

The EPAA contains certain provisions which outline types of development that are to be determined by Regional Planning Panels. In this instance, the proposal is one that is listed in Schedule 7 of State Environmental Planning Policy (State and Regional Development) 2011 as Regionally Significant Development, therefore the designated consent authority specified by Clause 4.5 of the EPAA is a Regional Planning Panel. For this development application, the Southern Regional Planning Panel will act as the consent authority on behalf of Shoalhaven City Council and make a determination of the same.

6.3.5 Fisheries Management Act 1994

The *Fisheries Management Act 1994* (NSW) ("FM Act") commenced on 16 January 1995. It aims to conserve, develop and share the fishery resources of the State for the benefit of present and future generations.

Under section 201 of the FM Act, a permit is required to carry out dredging or reclamation work. Pursuant to Clause 210 (2) (a) this requirement does not apply where the works will be authorised under a licence issued in accordance with the *Crown Lands Management Act 2016* (NSW). The current operations are subject to licence R13515347 issued under the previous *Crown Lands Act 1989* (NSW).

Section 205 of the FM Act relates to the regulation of harm to marine vegetation including mangroves, seagrasses and any other marine vegetation declared by the regulations to be marine vegetation. Section 205 of the FM Act stipulates that a person must not harm any such marine vegetation in a protected area, except under the authority of a permit issued by the Minister under this Part.

The FM Act defines Protected area and Harm as follows:

- **Protected area** means any public water land, or any area that is the subject of an aquaculture lease, and includes the foreshore
- **Harm**, in relation to marine vegetation, means gather, cut, pull up, destroy, poison, dig up, remove, injure, prevent light from reaching or otherwise harm the marine vegetation, or any part of it.

This Environmental Impact Statement contains all information required for the Minister to make an assessment of an application for a Permit under Section 205 of the FM Act. The proposed development will not harm a significant amount of marine vegetation during the dredging of the river. With regard to potential indirect impacts on habitat, Martens & Associates (2019) concluded that the proposed works will have insignificant impacts on riverine vegetation as:

- historical extraction works does not appear to have contributed to riverbank erosion;
- no significant change to flow velocity or sedimentation/erosion process are anticipated within the River;
- the expanded dredge area is outside areas of significant aquatic vegetation cover and the work is not expected to impact on areas with significant seagrass or seaweed cover as adequate buffers have been provided;

The Aquatic Habitat, Flora and Fauna Assessment prepared by Peter Dalmazzo reports that:

> *The proposed extraction would directly convert intertidal and shallow subtidal sand flat (up to 27.9 hectares) to deeper subtidal habitat. This would happen progressively over a period of two to three decades based on currently permissible extraction rates. The new subtidal habitat created in the dredged area would be available to a suite of estuarine fish and invertebrates different to that of the original habitat.*
>
> *Seagrass is an important nursery habitat for juveniles of many commercially and recreationally important species of fish. Seagrass generally supports a diverse and abundant fauna of fish and invertebrates. For this reason, the proposed extraction area has been defined to generally avoid dense seagrass beds and a 25 metre buffer has been proposed between the extraction area and existing seagrass beds.*
>
> *However, some areas with scattered seagrass patches that ranged from less than one square metre to a few square metres in area would be removed. This change in extent of seagrass that would result from the proposed dredging is within the known range of natural variation within the estuary.*
>
> *West (2010) measured the total seagrass in the Shoalhaven system as approximately 539 hectares (see Table 2). The proportion of this habitat type that would be affected relative to the total in the estuary is small.*

6.3.6 Mining Act 1992

Construction materials generally, including sand, are not prescribed as minerals within the meaning of the *Mining Act 1992* (NSW) ("Mining Act"). The Mining Act regulates the mining of mineral resources such as coal, copper and gold.

The provisions of the Mining Act have no application to this proposal and a mining lease issued under the provisions of the Mining Act is not required.

6.3.7 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (NSW) ("POEO Act") is administered by the NSW Environmental Protection Authority. The POEO Act commenced operation on 1 July 1999 and it enables the NSW State Government to regulate and reduce pollution. Extractive industries (land and water based) are a scheduled activity where they exceed specified extraction quantities pursuant to Schedule 1, clause 19 of the POEO Act. As a water-based extraction activity with a maximum extraction rate of 100,000 Tonnes per annum, the proposed development is a scheduled activity and requires licencing.

The proponents currently hold licences issued under the provisions of the POEO Act with respect to current sand extraction / dredging and pollution control activities. New licences will need to be issued should this application be approved. It is proposed to attain these licences through the integrated development application assessment system.

Specifically, a licence to authorise the carrying out of scheduled activities at any premises (Sec 43(b), POEO Act) is required. This Environmental Impact Statement will provide all information required for the NSW Environmental Protection Authority to make an assessment of an application for the aforementioned licence.

6.3.8 Water Act 1912

The proposed sand dredging does not involve any works related to water conservation, irrigation, water supply, drainage or changing the course of the River, therefore no licences or permits are required under the *Water Act 1912* (NSW).

6.3.9 Water Management Act 2000 and Water Management (General) Regulation 2011

The object of the *Water Management Act 2000* (NSW) ("WM Act") is the sustainable and integrated management of the State's water for the benefit of both present and future generations.

The dredging of sand from the bed of the Shoalhaven River is not a Controlled Activity in accordance with the provisions of the Act. Controlled Activity is defined as;

a. *the erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979), or*
b. *the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or*
c. *the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or*
d. *the carrying out of any other activity that affects the quantity or flow of water in a water source.*

The proposal is for excavation of material from an area below the MHWM boundary and is therefore not "land". Flood modelling by Martens demonstrates there is no effect on water quality or flows within the river system.

Pursuant to the provisions of Section 91 of the WM Act, a controlled activity approval is not required.

6.3.10 State Environmental Planning Policy (Coastal Management) 2018

State Environmental Planning Policy (Coastal Management) 2018 ("CM SEPP") applies to the NSW Coastal Zone as defined under the *Coastal Management Act 2016* (NSW). The Coastal Zone includes coastal wetlands, littoral rainforests, land subject to coastal hazards, coastal waters including estuaries, lakes, lagoons and the adjoining lands including headlands, and rock platforms.

The expanded extraction area is located in the coastal zone (Coastal Environment Area).

Clause 13 of the CM SEPP requires the consent authority to consider the impacts of proposed development on specified matters prior to issuing consent to development within the coastal environment area. The tables below respond to each of the matters specified in clause 13.

13 Development on land within the coastal environment area	
(1) Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:	
(a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,	Refer to the water quality, land resources, flood, stability, rehabilitation, ASS and flora and fauna assessments which demonstrate the proposals acceptability in relation to biological and environmental impacts.
(b) coastal environmental values and natural coastal processes	No unacceptable impacts on the environmental values or coastal processes are considered likely from the proposed development. Refer to the supporting reports and documentation.
(c) the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,	Marten's water quality reports investigated the likelihood of offsite water quality impacts. No unacceptable impacts are expected. No new sewerage or stormwater sources are created as the development simply expands the location of the dredge and the life expectancy of the operation. Dredge volumes and processes will be unchanged. Marten's river stability, flooding and rehabilitation assessments demonstrate that the proposal is not expected to present any problems for erosion and sedimentation. The works are not located in, or in close proximity to any of the coastal lakes identified in Schedule 1.
(d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,	No terrestrial vegetation will be affected. The proposed dredge area provides a 25m buffer from identified seagrass beds to ensure marine vegetation is not affected by the proposal.
(e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,	The site is not located in an area that could affect public access to coastal waterways.
(f) Aboriginal cultural heritage, practices and places,	A heritage impact assessment was prepared in support of RA12/1001. This report included the area subject to this current application. It did not identify any items or places of cultural significance and assessed the likelihood of discovering relics as low. The proposal is therefore considered unlikely to have unacceptable impacts on items or places of cultural significance to Aboriginal people.
(g) The use of the surf zone	N/A

Table 5: Response to Clause 13 of the Coastal Management SEPP 2018

6.3.11 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 ("Mining et al SEPP") applies to this proposal. The policy has the following aims:

a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and

b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and

b1) to promote the development of significant mineral resources, and

c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources, and

d) to establish a gateway assessment process for certain mining and petroleum (oil and gas) development:

i. to recognise the importance of agricultural resources, and

ii. to ensure protection of strategic agricultural land and water resources, and

iii. to ensure a balanced use of land by potentially competing industries, and

iv. to provide for the sustainable growth of mining, petroleum and agricultural industries.

The proposal is consistent with the definition of an extractive industry as provided for by Clause 3 of the Mining et al SEPP. Clause 7 of the Mining et al SEPP identifies development which can be carried out only with consent. Extractive industries are listed as development that requires consent.

Part 3 of the Mining et al SEPP sets out matters for consideration with respect to the assessment of development applications. The matters are addressed in the following table.

