ENVIRONMENTAL IMPACT STATEMENT

FOR

THE ESTABLISHMENT & OPERATION OF A GREASE TRAP AND OILY WATER PROCESSING FACILITY

AT

LOT 2 DP 538542

KELLY CLOSE,

MACKSVILLE

Prepared by: David Pensini

Building Certification and Environmental Services

PO Box 5581

Port Macquarie NSW 2444

JULY 2015

Submission of Environmental Impact Statement (EIS)
Prepared under the Environmental Planning and Assessment Act 1979 Section 112

EIS PREPARED BY:	
Name:	**David Pensini**
Qualifications:	**B. App. Sci. (Environmental Health)**
Address:	**3 Blair Street, Port Macquarie NSW 2444**
In respect of:	**Grease Trap and Oily Water Waste Treatment Facility**
PART 5 ACTIVITY:	
Proponent name:	**Tony Gordon**
Proponent address:	**PO Box 195 Macksville NSW 2447**
Land on which activity to be carried out:	**Lot 2 DP 538542 Kelly Close, Macksville**
Proposed Development:	**Grease Trap and Oily Water Waste Treatment Facility**
ENVIRONMENTAL IMPACT STATEMENT:	
Environmental Impact Statement (EIS):	Attached
Declaration:	I declare that I have prepared this Environmental Impact Statement and to the best of my knowledge: • it has been prepared in accordance with Schedule 2 the Environmental Planning and Assessment Regulation 2000; • it contains all available information that is relevant to the environmental assessment of the activity to which the statement relates; and • the information which it contains is neither false nor misleading.
Signature:	
Name:	David Pensini
Date:	21st July 2015

EXECUTIVE SUMMARY

Introduction

It is proposed to develop a grease trap and oily water waste treatment facility on land which currently supports the operation of the Macksville Sewage Treatment Plant (MSTP). This land is known as Lot 2 DP 538542 Kelly Close, Macksville and is owned by Nambucca Shire Council. The proposed development will provide for the treatment of collected grease trap and oily water waste prior to discharge to the MSTP.

The proposed development

The proposed development involves the construction and operation of a grease trap and oily water treatment facility on the subject site. The proposed development comprises the following major components;

- Construction of a vehicle access road and manoeuvring area.
- Construction of a bunded process hardstand area.
- Installation of a Bioreactor Waste Water Treatment System. This system comprises the following major components;

    - Balance Tank, Trommel and Pit; and
    - Bio Rector Treatment System (3 x 40,000 litre tanks); and
    - Treated Water Storage (2 x 40,000 litre tanks).
    - Provision of staff toilet facility.

It is expected that the weekly processing of wastewaters will be in the order of 15,000 litres. This means that the daily rate of processing will be in the order of 2200 litres. The through put of the proposed treatment facility can however vary depending upon servicing demands.

The proposed facility will operate continuously in response to demand however it is noted that the delivery of wastewaters will be confined predominately to daylight hours between normal business hours - Monday to Friday. The maximum number of weekly deliveries to the proposed facility is likely to be in the order of 2 – 3.

Need and justification

At present the majority of collected grease trap and oily waste waters are collected by contractor for transport to Port Macquarie for further treatment with wastewaters discharged following treatment to the Port Macquarie reticulated sewerage system with solids transported elsewhere for further processing/recycling/disposal.

The proposed development provides an important opportunity to provide for diversity in local business and employment opportunities whilst providing local grease trap and oily waste water generators with a cost efficient and convenient local waste collection and disposal service.

The proposed development also provides for competition in the market place which assists in ensuring that waste collection and disposal costs are reasonable and responsive to the market.

Current planning framework and consent

As the proposed development is considered to be an extension of the current liquid waste management activities conducted on the subject site, development consent for the proposed development is required to be obtained from Nambucca Shire Council. It is also noted that as the subject site is within the floodplain of the Nambucca River the designated development provisions of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) are applicable to the proposed development.

The proposed development complies with the requirements of local and state legislation, planning objectives and development standards. The proposed development is also consistent with the zoning for the area and is compatible with the existing rural context.

The proposed development is considered to be consistent with the form and nature of development which is present and envisaged on the subject site and in the locality.

Consultations

The following Agencies and groups were consulted in the preparation of this document;

- NSW Department of Planning
- Nambucca Shire Council

A comprehensive program of community consultation has been undertaken by Nambucca Council and the NSW Department of Public Works during the formulation of a strategy for sewage treatment and effluent management in Macksville and during the development, selection and augmentation of the Macksville Sewage Scheme including the upgrading of the Macksville Sewerage Treatment Plant (MSTP). This process commenced in January 1991 and continued into 1995.

It is considered that the proposed grease trap and oily water waste treatment facility is an ancillary activity to the existing MSTP and as such the operation of the proposed development would be entirely consistent with the communities and regulatory authorities expectations associated with the treatment and disposal of sewerage/wastewaters. Accordingly the consultation initiates which where relevant to the upgrading of the MSTP are considered relevant to the proposed development.

Environmental assessment

An environmental assessment (EA) of the proposed development has been carried out with particular regard to the matters listed in the Director General's Requirements (NSW Planning Department). An environmental risk analysis has been carried out as a basis for critical assessment of the potential impacts of the proposal on the local environment.

Conclusion

The proposal has been assessed against and found to be consistent with all relevant Federal, State and Local legislation, Planning Instruments and Controls. A thorough assessment of all potential environmental and amenity impacts has also been completed. Specific impacts have been assessed with regard to:

- *Planning and Land Uses*

The construction and operation of the proposal would have few if any impacts on existing settlement patterns and planning initiatives. The site of the proposal is separated from the main part of Macksville town area, and there are no known development proposals in the vicinity of the subject site. Construction of the facility would result in only short term minor impacts.

- *Traffic*

Minor traffic impacts would occur during construction mainly as a result of the delivery of materials, plant and equipment to the site. Any impacts will be localized and for short durations. Increases in traffic are insignificant and would not be noticeable to residents.

Vehicular traffic movements will not significantly increase as a result of the operation of the proposed development. Given that the proposed development is consistent with the wastewater treatment activities already undertaken on the subject site, traffic movements to and from the proposed grease trap and oily water treatment facility will remain low with access to and from the proposed development infrequent.

The roads in the locality will have sufficient capacity to accommodate any minor increase in traffic that would occur as a result of the proposed development.

- *Noise*

During construction of the proposal, potential noise impacts arise from trucks and other small vehicles delivering materials, plant and equipment to the site. The main sources of noise at during the operation of the proposed facility would be aeration equipment and pumps.

Given with small scale of the proposed development, the enclosed nature of infrastructure and plant and the significant spatial separation which exists between the proposed development and residential receivers, operational noise impacts are considered to be negligible.

- *Heritage*

The construction and operation of the proposal would not impact on any aboriginal archaeological sites or items, nor any European heritage items.

- *Air quality*

Given with small scale of the proposed development, the enclosed nature of infrastructure and plant and the significant spatial separation which exists between the proposed development and residential receiver's air quality is unlikely to be altered during the construction and operation of the proposal.

Dust may however be generated from the site during construction activities. These impacts would be controlled by watering of exposed areas and stockpiles, and if required covering them. Following completion of construction, all exposed areas would be rehabilitated.

- *Geology and Soils*

During construction there is the potential for the erosion of exposed soils and sedimentation of local watercourses. These impacts are unlikely due to the flat topography of the site and the limited excavation required for construction. Erosion and sedimentation safeguards are proposed to be implemented to mitigate against potential impacts and a soil management plan would be prepared.

The geology of the area and soils of the subject site would not be affected by the operation of the proposed grease trap and oily waste water treatment facility.

- *Aquatic Environment*

There would be no impacts on aquatic flora and fauna and water quality in the Nambucca River or other watercourses during construction and operation of the proposal. Erosion and sedimentation controls would minimise the potential for runoff from the site and mitigate against increased turbidity in the Nambucca River/other watercourses.

- *Hydrology*

Construction and operation of the proposal would have no impacts on the hydrology of the area and the flood levels of the Nambucca River.

- *Terrestrial Flora and Fauna*

Due to the nature of the site being previously cleared and filled most of the construction work will not have a significant impact on native vegetation.

Pest management issues are however considered to be relevant to the ongoing operation and management of the proposed facility. The adoption of best practice pest management strategies is required for the operation of the proposed facility.

- *Management, Monitoring and Auditing*

A comprehensive site Environmental Management Plan (EMP) would be prepared prior to construction of the proposal. This plan would incorporate safeguards and measures to minimise environmental impacts of the proposal prior to, during and following construction of the works. It would include erosion and sedimentation controls, dust mitigation measures, approvals and licences from relevant authorities and other safeguards specified in this EIS.

The EMP would also incorporate details of ongoing monitoring programs, community liaison, and requirements for site audits during construction to examine compliance with the details of the EMP.

Systems would be incorporated within the design of the facility to regularly monitor the performance of the facility and to provide alarms in the event of some form of a breakdown at the site.

The detailed design of the proposal would be carried out taking into account the environmental issues raised in this EIS, and incorporating all relevant safeguards discussed and developed through the EMP.

DIRECTOR GENERAL's REQUIREMENTS

Director General's Requirements (DGR's) for the Environmental Assessment to accompany this proposal were issued to David Pensini – Building Certification and Environmental Services on 24th March 2014, see **Appendix 1**.

CONTENTS

1. INTRODUCTION

1.1 Background to the Proposal

It is proposed to develop a grease trap and oily water waste treatment facility on land which currently supports the operation of the Macksville Sewage Treatment Plant (MSTP). This land is known as Lot 2 DP 538542 Kelly Close, Macksville and is currently owned by Nambucca Shire Council. The proposed development will provide for the treatment of collected grease trap and oily water waste prior to discharge to the MSTP.

As the proposed development will be privately owned and operated the development and management strategy for the proposed facility involves the subdivision of the subject site so as to provide for a separate Torrens Title lot which will contain the grease trap and oily water waste treatment facility. It is however noted that the subdivision of the subject site does not form part of this development application. A separate Development Application will deal with the subdivision of the subject site.

As the proposed development is considered to be an extension of the current liquid waste management activities conducted on the subject site, development consent for the proposal t is required to be obtained from Nambucca Shire Council.

This Environmental Impact Statement (EIS) addresses the nature and form of the proposed development, the characteristics of the site and surrounding area and the impacts of the proposed development.

The proposed development complies with the requirements of local and state legislation, planning objectives and development standards. The proposed development is also consistent with the zoning for the area and is compatible with the existing rural context.

The proposed development is considered to be consistent with the form and nature of development which is envisaged on the subject site and in the locality.

1.2 Purpose of this Environmental Impact Assessment

The main purpose of this EIS is to enable a clear understanding of the potential environmental impacts of the proposal. It describes the proposal, investigates and documents the likely impacts of the proposal on the natural and social environments and details measures to protect and ameliorate any impacts on those environments during construction and operation of the proposed development. It also outlines community involvement in the project to date, options that have been considered, the need for the project and the future environmental monitoring and audit measures that are proposed.

The EIS will enable the determining authority to assess whether the proposal would have significant environmental impacts and the nature of management actions required to minimize the impact of the development on the environment.

The EIS has been prepared in accordance with Section 112 of the Environmental Planning and Assessment Act 1979 by David Pensini.

1.3 Statutory Requirements

1.3.1 Background

Development in New South Wales is subject to the provisions of the *Environmental Planning and Assessment Act, 1979* (EP&A Act), as amended, and planning instruments developed pursuant to that Act. The *EP&A Act* and planning instruments prepared under the Act, establish that development may be either:

- Permissible with development consent;
- Permissible without development consent; or
- Prohibited.

Development that requires consent is assessed under the provisions of Part 4 of the EP&A Act, and the specific controls and matters for consideration established by environmental planning instruments. Development that is prohibited cannot be undertaken. Development that is permissible without consent is still subject to environmental impact assessment, and Part 5 of the EP&A Act establishes processes and requirements. The entire project has been assessed as permissible with consent, and will be assessed under Part 4 of the EP&A Act.

Under Part 4, developments that have the potential to have a significant impact on the environment are required to be assessed through an Environmental Impact Statement (EIS). In this regard Clause 112 of the EP&A Act provides that;

'a determining authority shall not carry out an activity, or grant an approval in relation to an activity, being an activity that is a prescribed activity, an activity of a prescribed kind or an activity that is likely to significantly affect the environment (including critical habitat) or threatened species, populations or ecological communities, or their habitats, unless:

(a) the determining authority has obtained or been furnished with and has examined and considered an environmental impact statement in respect of the activity:

(i) prepared in the prescribed form and manner by or on behalf of the proponent, and

(ii) except where the proponent is the determining authority, submitted to the determining authority in the prescribed manner'.

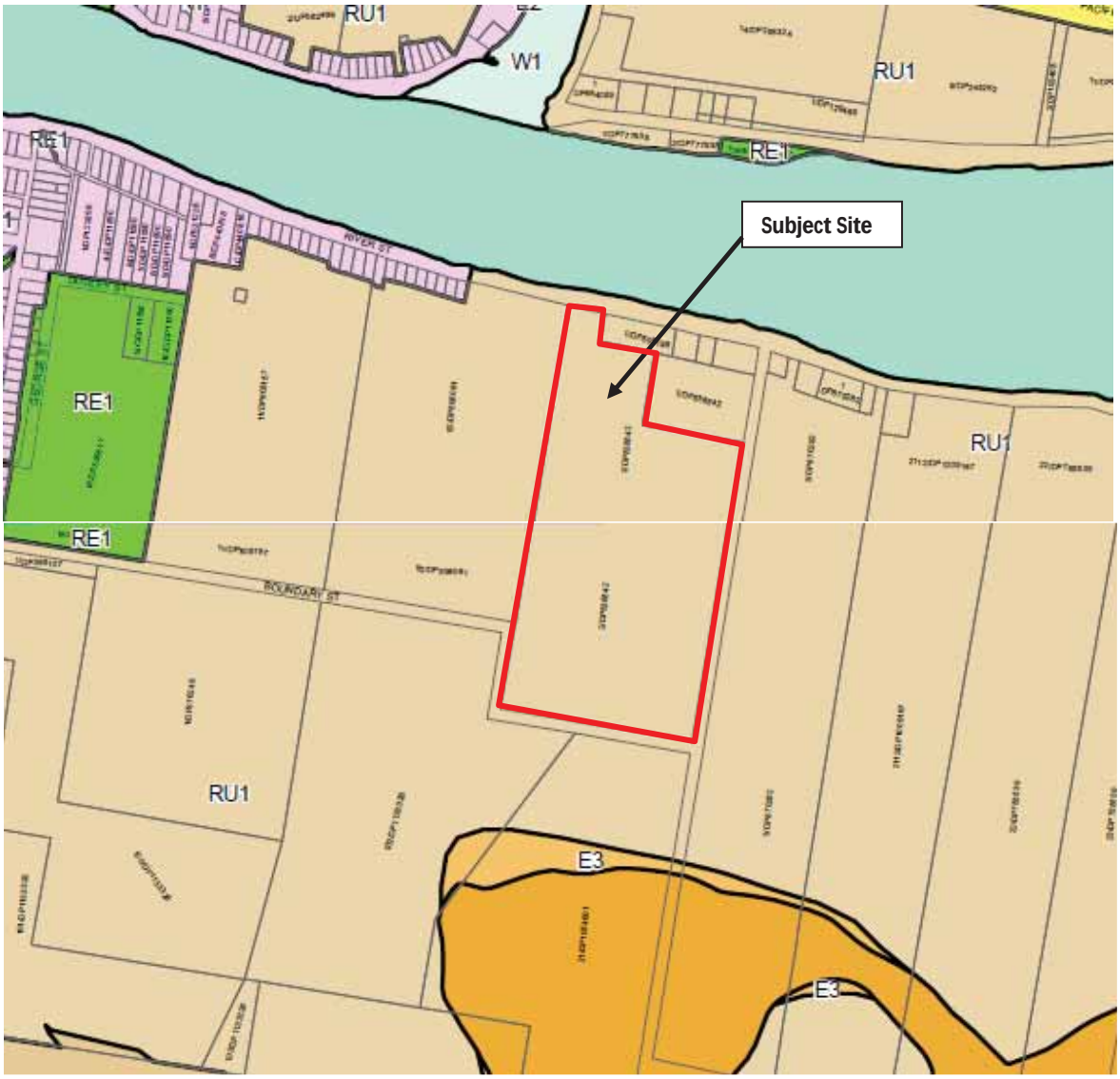
As the subject site and proposed development is identified as being within the Flood Plain of the Nambucca River the proposed development, (waste management facility or works), has been identified as Designated Development pursuant to Schedule 3 of the Environmental Planning and Assessment Regulation, 2000 and accordingly an EIS is required to accompany any development application which is lodged with Nambucca Shire Council as the determining authority.

1.3.2 Environmental Planning Instruments

(i) Nambucca Local Environment Plan (LEP)

The subject land is zoned Primary Production RU1 pursuant to Nambucca Local Environmental Plan - 2010 (NLEP 2010).

Figure 1 – Landuse Zoning



- *Permissibility*

The relevant permissibility provisions of NLEP 2010 as they relate to the proposed development are as follows;

Zone; RU1 Primary Production

Permitted without consent
Environmental protection works; Extensive agriculture; Forestry; Home-based child care; Home occupations; Horticulture

Permitted with consent
Cellar door premises; Dual occupancies (attached); Dwelling houses; Extractive industries; Farm buildings; Heavy industries; Home industries; Intensive livestock agriculture; Intensive plant agriculture; Landscaping material supplies; Neighbourhood shops; Open cut mining; Plant nurseries; Roads; Roadside stalls; Rural supplies; Rural workers' dwellings; Secondary dwellings; Shop top housing; Tourist and visitor accommodation; Any other development not specified in item 2 or 4.

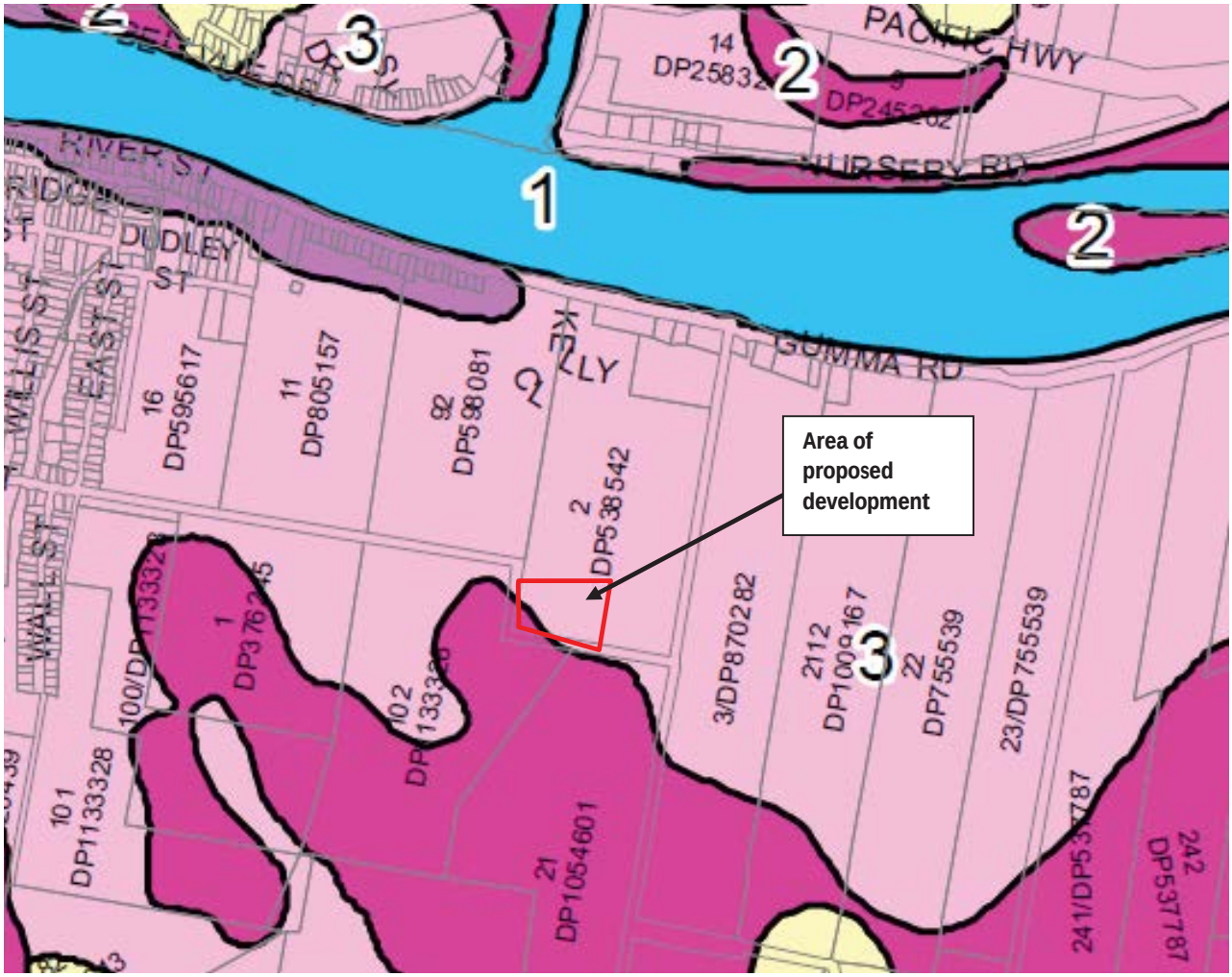
Prohibited
Amusement centres; Backpackers' accommodation; Camping grounds; Caravan parks; Cemeteries; Child care centres; Commercial premises; Correctional centres; Crematoria; Eco-tourist facilities; Entertainment facilities; Exhibition homes; Exhibition villages; Function centres; Health services facilities; Heavy industrial storage establishments; Heliports; Hotel or motel accommodation; Industrial retail outlets; Industrial training facilities; Industries; Mortuaries; Recreation facilities (indoor); Registered clubs; Residential accommodation; Respite day care centres; Restricted premises; Service stations; Serviced apartments; Sex services premises; Storage premises; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Wharf or boating facilities; Wholesale supplies

Having regard to the above, a grease trap and oily water waste treatment facility of the nature of the proposed development is permissible with consent in land use zone RU1 as it is not a prohibited form of development within the zone.