Clause	Matter for Consideration	Reference / Comment
12AB Non-discretionary development standards for mining	(1) The object of this clause is to identify development standards on particular matters relating to mining that, if complied with, prevents the consent authority from requiring more onerous standards for those matters (but that does not prevent the consent authority granting consent even though any such standard is not complied with). (2) The matters set out in this clause are identified as non-discretionary development standards for the purposes of section 4.15 (2) and (3) of the Act in relation to the carrying out of development for the purposes of mining. Note. The development standards do not prevent a consent authority from imposing conditions to regulate project-related noise, air quality, blasting or ground vibration impacts that are not the subject of the development standards. (3) **Cumulative noise level** The development does not result in a cumulative amenity noise level greater than the recommended amenity noise levels, as determined in accordance with Table 2.2 of the Noise Policy for Industry, for residences that are private dwellings. (4) **Cumulative air quality level** The development does not result in a cumulative annual average level greater than 25 µg/m^3 of PM_{10} or 8 µg/m^3 of $PM_{2.5}$ for private dwellings. (5) **Airblast overpressure** Airblast overpressure caused by the development does not exceed: (a) 120 dB (Lin Peak) at any time, and	The proposed development involves an expansion in dredge area, however the expanded area moves dredging equipment further away from residential receivers. The processing equipment and quantities will not change therefore no change to noise levels, air quality or vibrations are involved. No blasting activities are proposed. No aquifer interference is likely.

	(b) 115 dB (Lin Peak) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver. (6) **Ground vibration** Ground vibration caused by the development does not exceed: (a) 10 mm/sec (peak particle velocity) at any time, and (b) 5 mm/sec (peak particle velocity) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver. (7) **Aquifer interference** Any interference with an aquifer caused by the development does not exceed the respective water table, water pressure and water quality requirements specified for item 1 in columns 2, 3 and 4 of Table 1 of the Aquifer Interference Policy for each relevant water source listed in column 1 of that Table. Note. The taking of water from all water sources must be authorised by way of licences or exemptions under the relevant water legislation. (8) The Minister is to review a non-discretionary development standard under this clause if a government policy on which the standard is based is changed.	
12 Compatibility of proposed mine, petroleum production or extractive industry with other land uses	Before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must: (a) consider: (i) the existing uses and approved uses of land in the vicinity of the development, and (ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and (iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and (b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and (c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).	Existing uses within the vicinity are as described within this EIS. The proposal is to expand the area over the bed of the Shoalhaven River whereby sand is won. The expansion area takes the dredging activity further away from residential receivers and rural uses toward the industrial lands on the northern side of Pig Island. The dredging activities are not expected to impact on these industrial lands in any way. The sand dredging operation has been in existence for many years, particularly on the southern side of Pig Island, therefore the impact on the southern banks is existing. The development is not considered to be incompatible with any existing, or likely future land uses in the vicinity of the dredging area. This EIS and supporting studies address noise impacts of the development, air quality, traffic, visual, social and economic and impacts on the Shoalhaven River generally. The specialist reports contain a host of recommendations and conclusions aimed at avoiding/ minimising/mitigating incompatibilities with development within the vicinity of the activity proposed. A review of this EIS and associated specialist reports will demonstrate that the proposal is acceptable in this regard.
12A Consideration of voluntary land acquisition and mitigation policy	(2) Before determining an application for consent for State significant development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider any applicable provisions of the voluntary land acquisition and mitigation policy and, in particular:	N/A. The proposal does not constitute State Significant Development.

	(a) any applicable provisions of the policy for the mitigation or avoidance of noise or particulate matter impacts outside the land on which the development is to be carried out, and (b) any applicable provisions of the policy relating to the developer making an offer to acquire land affected by those impacts. (3) To avoid doubt, the obligations of a consent authority under this clause extend to any application to modify a development consent for State significant development for the purposes of mining, petroleum production or extractive industry. (4) This clause extends to applications made, but not determined, before the commencement of this clause.	
13 Compatibility of proposed development with mining, petroleum production or extractive industry	(1) This clause applies to an application for consent for development on land that is, immediately before the application is determined: (a) in the vicinity of an existing mine, petroleum production facility or extractive industry, or (b) identified on a map (being a map that is approved and signed by the Minister and copies of which are deposited in the head office of the Department and publicly available on the Department's website) as being the location of State or regionally significant resources of minerals, petroleum or extractive materials, or Note. At the commencement of this Policy, no land was identified as referred to in paragraph (b). (c) identified by an environmental planning instrument as being the location of significant resources of minerals, petroleum or extractive materials. Note. *Sydney Regional Environmental Plan No 9—Extractive Industry (No 2—1995)* is an example of an environmental planning instrument that identifies land as containing significant deposits of extractive materials. (2) Before determining an application to which this clause applies, the consent authority must: (a) consider: (i) the existing uses and approved uses of land in the vicinity of the development, and (ii) whether or not the development is likely to have a significant impact on current or future extraction or recovery of minerals, petroleum or extractive materials (including by limiting access to, or impeding assessment of, those resources), and (iii) any ways in which the development may be incompatible with any of those existing or approved uses or that current or future extraction or recovery, and (b) evaluate and compare the respective public benefits of the development and the uses, extraction and recovery referred to in paragraph (a) (i) and (ii), and	N/A. this clause relates to other development proposed near mine or extractive industry sites.

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	(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).	
14 Natural resource management and environmental management	(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following: (a) that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable, (b) that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable, (c) that greenhouse gas emissions are minimised to the greatest extent practicable. (2) Without limiting subclause (1), in determining a development application for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions. (3) Without limiting subclause (1), in determining a development application for development for the purposes of mining, the consent authority must consider any certification by the Chief Executive of the Office of Environment and Heritage or the Director-General of the Department of Primary Industries that measures to mitigate or offset the biodiversity impact of the proposed development will be adequate.	Refer to the assessments prepared by Martens – Consulting Engineers (River Stability, Water Quality, Land Resource and Flooding) and the Threatened Species Assessment by Peter Dalmazzo for detail on the likely impact of the expanded dredge area on the natural environment. The activity is one that will not result in unacceptable greenhouse gas emissions. The bulk of the operation is existing. The proposed expansion area does not increase the processing capacity or emissions on a per-year or per-tonne basis as operational processing will remain consistent. The expansion will however allow for the activity to continue for a further 30 years, however it is worth noting that the process of resource recovery is not incredibly energy intensive.
15 Resource recovery	(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery. (2) Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material. (3) The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to	Refer to Waste Management section of EIS (section 7.7). The types and volumes of waste will remain consistent with existing operations therefore it is appropriate for the waste management practices approved in association with RA12/1001 to continued unchanged.

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	minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.	
16 Transport	(1) Before granting consent for development for the purposes of mining or extractive industry that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following: (a) require that some or all of the transport of materials in connection with the development is not to be by public road, (b) limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools, (c) require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads. (2) If the consent authority considers that the development involves the transport of materials on a public road, the consent authority must, within 7 days after receiving the development application, provide a copy of the application to: (a) each roads authority for the road, and (b) the Roads and Traffic Authority (if it is not a roads authority for the road). Note. Section 7 of the Roads Act 1993 specifies who the roads authority is for different types of roads. Some roads have more than one roads authority. (3) The consent authority: (a) must not determine the application until it has taken into consideration any submissions that it receives in response from any roads authority or the Roads and Traffic Authority within 21 days after they were provided with a copy of the application, and (b) must provide them with a copy of the determination. (4) In circumstances where the consent authority is a roads authority for a public road to which subclause (2) applies, the references in subclauses (2) and (3) to a roads authority for that road do not include the consent authority.	No change to existing traffic type or rates is associated with the proposal. The operational capacity of the development will not change.
17 Rehabilitation	(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring the rehabilitation of land that will be affected by the development. (2) In particular, the consent authority must consider whether conditions of the consent should: (a) require the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated, or	Refer to the Rehabilitation Management Plan prepared by Martens – Consulting Engineers (Volume 2 Appendix 9).

	(b) require waste generated by the development or the rehabilitation to be dealt with appropriately, or (c) require any soil contaminated as a result of the development to be remediated in accordance with relevant guidelines (including guidelines under section 145C of the Act and the Contaminated Land Management Act 1997), or (d) require steps to be taken to ensure that the state of the land, while being rehabilitated and at the completion of the rehabilitation, does not jeopardize public safety.	

6.3.12 6.3.16 State Environmental Planning Policy (Primary Production and Rural Development) 2019

State Environmental Planning Policy (Primary Production and Rural Development) 2019 ("PP&RD SEEP") applies to the State of NSW.

Part 2 does not apply to the proposal as the land is not mapped as State Significant Agricultural Land.

Part 3 does not apply to the proposal as the land is not land which is:

a) land within the area of operations of an irrigation corporation within the meaning of Part 1 of Chapter 4 of the Water Management Act 2000, and
b) the land shown edged heavy black on the East Cadell Map.

Part 4 does not apply to the proposal as the proposal does not involve the keeping of Livestock.

While the proposal is not classified as aquaculture, Part 5 Division 4 applies as oyster aquaculture is undertaken at Greenwell Point.

With regard to the proposals effect on oyster aquaculture the following is noted. The water quality upstream and downstream of the proposed site has been assessed in the Martens Report Estuarine Water Quality Impact Assessment (Vol 2 App 10). The report concludes that the proposed expanded dredge pit operations are not likely to detrimentally impact on Shoalhaven River or estuarine water quality. No cumulative impacts are expected as any impacts are < 0.2% change and very short lived, being in the order of few hours after cessation of daily operations.

The proposal does not seek to alter the method of extraction and processing it only seeks to expand the area on the bed of the Shoalhaven River where sediment is won from.

The nearest oyster leases to the site are located at Greenwell point, some 14 kilometres downstream, and will not be adversely impacted upon by the proposed development. The current dredging activities have been ongoing since 1968, in one form or another and have not adversely impacted on the downstream oyster leases.

The land does not from part of a rural sharing community as defined by PP & RD SEPP.

6.3.13 State Environmental Planning Policy (State and Regional Development) 2011

The provisions of the State Environmental Planning Policy (State and Regional Development) 2011 ("S & R SEPP") have been reviewed and the proposal does not meet the criteria of State Significant Development.

Part 4 of the S & R SEPP identifies those developments of Regional Significance. Pursuant to Schedule 7 of this SEPP the development meets the criteria of Regional Development. As a consequence, the local Regional Planning Panel will be the consent Authority for the project.

6.3.14 State Environmental Planning Policy (Infrastructure) 2007

The provisions of the *State Environmental Planning Policy (Infrastructure) 2007* have been investigated. The proposed dredging activity is not impacted by the provisions of this SEPP.

6.3.15 State Environmental Planning Policy No 33- Hazardous and Offensive Development

State Environmental Planning Policy No 33- Hazardous and Offensive Development ("SEPP 33") indicates that consent authorities should, when assessing proposals, consider the potential risks and offensiveness of the activity in the context of potential impacts on human health, property and the biophysical environment.

The proposed expansion of the dredge area does not alter the current practices with respect to the storage or use of hazardous materials at the site. The development is not a potentially hazardous development for the purposes of SEPP 33, as no risks to human health, life, property or the biophysical environment are created by the activity.

The proposal is not considered to be an offensive industry, as defined in Clause 4, as no significant adverse impacts on the locality, existing or future development opportunities are expected provided the protective measures outlined in the associated reports are adequately implemented.

SEPP 33 therefore does not impact on this proposal.

6.3.16 State Environmental Planning Policy 55 - Remediation of Land

The objects of State Environmental Planning Policy 55 – Remediation of Land ("SEPP 55") are:

1) *The object of this Policy is to provide for a Statewide planning approach to the remediation of contaminated land.*
2) *In particular, this Policy aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment:*
    a. *by specifying when consent is required, and when it is not required, for a remediation work, and*

b. *by specifying certain considerations that are relevant in rezoning land and in determining development applications in general and development applications for consent to carry out a remediation work in particular, and*
c. *by requiring that a remediation work meet certain standards and notification requirements*.

Clause 7 of SEPP 55 stipulates that contamination and remediation matters are to be considered in determining development applications.

The expanded dredge area is located to the north and west of Pig Island, within the channel of the Shoalhaven River. The area is not within an investigation area and, to the proponent's knowledge, has never been used for a purpose specified in Table 1 of the Contaminated Land planning guidelines published by the New South Wales Government.

6.4 Regional Planning Instruments and Guidelines

6.4.1 Illawarra-Shoalhaven Regional Plan

The Illawarra-Shoalhaven Regional Plan ("ISRP") has been reviewed in relation to this project.

The ISRP is primarily concerned with population, housing and economic growth. There is nothing within the strategy of direct relevance to the assessment of development applications or specific proposals.

The ISRP indicates that a further 35,400 new dwellings will be required between 2016 and 2036.

For new land subdivisions with associated roads and services, coarse river sand is an important construction element for such developments. The approval of this development will ensure that the local area has a ready supply of coarse river sand for important developments.

The land surrounding the extraction area is identified in this plan as strategic agricultural land, however the proposed dredging will have no impact on the ability of this land to continue being used for agricultural production.

The proposal is consistent with the vision and directives of this plan.

6.5 Local Planning Instruments and Guidelines

6.5.1 Shoalhaven Local Environmental Plan 2014

The Shoalhaven Local Environmental Plan 2014 (SLEP 2014) is the principle planning document within the City of Shoalhaven. The SLEP 2014 sets out land zoning and details permitted and prohibited development types. It also sets various standards in relation to a broad range of issues including subdivision, environmental management and other miscellaneous matters.

The proposed extraction activity is consistent with the aims of SLEP 2014 as set out in Clause 1.2. Pursuant to the definitions provided in the SLEP, the development can be defined as an extractive industry.

The area of the river proposed to be dredged is zoned W2 – Recreational Waterways.

The objectives of the W2 zone are as follows:

- *To protect the ecological, scenic and recreation values of recreational waterways.*
- *To allow for water-based recreation and related uses.*
- *To provide for sustainable fishing industries and recreational fishing*.

The proposal is not inconsistent with these objectives. Reasons for this are as follows:

1) the proposal does not have any unacceptable impacts on the natural environment,
2) the expanded dredge area does not unreasonably affect the visual amenity of the area
3) the dredge will not reduce the recreational value of the Shoalhaven River
4) the proposal does not affect fishing industries or fish stocks.

Extractive industries are not specified as permitted with, or without consent. Any development not specified as permitted with or without development consent is specified as prohibited development.

Although the proposal is prohibited development under SLEP 2014, it is permissible pursuant to the provisions of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 ("Mining et al SEPP"). The Mining et al SEPP prevails to the extent of any inconsistency with any other Environmental Planning Instrument (Part 1, Clause 5). Part 2, Clause 7 of the Mining et al SEPP indicates that extractive industries are permissible within any waterway not in an environmental conservation zone.

Other provisions of the SLEP 2014 that need consideration with respect to this proposal are as follows:

Clause 5.7 – Development below mean high water mark.

The provisions of this clause should be considered due to the development involving excavation of material below the mean high watermark. It requires that development consent be sought for such works. This application seeks development consent for the works.

Clause 7.1 – Acid sulfate soils

The expanded dredge area includes land mapped as class 2 and 3 acid sulfate soils.

Marten's undertook an acid sulfate soil assessment over the dredge area however no acid sulfate soils were identified. The report recommends that works be undertaken in accordance with the existing acid sulfate soils management plan to ensure no impact on the environment.

The Martens report assessing acid sulfate soils is included in Volume 2 Appendix 7.

Clause 7.2 – Earthworks

The proposed dredging involves the removal of material from the bed of the Shoalhaven River. Pursuant to clause 7.2(3) development consent should not be granted for earthworks unless the following matters have been considered:

a. the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development,

b. the effect of the development on the likely future use or redevelopment of the land,
c. the quality of the fill or the soil to be excavated, or both,
d. the effect of the development on the existing and likely amenity of adjoining properties,
e. the source of any fill material and the destination of any excavated material,
f. the likelihood of disturbing relics,
g. the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area,
h. any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

This EIS and supporting documentation provides evidence that no detrimental effects on drainage patterns, riverbed stability or redevelopment potential of the land are associated with the proposed works. Refer to the Marten's report in Volume 2 Appendix 3, 4 and 8.

The material to be excavated meets guidelines for landscaping materials and does not present a risk to human health or safety. The dredged sand is used in landscaping and construction materials predominantly in the Shoalhaven, Illawarra and Sydney areas. Refer to the Marten's report in Volume 2, Appendix 6.

No significant amenity impacts are associated with the proposal. The dredging and processing are already occurring in the area and quantities will remain the same. The dredge will move further to the west and north of the currently dredged area, however there are no unreasonable noise or visual impacts associated with this.

An indigenous archaeology assessment undertaken during the previous development assessment (RA12/1001) included the current dredge area. The assessment did not identify any areas of concern or consider the site likely to contain any relics or items of significance, therefore it is considered that the risk for the current application remains low. Refer to the Biosis report in Volume 2 Appendix 13.

Martens' have prepared reports on water quality (Volume 2 Appendix 5 and 10), riverbank stability (Volume 2 Appendix 4), flood behaviour (Volume 2 Appendix 3) and contamination (Volume 2 Appendix 6). Peter Dalmazzo has prepared a report on flora and fauna impacts (Volume 2 Appendix 11). Provided appropriate management actions are implemented no unreasonable detrimental impacts have been identified by any of the qualified consultants that have reviewed the proposal. The recommendations of these reports will be incorporated into the management plans and are likely to form conditions of any consent granted.