- *Acid Sulphate Soils*

The proposed development is subject to compliance with Clause 7.1 of Nambucca Local Environmental Plan 2010 as the site of the proposed development is shown as being affected by acid sulphate soils, refer to **Figure 2** below.

Figure 2 – Extract from Acid Sulphate Soil LEP Map



Clause 7.1 of the LEP provides that development consent is required for works in a Class 2 or 3 area where the works are proposed at or 1m below natural ground level or works by which the water table is likely to be lowered below natural ground level or by more than 1m below natural ground level.

Specifically Clause 7.1 of NLEP 2010 provides that:

'Development consent must not be granted under this clause for the carrying out of works unless an acid sulfate soils management plan has been prepared for the proposed works in accordance with the Acid Sulfate Soils Manual and has been provided to the consent authority.

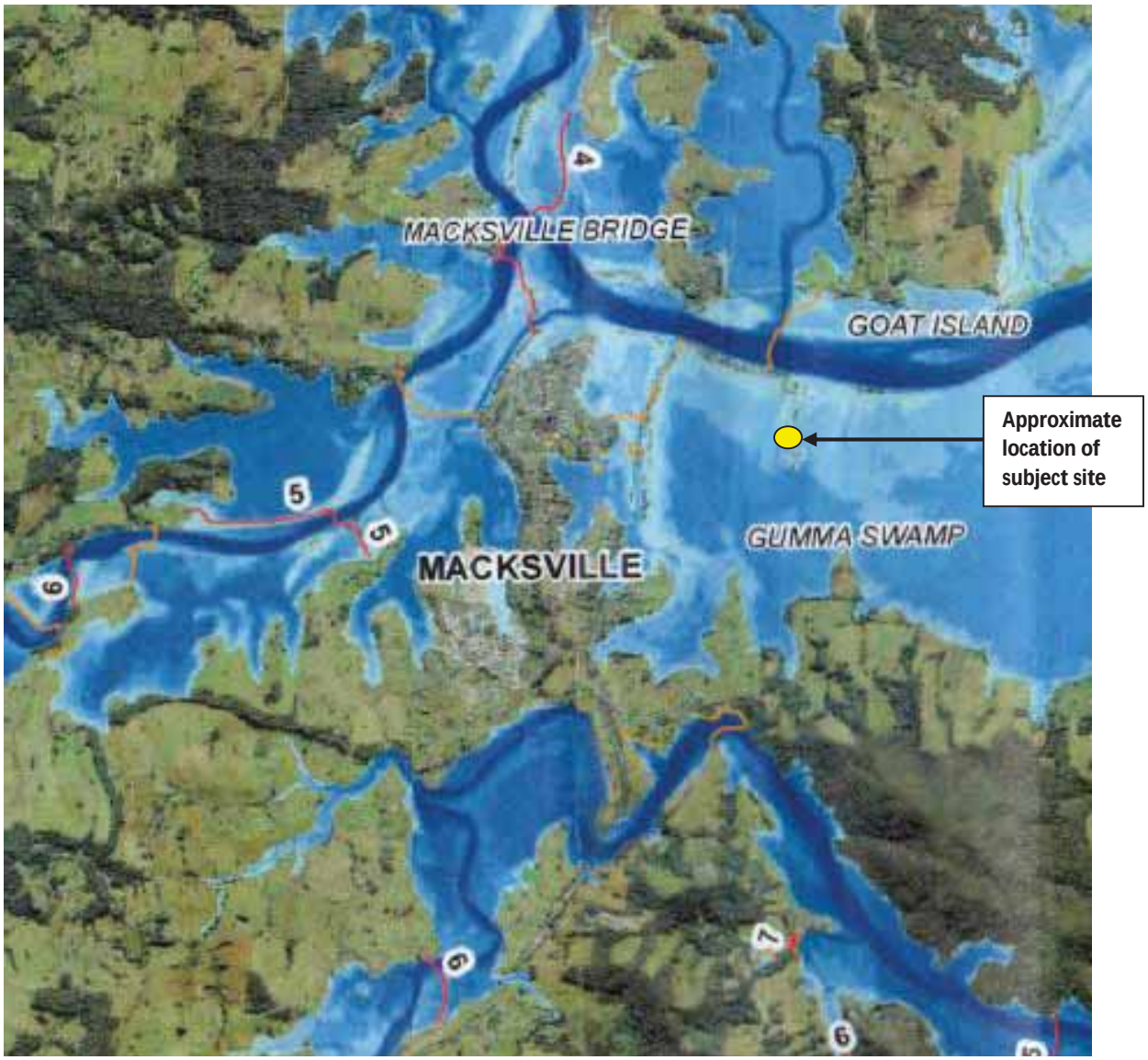
(4) Despite subclause (2), development consent is not required under this clause for the carrying out of works if:
(a) a preliminary assessment of the proposed works prepared in accordance with the Acid Sulfate Soils Manual indicates that an acid sulfate soils management plan need not be carried out for the works, and
(b) the preliminary assessment has been provided to the consent authority and the consent authority has confirmed the assessment by notice in writing to the person proposing to carry out the works'.

The already filled nature of the subject site and the nature of the proposed development are such that there will be no works undertaken below natural ground level nor will the proposed development have any impact on ground water levels beyond that which already exists. Accordingly the proposed development can be approved by the Council without the need for an Acid Sulphate Soils Management Plan.

- *Flood Affected Land Provisions*

The subject site is identified as being flood prone land for the purposes of NLEP 2010 in that the land is identified as being affected by the 1:100 flood event, refer to **Figure 3**.

Figure 3 – 1:100 Year Flood Event



It is however noted that the site of the proposed development does not appear to be impacted upon by the 5 year ARI event or the 10% AEP event. In this regard Clause 7.3 of Nambucca Local Environmental Plan 2010 provides that;

'Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:
(a) is compatible with the flood hazard of the land, and

(b) will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and

(c) incorporates appropriate measures to manage risk to life from flood, and

(d) will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and

(e) is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding'.

The objectives of the above clause are as follows:

(a) to minimise the flood risk to life and property associated with the use of land,

(b) to allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change,

(c) to avoid significant adverse impacts on flood behaviour and the environment.

Having regards to the heads of consideration provided for by Clause 7.3 of the LEP the following information is provided;

Table 1– Flood Planning Heads of Consideration

CONSIDERATION	COMMENT
The development is compatible with the flood hazard of the land	The proposed infrastructure on the subject site is compatible with the existing STP infrastructure which is present to the east of the proposed development. The flooding hazard and impacts on the proposed development are therefore considered to be the same as that which exists in relation to the STP. The minimal size and nature of the proposed development are such that any impacts would be expected to be minimal with the proposed development able to withstand the impacts of flooding. The selection of the subject site to accommodate the operation of the existing STP provides that the location of wastewater treatment infrastructure in the locality is consistent with the flood hazard. In this regard the proposed development is considered to be similar in nature and function to the existing STP and as such the proposed development is compatible with the flood hazard of the land.
The development will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties	The minimal size and nature of the proposed development is such that flood behaviour will not be affected. The already filled nature of the subject site and the minimal footprint of the proposed development site are such that there will be no increases in the potential flood affectation of other development or

	properties.
The development incorporates appropriate measures to manage risk to life from flood	The proposed development does not propose nor require a full time or residential presence. During periods of floods it is unlikely that the site will be occupied and it is likely that access to the site would be restricted prior to the site being inundated. Therefore it is highly unlikely that there would be any flood related life safety risks associated with the proposed development. The operating and maintenance procedures for the proposed development will incorporate emergency evacuation and management procedures which will respond to any flood risk associated with the proposed development.
The development is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding	The size and nature of the proposed development will not result in unsustainable social and economic costs to the community as a consequence of flooding. The nature of the proposed development is such that any flooding will have minimal impacts in relation to asset damage.

Based upon the information provided in **Table 1** above it is considered that the proposed development is consistent with the objectives which are applicable to Clause 7.3 of the LEP and accordingly Council can be satisfied that Clause 7.3 of the LEP is satisfied.

- *Provision of Services*

Clause 7.4 of Nambucca LEP 2010 provides that Council shall not grant consent to development on any land unless services are available to the land.

Services including electricity, telephone, reticulated water supply and reticulated sewerage are readily available from the existing service networks in the area without system augmentation.

(ii) North Coast Regional Environmental Plan (NCREP)

The North Coast Regional Environmental Plan (REP) applies to the Nambucca local government area and must be considered when assessing developments in the region. The aims of the North Coast REP include:

(a) to develop regional policies that protect the natural environment, encourage an efficient and attractive built environment and guide development into a productive yet environmentally sound future;

(b) to consolidate and amend various existing policies applying to the region, make them more appropriate to regional needs and place them in an overall context of regional policy;

(c) to provide a basis for the co-ordination of activities related to growth in the region and encourage optimum economic and social benefit to the local community and visitors to the region; and

(d) to initiate a regional planning process that will serve as a framework for identifying priorities for further investigation to be carried out by the Department and other agencies.

The REP specifies a number of requirements that must be assessed during the development consent process. This proposal is consistent with the overall objectives of the NCREP as well as the specific provisions which are relevant to developments of the nature which is proposed.

1.3.3 Environmental Planning Policies

(i) State Environmental Planning Policy 14 (SEPP 14) – Coastal Wetlands

SEPP 14 aims to ensure coastal wetlands are preserved and protected for environmental and economic reasons. The policy applies to local government areas with frontage to the Pacific Ocean, excluding those in the Sydney metropolitan area, and identifies over 1300 wetlands of high natural value. Land clearing, levee construction and drainage or filling may only be able to be carried out on wetlands identified by the policy with the consent of the local council and the concurrence of the Director of Planning.

SEPP 14 wetlands are located on adjacent land to the south of the subject site.

As the proposed development will not directly or indirectly impact upon these wetlands, no additional approval under this SEPP is required.

(i) State Environmental Planning Policy 33 (SEPP 33) – Hazardous and Offensive Development

This SEPP provides definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. Any application to carry out a potentially hazardous or potentially offensive development must be advertised for public comment, and applications to carry out potentially hazardous development must be supported by a preliminary hazard analysis (PHA).

The proposed development is not considered to be a potentially hazardous develop under SEPP 33 due to:

- The nature and scale of the proposed development; and
- The enclosed nature of all processing and storage infrastructure; and
- The processes involved in the operation of the proposed development; and
- The location of the subject site and the absence of sensitive receivers in proximity to the subject site.

(iii) State Environmental Planning Policy 71 (SEPP 71) – Coastal Protection

This policy makes the Minister of Planning the consent authority for certain development and makes provision for referral of certain developments to the Director-General of Planning NSW.

SEPP 71 does not change consent requirements, i.e. development that does not require consent under other planning instruments does not fall within the provisions of SEPP 71. As the proposed development is permissible with consent under NLEP 2010, SEPP 71 does not apply. However, the proposal is within the coastal zone as defined by the *NSW Coastal Policy*, and as such it is appropriate that this EIS addresses the matters for consideration of SEPP 71 and the relevant objectives and policy statements in the *NSW Coastal Policy*. The proposed development is assessed against the *NSW Coastal Policy* as follows;

Table 2 – SEPP 71 Compliance

Clause 8 matters for consideration, SEPP No. 71 – Coastal Protection	**Compliance**	**Proposal as assessed under Clause 8 matters for consideration, SEPP No. 71 – Coastal Protection**
(a) the aims of this Policy set out in clause 2, (1) This Policy aims: (a) to protect and manage the natural, cultural, recreational and economic attributes of the New South Wales coast, and	Complies	The proposal will have a minimal impact on the natural, cultural, recreational and economic attributes of the NSW coast. This development will support economic investment within the local area specifically and the Mid-North Coast generally and will have positive economic benefits for the community.
(b) to protect and improve existing public access to and along coastal foreshores to the extent that this is compatible with the natural attributes of the coastal foreshore, and	Not applicable	The proposal has no impact on public access to and along the coastal foreshore.
(c) to ensure that new opportunities for public access to and along coastal foreshores are	Not applicable	See above comment

identified and realized to the extent that this is compatible with the natural attributes of the coastal foreshore. and		
(d) to protect and preserve Aboriginal cultural heritage, and Aboriginal places, values, customs, beliefs and traditional knowledge, and	Complies	There are no known archaeological or heritage issues present on site.
(e) to ensure that the visual amenity of the coast is protected, and	Complies	The proposal will protect the visual amenity of the coast as it will be in keeping with the characteristics of the area.
(f) to protect and preserve beach environments and beach amenity, and	Complies	The proposal will have no impact on the environment or amenity of beach areas.
(g) to protect and preserve native coastal vegetation, and	Not applicable	The proposal will have no impact on native coastal vegetation.
(h) to protect and preserve the marine environment of NSW, and	Not applicable	The proposal will have no impacts on the marine environment of NSW
(i) to protect and preserve rock platforms, and	Not applicable	The proposal will have no impacts on rock platforms
(j) to manage the coastal zone in accordance with the principles of ecologically sustainable development (within the meaning of section 6 (2) of the Protection of the Environment Administration Act 1991), and	Not applicable	The proposal has been designed to consider the principles of ecologically sustainable development.
(k) to ensure that the type, bulk, scale and size of development is appropriate for the location and protects and improves the natural scenic quality of the surrounding area, and	Complies	The proposal is of an appropriate type, bulk, scale and size for its location which complements not only the existing built environment but also the scenic quality of the surrounding area.
(l) to encourage a strategic approach to coastal		The proposal does not impact on

management.	Complies	strategic coastal management.
(b) existing public access to and along the coastal foreshore for pedestrians or persons with a disability should be retained and, where possible, public access to and along the coastal foreshore for pedestrians or persons with a disability should be improved,	Not applicable	The proposal has no impact on public access to and along the coastal foreshore.
(c) opportunities to provide new public access to and along the coastal foreshore for pedestrians or persons with a disability,	Not Applicable	
(d) the suitability of development given its type, location and design and its relationship with the surrounding area,	Complies	See the comments made earlier in relation to 1(k).
(e) any detrimental impact that development may have on the amenity of the coastal foreshore, including any significant overshadowing of the coastal foreshore and any significant loss of views from a public place to the coastal foreshore,	Complies	The proposal will not result in any detrimental impact, overshadowing or loss of views from a public place to the foreshore.
(f) the scenic qualities of the New South Wales coast, and means to protect and improve these qualities,	Complies	Given the location of the subject development there are no scenic protections issues
(g) measures to conserve animals (within the meaning of the Threatened Species Conservation Act 1995) and plants (within the meaning of that Act), and their habitats,	Not applicable	Given the developed nature of the subject site it is extremely unlikely that the site includes any threatened species or items of conservation significance
(h) measures to conserve fish (within the meaning of Part 7A of the Fisheries Management Act 1994) and marine vegetation (within the meaning of that Part),	Not applicable	The proposal will have no impact on fish species or their environment.

and their habitats		
(i) existing wildlife corridors and the impact of development on these corridors,	Not applicable	No corridors exist on or adjacent to the subject site
(j) the likely impact of coastal processes and coastal hazards on development and any likely impacts of development on coastal processes and coastal hazards,	Not applicable	Given the location of the subject site it is unlikely that coastal processes or hazards will impact on the development.
(k) measures to reduce the potential for conflict between land-based and water based coastal activities,	Not applicable	Due to its location the development proposal will not conflict with land based and water based activities.
(l) measures to protect the cultural places, values, customs, beliefs and traditional knowledge of Aboriginals,	Complies	See comments made earlier in this table regarding cultural and archaeological considerations.
(m) likely impacts of development on the water quality of coastal water bodies,	Complies	The proposal will not have a detectable impact on the water quality of coastal waters.
(n) the conservation and preservation of items of heritage, archaeological or historic significance,	Complies	See the comments made earlier in this table regarding archaeological issues on the subject site.
(o) only in cases in which a council prepares a draft local environmental plan that applies to land to which this Policy applies, the means to encourage compact towns and cities,	Not Applicable	Not Applicable
(p) only in cases in which a development application in relation to proposed development is determined: (i) the cumulative impacts of the proposed development on the environment, and (ii) measures to ensure that water and energy usage by the proposed development is	Complies	The cumulative impacts of the proposal on the environment are considered to be minimal. Compliance with Building Code of Australia requirements which are applicable to the subject development will provide for water and energy efficiency in the operation of the proposed

efficient.		development.

1.3.4 Development Control Plans

(i) Nambucca Development Control Plan 2010

The relevant provisions of the Nambucca Development Control Plan (DCP) 2010 are applicable to the development of the subject site. In this regard the following requirements are noted as being of relevance to the proposed development.

Table 3 – Nambucca DCP 2010 Requirements

PROVISION	COMMENT
PART A - Environmental Context	
A5.1 Acid Sulphate Soils	The proposed development will have no impacts on acid sulphate soils as no excavation of natural ground is proposed nor will the development result in the lowering of ground water conditions.
A5.2 Bushfire Prone Land	The southern portion of the subject site is identified as Bushfire Prone Land however given the 'infrastructure' nature of the proposed development it is considered that a Bushfire Hazard Assessment Report is not required.
A5.3 Flood Prone Land	Whilst the subject site is shown to be affected by the 1:100 year flood event it is noted that the proposed development will have no impacts upon flooding beyond that which already exists. The nature of the proposed development is such that any flooding will have minimal impacts in relation to asset damage.
A5.4 Site Contamination	The subject site is not identified as a contaminated site by Nambucca Council.
A5.6 Aboriginal Cultural Heritage	The subject site is neither a heritage item or located within conservation area and it is unlikely to include any archaeological remains.
A5.7 European Heritage	The subject site is neither a heritage item or located within conservation area and it is unlikely to include any archaeological remains.

A5.8 Flora and Fauna	Given that the site has been cleared of the majority of native vegetation as part of the historic development and use of the subject site the impacts on flora and fauna associated with the proposed development will be minimal.
A5.9 Water Courses	The development and use of the subject site will have no impacts on natural watercourses, drainage channels and riparian zones.
A5.10 Noise	The operation of the proposed facility will have minimal impact on the acoustic environment of the subject site and locality.
PART C – Car Parking and Traffic	
	All vehicle movements to the site of the proposed development will be via the existing bitumen sealed two wheel drive all weather internal access road which connects with Kelly Close. Vehicular traffic movements will not significantly increase as a result of the proposed development. All vehicle movements to and from the site of the proposed development will be in a forward direction. Given the size of the subject site ample parking and vehicle manoeuvring will be available.
PART E – Sediment and Erosion Control	
	Soil disturbance will occur as a result of the construction of the proposed development including the movement of vehicles to and from the site during construction. The utilization of silt fences and other standard erosion and sediment control devices can be incorporated on site to minimize any erosion and sedimentation caused through site disturbance. In this regard an erosion and sediment control plan will be implemented on site during construction activities on the site. Once the development has been constructed the impacts on soils will be negligible as the

	operational requirements for the proposed infrastructure provides for minimal soil disturbance.
PART F – Rural and Environmental Development	
Building lines	Complies
Buffers	Complies

1.3.5 Licences and Approvals

Should the proposal proceed the proponent would need to obtain relevant approvals and licences that are generally aimed at monitoring the performance of the proposed development both during its construction and operation.

Schedule 2 of the *EP&A Regulation* requires this EIS to contain a list of any approvals that must be obtained under any Act or law, (other than the *EP&A Act*), before the proposal may lawfully be carried out. Following is a discussion of the licences and approvals which have been identified as being required under relevant State and Federal legislation.

(i) NSW Government Requirements

- **Protection of the Environment Operations Act, 1997**

The Environment Protection Authority (EPA) is responsible for the administration of this Act in relation to air, noise, water pollution and waste management. The proposal is a Scheduled Activity under the Act and the operators of the proposed grease trap and oily water waste treatment facility would be required to obtain an Environmental Protection Licence (EPL) for the operation of the proposed facility.

As the proposed grease trap and oily water waste treatment facility involves having on site at any time more than 200 kilograms of liquid waste, (other than clinical and related waste), the proposed activity is a Scheduled Activity pursuant to the Protection of the Environment Operations Act, 1997 and as such the operation of the facility may only proceed where an EPL is in place.

- **Local Government Act, 1993**

Department of Environment Climate Change and Water (DECCW) concurrence is required before a council may approve an application for the discharge of liquid trade waste, (including septic tank and pan waste), to the sewerage system.

It is a requirement under section 90(1) of the Local Government Act, 1993 and clause 28 of the Local Government (General) Regulation 2005 that council obtain the written concurrence of the Director-General of the Department of Environment Climate Change and Water (DECCW) prior to approving such waste to be discharged to the council's sewerage system.

It is noted that the proposed development would be subject to the Category 3 Discharger, (large or industrial waste dischargers), requirements of Nambucca Shire Councils Liquid Trade Waste Management Policy. Category 3 liquid trade waste dischargers are those conducting an activity

which is of an industrial nature and/or which results in the discharge of large volumes, (over 20kL/d) of liquid trade waste to the sewerage system. Any Category 1 or 2 discharger whose volume exceeds 20kL/d becomes a Category 3 discharger, except shopping complexes and institutions (e.g. hospitals, educational facilities, correctional facilities, etc.)

1.3.6 Determining Authorities

The determining authority for the proposed development is Nambucca Shire Council. As approvals are required from the EPA and DECCW for the operation of the grease trap and oily water waste treatment facility, these organisations as well as Nambucca Shire Council are determining authorities for the proposal.

1.3.7 Other Requirements

(i) NSW Coastal Policy 1997

The NSW Coastal Policy 1997 (NSW Government 1997) provides general objectives and principles for environmental protection and development along the NSW coast. The proposed development is contained within the boundaries of the 'coastal zone' and thus development should be in accordance with the policy.

There are nine goals specified in the coastal policy relating to conservation, human activities and implementation. These have been translated into key strategic actions to achieve the goals. The proposed development has been assessed against the relevant key strategic actions in **Table 2** above.

The proposed development is compliant with all relevant key strategic actions under the Coastal Policy.

(ii) NSW Groundwater Quality Protection Policy

The NSW Groundwater Quality Protection Policy developed by the Department of Land and Water Conservation (1998) is aimed at preventing the degradation of the State's aquifers where each aquifer system is evaluated by its beneficial use.

Given the location, size and enclosed nature of the proposed grease trap and oily water waste treatment facility no impacts on ground water resources would be expected.

1.3.8 EIS Exhibition and Approval

This EIS will be placed on public display in various locations for a minimum of 30 days as required by the EP&A Act. Interested or affected parties are encouraged to make submissions regarding the EIS to Nambucca Shire Council.

Nambucca Shire Council, Department of Environment Climate Change and Water and the Environment Protection Authority all have approval roles for various aspects of the project.

Following exhibition and representations from the relevant authorities and the community, Nambucca Shire Council, the EPA and DECCW would then decide whether or not the proposal should proceed.

1.4 Consultation

Consultation with Nambucca Shire Council has been undertaken during the development of this EIS. The proposal has been developed in close consultation with relevant parties who have provided valuable input into the selection of a preferred option for the location of the proposed facility and finalisation of the concept design and report.

The NSW Department of Planning has also been consulted in relation to the requirements for the preparation of this EIS.

1.4.1 Previous Environmental Assessment Consultation

It is noted that a comprehensive program of community consultation has already been undertaken by Nambucca Shire Council and the Department of Public Works during the formulation of a strategy for sewage treatment and effluent management in Macksville and during the development, selection and augmentation of the Macksville Sewage Scheme including the upgrading of the Macksville Sewerage Treatment Plant (MSTP). This process commenced in January 1991 and continued into 1995.

The resultant upgrading of the MSTP provides for a facility which is able to operate in an environmentally responsible manner which reflects community and legislative expectations and requirements.

It is considered that the proposed grease trap and oily water waste treatment facility is an ancillary activity to the existing MSTP and as such the operation of the proposed development would be entirely consistent with the communities expectations associated with the treatment and disposal of sewerage/wastewaters. Accordingly the consultation initiatives which where relevant to the upgrading of the MSTP are considered to be still relevant to the proposed development.

1.5 Previous Studies

Studies and investigations which have previously been undertaken in relation to the current and continued use of subject site for the purposes of sewage/wastewater treatment and disposal include:

- NSW Public Works (1991) Macksville Sewage Augmentation Assessment of Loading on and Performance of the Macksville Sewage Treatment Works;
- Sinclair Knight and Partners (1991) Macksville Sewage Development Study – Report on Flow Monitoring of Macksville Sewage System;
- Resource Design and Management Pty Ltd (1993) Macksville Sewage Augmentation – Draft Strategy Report.
- Slattery de Groot and Partners Pty Ltd (1993b) Physical Investigation of Sewage Catchment Area 2 at Macksville, Nambucca Council;
- Slattery de Groot and Partners Pty Ltd (1993b) Physical Investigation of Sewage Catchment Area 3 at Macksville, Nambucca Council;
- NSW Public Works (1994a) Macksville Sewage Augmentation – Value Management Study;
- NSW Public Works (1994b) Macksville Sewage Augmentation – Options Report;
- Willing and Partners (1994) Hydraulic Modelling of Macksville Sewage Treatment Plant Augmentation;

- NSW Agriculture (1994) Irrigation Management Services Macksville Sewage Augmentation Agronomy Study;
- NSW Public Works (1994c) Engineering and Surveying Branch Macksville Sewage Augmentation Sewage Treatment Works Potential Acid Sulphate Soil Study;
- NSW Public Works (1994d) Water Services Policy Division Macksville Sewage Augmentation, Reticulation Strategy Report;
- NSW Public Works (1994e) Estuary and Environment Policy Division Macksville Sewage Augmentation – Nambucca River Tidal Modelling.
- NSW Public Works (1994) Water Services Policy Division Macksville Sewage Augmentation, Sewage Treatment Works – Concept Design Report; and
- RUST PPK Pty Ltd (1995) Macksville Sewage Augmentation Review of Environmental Factors – Final Draft report

It is noted that all previous studies and investigations have supported the suitability of the subject site for use for the purposes of sewage/wastewater treatment and disposal.

2. NEED FOR PROJECT

2.1 Existing Waste Management Practices

At present the majority of grease trap and oily waste waters are collected by private contractors for transport to Port Macquarie for further pre-treatment with resultant wastewaters discharged to the Port Macquarie reticulated sewerage system with solids transported elsewhere for further processing/recycling/disposal.

It is understood that there is a level of uncertainty regarding the continued operation of the Port Macquarie treatment facility. Should the facility be closed or relocated elsewhere then additional treatment and disposal costs may result due to increased transport costs.

It is considered that the proposed development provides an important opportunity to provide for diversity in local business and employment opportunities whilst providing local grease trap and oily waste water generators with a cost efficient and convenient local waste collection and disposal service.

The proposed development also provides for competition in the market place which assists in ensuring that waste collection and disposal costs are reasonable and responsive to the market.

2.2 Objectives of the Proposal

The objectives of the proposal are:

- To provide the Nambucca Shire Council Local Government Area, (and surrounds), with a cost efficient grease trap and oily waste water disposal system which provides for minimal environmental impact;
- To meet the Nambucca Shire Council and DECCW standards for discharge of wastewaters to the Macksville Sewerage Treatment Plant; and
- To meet EPA standards for the operation of a liquid waste processing and storage facility.

3. EXISTING ENVIRONMENT

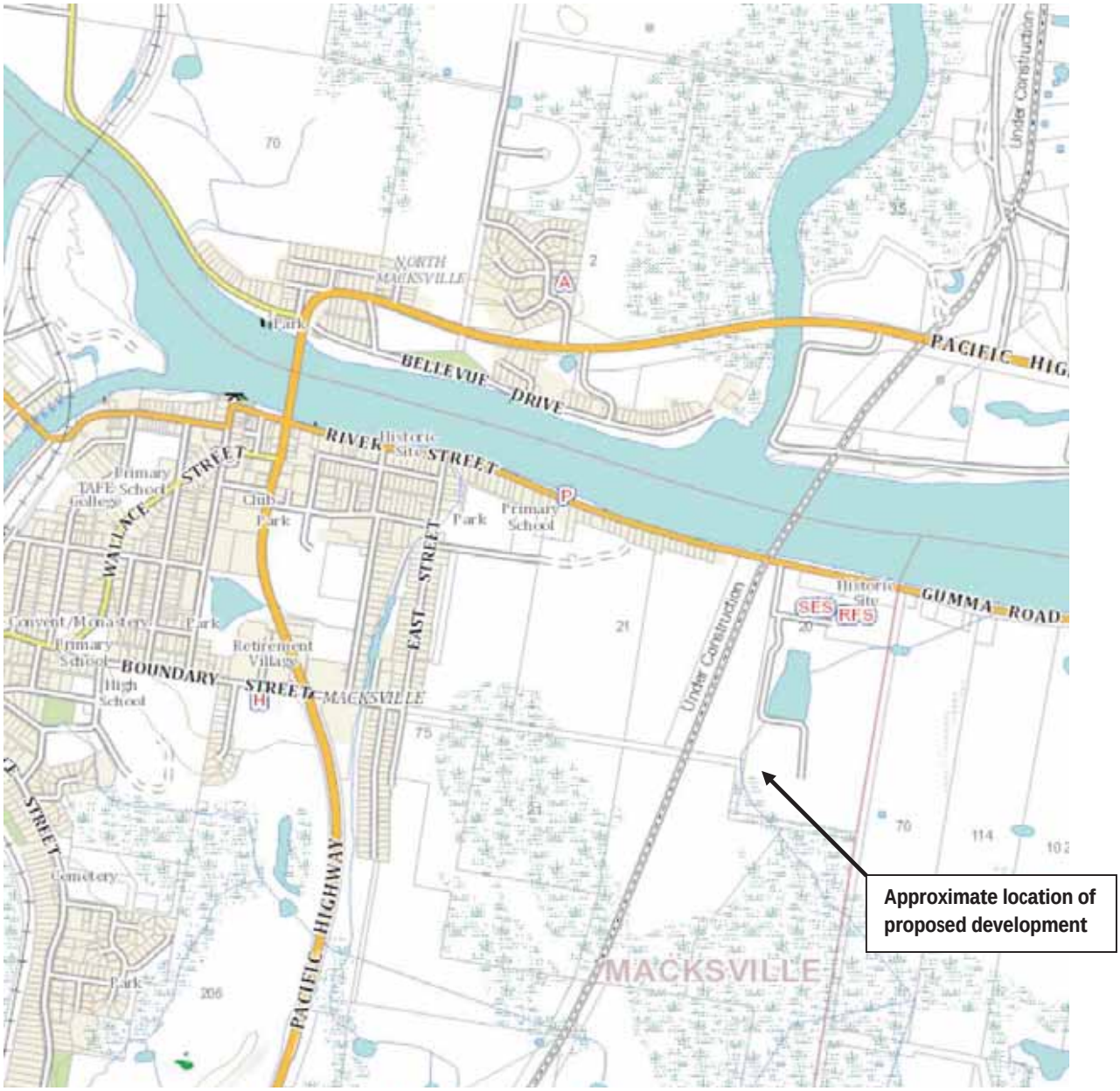
3.1 Location and Landuse

The subject land is situated within a rural area which is located approximately 1.5km to the southeast of the Macksville Central Business District (CBD).

The subject site is known as Lot 2 DP 538542 Kelly Close, Macksville and is owned by Nambucca Council.

The township of Macksville is located on the mid coast of NSW approximately 50km to the south of Coffs Harbour and approximately 80km north of Port Macquarie. Macksville has a population of around 2500 people and is the centre of an agricultural district, refer to **Figure 4**.

Figure 4 – Site Locality

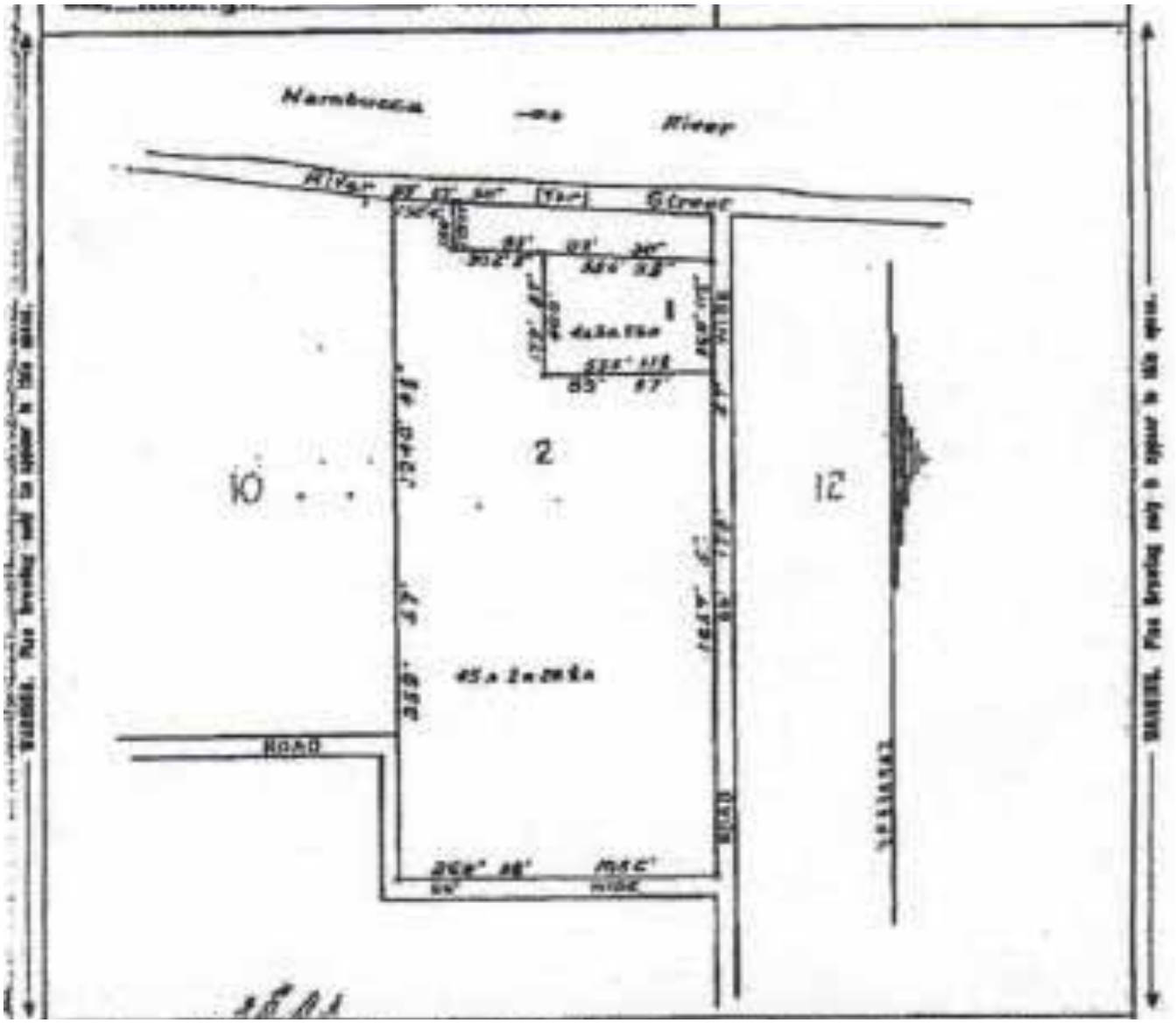


Macksville forms part of the Nambucca Shire Local Government Area (LGA). The Nambucca LGA comprises an area of approximately 1,500 square kilometres, including ten (10) towns and villages and has a local government area population of approximately 19,000. There are 23 km of coastline and the LGA stretches 70 km west into the Great Dividing Range.

Macksville is characterised by low-density residential development in the main town area, and both rural residential and rural development on the outskirts and in the surrounding district. Historically the creation of small rural lots, generally less than 40 hectares has been the dominant subdivision feature of the area. Demand for rural residential lots has increased the demand for these small lots and the further subdivision of 'englobo' lots. This has resulted in a large number of small rural lots around Macksville that are not economically viable for agriculture.

The subject site consists of one (1) Torrens Title allotment has an area of some 18.49 hectares and is irregular in shape, refer to **Figure 5**.

Figure 5 – Subject Lot



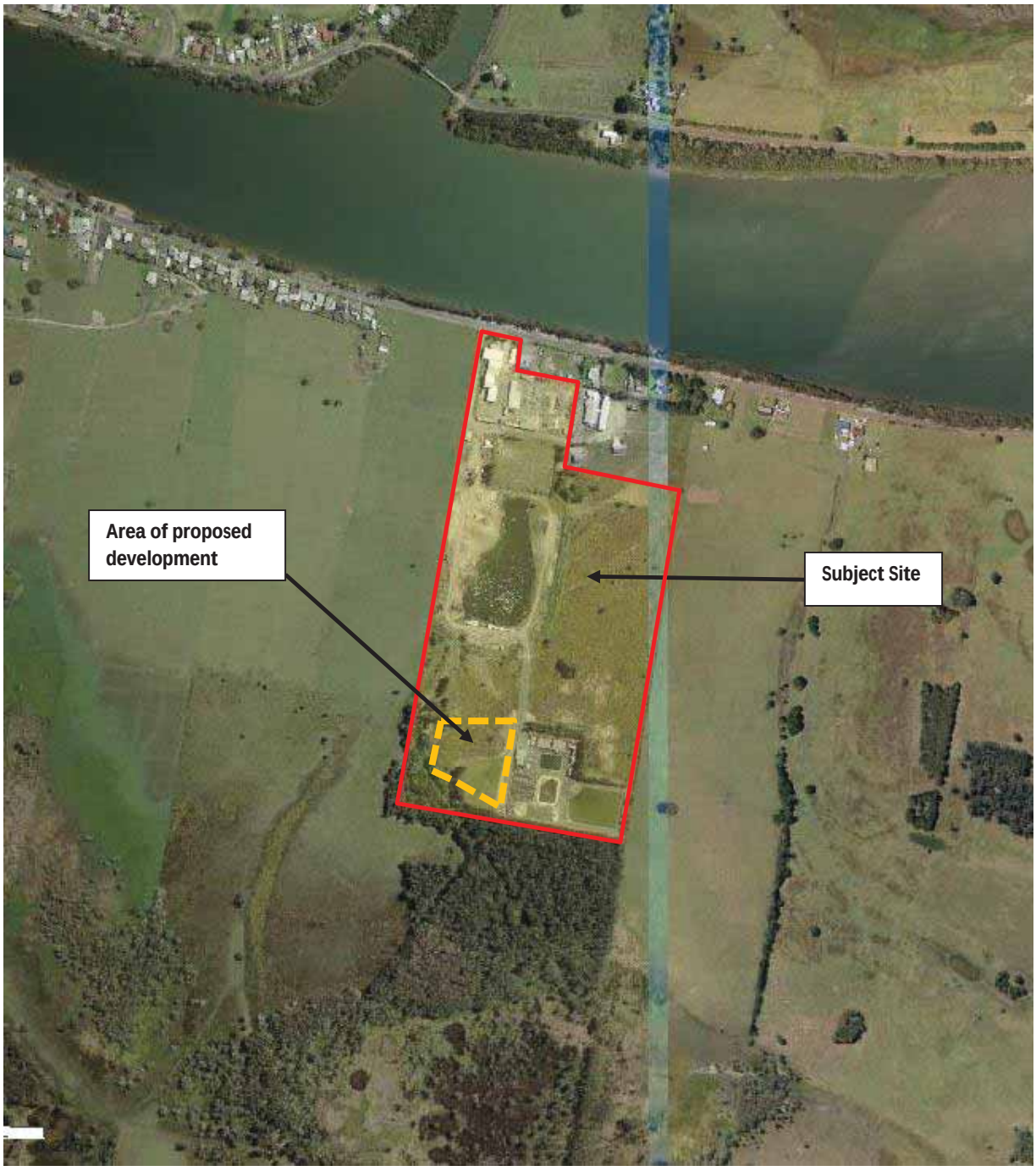
As can be seen in the above figure road reserves adjoin the subject site to the east, south and southwest however it is noted that the road reserves are unformed in that no formalized road infrastructure has been constructed within the road reserves.

It is noted that the subject site currently supports the operation of the Macksville Sewerage Treatment Plant (MSTP) with the majority of plant and infrastructure located in the southeastern portion of the subject site. The sewage treatment plant is located approximately 500m behind the Nambucca Council Depot. Details of the MSTP are shown as follows;

Figure 6 – Macksville STP

The proposed development will however only occupy the south-western portion of the subject site being located immediately to the west of the existing MSTP. Accordingly rural land uses are present to the west and south of the area of the subject site which will be developed for the purposes of a grease trap and oily waste water treatment facility with plant and infrastructure associated with the MSTP present immediately to the east of the development site. Vacant areas of the subject site itself are present to the north of the proposed development area, refer to **Figure 7** below;

Figure 7 – Locality Context



Rural land use in the area consists mostly of cattle and vegetable/fruit production including bananas. In the immediate area surrounding the subject site, the predominant land use is cattle grazing. Other land uses in the area are residences, limited commercial activities along River Street including a court house, police station and telecommunications company depot, and areas of open space, (including Donnelly Welsh Playing Fields), west of the site. To the north of site along River Street there are also several other land uses including the Nambucca Councils works depot, RSPCA Shelter, the NSW Rural Fire Service (RFS) and State Emergency Service (SES). It is also noted that the recently commenced Pacific Highway bypass of Macksville is present to the west of the subject site.

Apart from several small lots fronting River Street further to the west, all the land surrounding the subject site is privately owned.

The majority of native vegetation has been removed from the area which is the subject of this development application as part of its historic development and use of the subject site for waste management activities. Grasslands with clusters and scattered trees predominate. Areas of native vegetation are present to the south and west of the subject site. This vegetation contains a mixture of vegetation types which are suited to low lying lands.

Access to the subject site is via Kelly Close which is a bitumen sealed two wheel drive all weather road which is present in the north-western aspect of the subject site. A bitumen sealed two wheel drive all weather internal access road provides for access from Kelly Close to the southern portion of the subject site. The existing MSTP and the site of the proposed development are located in the southern portion of the subject site.

Kelly Close

Internal access road to MSTP

3.2 Site History

The Macksville Sewerage Treatment Plant (MSTP) which occupies the south-eastern portion of the subject site was constructed in 1968. The operation of the MSTP has since been augmented further. The MSTP serves the urban area of Macksville by a conventional sewage system comprising approximately 34 km of reticulation mains and 18 pump stations. The existing unused portion of the site had a history, (up until the mid-1990's), of use for cattle grazing.

The Environmental Protection Licence No. for the sewerage system is 579.

A buffer area of 400 metres applies around the MSTP with residential or other potentially sensitive land uses prohibited from being developed within the buffer area. It is noted that such developments are unlikely due to the flooding constraints which exist within the locality.

3.3 Potential Future Land Uses near the Site

Currently there are no known development proposals for land adjacent to or within close proximity to the subject site. This land has low development capability, as it is low lying and flood prone. As such the future use of the land for purposes other than grazing is unlikely to occur. The area to the south of the site contains a SEPP 14 wetland on which development is also unlikely to occur.

Land use is anticipated to remain residential along River Street and East Street with no substantial new developments occurring.

It is however noted that the corridor for the Pacific Highway bypass of Macksville is located adjacent to the west of the subject site. It is understood that construction of the bypass has commenced with the new alignment of the highway ultimately being present adjacent to the west of the subject site.

3.4 Impacts and Proposed Safeguards

The proposal would have few, if any impacts on existing settlement patterns, land tenure and planning initiatives in the Macksville area.

The existing MSTP and the proposed development would be more than 400 metres from existing residences, particularly along River Street and East Street. It is unlikely that significant residential or urban development will be constrained by the proposed development with the commencement of the construction of the Pacific Highway bypass reflecting the historical rural land use patterns in the locality.