Clause 7.3 – Flood Planning

The provisions of this clause require consent authorities to consider certain flood related matters prior to issuing a development consent relating to flood liable land. The clause is written such that it applies more fully to traditional land development, however the Martens' reports on flood behaviour address the matters required under this clause. The Martens' report on flooding impacts associated with the dredging activities is included in Volume 2 Appendix 3. The Martens' report on flooding impacts associated with the livestock refuge mounds is included in Volume 2 Appendix 16.

Clause 7.6 – Riparian land and watercourses

This clause requires the consent authority to consider water quality, bank stability, habitat for aquatic flora and fauna and rehabilitation. Martens' have prepared reports addressing water quality (Volume 2 Appendix 5 and 10), bank stability (Volume 2 Appendix 4) and rehabilitation (Volume 2 Appendix 9). Peter Dalmazzo has addressed impacts on native flora and fauna and their habitats (Volume 2 Appendix 11). We invite the consent authority to review and consider the findings of these reports.

Clause 7.8 – Scenic protection

This clause requires the consent authority to consider the visual impact of proposed development. The proposed dredging has no impact on terrestrial vegetation cover and will have negligible visible impacts. The dredge is already operating within vicinity of Pig Island and has been for an extended period of time. The proposed expanded dredge area will bring the dredge closer to the Shoalhaven River bridge and industrial development on the northern bank of the Shoalhaven River, however the dredge is already visible from these places. The dredge therefore already forms part of the visual makeup of this part of the River.

Visual impacts are considered in further detail in section 7.9 of this EIS.

6.5.2 Shoalhaven Development Control Plan 2014

The Shoalhaven DCP generally contains performance-based provisions for a range of development types including new residential dwellings. Performance based provisions are used instead of prescriptive development controls.

Performance criteria cover a range of matters that need to be addressed in order to achieve a desired result (called the objective). Acceptable solutions are provided as examples of what is considered acceptable to enable the performance criteria to be achieved. Acceptable solutions should not be interpreted as an alternative prescriptive form of regulation. They are within the DCP as examples of what is considered acceptable, but they do not preclude other solutions which achieve the desired performance.

The Shoalhaven DCP 2014 indicates that alternatives to the *acceptable solution* examples may be proposed by applicants if it can be demonstrated to the satisfaction of Council that the alternative will meet performance criteria.

The performance criteria and acceptable solutions for the relevant sections of each Chapter of the DCP are addressed below.

Chapter G7 – Waste Minimisation and Management Controls

No construction or demolition wastes are created by the proposed expansion.

The proposed expansion of the dredge area will not affect the volume or types of wastes generated by the activity. It is appropriate for the existing waste management processes approved in association with RA12/1001 to continue.

The use of fines for stock mounds and routine agricultural activities is already approved as on offsite activity. The use of fines is therefore not changing, rather, the application seeks to provide an

additional location for the use of the waste fines. Further detail on the proposed use of fines on Pig Island is provided in section 7.7 of this EIS and in the Martens' report in Appendix 16.

Chapter G9 – Development on Flood Prone Land

5.1 General		
P1 Development or work on flood prone land will meet the following: • The development will not increase the risk to life or safety of persons during a flood event on the development site and adjoining land. • The development or work will not unduly restrict the flow behaviour of floodwaters. • The development or work will not unduly increase the level or flow of floodwaters or stormwater runoff on land in the vicinity. • The development or work will not exacerbate the adverse consequences of floodwaters flowing on the land with regard to erosion, siltation and destruction of vegetation. • The structural characteristics of any building or work that are the subject of the application are capable of withstanding flooding in accordance with the requirements of the Council. • The development will not become unsafe during floods or result in moving debris that potentially threatens the safety of people or the integrity of structures. • Potential damage due to inundation of proposed buildings and structures is minimised. • The development will not obstruct escape routes for both people and stock in the event of a flood. • The development will not unduly increase dependency on emergency services. • Interaction of flooding from all possible sources has been taken into account in assessing the proposed development against risks to life and property resulting from any adverse hydraulic impacts. • The development will not adversely affect the integrity of	A1.1 The development satisfies the requirements as shown in the planning matrix at Schedule 2 including climate change considerations; and A1.2 Buildings and structures are constructed in accordance with the flood proofing guidelines (see Supporting Document 1: Chapter G9 – Guidelines for Development on Flood Prone Land); and A1.3 Buildings and structures are constructed in accordance with the Building Code of Australia – ABCB Standard for Construction of Buildings in Flood Hazard Areas. The controls in this Chapter are to be used in instances where this Chapter specifies more stringent controls; and Buildings and structures are designed to withstand the forces of flood waters in accordance with best practice engineering standards; or A1.4 Where appropriate, structures are designed to collapse under the force of water to not obstruct the flood flow, but are sufficiently secured to not become floating debris and to not endanger people or animals; or A1.5 Openings in structures such as fences or the like will be provided below the flood planning level to allow free flow of water; and where relevant; A1.6 Building foundations are designed by a suitably qualified geotechnical engineer to be suitable for grounds with potentially reduced bearing capacity under flooding conditions; and A1.7 The development complies with ecological sustainable development principles, taking into account floodplain ecology and integrity; and A1.8 A report demonstrating that all performance criteria have been met is supplied with the development application.	Extractive industries are classified as land use 'E' for the purpose of Schedule 2. Earthworks are marked as not suitable within a High Hazard Floodway. Flood modelling by Martens indicates that despite the flood category of the land the extractive activities do not present a risk to life or property and has no impact on flood behaviour on surrounding land. No new buildings or structures are proposed. The flora and fauna assessment prepared by Peter Dalmazzo indicates that the proposal does not have any unreasonable ecological impacts.

floodplains and floodways, including riparian vegetation, fluvial geomorphologic environmental processes and water quality.		
5.2 Fill or Excavation on the Floodplain		
P2 Filling or excavation on flood prone land will meet the following: • High hazard floodway areas are kept free of fill and/or obstructions. • The proposed fill or excavation will not unduly restrict the flow behaviour of floodwaters. • The proposed fill or excavation will not unduly increase the level or flow of floodwaters or stormwater runoff on land in the vicinity, including adjoining land. • The proposed fill or excavation will not exacerbate erosion, siltation and destruction of vegetation caused by floodwaters flowing on the land. • The proposed fill or excavation will not be carried out on flood prone land if sufficient flood free area is available for development within the subject property. • The proposed excavation does not create new habitable rooms, nonhabitable storage areas or carparks with floor levels below the existing ground level.	A2.1 The development satisfies the requirements as shown in the planning matrix at Schedule 2. A2.2 The proposed fill volume occupies less than 1% of the 2050 20%, 5% and 1% AEP flood volume on the development site and does not create a depth exceeding 1 metre above natural ground level or require more than 250 cubic metres of filling materials. A2.3 The proposed fill and excavation does not adversely affect neighbouring properties or the overall flood behaviour and flood storage volume. A2.4 The proposed fill is used only for the purpose of filling a local depression beneath the confines of a building within an existing residential/ commercial area.	The proposed livestock refuge mounds on Pig Island represent filling within the floodplain. A flood assessment has been prepared by Martens's and is provided in Appendix 16. The report by Martens demonstrates that the three livestock refuge mounds will not affect neighbouring land or flood behaviour.
5..3 Subdivision in the Floodplain		
P3.1 Potential development as a consequence of a subdivision proposal must be able to be undertaken in compliance with this Chapter. P3.2 The proposed subdivision will not create new lots that are affected by a high hazard area, or floodway in today's flood conditions or in climate change conditions up to the year 2100. P3.3 The proposed subdivision will not increase the potential population density in any areas (flood prone or flood free) with restricted evacuation access	A3.1 The development (subdivision and intended future use) satisfies the requirements as shown in the planning matrix at Schedule 2; and A3.2 Flood conditions for the year 2100, which include the respective sea level rise projection, are used.	N/A The proposal does not involve any subdivision.

Chapter G21 – Car Parking and Traffic

The proposal is impacted upon by Chapter G21 of the Shoalhaven DCP, however the proposed expansion of extraction area does not increase the processing volume, increase operational hours or staffing rates, therefore the proposal does not generate any additional traffic flows or parking demands. The existing operation will continue to operate in accordance with the existing consent conditions relating to parking and access.

Chapter G26 – Acid Sulfate Soils and Geotechnical (Site Stability) Guidelines

The purpose of this Chapter is to outline controls and guidelines for subject to acid sulfate soils or geotechnical instability.