3.5 Geology and Soils

3.5.1 Geology

The Macksville region is located in the synclinorial structural unit known as the Nambucca Block which forms part of the New England Fold Belt (Public Works, 1994g).

The subject site is located upon quaternary alluvial and estuarine deposits of the Nambucca River. These deposits consist of sands, silts and gravels and have been deposited by the river over a basement of metamorphosed sedimentary rocks, which are at Permian age. The depth to basement

rock is expected to be greater than 10 metres, and could exceed 20 metres. No rock outcrops exist in the vicinity of the subject site (Public Works, 1994g).

3.5.2 Soils

Detailed subsurface investigations have been undertaken at the site by the NSW Department of Public Works as part of the augmentation of the Macksville STP. The results of these investigations indicated that the site is underlain by alluvial materials to a depth of at least 4.5 metres.

The soil profile consists of six horizons including filling materials which were identified at only one location. Generally, the profiles consist of topsoil overlying sandy silts, sandy clayey silts, sandy silt with clay, silty sand, and sandy clayey silt.

Chemical tests undertaken as part of the aforementioned investigations on samples indicate some risk of encountering potential acid sulphate soils, particularly in excavations greater than one metre below natural surface level.

Results of geotechnical studies indicate that the site is underlain by unconsolidated sediments to an average depth of 17 metres. The upper 1 to 15 metres of sediments are firm, however below this depth they may become very soft.

It is however noted that the subject site in the area of the proposed development appears to have a more recent history of filling which has elevated the land above natural conditions. In the area of the proposed development land form appears to have been altered, over time, with fill up to 1.5m/2.0m in depth being noted.

Given the filled nature of the subject site the proposed development will have no impacts on or in relation to natural soils conditions.

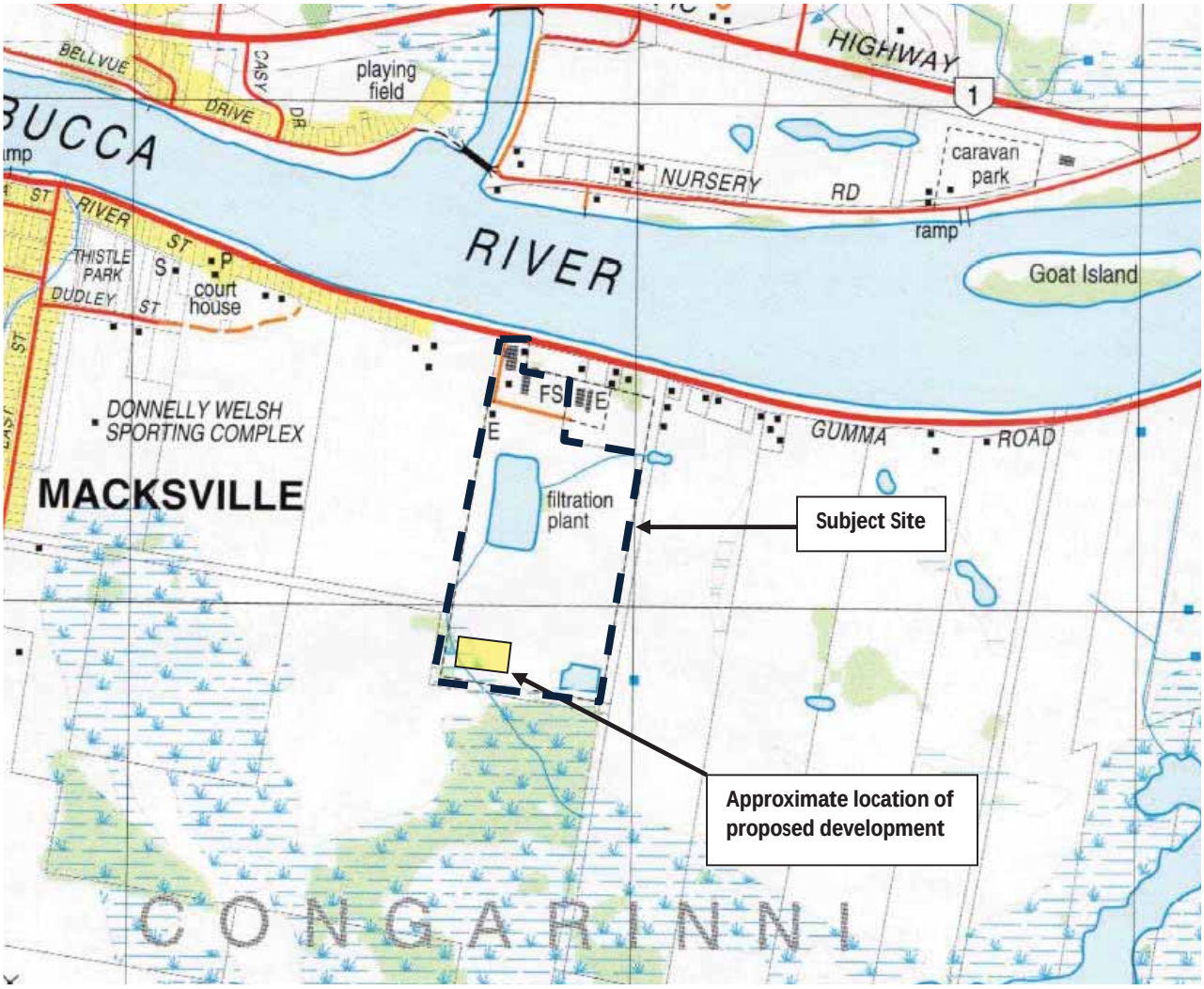
3.5.3 Topography

The topography of the subject site in the area of the proposed development consists predominately of flat land with the Nambucca River, which is located to the north of the subject site, being the main hydraulic feature of the area.

The elevation of the site is approximately 10 metres Australian Height Datum (AHD). It is however noted that a slight north to south fall, (maximum 1˚), exists in the general locality with this reflecting the 'back swamp' relationship of the land to the banks of the Nambucca River.

The topography and hydraulic features of the subject site and immediate surrounds can be seen in **Figure 8** below;

Figure 8 – Topography and Hydraulic Features



3.6 Groundwater

Investigations undertaken by the NSW Department of Public Works as part of the augmentation of the Macksville STP revealed uniform subsurface geological conditions on the site and a shallow water table at approximately two (2) metres below the surface level.

3.7 Surface Water

The Nambucca River has a catchment of 1330 square kilometres and has two main tributaries, Taylors Arm, which joins it immediately upstream of Macksville, and Warrell Creek which joins the river immediately upstream of its entrance to the ocean. After Macksville the river flows in a north-easterly direction across the main floodplain. The floodplain in the vicinity of Macksville is constricted by hills to the north and south.

Tidal influence extends upstream almost to Bowraville on the Nambucca River and to Utungun on Taylors Arm during low to average flows. The tidal channel is wider and deeper than the non-tidal sections and has a flatter gradient. The tidal range is about 1.6 metres and at low water bars, mud banks and beaches are exposed. At high tide the water is probably within 2 to 3 metres of most of the alluvial bank tops.

Macksville is the most flood affected urban settlement in the catchment area. The township and the surrounding land are low-lying and approximately 50 percent of the area is subject to flooding. In addition to flooding from the Nambucca River, Macksville is also affected by backwater flooding from the Gumma-Gumma Creek flats east of the town. This can cause flooding of the eastern and southern sections of the town along East Street and across the Pacific Highway. A town drain along East Street is designed to drain the backwater and local runoff from the south-eastern town area. Any development to the east of the town has the potential to exacerbate any current flooding problems.

The floodplain to the east of Macksville is low lying and is drained by Gumma-Gumma Creek. The creek drains towards the east along a similar alignment to the Nambucca River before it is deflected north by an escarpment. It then discharges into the Nambucca River approximately three kilometres downstream of Macksville.

Historical survey data has shown that the level of River Street in the area of the subject site is higher than the 1 in 100 year flood level. Consequently flows would not spill from the Nambucca River across the site and into Gumma-Gumma Creek during a 1 in 100 year flood. Rather, flooding of the site originates primarily as backwater from the Nambucca River flowing back up Gumma-Gumma Creek to and beyond the subject site.

The subject site is identified as being flood prone land for the purposes of Nambucca LEP 2010 in that the land is identified as being affected by the 1:100 flood event. It is however noted that the site of the proposed development does not appear to be impacted upon by the 5 year ARI event or the 10% AEP events. In the context of the scale and nature of the proposed development and its relationship to the existing MSTP it is considered that the proposed development will not have any impacts on flood levels or flood velocities above that which has already has been assessed and considered acceptable in relation to the existing MSTP.

It is noted that the meander of a small intermittently flowing creek/drainage feature is present on the subject site with the direction of water movement being from the northeast towards the south/southwest. The direction of flow reflects the back swamp topography of the area with there being no direct connection of this creek/drainage feature with the Nambucca River with water movement being to the east towards Gumma-Gumma Creek.

The Nambucca River has previously been reported to be a large and very healthy river which can receive high quality effluent with little ill effect and return it to the ocean as part of the water cycle (Public Works, 1994b).

Major sources of pollutants or nutrients to the river include surface water runoff from cleared grazing areas, stormwater runoff from urban areas and effluent discharge from the Macksville STP.

3.8 Meteorology

3.8.1 Temperature, Rainfall and Humidity

The local climate is considered to be semi-tropical with summer dominant rainfall. The average daily maximum temperature is around 23.2^{0}C, while the average daily minimum temperature is around 14^{0}C.

Long-term average annual rainfall over the eastern portion of the Nambucca local government area is between 1,300 mm and 1,400 mm. Annual rainfall typically ranges from 1,300 mm to 1,600 mm.

Annual pan evaporation is estimated to be approximately 1,650 mm.

3.8.2 Wind Speed and Direction

Wind speed and wind direction data from the Macksville area are only available from the Bureau of Meteorology in the form of observer estimates made at Coffs Harbour and Kempsey.

On an annual basis winds at Kempsey blow mainly from the west, north-east and south-west. A similar pattern is seen in autumn. In spring and summer the most common winds are from the north-east and in winter westerly winds are the most common.

In line with the local topography there are less westerly winds at Coffs Harbour than at Kempsey, although the strong north-east component is still present. On an annual basis the most common winds are from the south-west, north-east and south. In autumn and winter the winds from the south-west are the most common, while in spring and summer the winds from the north-east predominate. Winds from the south are reasonably common throughout the year.

3.9 Air Quality

3.9.1 Existing Environment

Air quality issues most relevant to the proposal are emissions of odours resulting from the various processes that take place within the proposed facility.

No suitable site-specific meteorological data are available. The data from Coffs Harbour and Kempsey are useful only in showing the general pattern of winds in the area.

The air quality at the subject site and surrounds reflects the agricultural/rural nature of the predominant land use although the operation of the adjacent Mackville STP has a localized impact upon air quality.

Notwithstanding the above the air quality at the subject site and surrounding area is expected to be generally good albeit that localized air quality impacts may exist from time to time associated with the operation of the Mackville STP.

3.9.2 Air Quality Criteria

Odour in the air is quantified in terms of odour units. Generally air quality goals are set so that odour is not detectable beyond the boundary of the property on which the odour is generated. Because of the very large range in the sensitivity of individuals to odours this is often difficult to achieve.

Normally an odour level of one odour unit would ensure that only fifty percent of the population would be able to detect the odour. The public's reaction to an odour will depend on social and regional conditions as well as the quality and strength of the odour. The intensity of the odour will also depend on temperature and humidity which affects the sensitivity of the nose. It is suggested that the nuisance limit can be as low as two odour units, but a figure of five represents a reasonable compromise for "offensive" smells and a figure of ten for less "offensive" ones.

The level of acceptability of an odour depends not only on the maximum level experienced in a year but also of the frequency of exposure that a receptor experiences to a range of odour levels.

A complication arises when dispersion models are used to estimate odour levels around a source. The complication arises because dispersion models predict average concentrations over specified intervals of time, however within the specified interval of time the concentration of pollutant will carry above and below the average level.

Odour is probably the most widespread and complex local air pollution problem in Australia. It accounts for the majority of complaints received by environmental authorities and can be a major source of annoyance and stress in affected communities.

There are currently no regulations in NSW that specifically set concentration limits for odours. In January 2001, the NSW EPA issued as a Draft Policy, titled*: Assessment and Management of Odour from Stationary Sources in NSW* (the Draft Policy). The Draft Policy guidelines state that the level at which an odour is perceived to be of nuisance depends on the combination of odour quality, (whether the odour consists of an individual identifiable compound or a complex mixture of compounds), the sensitivity of the given population is to odours, the background odour level, how tolerant the community is to a particular type of odour and the characteristic of the source.

As an initial approach for mitigating the potential for "offensive" odours, the Draft Policy lists odour performance criteria based on population density. **Table 4** below displays the proposed odour performance criteria for various population densities**.** These criteria state that no individual should be exposed to ambient odour levels greater than 7 Odour Units/m^3 and the level from which odours generally begin to cause annoyance is 2 Odour Units/m3. These odour criteria must be complied with 99% of the time, using site representative hourly average meteorological data of at least one year's duration and suitable peak to mean ratios.

Table 4 - Odour Performance Criteria

Population of Affected Community	Odour Performance Criteria #(Odour Units/m^3)
Urban area (>2 000)	2.0
500 – 2000	3.0
125 - 500	4.0
30 – 125	5.0
10 – 30	6.0
Single Residence	7.0

It has been estimated that the size of the community potentially affected by the odours is typically >2000. The odour performance criterion applicable to this project is therefore considered to be a 99th percentile odour concentration of 2 Odour Units.

In November 2006, NSW Department of Environment and Climate Change (DECC) released two documents, i.e. *Technical framework for the Assessment and Management of Odour from Stationary Sources in NSW* (DECC, 2006) and its associated *Technical Notes for the Assessment and Management of Odour from Stationary Sources in NSW* (DECC, 2006). These documents outline the DECC's approach for the assessment of odour emissions, using a three-level system of odour impact assessment of increasing complexity and detail. Depending on the individual characteristics of a new

development and its proposed location, a varying degree of investigation into the potential for odour impacts may be required. The three levels of assessment advocated by the DECC area as follows;

- Level 1 is a screening-level technique based on generic parameters for the type of activity and site. It requires minimal data and uses simple equations to provide a broad estimate of the extent of any odour impact. It may be used to identify the potentially affected zone and site suitability for a proposed facility or new neighbouring development or expansion of an existing facility.

- Level 2 is a screening-level dispersion modelling technique, using worst-case input data (rather than site-specific data). It is more rigorous and more realistic than a Level 1 assessment. It may be used to assess site suitability and odour mitigation measures for new, modified or existing activities

- Level 3 is a refined dispersion modelling study using site-specific input data. This is the most comprehensive and realistic level of assessment available. It may be used to assess site suitability and odour mitigation measures for new, modified or existing activities

For a Level 1 assessment, a 'pass' suggests the calculated extent of the odour impact is less than the distance to the nearest (or likely future) sensitive receptor. Conversely, a 'fail' suggests the site is probably unsuitable but may warrant further, more detailed investigation. Typically, if a proposal fails Level 1 assessment, the following actions should be considered:

- adopt better management practices;
- increase the level of pollution control;
- relocate the activity to an alternative site;
- assess the activity using either a Level 2 or 3 assessment, and/or
- redesign the activity or consider other actions as necessary.

When conducting either a Level 2 or Level 3 odour impact assessment, the dispersion modelling requirements in *Approved methods for the modelling and assessment of air pollutants in New South Wales* (DECC, 2005) should be adhered to. The Approved methods document covers:

- ground-level concentration (GLC) criteria for individual odorous and toxic air pollutants
- GLC criteria for hydrogen sulphide;
- odour assessment criteria for complex mixtures of odours;
- impact assessment methodology based on dispersion modelling; and
- the procedure for developing site-specific emission limits.

Note that Level 2 and 3 odour impact assessments in the Technical Notes document are equivalent to Level 1 and 2 odour impact assessments respectively in the Approved Methods document.

The three most important pieces of legislation for preventing and controlling odour, dust and other pollutants in NSW are the:

- Environmental Planning and Assessment Act 1979 (EP&A Act)
- Protection of the Environment Operations Act 1997 (POEO Act)
- Local Government Act 1993 (LG Act)

The EP&A Act deals with land-use planning, development, assessment and approvals.

The POEO Act requires that no occupier of any premises causes air pollution (including odour) through a failure to maintain or operate equipment or deal with materials in a proper and efficient manner. The operator must also take all practicable means to minimise and prevent air pollution (sections 124, 125, 126 and 128 of the POEO Act). The POEO Act includes the concept of 'offensive odour' (section 129) and states that it is an offence for scheduled activities to emit 'offensive odour'.

The Local Government Act gives local councils the power to deal with public nuisance, including odour and dust emissions.

No formalized assessment of air quality impacts of the proposed development has been undertaken due to;

- the nature and small size of the proposed development;
- the extensive spatial separation, (>500m), which exists to sensitive receivers from the proposed development;
- the enclosed nature of all proposed treatment and storage infrastructure;
- the existing impact of the operation of the Macksville STP on local air quality;
- the impending use of the new Pacific Highway bypass of Macksville and its impacts on local air quality; and
- the negligible cumulative contribution of the proposed development to existing air quality impacts in the locality.

Having regard to the above the proposed grease trap and oily waste waters treatment facility will have a negligible impact on local air quality due to its scale and the nature of the processes which underpin the operation of the facility.

3.10 Noise

3.10.1 Existing Noise Levels

The nearest affected residences, (sensitive receivers), to the proposed development are as follows:

- A residence is located to the north of the site adjacent to the Council works depot, as well as other residences further to the east and west on River Street and Gumma Road;
- To the west of the site are residences in East Street and Wall Street and, in particular, the residence to the east of the Boundary Street/East Street corner; and
- To the south a house approximately 12 kilometres from the southern site boundary.

There are no residences to the east of the site that would be affected by noise from the proposed development.

The topography of the area surrounding the subject site is flat, as it forms part of the floodplain of the Nambucca River. There are no natural barriers that would shield noise from the proposed development from the nearest residences.

No formalized assessment of noise impacts of the proposed development has been undertaken due to;

- the nature and small size of the proposed development;
- the extensive spatial separation (>500m) which exists to sensitive receivers from the proposed development;
- the enclosed nature of all treatment and storage infrastructure;
- the existing impact of the operation of the Macksville STP on the existing acoustic environment;
- the impending use of the new Pacific Highway bypass of Macksville and its impacts on the local acoustic environment; and
- the negligible cumulative contribute of the proposed development on the existing acoustic environment of the locality.

Notwithstanding the above noise levels around the site were measured in 1995 (Rust PPK, 1995) at the locations which were identified as being representative of the background noise levels at the various locations in proximity to the MSTP. The results of the assessment carried out at this time are provided as follows;

Table 5 - Background Noise Measurements (1995)

Measurement Location		Measured Noise Levels dB (A)		
		L10	L11	L90
	Night Measurements			
A	Cnr East and Boundary Streets	46	47	38
B	Residence at end of Boundary St	41	38	28
		47	44	37
C	River Street near East Street	53	53	39
		55	51	34
D	River Street west of STW	48	43	27
		51	51	28
E	River Street east of STW	52	46	27
	Day Measurements			
A	Cnr East and Boundary Streets	47	57	36
B	Residence at end of Boundary St	48	45	40
		42	41	35
D	River Street west of STW	61	64	43
		54	52	43
E	Gumma Road east of STW	55	60	42

The following comments were applicable to the above results at the time of assessment.

The results for all locations and times the background (L90) noise level was primarily determined by noise from vehicles on the Pacific Highway. The variation in the background noise levels between the

locations on River Street/Gumma Road was primarily due to variations in traffic flow on the Highway between the measurement intervals.

At night during breaks in traffic flow, noise from insects was audible. During the day, noise form birds also contributed to the measured background noise levels. Noise from the sewerage treatment works was inaudible at all of the locations and did not contribute to the background noise levels measured.

It is however noted that over time background creep would have resulted in increases in background (L90) levels beyond that provided for above. Background creep could be attributed to the operation of the upgraded MSTP as well as increases in traffic movement on local and major, (Pacific Highway), road infrastructure. It is also noted that the impending construction and use of the Pacific Highway bypass will have an impact upon background noise levels. In this regard the Noise and Vibration Assessment Report for the Warrell Creek to Urunga Upgrading of the Pacific Highway prepared by SKM (2010) provided for the following noise environment descriptors for two sites in the vicinity to the subject site;

Table 6 - Background Noise Measurements (2010)

Location	Day			Evening			Night		
	L_{Amax}	L_{Aeq}	RBL	L_{Amax}	L_{Aeq}	RBL	L_{Amax}	L_{Aeq}	RBL
Location 4	64	53	48	65	54	45	65	53	40
Location 5	65	51	41	65	53	38	65	52	34

The ambient noise environment at the subject site is already influenced by the following noise sources:

- plant and equipment noise from the MSTP;
- plant and equipment noise from the Nambucca Council works deport;
- bird and insect noise; and
- wind causing rustling of tree leaves.

Having regard to the above information the following noise environment descriptors have been adopted for the purposes of this report and the assessment of the impact of the proposed development on the local environment.

Table 7 – Adopted Background Noise Environment Descriptors

Day			Evening			Night		
L_{Amax}	L_{Aeq}	RBL	L_{Amax}	L_{Aeq}	RBL	L_{Amax}	L_{Aeq}	RBL
60	50	45	60	50	40	60	50	**35**

3.11 Traffic and Access

3.11.1 Existing Traffic

The subject site is located approximately halfway along River Street to the east of the township of Macksville. River Street is a two lane, narrow, paved road in reasonable condition, accommodating mostly local traffic travelling to either the village of Gumma or various commercial and industrial employment uses along the road.

Access to the subject site is via Kelly Close which is a bitumen sealed two wheel drive all weather road which is present in the north-western aspect of the subject site and connects with River Street. A bitumen sealed two wheel drive all weather internal access road provides for access from Kelly Close to the southern portion of the subject site, (area of the proposed development). The existing internal access road services the MSTP which is located in the south-eastern portion of the subject site.