5.1 Acid Sulfate Soils	
A1.1 Clause 7.1 of Shoalhaven LEP 2014 is complied with in any development application.	This clause is addressed earlier in this report. The matters specified in Clause 7.1 of SLEP 2014 have been addressed in Martens report in Volume 2, Appendix 7.
A1.2 Where earthworks are proposed, Clause 7.2 of Shoalhaven LEP 2014 is complied with in any development application.	This clause is addressed earlier in this report. A series of report prepared by Martens address the matters specified in this Clause.
5.2 Geotechnical – Site Stability	
A2.1 Buildings and structures are to be located on land with a slope less than 20% and are not in an area known or likely to be subject to site stability problems. A geotechnical report is provided if requested by Council.	No slopes of greater than 20% are located within the investigation area.
A2.2 An application for buildings/structures on land with a slope of 20% or greater, or proposed to be located in an area known or likely to be subject to site stability problems, is accompanied by a geotechnical report. **Note**: A geotechnical report is to be prepared by a suitably qualified practicing geotechnical engineer or scientist. The report is to examine: • the stability of the site; • whether the development of the site will adversely affect the stability of the site; • the stability of adjoining land; and • Whether the site stability could have adverse effects on the proposed development. The report is also to include recommendations of works required and methods of construction to be used to ensure the stability of the building, the site and adjoining properties. The geotechnical report will be subject to assessment and approval by Council. Accordingly, the submission of a geotechnical report does not guarantee that the application will be approved, or approved without conditions.	N/A
A3.1 Excavated and filled areas are retained by appropriately designed retaining walls or provided with a stabilised batter slope, and an effective drainage system.	Batters will form naturally and their slope has been considered in calculating the extent of the dredge area to ensure no impacts on sea grass beds.

A3.2 Measures are identified that will retain and/or establish vegetation for erosion control and visual amenity.	N/A This control relates to terrestrial land. The excavation area is not visible from the public domain.
A4.1 A soil and water management plan is submitted that complies with Council's guidelines. The plan demonstrates what measures will be utilised both during and after construction to control erosion and sedimentation of local water courses and drainage systems. **Note**: The soil and water management plan is to be submitted with your development application. If a construction certificate is required, the soil and water management plan may be submitted with your application for a construction certificate.	Martens reports include an assessment of River Stability
A4.2 Erosion and sediment control devices are installed in accordance with Council's guidelines. The size, shape and slope of the allotment and the scale of the building will facilitate the installation of appropriate devices.	Any erosion and sedimentation controls required will be installed and maintained as necessary.

7.0 Key Environmental Issues

7.1 Water

The proposed development does not require a licence under the *Water Act 1912* (NSW) or the *Water management Act 2000* (NSW). The proposal does not require the extraction of water from any underground water table nor is it located on land within 40 metres of the MHWM.

Detailed assessments and reports on sediment issues, flooding, water resource, water quality and estuarine health including water management and monitoring have been prepared by Martens Consulting Engineers. The full reports are attached in Volume 2 appendices 3 to 10.

7.1.1 River Stability

The River Stability Assessment undertaken by Martens provides a discussion of the geomorphology of the study area and undertakes an analysis of historic and existing bank conditions, an assessment of recent bank changes, likely velocity changes and impacts to the levee, tidal prism and seagrass beds.

The River Stability Assessment concluded that the impacts of the proposed works on riverine vegetation and bank stability are anticipated to be insignificant. Historical extraction works do not appear to have been a significant cause of existing bank erosion in the study area.

Flow velocity changes due to extraction works were investigated and found to be insignificant and are unlikely to lead to a change in sedimentation/erosion processes along the riverbank. The proposed expanded extraction area is outside of areas with significant existing aquatic vegetation (seagrass and seaweed) and works are not expected to impact on these areas.

7.1.2 Flooding Impact

Martens' Consulting Engineers have prepared two Flooding Assessments to determine the peak flow over a series of flood event scenarios (Appendix 3 and Appendix 16). These events included 10% annual exceedance probability (AEP) flood, 1% AEP flood, 0.5% AEP flood, 0.2% AEP flood, and probable maximum flood (PMF) events. To determine the impact these events would have Martens prepared a hydraulic model (TUFLOW) for the site under existing and proposed conditions and calibrated it to Council's available design flood levels. Relevant flood maps including flood extents, depths, levels, velocities, hazards, hydraulic categories and impacts were also prepared.

The modelling concluded that the flood behaviour during operations will be largely consistent with existing conditions. The proposed development would not have unacceptable offsite flood impacts. The proposed development is compatible with the existing floodplain environment.

In short, the proposal will not have an adverse impact on the normal flow of the river during flood events.

7.1.3 Estuarine Water Quality

The Estuarine Water Quality Impact Assessment included a description of receiving waters and expected water quality. This information was compiled through a review of available literature; collection and assessment of water samples from representative sites within and external to the existing dredge area; a summary of the historical river water quality records and comparison with results of site water sampling and preparation of an estuarine process model (TUFLOW AD) for the Shoalhaven River in the vicinity of Pig Island.

The assessment concluded that monthly estuarine water quality testing in five locations around Pig Island, including one 500 metres up and down stream (background) and testing of surface water prior to discharge to Shoalhaven River, should be undertaken. By doing so the water quality can be compared to Site Specific Trigger Values (SSTV) and background values.

It was also concluded that annual reporting of findings should be made. TSS will implement this testing regime as part of its ongoing commitment to work in an ecologically sensitive manner. The proposed development has been designed to minimise impacts from dredging on the surrounding environment.

The investigations and assessment found that the existing Shoalhaven River water quality within and near to the proposed extraction reach, including the present extraction area, is generally of a high quality and broadly consistent with ANZG guidelines for fresh and marine water quality. The existing dredging operations have not presented any observable impact on Shoalhaven River water quality. In fact, river water sampling undertaken during 2018 has indeed shown some lowering of nitrogen levels since 2011. TUFLOW AD modelling of the proposed expanded dredge area under typical tidal flushing cycles has demonstrated that those operations will not materially alter water chemistry in the River, either during or after cessation of daily dredging activities.

Martens concluded that the proposed expanded dredge area operations are not likely to detrimentally impact on Shoalhaven River or estuarine water quality. No cumulative impacts are expected as any impacts are < 0.2% change and very short lived, being in the order of few hours after cessation of daily operation.

7.2 Noise

An Environmental Noise Impact assessment was prepared and completed by Harwood Acoustics to assess the noise emissions from the floating dredge at neighbouring receptor locations.

This assessment addresses noise emission from the operation of the sand dredge in the proposed expanded area only. It did not consider noise emission from the operation of any land-based activities as land-based activities are currently approved and there are no proposed changes to those operations.

The nearest residential receptors to the proposed expanded dredging area are located on the southern side of the Shoalhaven River in the Shoalhaven Village Caravan Park to the south east and Riverview Road and Ferry Lane to the south west.

The recommendations made were administrative and include restricting the operation of the dredge to daytime hours only, as defined by the EPA, and ensuring the dredge does not operate closer than 120 metres from any residential receptor.

Providing the recommendations made are implemented and adhered to the EPA's Noise Policy for Industry 2017 project noise trigger levels will not be exceeded for this proposal.

The Noise assessment report prepared by Harwood Acoustics is included as appendix 12 volume 2 of this EIS.

7.3 Air

A noise impact assessment was prepared by Clearsafe Environmental Solutions as part of the assessment undertaken in 2012 in relation to RA12/1001. The Clearsafe report indicates that no changes are anticipated to air quality based on expanding the dredge area as impacts are limited to the exhaust emitted by the current dredge. The dredge is fitted with a factory standard diesel motor, Cummins KTA 19, and has not been modified. The motor and exhaust meet Australian Standards as to noise and air quality.

The dredge has been and will continue to be, serviced at predetermined regular intervals as nominated by the manufacturer.

The Clearsafe report concludes that the proposed development is unlikely to have a significant adverse impact on nearby sensitive receptors.

7.4 Biodiversity

A Flora & Fauna Assessment has been prepared by Peter Dalmazzo. The assessment reviews existing habitat and vegetation including subtidal, inter tidal and terrestrial habitats, benthic invertebrates and shallow water fish, recreational and commercially important fish, amphibians, reptiles and mammals as well as birds.

The assessment investigates the statutory legislation associated with the proposal including the CM SEPP, FM Act, BCA 2016 (NSW), EPBC Act and the SLEP 2014.

Recommendations made and conclusions reached within the report show that the proposal will not have a detrimental impact on flora and fauna investigated in association with the report.

The report recommended safeguards to protect the seagrasses, mangroves and saltmarsh areas by establishing a 25 metre buffer zone to these areas where no material is extracted. Other safeguards include inspection of all watercrafts and associated equipment for noxious weed/plants, particularly the macroalga *Caulerpa taxifolia*. As recommended, TSS will ensure that all workers are educated on their responsibilities under the NSW BC Act and the Commonwealth EPBC Act and processes to be adhered to if injured fauna is discovered.

The report concludes that provided the environmental safeguards listed in the report and in the Martens reports (2019a, 2019b, 2019c & 2019d) are employed, the proposed extension of the sand

extraction area is not likely to significantly affect threatened species, populations or ecological communities, or their habitats. As such, neither a species impact statement nor a biodiversity development assessment report is required.

The report also concludes that the proposed development is not likely to have a significant impact on a matter of national environmental significance and will not be undertaken on, or have an effect on, Commonwealth land; the proposed action therefore does not need to be referred to the Australian Minister for the Environment.

A full copy of the Flora & Fauna Assessment prepared by Peter Dalmazzo – Environmental Consultant is attached in volume 2 appendix 11 of this EIS.

7.5 Heritage

The proposed development is restricted to the bed of the Shoalhaven River and does not involve any new land-based activities. Accordingly, we rely on the Aboriginal Heritage report prepared for RA12/1001 by Biosis Research. This report included the current area in its investigations.

The report prepared by Biosis Research, in 2011, recommended that a cultural heritage induction package be prepared and implemented for all workers on site. TSS has prepared such an induction program which includes information on visual identification of Aboriginal cultural material, particularly stone and wooden artefacts. All workers employed by TSS have been inducted with respect to the cultural heritage induction plan.

This induction program will continue to be implemented for all workers employed in association with the expanded dredge area.

7.6 Land Resource

Martens Consulting Engineers have prepared a number of reports which address the land resource issues identified in the SEARs. The Land Resource Assessment report, which forms part of this EIS document, has been tailored to address the land resource as well as the State and local statutory and regulatory requirements applicable to the proposed development. The report assessed the volume and quality of sand deposits at the site and provides a geological site summary, including land capability and potential contamination as well as justifying the proposed expansion.

The reports identified one major subsurface unit of medium and coarse grained, poorly graded sand that is generally suitable for use in concrete, subject to removal of thin lenses of silts, clays and carbonaceous matter. The sand may also be suitable for a variety of soft landscaping purposes, which has been identified as a predominant existing market for TSS.

The potential resource volume has been calculated with an assumed maximum resource extraction depth of -6.7m AHD. The potential resource volume in the expanded dredge area is 1,140,000 m^3, weighing approximately 1,940,000 tonnes.

The current extraction licence allows a total of 100,000 tonnes of sand to be extracted annually, giving a minimum mine life expectancy of approximately 19 years. It is worth considering however

that previous operations have extracted a maximum of 70,000 tonnes and a minimum of 40,000 tonnes of sand in any one year. Based on these previous extraction figures, a mine life expectancy of between 30 - 40 years is likely.

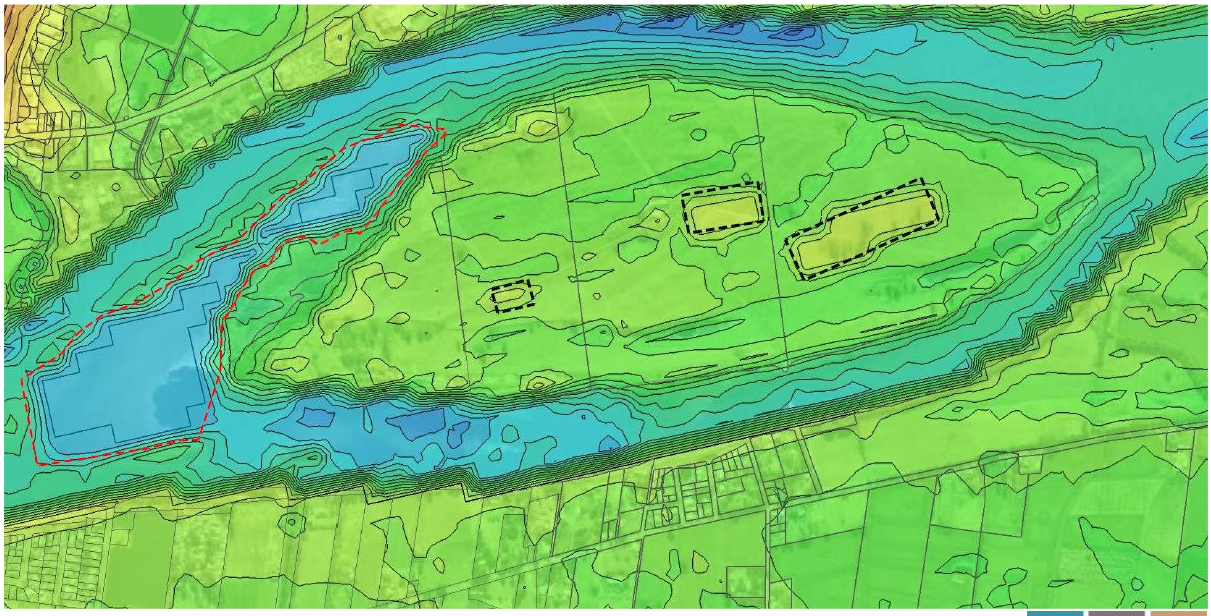
The expanded sand extraction area is justifiable in terms of its location and resource. It will ensure the continued availability of on-going sand resources to the South Coast construction market. These markets are currently experiencing a shortfall of available, local and suitable construction and landscaping sand. This shortfall of suitable construction sand is projected to worsen, leading to increased costs, particularly considering the number of major infrastructure projects and developments underway and likely in the future resulting from population growth.

7.7 Waste

The proposed extension of the dredge area on the bed of the Shoalhaven River will not generate waste in its own right. Waste is generated in the processing of the sediment. As noted, the proposal at hand does not alter or modify the existing processing activities or quantities. The current conditions which stipulate the method in which waste is processed, as per RA12/1001, will be maintained. The current approved treatment process and disposal/reuse options will not alter.

The quantity and physical attributes of fines generated during the approved processing of river sand activity will remain unchanged, though the application seeks to nominate an additional disposal location – Pig Island. The island is actively grazed by livestock that cannot be easily relocated, and cattle refuge mounds are needed when livestock cannot be herded to higher ground. Consequently, the fines are proposed to be used to form stock refuge mounds and to enable routine agricultural activities, as outlined in the Martens report dated 5th August 2020, reference P1404280JC01V02 (Appendix 16). In total three (3) refugee mounds are proposed, one on Lot 2, one on Lot 3 and one on Lot 4 in DP 1184790 (Figure 6).

The approximate location and size of the proposed Stock Refuge Mounds is shown in the Martens' Report, Appendix 16 (page 2 and plan PS03-K021).



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The need for additional stock refuge areas was most recently exhibited by floods in February and August of this year.

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As the images above show, the area currently available for stock to seek refuge is limited. The proposed reuse of fines will increase the availability of higher ground for stock during future flood events, thus reducing the risk to property and life on Pig Island.

The proposed mounds provide additional (and quickly accessible) areas within each of the registered lots on the island for informal cattle refuge in times of flood. The existing dairy mound is central to the island, and not readily accessible by cattle (due to distance, fencing and gates between lots), and is largely occupied with operational equipment for farm maintenance.

The owner of Burraga Island indicates that each refuge mound is located and sized having regard for the recommendations within the NSW Department of Primary Industry Primefact Sheet 961 Livestock Flood Refuge Mounds (October 2009), with the additional benefits of providing:

a) safe access to feed and maintain cattle for up to 2-4 weeks, which is the recommended design period for refuge to allow time for waterlogged areas to dry out and for pastures to recover;
b) refuge and/or for the safe evacuation of occupants of the island and/or operators of the sand mine lease area in times of flood, should the Ferry become dangerous, inaccessible, or un-operational; and/or

Refuge mounds in the locations proposed will enable each lot on the island (regardless of ownership over time) to independently support grazing activities, provide emergency refuge, and obtain fill material as and when required, at short notice, to repair and maintain the land for operational farming purposes.

Currently, the dredging approval requires the regular removal of the fines from the island, once it is drained, by trucks across a vehicle ferry that is privately owned by Burraga Island on to other sites some distance away.

The retention of fines will reduce costs and increase safety of the operation, for it involves less risk of impact on the ferry, local roads, the environment, and residents, both in terms of negating the need to remove the fines from the island, but also and importantly, in terms of negating the risk that the owner of the Island will otherwise need to obtain fill material that may be compatible with the local riverine environment. The Martens Report has considered the proposed filling over a number of flooding scenarios (flood levels, depths, velocities and provisional hazard categories) for the critical duration 10%, 1%, 0.5%, 0.2% AEP flood and probable maximum flood (PMF) events in existing and proposed conditions. Consistent with the Martens Terara Sands Flood Report, the modelling indicates that flood level changes are imperceptible and contained within the backs of the Shoalhaven River and will not affect t adjoining land holders (<20mm flood level change for all flood events modelled).

The modelling indicates that:

1. Flood behaviour after introduction of the proposed livestock refuge mounds will not impact on the existing conditions.

2. The proposed refuge mounds have acceptable flood impacts.

3. The proposed refuge mounds are compatible with the existing floodplain environment.

As detailed in the Martens' report, the proposed Livestock Flood Refuge Mounds are to be constructed and designed in accordance with the Department of Primary Industries guidelines.

Contact with the Department of Planning, Industry and Environment, was made on the 24th of February 2020 to advise of the proposal to retain fines on the island for stock refuge and routine agricultural purposes and to determine if revised SEAR's were necessary. No revision of the SEAR's issued June 2018 were necessary. Our contact documentation with the Department and their reply is attached as Appendix 17.