3.11.2 Access for Construction Vehicles

Construction vehicles would be required to travel to and from the site for the duration of construction of the new works.

Construction vehicles will utilize the existing public and private road infrastructure to access the site of the proposed development.

3.11.3 Access for Maintenance and Operation Vehicles

Access for maintenance and operation vehicles to the site would be via the existing entrance and the public and internal access roads described above.

A small access driveway will connect the area of the proposed development with the existing internal access road infrastructure which currently services the MSTP. Internal carparking and vehicle manoeuvring areas will be constructed in conjunction with the proposed development with this infrastructure providing for forward vehicle movement when entering or leaving the site of the proposed development.

3.12 Terrestrial Flora and Fauna

3.12.1 Flora

Three (3) structural formations of vegetation (Specht *et al*, 1974) have previously been identified on the subject site and adjacent areas including open-forest, shrub land and closed herb land.

Areas in close proximity to the site have been identified as wetlands that are protected under SEPP 14. The aim of the SEPP 14 is to ensure that *coastal wetlands are preserved and protected in the environmental and economic interests of the State*. A SEPP 14 Wetland (No.387) exists within 500 metres of the southern boundary of the site and is connected by a tract of open-forest.

The general area has been previously disturbed by clearing and grazing to produce the herb land. Many weeds and introduced species have invaded and successfully colonised the subject site and adjoining and adjacent land.

The south-western corner of the subject site supports an open-forest with a few mature trees up to 25 metres high with 40 percent canopy cover and 30 percent ground cover. Almost delineating the forest and the herbland is a drainage ditch lined with sedges.

The area of the subject site which is proposed to be developed comprises predominately grasses and exotic species which have been established following the significant filling of the subject site in the area of the proposed development. In this regard the development envelope does not involve the

removal of native vegetation which is present in the south-western corner of the subject site with all development activities being confined to the already highly disturbed filled area of the subject site.

3.12.2 Fauna

The subject site and immediate surrounding area has previously been surveyed for fauna species and habitat. The historic surveys concluded that no rare or endangered species, either plant or animal were found on the subject site or adjacent areas.

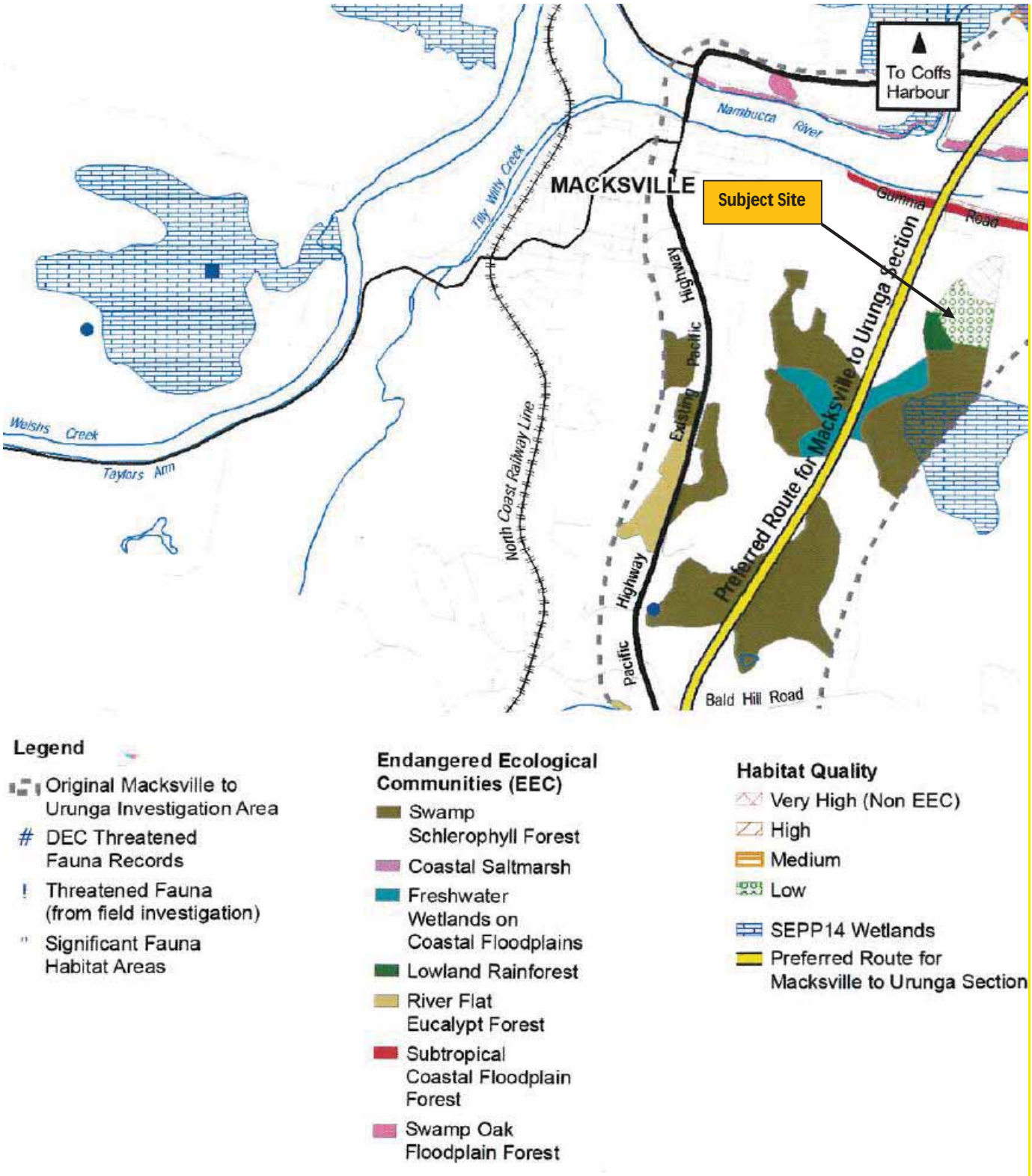
It is further noted that the site of the proposed development has been extensively disturbed. Vegetation has been cleared from the site with only a small "corner" area remaining of open-forest. The vegetation communities on site are found in adjacent areas and are common in the Macksville region.

The riparian vegetation and SEPP 14 wetlands which are present on adjoining and adjacent land would not be affected by the proposed development as no work would be carried which would directly affect this area and no run-off would reach the wetlands provided the safeguards in Section 6.2 are implemented.

The proposal is therefore unlikely to significantly impact on the native flora and fauna of the site or adjoining areas.

The major ecological constrains surrounding the subject site (RMS 2007) are provided for in **Figure 9** below;

Figure 9 – Ecological Constraints



3.13 Aquatic Flora and Fauna

3.13.1 Aquatic Flora

Both the Grey Mangrove *(Avicennia marina)* and the River Mangrove *(Aegicerus corniculatum*) grow within the Nambucca River. West *et al* (1985) indicates quite large areas of mangroves in Newee Creek, on the northern bank opposite Goat Island and in areas further downstream. The northern side of Goat Island is also shown to be fringed by mangroves.

Small beds of the seagrass, *Zostera* occur along the northern bank of the Nambucca River just downstream of the existing MSTP site, as well as further downstream.

Saltmarshes occur both upstream and downstream of the existing MSTP. The largest areas of saltmarsh are in Newee Creek.

The Nambucca estuary also supports substantial wetland areas that would provide feeding and nursery ground resources and adult habitat for a large number of species, (ARSFC 1989).

Adams *et al.* (1985) mapped coastal saltwater and freshwater wetlands by aerial photography and ground trothing. Their maps formed the basis for allocation of the SEPP 14 wetlands. There are a number of SEPP 14 wetlands in the vicinity of Macksville with Wetland No.387 about 500 metres from the southern boundary of the subject site. The proposal does not involve any modification to this SEPP 14 wetland.

Given the location of the subject site to the Nambucca River and Gumma Gumma Creek the proposed development will have no impact on aquatic fauna.

3.13.2 Aquatic Fauna

Given the location of the subject site to the Nambucca River and Gumma Gumma Creek the proposed development will have no impact on aquatic flora.

3.14 Socio-Economic Environment

3.14.1 General Social Characteristics

Most of the statistical data in this report was sourced from the Australian Bureau of Statistics (ABS) Census data pertaining to the Nambucca Statistical area which has the same borders as the Local Government Area (LGA).

At the 2011 Census there were 18,644 people in the Nambucca Shire local government area, of these 48.8% were male and 51.2% were female. Aboriginal and Torres Strait Islander people numbered 1,359 making up 7.3% of the population, nearly treble the national average.

The median age of people in the Nambucca Shire was 49 years; some twelve years higher than the national median. Children aged 0 — 14 years made up 17.8% of the population and people aged 65 years and over made up 24.4% of the population. Of people in the area aged 15 years and over, 46.6% were married and 16.4% were either divorced or separated.

Population growth in the Nambucca Shire between the 2001 Census and the 2006 Census was 1.34% and in the subsequent five years to the 2011 Census was 4.17%. When compared with total population growth of Australia for the same periods, being 5.78% and 8.32% respectively, the growth was significantly lower than the national average.

The median weekly income for residents within the Shire was significantly below the national average, being one of the factors that place parts of the Shire in an area of social disadvantage.

The number of occupied private dwellings was 7,616 with 2,384 (31.3%) being lone person households. The average household size was 2.3 and there were 1,175 unoccupied private dwellings. The number of households with an internet connection was 4,980 or 65%.

At the 2011 Census, the proportion of residents in the Shire who stated their ancestry as Australian or Anglo-Saxon exceeded 82% of all residents (national average was 65.2%) and 92.3% of the population were Australian citizens. In excess of 58% of all residents in the Shire nominated a religious affiliation with Christianity at the 2011 Census, which was slightly higher than the national average of 50.2%. Meanwhile, as at the Census date, compared to the national average, households had a significantly lower than average proportion (3.5%) where two or more languages are spoken (national average was 20.4%); and a significantly higher proportion (93.8%) where English only was spoken at home (national average was 76.8%).

Of the 60 Australian residents who stated that they speak Gumbaynggir, an Australian Aboriginal language, over half live within the Nambucca Shire.

Within Nambucca Shire the highest employment industries are government health and education, this increased by 19 percent from 2001 to 2006. Other significant industries include retail/ whole sale trade and recreation, personal services. The dominance of these industries is mainly due to:

- A strong tourism sector that leverages scenic hinterland and ‘sea-side’ holiday locations of the region utilising a strong local accommodation, food and beverage, cottage arts and crafts, cultural, and retail services sector; and
- A strong retirement culture and the migration of over 55 year olds to the region in search of the popular coastal ‘sea/tree-change’ lifestyle. This has the potential to place pressures on aged and health care facilities and recreational services due to increased demand in the Nambucca Shire.

Given its nature and size on the proposed development will have no impacts on the social characteristics of the local area.

3.14.2 Economic Characteristics

Most of the information in this report was sourced from Nambucca Shire Councils, Local Growth Management Strategy Employment Lands Report (2010). This information provides as follows;

Economic growth can be defined as the increase over time in the capacity of an economy to produce goods and services. Traditionally, economic development relied on the development of infrastructure, population and services around the use or exploitation of specific resources and natural assets. It is a function of factors such as:

- Population growth and skill base;
- Capital availability;

- Infrastructure development;
- Technical innovation;
- Attitudinal trends; and
- External factors such as global market forces and government policy.

In the context of Nambucca Shire, this includes timber and primary industries such as beef cattle, dairying, bananas and fishing. Where these resources are, (or are close to), being fully exploited, without a specific development impetus additional economic development can only be achieved through organic growth and expansion.

The Nambucca LGA is rapidly becoming a desired destination for lifestyle sea and tree changes and for industry relocation and business start-ups. The LGA has an annual growth rate of 2.1% and has attracted major manufacturers to relocate and expand in the LGA. Council has also facilitated the growth and expansion of a significant number of local manufacturing businesses and has established business and industry development initiatives to support and promote key emerging and developing industries.

The major industries are niche manufacturing and vehicle body manufacturing, tourism, logistics, warehousing and distribution, agribusiness, timber processing, aged care and regional cuisine and creative industries.

Nambucca is in a strategic location accessing both Sydney and Brisbane markets by way of North Coast rail and the Pacific Highway. Council has also implemented Investment Attraction, Facilitations and development initiatives to improve the investment readiness and attractiveness of the Nambucca Shire.

The Shire now has three major retail centres, Nambucca Heads, Macksville and Bowraville that offer retail space to service a growing population of 19,500 people and the many tourists that are attracted to our LGA. Nambucca Heads and Macksville both have Industrial Estates with a new Industrial land expansion in Macksville comparatively priced compared with other regional centres along the North Coast.

Building on strengths, increasing value-adding in existing industries, attracting new industries and, to a lesser extent, increasing diversity and structural change are considered to be essential ingredients for the development of the Nambucca regional economy over the coming decades.

In this regard the proposed development will have a positive local economic effect through the creation of job/business opportunities through the operational phase of the project in conjunction with the multiplier effect which results as a consequence of new businesses being undertaken in the local community.

3.15 Visual Assessment

The site of the proposed development is situated in the Lower Nambucca River Valley in a low lying floodplain adjacent to the southern side of Nambucca River. Much of the area immediately surrounding the site has been cleared for grazing and agricultural uses, with the area becoming increasingly urbanised further west towards the Macksville town-ship.

Behind the site to the south landform gradually changes to become steeper, rising to Bald Hill which has a height of 179 metres. An area of wetland is also located to the south of the subject site

approximately 500 metres from its boundary. Riparian vegetation lines the banks of the Nambucca River on both sides.

The topography of the valley and the location of existing buildings limit the visual catchment of the subject site. Foreground and middle ground views of the subject site are obtained from several residences to the north, east and west of the site, and traffic travelling along River Street, although views are often screened or impaired by other structures or the angle of the line of sight. There are a number of houses to the east of the site along River Street, before the land is used mostly for grazing. These houses obtain limited views, particularly to the southern portion of the subject site. Similarly, the houses along River Street to the west of the subject site obtain some views from the back of these properties, with the views becoming more oblique and distant as one travels further west.

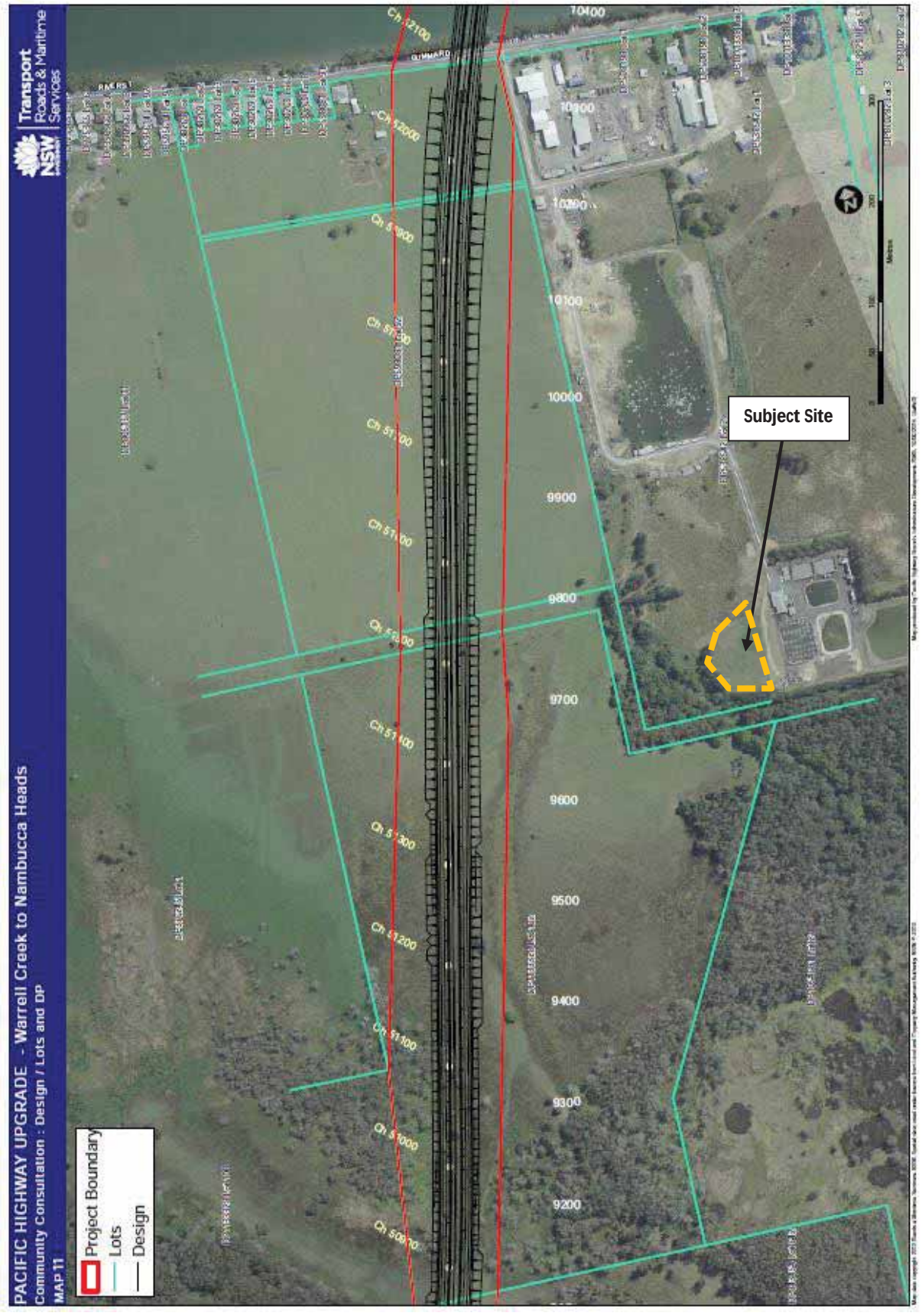
Another row of residences situated along East Street to the west, obtain middle to distant views of the subject site across the Donnelly Welsh Sporting Complex ovals and grazing land. These houses back onto the playing ovals and thus have views from their backyards, which in some instances are obscured.

It is also noted that the existing MSTP provides for a backdrop to the proposed development with the nature and form of the proposed development being consistent with the existing view characteristics of the locality.

The proposal would not alter the existing natural landscape to a significant extent.

It is also noted that the impending construction of the Pacific Highway by-pass will significantly change views to the subject site from the west and northwest. In this regard it is suggested that with the raised construction and use of the Pacific Highway bypass views to the proposed development from the Macksville Township will be obscured and accordingly the impact of the proposed development on views will be minimum in the context of the more significant impact of the Pacific Highway by-pass, refer to **Figure 10** below;

Figure 10 – Macksville Pacific Highway By-Pass



3.16 Cultural Heritage

3.16.1 Aboriginal Heritage

The survival of surface and subsurface archaeological sites on the STP site is effected by previous land uses, which included vegetation clearance, grazing (and possibly cultivation), earthworks associated with sewage treatment works and a series of drainage channels.

An archaeological survey has previously been undertaken as part of the preparation of the REF for the augmentation of the Macksville STP in 1995. The purpose of this survey was to assess the impact of the proposed augmentation of the Macksville STP on the archaeological resource of the area. A summary of the results of the survey is provided below.

- *Previous Archaeological Investigations*

Aboriginal site survey work that has been undertaken in the local area includes the recording of sites of traditional significance to local aboriginal groups by National Parks and Wildlife Service (NPWS) staff (Kelly and Donovan, 1976 (a) and (b), and surveys undertaken for specific projects. Several of these located Aboriginal sites and artefacts.

Navin (1991b) surveyed a proposed deviation of the Pacific Highway from north of the Nambucca River to 2.3 kilometres south of Macksville. Her survey route was 3.5 kilometres in length and passed through the centre of the current STW site. The survey transect comprised the floodplain and wetlands of the Nambucca River in addition to a small sample of basal and terminal ridge slopes south of Macksville. No archaeological sites were located, however, a collection of artefacts made by a local landowner from a prominent ridge line spur adjacent to wetlands on his property was discovered.

Narvin interpreted the failure of her survey to identify sites as a result of the low archaeological potential of the low lying and swampy land which comprised the major proportion of the survey route (Navin 1991a).

In addition, a number of Aboriginal pre-contact and historic archaeological sites have been recorded in the vicinity but not within the STW site. These sites include natural mythological sites, bora (keepara) grounds/ceremonial sites, shell middens, open campsites, a carved tree and a well.
Based on the small sample of recorded sites of this type, factors which appear to determine their location are:

- *The availability of an elevated and/or well drained site;*
- *Proximity to fresh water; and*
- *Access to resource rich habitats.*

No sites have been recorded in similar environmental contexts to the current site. This a result of the low lying and poorly drained nature of the terrain which is unsuitable for campsite location. The STW site is therefore considered to have low potential for Aboriginal archaeological surface or subsurface sites.

An officer and an elder from this LALC were present during the field survey. The Council does not have any objections to the proposal from an archaeological viewpoint.
No aboriginal archaeological materials were identified during the field survey. Although poor surface visibility provided minimal effective survey coverage, the inspection confirmed the low lying nature

and general unsuitability of the site as an aboriginal campsite location, hence the presence of undetected archaeological materials at the site is considered low.

All areas of the site have been impacted by prior vegetation clearance in addition approximately 50 percent of the site has been disturbed by deeper excavation associated with the construction of the existing STW and drainage channels. These impacts would have disturbed any archaeological sites present.

In consideration of the land use history of the site and its unsuitability is an aboriginal campsite the archaeological potential of the site is assessed as low. No archaeological constraints are therefore placed upon the proposal. If, however, any potential archaeological sites or items are uncovered during excavation or construction work, work would be stopped and the NPWS or the Unkya LALC contacted for further advice.

Having regard to the above information and the subsequent filing of the subject site, there is no likelihood of any disturbance of items of cultural heritage associated with the proposed development.

3.16.2 Post-settlement Heritage

There are only two items listed as having heritage significance in Macksville Township. These are two hotels situated in the main part of the town area. The proposed upgrading development would not affect either of these heritage items.

There are no items of heritage significance on or in the vicinity of the site. The proposal thus has no impact in this regard. “Mary Boultons Pioneer Cottage” is located on River Street adjacent to the site. This house is not listed as a heritage item. The proposal would not have any impact on this house.