Community consultation with residents of Terara Village was undertaken directly on the 22nd of September to explain the proposal to create stock refuge mounds on the island and provide an opportunity for comment. The Martens' Report, Appendix 16, was presented to the residents. Appendix 18 outlines the extent of community consultation in this regard. To date no objections have been received.

7.8 Hazards

The floating dredge is licenced (Certificate of Operation) by the Roads and Maritime Services (RMS) through the Australian Maritime Safety Authority. The Certificate of Operation, AGX531C05052014, is issued with limits and conditions. These Limits and Conditions have regard to navigational requirements, pollution and substance discharge, mooring details and ensuring safety of movement in proximity to the dredge. Reference is made to *Marine Safety (General) Regulation 2009* (NSW)*, POEO Act and NSW Marine Pollution Act 1987* (NSW), within the limits and conditions and adherence with these controls are necessary for ongoing licence renewals to be granted.

The dredge has recently been registered and licenced and complies with the various legislative requirements within the terms of the licence. The mechanical workings of the floating dredge will not be amended or altered as part of this application.

The proposal at hand does not seek to alter any of these requirements. TSS will maintain the current workings of the dredge to comply with its statutory obligations.

7.9 Visual

The proposal does not seek to change nor alter the size, shape or colour of the existing floating dredge currently used by TSS. There is no change to the appearance or location of processing equipment at the processing facility in Terara.

The floating dredge is already visible within the River environs adjacent to the south western portion of Pig Island. The expanded dredge area will allow the dredge to move approximately 500m further to the west, 400m north and approximately 700m to the east (albeit around the northern side of Pig Island) than the current extraction area permits.

At the western most extent of the proposed extraction area the dredge will be approximately 1-kilometre east of the Nowra Bridge at the closest point. At its eastern extent the dredge will be approximately 2 kilometres east the bridge. The dredge will also visible from the public wharf on the

south side of the Shoalhaven River and walkway along Riverview Road (Mavro Mattes Reserve) when it is at the western end of the extraction area.

Views of the river from the properties along Riverview Road are restricted by the flood levee bank along the southern bank of the river. Residences within the Shoalhaven Caravan Village may be able to glimpse the dredge, however significant vegetation exists along the riverbank in this area.

Regardless of the viewing position, the dredge will be backdropped by the Manildra industrial complex on the northern bank.

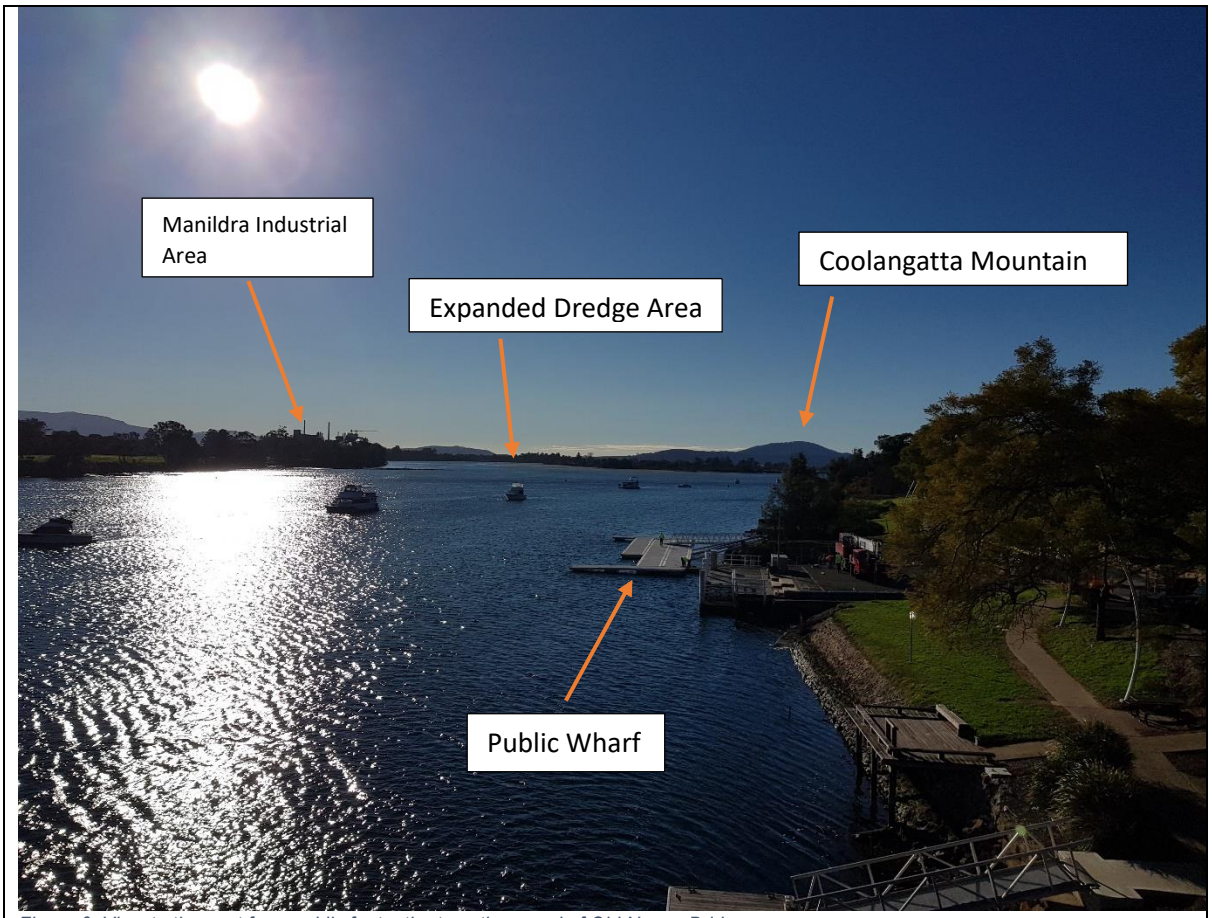

Figure 6: View to the east from public footpath at southern end of Old Nowra Bridge.

Figure 8 shows the view across the Shoalhaven River from the public footpath at the southern end of the Old Nowra Bridge. As can be seen the backdrop of Coolangatta Mountain and the industrial complexes on the northern bank of the river are the dominant vistas when viewing to the east towards the proposed dredge area. Given the scale of the dredge and the separation distances involved the visual impact of the new dredge location is not considered to be significant in context.

Figure 9 shows the view north west from Terara Village toward the western end of Pig Island. The existing dredge area is roughly level with the Manildra Industrial area indicated in the image. The proposed expanded area will be slightly further to the west and behind Pig Island when viewed from this location. The proposal will lessen, and in some cases remove the dredge from the visual field in this location.

Figure 7: View from the southern bank of the River adjacent to West Berry Street in Terara village, east of Public Wharf (currently under construction)

As noted, the majority of the proposed dredge area is located on the northern side of Pig Island between the island and the industrial complexes (Manildra site etc.) on the northern foreshore of the Shoalhaven River. Public access to the northern side of the Shoalhaven River adjacent to the proposed dredge area is restricted.

The floating dredge, once positioned within the proposed area, will be dwarfed by Coolangatta Mountain in the background when viewed from the Nowra Bridge and public wharf, as shown on the above photographs. The dredge's position within the river will not be out of character with the existing boats moored, on the stretch of the river between the Nowra Bridge and Pig Island.

It is considered that the location of the floating dredge will have a lesser visual impact on places of residence as well as public places along the southern foreshore of the Shoalhaven River, than the location of the existing dredge in the current extraction area within the Shoalhaven River.

7.10 Social and Economic

The dredging of this general section of the river has been continuous since around 1968 when the first Permissive Occupancy (PO1968/29) was issued.

As noted, the proposal does not seek to increase the extraction output, over and above its annual licence limit of 100,000 tonnes. The area where the land-based activity and existing processing plant is located will not alter in size or output as a result of the proposed extension to the dredge area.

Given that the output limits will not change and that the operation has been in place for over some 50 years, it is unlikely that the proposed extension to the dredge area will have any detrimental impact on the existing social and economic environment. The guarantee of supply of coarse river sand into the future will ensure that the economic benefits currently enjoyed by the local community will be maintained.

At the moment TSS directly employs 5 full time and 1 part time employees from the local area. Full-time positions at the company include two office staff, two plant operators and one truck driver.

In commercial terms the local economy benefits directly and indirectly from TSS. In direct terms it purchases its fuel, machine parts, fittings, office equipment and hardware all from local businesses. On average Terara Shoalhaven Sand Pty Ltd directly injects some $100,000 per month into the local economy by using local businesses for its materials, equipment purchases and services.

In indirect terms its local employees generate spending by shopping in the local area and with local businesses. The State Government directly benefits from the dredging operation by collecting royalties which are currently paid at the rate of $2.15 per Tonne. Last financial year some $130,000 in royalties was paid to the State of NSW over and above licence renewal payments.