4. OPTIONS EVALUATION

4.1 Development of Options

At present the majority of grease trap and oily water waste which is collected within the Nambucca Local Government Area is trucked out of the LGA with processing/disposal predominately in Port Macquarie. This approach is necessary as the quality of the collected wastewaters is such as to be unsuitable for discharge to Councils existing STP.

The transportation of wastewaters outside the local government area for processing/disposal adds significantly to the cost of the management of grease trap and oily water waste.

The establishment of a local plant will significantly reduce the costs of disposal as well as providing for opportunities to pursue additional local and regional business opportunities.

4.2 Do nothing option

The current grease trap and oily water waste treatment and disposal options are inefficient in the context of providing for local waste treatment and disposal options and provides for a level of inequality in relation to local communities taking responsibility for local waste generation and disposal.

The current approach is inefficient in relation to the energy costs associated with transporting collected waste to treatment facilities with this costs set to increase where existing treatment facilities are relocated such that increase travel distances result.

A lack of treatment and disposal options provides for a lack of commercial completion and accordingly the costs associated with using existing options does not reflect a highly competitive market.

In the event that the do nothing option results the existing treatment and disposal options will remain albeit that these options will continue to provide for the outcomes as mentioned above.

5. SCOPE OF WORK

5.1 Description of Infrastructure

The proposed development involves the construction and operation of a grease trap and oily water treatment facility on the subject site. The proposed development comprises the following major components;

- Construction of a vehicle access road and manoeuvring area.
- Construction of a bunded process hardstand area.
- Installation of a Bioreactor Waste Water Treatment System. This system comprises the following major components;

    - Balance Tank, Trommel and Pit; and
    - Bio Rector Treatment System (3 x 40,000 litre tanks); and
    - Treated Water Storage (2 x 40,000 litre tanks).
    - Provision of toilet facility.

A diagrammatic representation of the proposed grease trap and oily water processing facility is provided as **Appendix 2**.

5.1.1 Operational Context

Generally the purpose of the proposed grease trap and oily waste water treatment facility is to treat the collected wastewaters such that the wastewaters are suitable for discharge into the Macksville STP where it will be further treated prior to disposal. In this regard all grease trap and oily waste water which is collected, (from Council approved commercial trade waste generators), will be transported to the proposed treatment facility where it will be pre-treated via balance tank and trommel prior to being conveyed by sealed pipes to the fully enclosed Bio Reactor Treatment System. This system will treat the wastewaters so as to produce waters which are suitable for discharge to Councils STP, (complying with Councils trade waste discharge requirements, refer to **Appendix 3**).

The proposed facility also includes 80,000 litres of treated wastewater storage such that there is no direct discharge of wastewaters to the Macksville STP from the Bio Reactor Treatment System. This will provide for all treated wastewaters to be stored onsite prior to discharge to the STP and will enable flexibility in relation to the time and volumes of discharge to the STP. This will also allow for the monitoring and checking of all treated wastewater to ensure that water quality standards are achieved prior to release to the STP. No wastewater will be conveyed to the STP unless it meets Councils trade waste discharge standards.

Apart from the production of treated wastewater the operation of the proposed facility will give rise to the generation of a minor quantity of sludge material which will either be recycled through the Bio Reactor Treatment System or immediately removed from the site and used as part of the commercial production of compost materials or for approved pasture improvement purposes.

The proposed activities on the subject site will be consistent with that which would be expected of wastewater/sewerage management activities and are entirely consistent with the existing sewerage treatment and disposal activities which are undertaken at the Macksville STP which is immediately adjoining to the east.

5.1.2 Plant Capacity

It is expected that the weekly processing of wastewaters will be in the order of 15,000 litres. This means that the daily rate of processing will be in the order of 2200 litres. The through put of the proposed facility can however vary depending upon servicing demands.

Given the expected volumes of wastewater which will be treated significant storage capacity is available in the system with the treated wastewater storage tanks providing for in excess of five (5) weeks storage.

5.1.3 Operating Hours

The proposed facility will operate continuously in response to demand however it is noted that the delivery of wastewaters will be confined predominately to daylight hours between normal business hours Monday to Friday. It is however noted that some infrequent after-hours deliveries to the proposed facility maybe required where unavoidable or emergency servicing of waste generating facilities is required.

The maximum number of weekly deliveries to the proposed facility is likely to be in the order of 2 – 3 and as such the level of activity on the subject site is expected to be minimal.

5.1.4 Employment

The proposed facility does not require full time supervision with the supervision, operation and maintenance of the facility undertaken by the owner/operator of the facility. Collected wastewaters will be conveyed to the proposed plant by a 10,000 litre collection vehicle where it will be transferred by sealed pipes to the treatment facility. All delivery operations will be carried out by the driver of the collection vehicle.

The operation of the proposed facility does not require a full time presence with supervision activities undertaken on a daily basis by the owner/operator of the facility.

Notwithstanding the above the construction and operation of the facility will have positive direct and indirect flow on effects to employment in the region.

5.1.5 Traffic Generation

Traffic generated by the proposed facility will consist of:

- Owner/operator driving to and from the plant, (1 – 2 movements per day).
- Truck movements carrying wastewater to the site, (maximum 0.5 movements per day).
- Miscellaneous traffic, (possibly 0.5 vehicle movements per day).

Predicted weekly traffic movements to and from the subject site are provided for in **Table 5** below. The predicted truck movements are based on an expected annual throughput of 500,000 litres of grease trap and oily waste water and a 50 week operating year.

Table 8 – Predicted Weekly Traffic Movements

ITEM	TRUCK CAPACITY	TRUCKS	LIGHT VEHICLES
Grease trap and oily waste water	10,000 Litres	3	N/A
Employees	N/A		7
Miscellaneous		1	2
TOTAL		4	9

5.1.6 Road Usage

All vehicle movements to and from the subject site will be via Kelly Close and the connecting local road infrastructure. Kelly Close and the connecting public road infrastructure in the locality are bitumen sealed two wheel drive all weather roads.

All vehicle movements to the site of the proposed development will be via the existing bitumen sealed two wheel drive all weather internal access road which connects with Kelly Close. An access driveway, carparking and vehicle manoeuvring areas will be constructed with this infrastructure connecting to the existing internal access road which currently services the MSTP.

All vehicle movements to and from the site of the proposed development will be in a forward direction.

5.1.7 Energy Requirements

Electricity will be the main source of energy required for the operation of the proposed development.

Electric mains power (240 volts) will be connected to the facility.

5.1.8 Utilities

Water usage at the site will be for potable purposes at the site amenities.

Water will be sourced from the existing reticulated supply which services the area.

Wastewater from the proposed development will be directed to the MSTP which services the area.

All utilities which are required to service the proposed development are available for connection to the subject site.

5.2 Construction Issues

Most of the operational structures and plant at the site of the proposed grease trap and oily waste water treatment facility will be installed onsite rather than constructed insitu.

Construction activities onsite will encompass relevant civil works to create;

- access road/driveway
- onsite car parking and manoeuvring areas
- bunded hardstand area which will service the loading/unloading of vehicles and provide for the installation of all operational structures and plant.

It is likely that some excess soil will be generated during construction and this will be reused wherever possible. It is expected that the proposed grease trap and oily waste water treatment facility will take up to four (4) weeks to construct. Possible impacts from the construction include:

- dust – from earthmoving and cleared areas;
- water – erosion of soils and off-site sedimentation from cleared areas; and
- traffic – from construction vehicles and plant.

These issues are addressed in more detail in **Section 6**.

5.3 Operational Issues

A modern facility of the type described in Section 5.1 would be equipped with extensive automatic monitoring systems. These systems allow for the continuous monitoring of the performance of the treatment process so as to allow for the making of adjustments as necessary to correct any deviation from the required performance. These automatic monitoring systems enable the performance and current status of the system to be monitored at any time by personnel at the facility or even at locations remote from the facility.

In the event of an emergency, (i.e. when there is a failure or the performance of the facility is outside set limits), the monitoring system would raise an alarm which could be automatically telephoned to the operator for attendance.

Under normal operation, operational personnel would attend the plant during working hours to ensure that the facility is working correctly and to attend to operational tasks that are not automated.

Possible impacts from operation of the proposed grease trap and oily waste water treatment facility include:

- noise - generated by pumps and other equipment used to treat wastewater;
- air quality - odours from the treatment process or the storage of treated wastewater;
- traffic & access - for the operation and maintenance of the treatment facility;
- surface waters - leakage of wastewater into the surface waters; and
- groundwater - leakage of wastewater into the groundwater.

These issues are addressed in more detail in **Section 6**.

5.4 Project Costs and Timing

It is expected that the proposed grease trap and oily waste water treatment facility will take up to four (4) weeks to construct with the cost of the facility being in the order of $250,000.

6. ENVIRONMENTAL ASSESSMENT

6.1 Ecologically Sustainable Development

While there is no universally accepted definition of ESD, the NSW Government in its 1997 State of the Environment Report has suggested the following definition of ESD:

"Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased."

Put more simply, ESD is development which aims to meet the needs of the community today, while conserving ecological processes for the benefit of future generations. There are two main features which distinguish the ecologically sustainable approach to development:

- consideration of the wider economic, social and environmental implications of decisions and proposals; and
- taking more of a long-term rather than a short-term view when making decisions.

By following an ecologically sustainable path of development, the likelihood of serious environmental impacts arising from economic activity and development should be reduced.

The principles of Ecologically Sustainable Development (ESD), as defined in Clause 6 of Schedule 2 of the EP&A Regulation 2000, are as follows:

- The precautionary principle – namely, that if there are threats of serious environmental damage, lack of scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- Intergenerational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- Conservation of biological diversity (biodiversity) and ecological integrity; and
- Improved valuation and pricing of environmental resources.

The principles of ESD provide a framework for the management of the water cycle. In the context of the proposal, the core principles of ESD require the preferred option to:

- avoid irreversible and detrimental damage to ecological resources;
- enhance the health and quality of the environment for the benefit of present and future generations;
- minimise any impact on rare and endangered species and ensure conservation of biological diversity;
- recognise, describe and assess the effects of construction and operation on environmental resources; and
- ensure that environmental costs are included, if possible, in the economic evaluation of the project.

All mitigation measures proposed in this section of this EIS have been developed based on the principles of ESD. It is clear that the principles of inter-generational equity and conservation of biological diversity are met and, if there is doubt about potential detrimental effects on the environment, a precautionary approach is applied.

6.2 Construction Impacts

6.2.1 Geology and Soils

The effects of construction on geology and soils would be relatively minor, and limited to excavations for foundations and civil works and pipe/infrastructure trenches. It is noted that site works are minimal which requires minimal vertical disturbance of soils. Spoil from these excavations is expected to be largely fill material, and to be suitable as either backfill or for offsite removal and disposal. The management of disturbed areas to minimise erosion and sedimentation is further discussed in Section 6.2.3. Acid Sulphate Soils are also discussed in the Section 6.2.3.

- *Mitigation Measures*

Mitigation measures proposed to minimise the impact of construction on geology and soils are detailed in Section 6.2.3 (Surface Water Quality).

6.2.2 Groundwater

The effects of construction on groundwater would be negligible as the proposed development does not involve any excavation which would intersect ground water nor are there any construction activities which will affect ground water quality or flow. The impact of the proposed development on Acid Sulphate Soils is discussed in the Section 6.2.3.

- *Mitigation Measures*

The following measures will be implemented to minimise the impact of construction on groundwater:

  - Nil

6.2.3 Surface Water Quality

During the construction of the development, the major potential impact on surface water quality would be erosion and sedimentation impacts from disturbed areas.

Acid Sulphate Soils will not be encountered during construction and will not have any impacts upon surface water quality.

(i) Sediment and Erosion Control

A potential risk to surface water quality during construction could arise from runoff from active construction sites. Earthworks will be required for the construction of the proposed development During these earthworks the potential exists for sediment to leave the site after intensive rainfall events and cause a reduction in water quality downstream. To minimise the risk of unacceptable water quality impacts, appropriate controls would be established to stabilise sites during the construction period and ensure natural erosion levels are not exceeded. Until vegetation cover has been established, measures to protect against erosion and sedimentation would be required.

Erosion and sedimentation would be minimised by the preparation of an Erosion and Sedimentation

Control Plan. This would identify the need for and implementation of appropriate erosion and sediment control measures in accordance with *Managing Urban Stormwater: Soils and Construction* (Department of Housing, 1998).

Surface runoff from the construction areas would be retained and managed on site. Other measures include the use of sediment trapping measures such as straw bales, geo-textile filter fences and silt traps. Weekly and post-rainfall inspections and reviews of erosion and sedimentation control measures would also be carried out.

(ii) Acid Sulphate Soils

Given the already filled nature of the area of the subject site and the nature and extent of construction activities there is no possibility of Acid Sulfate Soil being encountered during construction activities. It is also noted that the construction of the proposed development will have no impacts on ground water levels and accordingly associated Acid Sulfate Soil impacts will not result.

- *Mitigation Measures*

The following measures will be implemented to minimise the impact of construction on surface waters:

  - An Erosion and Sedimentation Control Plan would be prepared for the site and will be based upon recognised practices contained in *Managing Urban Stormwater - Soils and Construction* (Department of Housing 1998).

6.2.4 Aquatic Flora and Fauna

Given the location of the subject site in relation to surface waters and the highly disturbed nature of the subject site, direct impacts on aquatic flora and fauna will not occur as a result of the construction of the proposed grease trap and oily waste water treatment facility. It is however noted that indirect impacts associated with surface water quality impacts may have some minor relevance to construction activities on the subject site.

- ***Mitigation Measures***

Mitigation measures proposed to minimise the impact of construction on aquatic flora and fauna are detailed in Section 6.2.3 (Surface Water Quality)

6.2.5 Terrestrial Flora and Fauna

Given that the site has been cleared of the majority of native vegetation as part of the historic development and use of the subject site the impacts on flora and fauna associated with the proposed development will be minimal.

Construction activities within the development envelope will not require the removal of native vegetation which is present in the south-western corner of the subject site with all construction activities being confined to the already highly disturbed filled area of the subject site. Accordingly the impacts on native flora and fauna will be negligible.

- *Mitigation Measures*

Mitigation measures proposed to minimise the impact of construction on terrestrial flora and fauna will be minimized through;

  - the use of endemic species in conjunction with the landscaping of the disturbed areas of the subject site; and
  - confining all construction activities to already cleared areas of the subject site.

6.2.6 Air Quality

Potential effects on air quality during the construction of proposed development include:

- the generation of dust associated with excavation earthworks;
- emissions from diesel/petrol powered equipment (e.g. excavators, generators etc.); and
- exhausts from vehicles transporting materials and travelling to and from the site.

The extent to which each of the above activities would contribute dust and other air pollutants to the atmosphere is dependent on the level of activity being undertaken at the site and the prevailing weather conditions, and will vary throughout each day.

Detailed information relating to construction works and scheduling was not available at the time of preparation of this report and dust emission estimates for the site have therefore not been made.

Construction of the proposed development is expected to occur within approximately four (4) weeks. Construction equipment to be used at the development site would typically include excavators, backhoes, rollers, trucks and the like.

In order to minimise the potential dust impacts generated from these activities, exposed areas would be sprayed with water from a water cart or similar during dry and windy conditions. Stockpiles of soil and gravel/sand would also be watered as necessary to avoid dust generation.

Due to the relatively small scale of construction works the effects of any dust generated on site would be localised and short term in duration. Dust levels at nearest affected residences, (which are located more than 500m away from the site), due to the construction activities are not likely to create unacceptable environmental impacts.

The exhausts emitted from vehicles and equipment would contribute to volumes of particulates, carbon monoxide, carbon dioxide, hydrocarbons and nitrogen oxides in the atmosphere. However, such emissions would occur only intermittently and are not likely to result in any detectable reduction in air quality within the area surrounding the subject site.

- *Mitigation Measures*

The following measures will be implemented for the mitigation of construction impacts upon air quality;

  - construction plant will be maintained to meet appropriate air quality standards;
  - areas of land disturbed will be kept to a minimum and progressively rehabilitated;
  - exposed areas should be sprayed with water from a water cart or similar during dry and windy conditions; and

- stockpiles of soil and gravel/sand should also be watered as necessary to avoid dust generation.

6.2.7 Noise

The EPA is responsible for regulating noise in NSW and provides guidelines for the assessment of construction noise in its 2009 publication, *Interim Construction Noise Guideline (ICNG).* This Guideline provides that where there is the likelihood of annoyance due to noise from construction sites the following restrictions/best practices should be applied:

(i) Time Restrictions

The following time restrictions apply to construction activities:

- 7 am to 6 pm Monday to Friday;
- 8 am to 1 pm Saturday; and
- Sunday and Public Holidays, no work unless approval is obtained from the NSC prior to works being undertaken.

The above construction hours may be varied with the written prior approval of the Manager, Environment and Development, Nambucca Shire Council, if they can be satisfied that no significant adverse effects would occur at nearby sensitive receivers, or to mitigate environmental harm due to unforeseen or uncontrollable events.

(ii) Level Restrictions

For construction periods up to four (4) weeks in duration the L_{Aeq} level measured over a period of not less than 15 minutes when the construction site is in operation must not exceed the Rating Background Level (RBL) by more than 20 dB(A).

(iii) Silencing

All possible steps should be taken to silence construction site equipment.

Construction Phase Impacts

The construction works would be undertaken within 4 weeks and accordingly the appropriate L_{Aeq} noise level objective for construction works, when measured in the vicinity of the nearest noise sensitive dwellings to the site, is therefore background +20 dB(A) for the period.

The daytime existing background noise level predicted in the area surrounding the proposed development site is 45dB(A). Therefore, the construction noise levels during earthworks and the majority of the construction period should not exceed a level of 65dB(A), (background plus 20 dB(A)), at the nearest sensitive receptor.

The construction equipment used on the site would vary, depending on the stage of the works. The assessment of construction phase noise impacts is based on a selection of typical items of equipment operating at the subject site.

Sound Power Levels for typical activities associated with the construction works have been sourced from experience with typical construction equipment. The sound power levels for the activities are typically:

- Excavator - 116dB(A)
- Front End Loader - 117dB(A)
- 10t Product Truck - 105dB(A)
- Concrete Truck - 110dB(A)
- Concrete Pump - 102dB(A)

The spatial separation which is available between the subject site and the closest sensitive residential receiver, (minimum 500m), provides for a minimum distance noise attenuation of 60dB(A). In the context of the indicative sound power levels indicated above, noise levels at the closest sensitive residential receiver would be within the 65 dB(A) noise level objective of for construction activities. This is demonstrated as follows;

Table 9 – Construction Noise Level Predictions

CONSTRUCTION EQIPMENT	INDICATIVE SOUND PRESSURE LEVEL (EQUIPMENT)	MINIMUM ATTENUATION DUE TO DISTANCE dB(A)	SOUND PRESSURE LEVEL dB(A) (AT RECEIVER)	NOISE LEVEL OBJECTIVE dB(A)
Excavator	116dB(A)	60	56	65
Front End Loader	117dB(A)	60	57	65
10t Product Truck	105dB(A)	60	45	65
Concrete Truck	110dB(A)	60	50	65
Concrete Pump	102dB(A)	60	42	65

The adoption of noise predications based solely on distance attenuation is considered to provide for conservative impact predictions as other attenuation factors are likely to be relevant such as shielding and topographic considerations. Consequently a level of redundancy exists in relation to the prediction of noise impact.

- *Mitigation Measures*

The following measures will be implemented for the mitigation of construction impacts upon noise quality;

  - all possible steps should be taken to silence construction site equipment;
  - construction activities will be limited to the relevant time restriction indicated above; and

- the duration of construction activities onsite is to be four (4) weeks unless approved by Nambucca Shire Council.

6.2.8 Traffic and Access

During the construction period, vehicles would deliver equipment and materials to the subject Site. Vehicles would include:

- excavators;
- trucks (dump trucks and concrete trucks); and
- contractor's vehicles.

Peak vehicle volumes to the subject site are expected to occur during site grading and establishment. It is anticipated that up to two (2) truck movements per day will be required for this stage of construction.

All vehicle movements to and from the subject site will be via Kelly Close and the connecting local road infrastructure. Kelly Close and the connecting public road infrastructure in the locality are bitumen sealed two wheel drive all weather roads.

All vehicle movements to the site of the proposed development will be via the existing bitumen sealed two wheel drive all weather internal access road which connects with Kelly Close.

All vehicle movements to and from the site of the proposed development will be in a forward direction.

The estimated traffic generation associated with the proposal is not considered to be significant. Given the nature of road infrastructure in the area it is considered that traffic generation associated with the construction phase of the proposed development will be easily accommodated within the existing capacity of the existing public and private road system.

- ***Mitigation Measures***

Mitigation measures proposed to minimise the impact of construction on traffic and access are;

- Nil

6.2.9 Visual

There would be some temporary impacts on the landscape during construction with the presence of construction machinery and stockpiles of earthworks. Most of the site of the proposed works will not be visible due to the retention of vegetation, the presence of other structures within the view path towards the subject site, and the distances involved to the subject site from public areas or the active residential use areas of adjacent land.

It is also noted that the impending construction of the Pacific Highway by-pass will significantly change views to the subject site from the west and northwest. In this regard it is suggested that with the raised construction of the Pacific Highway bypass views of the construction of the proposed development from the Macksville Township will be obscured and accordingly the impact of the construction of the proposed development on views will be minimum in the context of the more significant impact of the construction of the Pacific Highway by-pass.

Once construction is complete, landscaping of the subject site would provide for disturbed areas would be undertaken using endemic species (see Section 6.2.5).

The low profile of the construction plant and equipment which will be utilized in the construction of the proposed development also greatly assists in minimizing visual impacts during the construction phase.

The contribution of the existing MSTP to the view backdrop to the proposed development also assists in minimizing the impact of the proposed development on the view characteristics of the locality.

- ***Mitigation Measures***

The following measures would be implemented to mitigate any impacts of construction on visual amenity;

  - re-plant disturbed areas with appropriate endemic species; and
  - avoid and/or minimise the removal of any vegetation during the construction of the proposed grease trap and oily water processing facility.

6.2.10 Heritage

As discussed in Section 3.15.1, no Aboriginal artefacts have been or are likely to be found on the subject site due to the sites highly disturbed and filled condition and the unsuitable nature of the site for activities of historic importance.

Historic vegetation clearance and soil disturbance of the subject site is such that the potential for disturbance to relics is considered be extremely low.

No items of European heritage significance have been found within the subject area, and therefore there would be no impact on European heritage from construction.

- ***Mitigation Measures***

The following measures would be implemented to mitigate any impacts from construction upon Aboriginal and European heritage:

  - if relics are found, the NPWS would be notified for advice and to ensure that these relics are recorded on the NPWS Sites Register.

6.2.11 Waste

The contractor responsible for the construction of the proposed grease trap and oily water treatment facility would be required to provide details on suitable waste management procedures and to assume responsibility for the appropriate disposal of any waste generated.

The construction contractors are required to initiate activities which maximise the amount of waste that can be reused and recycled, while minimising the volume to be disposed. All waste would be disposed of in accordance with the requirements of Nambucca Shire Council.

- *Mitigation Measures*

The following measures will be implemented to mitigate any impacts from construction upon waste:

  - waste management activities are to maximise the amount of material that can be reused and recycled, whist minimising the volume to be disposed of.

6.2.12 Social

Given the nature size and location of the proposed grease trap and oily water treatment facility the impacts of construction of the development on social context and characteristics of the area will be negligible. In this regard the proposed development will have a positive local economic effect through the creation of job/business opportunities through the construction phase of the project in conjunction with the multiplier effect which results as a consequence of new works being undertaken.

There will be no direct or indirect costs to the local community as a result of the construction of the proposed facility.

Existing businesses will not be negatively impacted upon nor affected by the proposed development.

Standards of public and environmental health will not be impacted upon by the project with the current standards of recreational amenity not being impacted upon.

- *Mitigation Measures*

Mitigation measures proposed to minimise the impact of construction on social are detailed in Section 6.2.6 (Dust), Section 6.2.7 (Noise), Section 6.2.8 (Traffic and Access), and Section 6.2.9 (Visual Amenity).

6.3 Operational Impacts

6.3.1 Geology and Soils

The geology of the area and soils of the subject site would not be affected by the operation of the proposed grease trap and oily waste water treatment facility.

The following measures are proposed to minimise the operational impact of the proposed grease trap and oily waste water treatment facility upon soils:

- *Mitigation Measures*

  - Nil.

6.3.2 Groundwater

Given its construction and the nature of its operation the grease trap and oily waste water treatment facility will have no impact upon groundwater resources in the Macksville area.

- ***Mitigation Measures***

The following measures are proposed to minimise the operational impact of the grease trap and oily waste water treatment facility upon groundwater;

  - regular assessment of operational integrity of the facility to ensure no discharges of wastewater from the facility.

6.3.3 Water Quality

Given its construction and the nature of its operation the grease trap and oily waste water treatment facility will have no impact upon the surface water resources in the locality.

- *Mitigation Measures*

The following measures are proposed to mitigate the impacts of the grease trap and oily waste water facility on surface water quality;

  - regular assessment of operational integrity of the facility to ensure no discharges of wastewater from the facility.

6.3.4 Flooding

The impacts of flooding on the subject site has been the subject of considerable investigation and assessment as part of the upgrading and operation of the MSTP on the subject site. In this regard these assessments have provided that the impacts of flooding on the subject site in the area of the MSTP are acceptable and that impacts on flood levels and velocities are minimal in the context of impacts on adjoining and adjacent properties and infrastructure. In this regard it is noted that the proposed development is located on land which is immediately to the west of the MSTP with this land containing a similar vertical relationship to the floodplain and accordingly the result of the previous flooding investigations and assessments are directly comparable to the proposed development.

Therefore given its nature and location immediately adjacent to the MSTP, the proposal would lead to a negligible increase in the 1 in 100 year flood level at the subject site as there are no land form modifications which would affect flood flows beyond that which currently exist and have been assessed as being acceptable in the context of the presence and operation of the MSTP. The proposal does not increase flood levels at any other adjacent area beyond that which would already exist.

The proposal would have no impacts on or implications for the peak average velocity during a 1 in 100 year flood beyond that which currently exists by virtue of the presence of existing development. It is however noted that it is important to ensure that the infrastructure which is incorporated into the facility is such that plant and equipment do not become flood debris and that work health and safety risks associated with flooding are mitigated.

- *Mitigation Measures*

The following measures are proposed to mitigate the impacts of the grease trap and oily waste water facility from flooding;

- the wastewater treatment system will be designed with the capability to isolate sections that will be potentially be impacted by flooding;
- the wastewater treatment system will be designed such that plant and equipment are able to resist flood floods such that they do not become flood borne debris; and
- all electrical equipment and switching are to be located above the 1:100 year flood level.

6.3.5 Aquatic Flora and Fauna

Given its location, construction and the nature of its operation the grease trap and oily waste water treatment facility will have no impact upon the aquatic flora or fauna.

- ***Mitigation Measures***

The following measures are proposed to minimise the operational impact of the grease trap and oily waste water facility upon aquatic flora or fauna;

- Nil

6.3.6 Terrestrial Flora and Fauna

Given its location, construction and the nature of its operation the grease trap and oily waste water treatment facility will have minimal impact upon the terrestrial flora or fauna within the area.

Pest management issues are however considered to be relevant to the ongoing operation and management of the proposed facility. The adoption of best practice pest management strategies is required for the operation of the proposed facility.

- ***Mitigation Measures***

The following measures are proposed to mitigate the operation of the proposed grease trap and oily waste water treatment facility on terrestrial flora and fauna;

- daily monitoring of fly numbers and rodent activity and implementation of control measures where required;
- monitoring water leaks;
- using good sanitation practices, such as cleaning up spilt waste waters;
- selectively using adulticides to treat flies, including using surface sprays when monitoring indicates fly numbers are increasing or at times of the year when flies regularly become a problem; and
- maintaining a rodent baiting program when required.

6.3.7 Air Quality

The operation of the proposed facility has a limited potential to generate odours however the aerobic biological activity which is proposed and the enclosed nature of the treatment infrastructure are such that odour generation will be extremely unlikely.

The extensive buffers between the proposed development and any residential receivers is such that significant attenuation of any odour impacts is available with no negative impacts associated with

the ongoing operation of the proposed development expected even under worst case climatic conditions.

It is also noted that the local air quality is already impacted upon by the operation of the Macksville STP. Given the size and nature of the proposed development and the odour management practices which underpin the operation of the proposed facility there will be no cumulative odour impacts either on the subject site or in the general locality.

- *Mitigation Measures*

The following measures are proposed to mitigate the operation of the proposed grease trap and oily waste water treatment facility on air quality;

  - a complaints management system will be implemented to investigate and resolve any complaints regarding odour.

6.3.8 Noise

The NSW Environment Protection Authority (EPA) is responsible for regulating noise in NSW. Operational noise is best assessed in accordance with the NSW *Industrial Noise Policy (INP)* (NSW EPA, 2000).

The INP provides the framework and process for deriving project specific noise limits for assessments and (separately) limits for consents and licences that will enable the authority to regulate premises that are scheduled under the *Protection of the Environment and Operations Act, 1997*.

The INP is designed to determine an acceptable level of impact expected at a community level, based on reactions to social surveys. Where the criteria are met, no adverse noise impacts would be reasonably expected at the closest receivers. The INP requires that the noise from a development under assessment comply with the lower of the amenity or intrusive noise criteria. The intrusive criterion is determined by the difference between the industrial noise under assessment being no more than 5dB(A) above the Rating Background Level (RBL). The RBL is evaluated in the absence of any industrial noise including the development in question. This is usually assessed prior to the commencement of operations.

The amenity criterion is based on the zoning, the land use of the receiver location and the extent of the implements modifying existing industrial noise in the area. Where there is an existing influence of industrial noise the INP factors to the criteria to account for cumulative noise impacts. The project specific noise goals are then set based on the more stringent of the amenity or intrusive criteria.

Intrusive Noise Criteria

A noise source is considered to be non-intrusive if the LAeq, 15 minute level does not exceed the RBL by more than 5 dB(A) for each of the day, evening and night-time periods, and does not contain tonal, impulsive, or other modifying factors as detailed in Chapter 4 of the INP.

Amenity Noise Criteria

The amenity criteria apply to the LAeq Level determined for the period of assessment of day, evening or night. The definition of the noise amenity classification for the residential area

surrounding the subject site is "suburban" based on the description of this type of location as detailed in the DEC's INP. Based on a site inspection the noise environment around the subject site is controlled by influences other than industrial sources. The modifying factors for the amenity criteria are only applied when existing industrial noise sources are present. The amenity noise criterion is therefore based on the acceptable levels for a suburban residential receiver.

The relevant Intrusive and Amenity Noise Criteria which is applicable to the operation of the proposed grease trap and oily waste water treatment facility are as follows;

Table 10 – Operational Noise Criteria

NOISE CRITERIA	DAY dB(A)	EVENING dB(A)	NIGHT TIME dB(A)
Determination of Intrusiveness Criteria			
Project Specific RBL levels (see section 3.10)	45	40	35
Intrusiveness Criteria (RBL + 5dB(A))	50	45	40
Determination of Amenity Criteria			
Acceptable Amenity Criteria	55	50	45
Adjustment to Amenity Criteria	0	0	0
Project Criteria			
	50	45	40

The DEC's Intrusiveness Criteria for daytime is the lower of the criteria determined for this project. It should be noted that the Amenity Criteria are primarily designed to control long term noise through stringent planning goals, while the Intrusiveness Criteria are more appropriate for assessing the annoyance resulting from operations of the proposed Facility.

Following completion of the construction works, operation of the proposed grease trap and oily waste water treatment facility would involve the emission of noise primarily from various process units, including:

- aeration blowers;
- trommel unit; and
- waste-water pumping.

The items at the treatment plant site itself having the greatest potential for adverse noise impacts within the nearby residential community include those that operate 24 hours per day. Based on design information available at the time of preparation of this report, a review of the likely plant units was undertaken and an assessment of the potential operational noise impacts from the main noise generating items was undertaken.

Sound Power Levels for typical activities associated with the operation of the facility have been sourced from experience with typical equipment of the nature which is relevant to the operation of a wastewater treatment system. The sound power levels for the activities are typically:

- Sewage Pumps - 75dB(A)
- Treatment tanks - 75dB(A)
- Mobile Centrifuge - 90dB(A)

Predictions made on the data result in the determination of the LAeq index and assume that the plant items are fully operational and under typical load conditions during operations.

The spatial separation which is available between the subject site and the closest sensitive residential receiver, (minimum 500m), provides for a minimum distance noise attenuation of 60dB(A). In the context of the indicative sound power levels indicated above, operational noise levels at the closest sensitive residential receiver would be within the aforementioned operational intrusive criteria for daytime, evening and night-time scenarios. This is demonstrated as follows;

Table 11 – Operational Noise Level Predictions

PLANT/EQIPMENT	INDICATIVE SOUND PRESSURE LEVEL (EQUIPMENT)	MINIMUM ATTENUATION DUE TO DISTANCE dB(A)	SOUND PRESSURE LEVEL dB(A) (AT RECEIVER)	INTRUSIVENESS CRTERIA dB(A)		
				DAY	EVENING	NIGHT TIME
Sewage Pumps	75dB(A)	60	No greater than 30	50	45	40
Treatment tanks	75dB(A)	60	No greater than 30	50	45	40
Mobile Centrifuge	90dB(A)	60	30	50	45	40

The adoption of noise predications based solely on distance attenuation is considered to provide for conservative impact predictions as other attenuation factors are likely to be relevant such as shielding and topographic considerations. Consequently a level of redundancy exists in relation to the prediction of noise impact.

The results of acoustic assessment for the operation of the proposed grease trap and oily waste water treatment facility show compliance with the project specific noise level objectives. An operational noise level of less than 30dB(A) was predicted at the nearest residential location under adverse meteorological conditions. Operation of the proposed grease trap and oily waste water treatment facility is therefore not expected to result in any significant change to the noise environment at the residential dwellings nearest to the site**.**

Compliance with the EPA criteria at the nearest residential dwellings to the site is likely to be achieved, even under adverse meteorological conditions.

Given the infrequent removal of bio-solids and the daily transport of collected wastewaters to the site will only occur during daytime hours, no adverse acoustical impacts are expected to result from this source. Other vehicle movements to the subject site will be minimal in the context of the existing number of vehicle movements in the area and the impacts of such on the existing acoustic environment will be indiscernible.

- *Mitigation Measures*

In order to maintain acceptable noise levels during the operation of the proposed facility the following measures would be implemented;

  - noise control measures on STP equipment, wastewater collection system and other infrastructure would be designed and maintained to comply the NSW EPA's Industrial Noise Policy; and
  - a complaints management system will be implemented to investigate and resolve any complaints regarding noise.

6.3.9 Traffic and Access

There are not expected to be any significant impacts on traffic and access during the operation of the grease trap and oily waste water treatment facility. The only traffic generated would be facility operator's vehicles, trucks delivering collected wastewaters and the very occasional removal of bio-solids and maintenance crews or emergency teams.

Vehicular traffic movements will not significantly increase as a result of the proposed development. Given that the proposed development is consistent with the wastewater treatment activities already undertaken on the subject site (MSTP), traffic movements to and from the proposed grease trap and oily water treatment facility will remain low with access to and from the proposed development infrequent.

The roads in the locality will have sufficient capacity to accommodate any increase in traffic that would occur as a result of the proposed development.

Given the size of the subject site ample parking and vehicle manoeuvring will be available.

- *Mitigation Measures*

The following measures are proposed to minimise the operational impact of the grease trap and oily waste water treatment facility upon traffic and access;

  - Nil

6.3.10 Heritage

As mentioned previously in Section 6.2.10 no Aboriginal artefacts have been or are likely to be found on the subject site due to the sites highly disturbed and filled condition and the unsuitable nature of the site for activities of historic importance.

Historic vegetation clearance and soil disturbance of the subject site is such that the potential for disturbance to relics is considered be extremely low.

No items of European heritage significance have been found within the subject area, and therefore there would be no impact on European heritage from construction.

Accordingly the operation of the proposed grease trap and oily waste water treatment facility will not result in any impacts upon heritage, therefore no mitigation measures are required.

- *Mitigation Measures*

The following measures are proposed to minimise the operational impact of the grease trap and oily waste water treatment facility upon local heritage;

  - Nil

6.3.11 Waste

Adequate dedicated solid waste storage and collection facilities complying with Nambucca Council's waste requirements will be incorporated into the operation of the proposed treatment facility. Opportunities for solid waste reduction and recycling will be incorporated into the operation of the development in accordance with Company waste reduction and recycling policies and procedures. The design and construction of the proposed facility provides for the provision of suitably designed and constructed bunds around all liquid waste processing and storage infrastructure. All bunding will be designed so as to provide for a bunded storage area which is equal to 110% of the volume of liquid stored within the bunded area. Impervious floors will also be utilized within the bunded areas thereby eliminating any direct discharges to the environment. Accordingly no liquid wastes, (under treatment or in storage), will be discharged to the environment.

Regular monitoring will ensure the operational integrity of the bunded areas and ensure that the maximum storage capacity of the bunded area is maintained at all times.

Wastewater from the proposed facility will be conveyed by sealed pipes to the Councils Macksville STP which adjoins to the east of the proposed development. In this regard all wastewater discharged to the STP will meet Councils trade waste discharge standards at all times, refer to **Appendix 3**. Examples of trade waste discharge standards which have been achieved for similar projects form part of this application, refer to **Appendix 4**.

Apart from the generation of treated wastewater the operation of the proposed facility will give rise to the generation of a minor quantity of sludge material which will either be recycled through the Bio Reactor Treatment System or immediately removed from the site and used as part of the commercial production of compost materials or for approved pasture improvement purposes. There will be no storage of solid waste materials from the treatment system onsite at any time.

Effluent generated from the staff amenities will be collected and disposed of to the Councils Macksville STP which adjoins to the east of the proposed development.

- *Mitigation Measures*

The following measures are proposed to minimise the operational impact of the grease trap and oily waste water treatment facility upon the generation and disposal of wastes;

- all wastewaters generated from the operation of the proposed facility will be collected and disposed of to the Councils Macksville STP in accordance with Nambucca Shire Councils Trade Waste Policy;
- the operational integrity of the bunded areas is to be monitored so as to ensure that the maximum storage capacity of the bunded area is maintained at all times; and
- all solid wastes generated from the operation of the proposed facility will be collected and disposed of in accordance with Nambucca Councils requirements/policies.

6.3.12 Social and Economic

Given the nature size and location of the proposed grease trap and oily water processing facility the impacts of the operation of the grease trap and oily waste water treatment facility on social context and characteristics of the area will be negligible. In this regard the proposed development will have a positive local economic effect through the creation of job/business opportunities through the operational phase of the project in conjunction with the multiplier effect which results as a consequence of new businesses being undertaken in the local community.

There will be no direct or indirect costs to the local community as a result of the operation of the proposed facility.

Existing businesses will not be negatively impacted upon nor affected by the proposed development.

Standards of public and environmental health will not be impacted upon by the project with the current standards of recreational amenity not being impacted upon.

- *Mitigation Measures*

See mitigation measures for noise, odour, public health, water quality, groundwater and visual amenity.

6.3.13 Hazards and Safety Management

In NSW, assessment of off-site risk posed by potentially hazardous industries is required to be conducted with due consideration given to *State Environmental Planning Policy No 33 - Hazardous and Offensive Development*, and associated guidelines issued by the former Department of Urban Affairs and Planning.

SEPP 33 provides for merit based assessment ensuring that locational and design considerations are an integral part of the assessment process. Planning NSW documentation provides several screening methods to assist the analyst in determining whether the proposed development is potentially hazardous.

The nature of the operation of the proposed facility is such that the use of chemicals would be minimal with treatment of wastewaters being achieved through biological processes where by the addition of chemicals is counterproductive. Consequently the operation of the facility is simple in process and design. In this regard the use and storage of Dangerous Goods will not result as a consequence of the operation of the proposed facility.

The proposed development does not constitute *Hazardous and Offensive Development* as provided for by SEPP 33.

As previously mentioned the design and construction of the proposed facility provides for the provision of suitably designed and constructed bunds around all liquid waste processing and storage infrastructure. All bunding will be designed so as to provide for a bunded storage area which is equal to 110% of the volume of liquid stored within the bunded area. Impervious floors will also be utilized within the bunded areas thereby providing for a level of redundancy in relation to safety management.

Relevant safety and environmental procedures and facilities will be implementation in conjunction with the operation of the grease trap and oily waste water treatment facility.

(i) Safety Management

Safety management issues would be incorporated into both the design and operation of the treatment facility. An outline of the safety features of the plant are discussed below.

- Operation of the treatment plant will conform to safety standing orders. These general orders cover the treatment plant operations and detail procedures to be followed, such as procedures for entering confined spaces.
- Specific safety features would be incorporated into the design of the plant and equipment
- Relevant warning signs would be displayed around the facility.

(ii) Emergency Plans/Counter-Disaster Plans

The objective of emergency plans or pollution incident management measures is to facilitate response to emergency situations. This minimises the effect of incidents by providing a plan. As part of the proposed development, the proponent would prepare a Pollution Incident Response Management Plan (PIRMP). The following principles and key features are important in the development of incident procedures;

- there should be an “on site” or facility plan. The plan should be available at the site;
- the procedures should be appropriate to the full range of possible pollution/emergency situations/incidents;
- the procedures should define points at which judgments and decisions are to be made, who has authority to make them, and should include, or direct the user to, easily accessible information to guide those decisions;
- there should be a routine for revising the procedures to match changes in equipment, organisation, people, etc; and
- a PIRMP should cover:
    - potential hazardous events (nature, scale etc);
    - management structure;
    - roles and responsibilities of key people;
    - incident risks and management requirements;
    - communications;
    - interface and liaison with external bodies (police, fire brigade, ambulance, local government, press etc);
    - procedures and instruction, prepared separately and bound in a folder of distinctive colour. They should not be part of the operating instruction;
    - actions to minimise the extent of the dislocation e.g. by containment of firefighting

water, prompt resumption of business etc.

- ***Mitigation***

The management of safety issues would be implemented through adherence to requirements relating to the incorporation of safety features in design and updating and implementation of the facility PIRMP.

6.3.14 Energy Considerations

Electricity from the mains grid will be used to power the operation of the proposed grease trap and oily waste water treatment facility. Given the sites proximity to the Macksville STP and the small scale of the proposed development from an energy consumption perspective sufficient capacity is likely to be available for the operation of the treatment facility. If required augmentation of the existing power supply infrastructure could be easily accommodated.

All components of the treatment facility would be designed to minimise energy consumption. Readily applicable methods of energy consumption which would be employed include:

- use of energy efficient lighting;
- use of energy efficient motors for plant items, where appropriate;
- regular maintenance of electrical and mechanical equipment.

The significance of the energy consumption of the proposed treatment facility is considered to be balanced by the avoided energy costs and emissions associated with the transportation of collected wastewaters to Port Macquarie (and possibly further).

- ***Mitigation***

The following measures are proposed to minimise the operational impact of the grease trap and oily waste water treatment facility upon energy consumption;

  - use of energy efficient lighting in relation to the facility;
  - use of energy efficient motors for plant items, where appropriate; and
  - regular maintenance of electrical and mechanical equipment.

6.3.15 Public Health

The relatively isolated nature of the subject site and the enclosed nature of the treatment facility are such that the public health risks associated with the operation of the facility are negotiable.

The possible discharge of wastewaters to the environment as a result of a pollution/emergency incident does present a level of risk however given the quantities of wastewater involved and the location of the facility potential negative impacts on public health would be minimal.

- ***Mitigation***

See mitigation measures for hazards and safety management, (see Section 6.3.13).