The coarse river sand produced is a valued resource as its application is suitable for construction purposes, environmental application as well as for areas where human contact is involved. The significance for this valued resource was identified by the state government in 1974. The sand's significance to the immediate area ensures that importation of river sand is reduced if not eliminated. By doing so heavy vehicle traffic into the area is also minimised.

It is envisaged that the proposal will maintain the status quo as to social and economic inputs and outputs. The proposal is not a new activity for the area both in terms of extraction and processing.

7.11 Rehabilitation

A Rehabilitation Management Plan (RMP) has been prepared by Martens, Consulting Engineers and forms part of this EIS (Volume 2 Appendix 9).

The objectives of the RMP are to:

1. Protect the environmental and ecological values of the river adjacent to, upstream and downstream of the proposed and existing extraction areas;
2. Provide rehabilitation management strategies to rehabilitate riverine and habitat areas affected by the extraction processes;
3. Recommend appropriate monitoring to determine changes to river stability and ecological processes; and
4. Propose a final landform which integrates well into the surrounding landscape.

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The RMP has been prepared from baseline studies and observations to detail the history of the area and the existing landform of the riverbed.

The following measures are recommended to be implemented,

1. *Former dredged area to be left for a minimum of 10 years to allow for sediment replenishment;*
2. *Regular periodic monitoring of water quality and river bank conditions; and*
3. *Implement appropriate bank stabilisation and / or bank revegetation works, where required*.

Management action schedules, to manage environmental and ecological values of the study area and to implement the RMP, along with timeframes and responsibilities have been provided as part of the plan.

8.0 Mitigation Measures

8.1 Table of Mitigating Measures

The following table of mitigating measures has been compiled from the various consultant reports prepared in support of this EIS.

Consultant Report	Issue	Mitigation Measures
Martens consulting engineers: Flood Assessments, Land Resource Assessment, River Stability Assessment, Acid Sulfate Assessment, Contamination Assessment, Estuarine & Water Quality Assessment, Estuarine Surface Water Quality Monitoring Plan and Rehabilitation Management Plan.	Modelling, Monitoring, Rehabilitation and Stabilisation	Preparation and implementation of a Rehabilitation Management Plan. Monthly collection, monitoring and annual reporting of water samples.
Aquatic Habitat, Flora and Fauna Assessment – Peter Dalmazzo Environmental Consultant	Impact Mitigation	To protect seagrass beds adjacent to the extraction area and reduce the risk of slumping into the dredge hole, an appropriate buffer distance of 25 metres is to be observed. The dredge will not extract sand from within the buffer zone. Prior to use at the site, machinery brought from another waterway is to be cleaned, degreased and serviced. If the machinery has previously been used in a waterway where the noxious macroalga Caulerpa taxifolia is present, the contractor shall: a) inspect anchors, ropes and chains for pieces of Caulerpa b) inspect diving equipment such as wetsuits, bags and other gear before c) and after use d) inspect trailers, propellers and engine intakes e) inspect all equipment and materials f) use dedicated 'wash-down' facilities where available, ensuring that vessel g) and equipment is thoroughly free of all matter before leaving the area h) collect any fragments of Caulerpa that may have been picked up, seal the pieces in a plastic bag and dispose of them in a bin where they cannot reenter the waterway. Workers shall be informed of their obligations and possible offences under the NSW Biodiversity Conservation Act and Commonwealth Environmental Protection and Biodiversity Conservation Act with respect to threatened and migratory species. All workers shall be made aware that they are potentially working in or near the habitat of threatened and migratory species. If injured native fauna is observed, immediate contact should be made with Wildlife Rescue South Coast and appropriate action taken. If a seal or turtle has hauled out at the site when the work is being done, the advice of the Nowra office of the National Parks and Wildlife Service shall be sought for an appropriate course of action.

Harwood Acoustics Acoustical Consulting	Operation times and distance requirements	Operating times restricted to: 7am to 6pm Mon to Fri 8am to 6pm Sun & Public Holidays. Continue to apply existing acid sulfate soils management plan for ongoing works. Dredge should be positioned no closer than 120m from residential receptors.
Clearsafe Air Quality Assessment	Air Quailty	A watering system is implemented and utilised during hot and dry conditions, allowing the application of moisture to road surfaces by means of trucks and/or sprinklers during vehicle operation as a means of supressing any dust stirred by site traffic; The above-mentioned watering system could be utilised on either on Burraga Island or at 125 Terara Road, depending on the origin of dust stirred by site traffic; The installation of a meteorological station is considered as a means of recording metrological conditions experienced during site operation. This meteorological station may be used in the event of public complaint to ascertain the wind strength and direction and thus assist in determining the possible source of the emissions in question. Additionally, the weather station could be used to determine when additional dust control measures such as water sprays and road sweeping should be utilised. A suitable location for such a facility would likely be in an area where readings reflect site conditions and should be based upon the relevant standards and/or manufacturer recommendations.
Biosis Research Due Diligence report	Aboriginal heritage matters	Proposal for cultural heritage induction to be included into the general induction package for all persons involved in proposed works.

9.0 Conclusion

TSS seeks to secure the volume and quality of the sediment it dredges from the bed of the Shoalhaven River, by extending the dredge area further west and north of Pig Island, in an ecologically sustainable manner. By doing so, a viable local industry which produces a valuable resource as well as contributes to the local and regional communities and economies within which is operates, can be maintained.

The proposed extension area, based on the current extraction rate of between 40,000 and 70,000 tonnes per annum, will ensure some 30-40 years of sand supply. If the maximum licensed rate of extraction is employed, then some 19 years of sand supply can be obtained.

By maintaining the current methods of extraction and processing, the water quality of the river within and outside of the dredge area, will not change or be detrimentally affected. No significant or unmanageable risks were identified in relation to water quality. The flood modelling undertaken shows that the proposed extension of the dredge area will not impact on the current water flows within the river system either under normal flows or during flood. The stability of the surrounding landforms will be maintained by adopting a 25 metre buffer zone from the proposed dredge area to existing seagrass beds.

Flora and fauna issues, including both terrestrial and aquatic species, surrounding and within the site have been identified and assessed against the relevant environmental legislation and guidelines. The assessment concludes that there is unlikely to be a significant threat to either local or nationally significant species, populations or ecological communities. The development does not require a species impact statement or biodiversity development assessment report, nor does it require referral to Minister for the Environment.

Aboriginal heritage was investigated in the 2012 study process. The study found that the site had little to nil value in terms of Aboriginal objects or places. Due to the sites' low-lying nature, below MHWM, archaeological potential was considered to be low. However, even though the potential was low, it was recommended that an Aboriginal Cultural Heritage Induction be prepared. This induction program was prepared and has been implemented to educate workers and visitors to the site.

Noise emitted from the current dredge has been assessed and recommendations made to ensure that noise levels emitted conform to EPA requirements. A minimum distance from the floating dredge to residential receptors of 120 metres has been calculated which will be implemented to ensure compliance.

Air quality has been addressed and as the floating dredge is currently in service the proposal will not emit any additional fumes than the existing approved operations. The motor and ancillary machinery on the dredge are standard and have not been modified. The current air quality, which is monitored by EPA requirements, will be maintained. The proposal will not have a detrimental impact on the air quality of the area.

The proposal will not generate any new waste streams as a consequence of the proposed expansion, that are not already managed as part of the current operations. The existing operational Waste Minimisation Management Plan will be maintained. One additional disposal location for waste fines

has been nominated (Pig Island). This activity should be covered by a separate construction certificate.

Potential hazards have been identified and it is concluded that the operations are "not potentially hazardous". The potential hazards have been identified in work safety procedures and a management plan is in place which directs work practices on the site. Licences from RMS and EPA are required to operate the floating dredge which ensures it is operated within safe guidelines to minimise risk and hazards.

The proposed extension area is located at the western end and northern side of Pig Island. When viewing the site, from the southern bank of the Shoalhaven River, the dredge is backdropped by parts of Pig Island, the distant land mass of Coolangatta Mountain and the industrial infrastructure on the northern bank of the river at Manildra. The majority of the proposed dredge area is further east of the approved dredge area and will be less intrusive. Accordingly, the floating dredge is dwarfed by land masses, industrial developments on the northern side of the river and is not the dominant feature on the water way.

Exiting utilities and services will not be impacted upon by the proposal nor will the demand for their usage increase.

The social and economic impacts the proposal may have on the local area and community have been assessed as being generally positive. In general, the status quo will be maintained, save for the implementation of certain mitigating measures.

This EIS has been prepared in accordance with the relevant legislation, the SEARs, and has considered the local residents as well as Shoalhaven City Council.

The expert reports, contained within volume 2 of this EIS, have been prepared by appropriately qualified professionals in accordance with relevant guidelines, industry standards and specific legislation.

Conclusions reached and the mitigation measures proposed within the body of this EIS show that the proposal to extend the dredge area over the bed of the Shoalhaven River towards the western end and northern side of Pig Island, will not have a detrimental impact on the ecology of the Shoalhaven River nor the surrounding environment.

END