6.3.16 Visual

The proposed grease trap and oily waste water treatment facility includes built components that will have an impact on the visual aspects of the landscape however the low profile of the structures which form the subject development greatly assists in minimizing visual impacts. It is also noted that the existing view paths are dominated by the infrastructure associated with the Macksville STP with the infrastructure associated with the proposed development being entirely consistent with the existing vistas of the area.

The location of the subject site and the small size of the plant and equipment required for the operation of the facility are such that the facility will not be readily visually apparent from adjacent public space areas. It is also noted that the impending construction of the Pacific Highway by-pass will significantly change views to the subject site from the west and northwest. In this regard it is suggested that with the raised construction and use of the Pacific Highway bypass views to the proposed development from the Macksville Township will be obscured and accordingly the impact of the proposed development on views will be minimum in the context of the more significant impact of the Pacific Highway by-pass.

Overall the visual impact of the proposed grease trap and oily waste water treatment facility would be minor provided the structures are designed to complement the surrounding landscape.

- *Mitigation*

The following measures would be implemented to mitigate any operational impacts on visual amenity;

  - ongoing maintenance of site landscaping.

6.4 Cumulative Impacts

In accordance with Clause 228 of the *Environmental Planning and Assessment Regulation, 2000,* any cumulative environmental effects of the proposal with other existing and likely future activities must be taken into account in determining the potential impacts of the proposal on the environment. The assessment of interaction of individual proposals with each other, in terms of aggregate effects or cumulative impacts over time, is therefore required in the EIS process.

However, it is often difficult to assess broader level impacts and possible synergistic effects of other projects within the context of an individual EIS. Cumulative impact assessment in the context of the proposal can be defined as:

"The cumulative impacts on the environment, both direct and indirect, which result from the proposed grease trap and oily waste water treatment facility, added to other past, present and reasonably foreseeable future development proposals and other activities in the region affected by new grease trap and oily waste water treatment facility".

Cumulative impacts occur partly due to the compounding effects and synergistic interactions arising from other developments occurring in the same area or over similar time frames which together act on an environment.

Given the reliance of the proposed grease trap and oily waste water treatment facility on the disposal of treated wastewaters via the existing Macksville STP the cumulative impacts of the

proposed development are considered to be minimal. The proposed development seeks to comply with standards which are already specifically relevant to the operation of the STP with the outcomes achieved through the proposed development being entirely consistent with the performance expectations and requirements associated with the MSTP which have already been assessed as being acceptable and sustainable.

The highly disturbed nature of the subject site, the scale and design of the proposed development and the relatively isolated nature of the site of the proposed development all contribute to ensuring that the environmental impacts of the proposed development are minimal with a corresponding minimal cumulative impact.

7. ENVIRONMENTAL MANAGEMENT

7.1 General Management Principles

Two Environmental Management Plans for the project would be prepared – a Construction Environmental Management Plan (CEMP) and an Operational Environmental Management Plan (OEMP). The EMPs would be based on the mitigation and monitoring measures proposed in Sections **5** and **6** of this EIS and from any additional requirements identified in the Development Consent for the project. The two EMPs are further discussed in the following sections.

The aims of the EMPs are to act principally as environmental operations manuals for use by builders and operators of the proposed grease trap and oily waste water treatment facility. The OEMP is also an advisory document for the regulatory authorities and would be updated regularly to reflect any changes in the operation of the facility or regulatory requirements.

7.2 Construction Environmental Management Plan (CEMP)

Initially a Construction Environmental Management Plan (CEMP) would be prepared by the construction contractor. The CEMP will detail operating conditions and temporary environmental protection measures to mitigate the impact of construction activities.

Other mitigation measures which will be included in the CEMP will be based upon this EIS, recognised best environmental practice and the conditions of development consent.

7.3 Operation Environmental Management Plan (OEMP)

Prior to the commissioning of the grease trap and oily waste water treatment facility, an Operational Environmental Management Plan (OEMP) would be prepared by the operator of the facility and contain information relating to the operation of the proposed grease trap and oily waste water treatment facility. The completed OEMP will include:

- environmental goals;
- environmental performance measures;
- responsibilities for the environmental management of the project;
- training of staff in environmental awareness and environmental best practice;
- timing for implementation of mitigation measures;
- records and document management;
- continuous improvement process arising from auditing and monitoring activities;
- regular and clear monitoring and auditing procedures; and
- clear guidelines for emergencies, corrective action, and procedures to notify potentially affected parties and authorities.

The environmental management measures recommended in this EIS and the conditions of consent would be included in the OEMP. In addition, the conditions of any operational licences and approvals to ensure that the environment is adequately protected and that adverse impacts are avoided or otherwise substantially ameliorated would be included.

Mitigation measures which will be included in the OEMP are based upon this EIS and recognised best environmental practices.

7.4 Monitoring

A monitoring program will be established by the operator of the proposed grease trap and oily waste water treatment facility. Monitoring requirements will be detailed in the EMPs prepared for the project.

7.4.1 Construction Monitoring

Monitoring during the construction period would include;

- environmental safeguard performance regarding protection of existing ponds and adjacent waterways, spoil stockpiles and storage, drainage and erosion controls, solids levels erosion and sediment controls.

7.4.2 Operations Monitoring

Monitoring during operation would include;

- Licence/approval condition requirements; and
- noise, odour and dust levels in response to public complaints.

8. JUSTIFICATION AND CONCLUSION

8.1 Justification of the Proposal

The EP&A Regulation, 2000 requires that an EIS include:

"the reasons, justifying the carrying out of the development or activity in the manner proposed, having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development."

The following sections document the justification for the proposed grease trap and oily water treatment facility.

8.1.1 Social Considerations

The proposed grease trap and oily water treatment facility will result in social benefits to the community, primarily in the provision of a more efficient and effective liquid trade waste management service.

The construction of the proposed grease trap and oily water treatment facility may lead to some temporary adverse impacts including potential noise, visual and transport impacts. When considering the nature and scale of these impacts, however, they are considered to be negligible.

8.1.2 Economic Considerations

The proposed grease trap and oily water treatment facility is estimated to cost less than $250,000, with the cost to be borne by the development proponent.

The proposal has taken cost considerations into account including the commercial operating costs whilst meeting the relevant environmental and social objectives.

The proposed development will ensure that the costs associated with the ongoing treatment and disposal of grease trap and oily water are commercially appropriate to facility users.

8.1.3 Biophysical Considerations

The EIS has determined that there will be no unacceptable impacts on the environment.

8.1.4 Ecologically Sustainable Development Issues

The NSW Government defines ESD as:

"development that uses, conserves and enhances the community's resources so that ecological processes, on which life depends, are maintained and the total quality of life now and in the future can be increased."

According to Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*, in developing a proposal the goals and principles of ecologically sustainable development need to be considered. The core objectives of ecologically sustainable development are:

- to enhance individual and community well-being by following a path of economic development that safeguards the welfare of future generations;
- to provide for equity within and between generations; and
- to protect biological diversity and maintain essential ecological processes and life-support systems.

The guiding principles of ecologically sustainable development are:

- the decision making processes should effectively integrate both long and short term economic, environmental, social and equity considerations;
- where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- the global dimension of environmental impacts should be recognised and considered;
- the need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised;
- the need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised;
- cost effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms; and
- broad community input into decisions and actions made which will affect them.

In preparing this EIS, the potential environmental impacts from the proposed activity has been investigated and a range of mitigation measures to minimise any adverse effects developed. **Section 6** addressed these principles in the context of environmental impact, and concluded that the proposal:

- would not cause irreversible effects on the environment nor threaten ecosystem integrity;
- would ensure that the health, diversity and productivity of the environment will be maintained for the future benefit of generations; and
- would not have a detrimental effect on the conservation of biological diversity.

8.2 Conclusions

The proposed development is consistent with the land use zoning for the area and will provide for the operation of a modern facility that provides positive workplace and environmental management benefits for its operators and the community.

The nature, scale and location of the proposed grease trap and oily water treatment facility are such that direct and indirect impacts on the environment are minimal.

This EIS assessed the impact of the proposed development and found that the development would not have a major negative impact on the environment subject to the incorporation of the appropriate mitigation measures.

8.3 Recommendations

Subject to the project acceptance and its approval for construction, the following recommendations are made:

- the safeguards to ameliorate any adverse environmental impacts on soils, water quality, , air quality and odour, noise, traffic and access, visual quality, the community and energy considerations as identified in this EIS, be implemented; and

- the monitoring programs outlined for the construction and operation phases of the proposed development are to be implemented.

9. REFERENCES

ANZECC (1992), Australian Water Quality Guidelines for Fresh and Marine Waters

ABS – Australian Bureau of Statistics *Census of Population and Housing: Selected Characteristics for Urban Centres*, Australia, Website

Adams P.,N. Urwin, I. Sim and P. Weiner (1985), Coastal Wetlands of New South Wales: A Survey and Report for the Coastal Council of NSW.

GHD (2010), Local Growth Management Strategy Employment Lands for Nambucca Shire

Holmes and Associates (1995), Air Quality Assessment: Sewage Treatment Works Macksville

Kelly R. and Donovan T (1976a), Survey of Aboriginal Sacred Sites in New South Wales. Fieldwork in the Gumbagarra, Thungutti and Ngumbar Tribal area. Report to the NSW NPWS.

Kelly R. and Donovan T (1976a), Survey of Sites in the Nambucca Area. Report to the NSW NPWS.

Nambucca Shire Council (2013), 2023 Community Strategic Plan

Nambucca Shire Council (2009), Liquid Trade Waste management Policy

Navin K. (1991a), An Archaeological Survey of the Preferred pacific highway By-pass Around Macksville, NSW. Reoort to GHD Group

NSW Agriculture (1994), Irrigation Management Services Macksville Sewage Augmentation Agronomy Study

NSW Department of Housing (2004), Managing Urban Stormwater: Soils and Construction

NSW Department of Land and Water Conservation (1997), Environmental Guide for Management of Local Government Water Supply, Sewerage and Drainage Services

NSW Department of Land and Water Conservation (1998), The NSW Groundwater Quality Protection Policy, A Component Policy of the NSW State Groundwater Policy

NSW EPA (1994), Environmental Noise Control Manual

NSW EPA (1997), Use and Disposal of Biosolids Products

NSW EPA (1999), Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes

NSW EPA (2000), NSW Industrial Noise Policy

NSW EPA (2001b), Draft Policy: Assessment and Management of Odour from Stationary Sources in NSW

NSW Government (1997), NSW Coastal Policy

NSW Public Works (1991), Macksville Sewage Augmentation Assessment of Loading on and Performance of the Macksville Sewage Treatment Works

NSW Public Works (1994a), Macksville Sewage Augmentation – Value Management Study

NSW Public Works (1994b), Macksville Sewage Augmentation – Options Report

NSW Public Works (1994c), Engineering and Surveying Branch Macksville Sewage Augmentation Sewage Treatment Works Potential Acid Sulphate Soil Study

NSW Public Works (1994d), Water Services Policy Division Macksville Sewage Augmentation, Reticulation Strategy Report

NSW Public Works (1994e), Estuary and Environment Policy Division Macksville Sewage Augmentation – Nambucca River Tidal Modelling

NSW Public Works (1994f), Water Services Policy Division Macksville Sewage Augmentation, Sewage Treatment Works – Concept Design

NSW Public Works (1994g), Engineering and Survey Branch Macksville Sewage Augmentation, Sewage Treatment Works – Geotechnical Investigation

NSW Public Works (1994) Water Services Policy Division Macksville Sewage Augmentation, Sewage Treatment Works – Concept Design Report

Planning NSW (1996), Sewerage Systems; EIS Guideline

Resource Design and Management Pty Ltd (1993) Macksville Sewage Augmentation – Draft Strategy Report

Roads and Traffic Authority (1990), Traffic Volumes and Supplementary Data, Lower North Coast Division

Roads and Traffic Authority (2007) Warrell Creek to Urunga Upgrade, Part 3A Project Application Report

Roads and Traffic Authority (2007) Warrell Creek to Urunga Upgrade, Preliminary Assessment of Impacts and Potential Management Measures

Roads and Traffic Authority (2013) Warrell Creek to Nambucca Heads Upgrade, Operational noise modelling and assessment

RUST PPK Pty Ltd (1995) Macksville Sewage Augmentation Review of Environmental Factors – Final Draft report

Sinclair Knight and Partners (1991) Macksville Sewage Development Study – Report on Flow Monitoring of Macksville Sewage System

Slattery de Groot and Partners Pty Ltd (1993b) Physical Investigation of Sewage Catchment Area 2 at Macksville, Nambucca Council

Specht R.L, Roe E.N and Broughton V.H (1974), Conservation of Major Plant Communities in Australia and Papua New Guinea

Slattery de Groot and Partners Pty Ltd (1993b) Physical Investigation of Sewage Catchment Area 3 at Macksville, Nambucca Council

West R.J., Thorogood C., Walford T. and Williams R.J (1985), An estuarine Inventory for New South wales, Australia

Willing and Partners (1994) Hydraulic Modelling of Macksville Sewage Treatment Plant Augmentation

10. GLOSSARY & ABBREVIATIONS

Glossary of Terms

Effluent	The liquid produce of sewage treatment that is discharged into the environment after being biologically stabilised, clarified and disinfected.
Effluent	The liquid produce of sewage treatment that is discharged into the environment after being biologically stabilised, clarified and disinfected.
ENCM	Environmental Noise Control Manual
Environmental Management Plan (EMP)	Plan prepared prior to commencement of work detailing approvals specific environmental safeguards, responsibility for implementation and the overall management of environmental issues in relation to the project
Grease trap and oily water waste treatment facility	A facility which is designed to treat wastewaters which contain oils and greases which are collected from Council approved pre-treatment devices used in conjunction with commercial and industrial premises.
LA10	The noise level exceeded for 10 per cent of the measurement interval, this is commonly referred to as the average-maximum level
LA90	The noise level exceeded for 90 per cent of the measurement interval. This is commonly referred to as the background noise level.
LAeq	The noise level having the same energy as the time varying noise level over the 15 minute interval. For traffic noise this descriptor is classified as LAeq 15 Hr and LAeq 9 Hr for the day and night-time noise levels respectively. This is commonly referred to as the ambient noise level.
LAmax	The maximum noise level measured at a given location over the measurement interval.
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan – a plan for a local government area that defines permissible development in zones and the mechanisms for approvals
Liquid Trade Waste	Liquid trade waste means all liquid waste other than sewage of a domestic nature.
Rating Background Level (RBL)	The Rating Background Level (RBL) is the overall single-figure background level, which is the 10th percentile of the LA90 values for each of the day, evening and night-time periods over the whole monitoring period.
REP	Regional Environmental Plan - a plan for a regional area that specifies the requirements that must be assessed during the development consent process.
Reticulation	The network of sewers and pumping stations used to transport sewage from premises to treatment plants.
SEPP	State Environmental Planning Policy – a planning regulation issued by the State Government that details permissible development for specific activities or locations and also the approvals and consultation requirements

Sewage	Wastewater that has been discharged to a sewage system from domestic, commercial or industrial premises. It comprises about 99.9 percent water.
Sewerage	The system of sewers, pumps, channels etc which is used to transport and treat sewage.
Sewage Treatment Plant (STP)	The works at which sewage is treated prior to discharge
Topography	The shape of the ground surface as depicted by the presence of hills, mountains and plains.
Wastewater	The raw sewage from homes, offices, shops and factories. Most sewage comes from domestic sources (for example from washing clothes, dishes and using the toilet and shower). Small amounts of trade wastes may also be present.
Wetlands	Habitats where the influence of groundwater and/or surface water has resulted in development of plant or animal communities adopted to aquatic or intermittently wet conditions. Wetlands include tidal flats, shallow subtidal areas, swamps, marshes, wet meadows, bogs and similar areas.

Abbreviations

Units of Measurement

dB(A)	decibel (A-weighted)
ha	hectare
L	litre
°C	degree Celsius
%	percent

Miscellaneous

DECCW	Department of Environment Climate Change and Water (DECCW)
DoP	Department of Planning
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	Environmental Planning and Assessment Act, 1979
MSTP	Macksville Sewerage Treatment Plant
NPWS	National Parks and Wildlife Service
RBL	Rating Background Level
REF	Review of Environmental Factors
RTA	Roads and Traffic Authority
SEPP	State Environmental Planning Policy
STW	Sewage Treatment Works

APPENDIX 1 – DIRECTOR GENERALS REQUIREMENTS

NSW GOVERNMENT | Planning & Infrastructure

Industry, Key Sites & Social Projects
Contact: Douglas Cunningham
Phone: (02) 9228 6517
Fax: (02) 9228 6455
Email: douglas.cunningham@planning.nsw.gov.au

Mr David Pensini
David Pensini Building and Environmental Services Pty Ltd
PO Box 5581
PORT MACQUARIE NSW 2444

Our ref: 14/03167

Dear Mr Pensini

Liquid Waste Management Facility – Macksville (DGR 810)
Director-General's Requirements

I refer to your request for the Director-General's Requirements (DGRs) for the preparation on an Environmental Impact Statement (EIS) for the above development proposal. I have attached a copy of these requirements.

In your Form A, you indicated that your proposal would require a license and/or approval under the *Protection of the Environment Operations Act 1997*. The Department has consulted with the Office of Environment and Heritage (OEH) and NSW Environmental Protection Agency (EPA) and a copy of their requirements for the EIS are attached to this letter.

If your proposal contains any actions that could have a significant impact on matters of National Environmental Significance, then it will require an additional approval under the *Commonwealth Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to your proposal, you should contact the Department of Sustainability, Environment, Water, Population and Communities on 6274 1111 or www.environment.gov.au.

If you have any further enquiries, please contact Douglas Cunningham on (02) 9228 6517.

Yours sincerely,

C. Ritchie 24/3/14

Chris Ritchie
Manager
Industry, Key Sites & Social Projects
as the Director-General's nominee

Director-General's Requirements

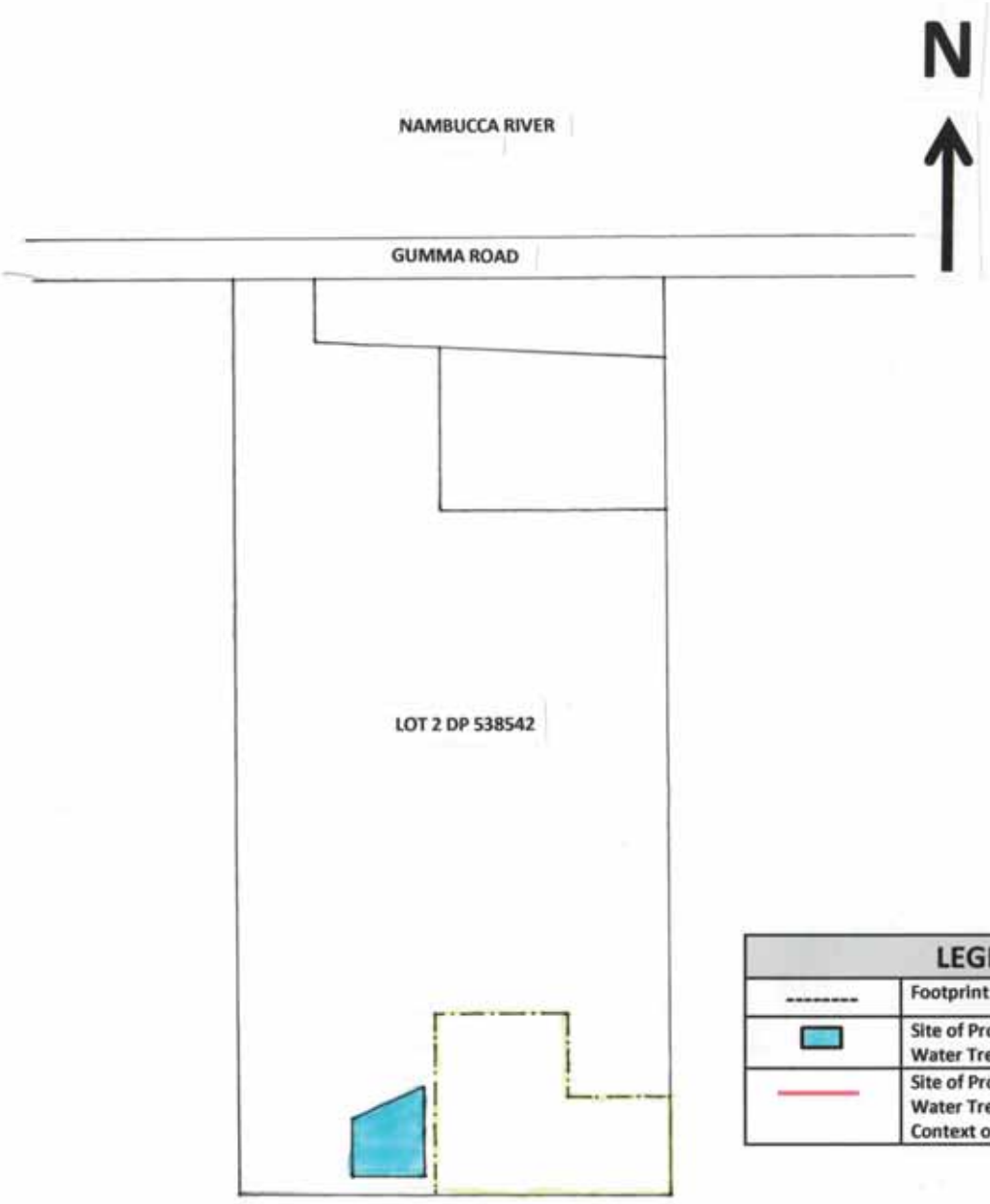
Section 78A (8) of the *Environmental Planning and Assessment Act 1979.*

Designated Development

DGR Number	810
Proposal	Liquid Waste Management Facility
Location	Kelly Close, Macksville (Part Lot 2 DP 538542)
Applicant	Tony Gordon
Date of Expiry	March 2016
General Requirements	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements in clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.*
Key Issues	• **strategic context** –including: – detailed justification for the proposal and suitability of the site for the development; and – a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies. • **waste management** – including: - type, classification and quantity of the waste streams that would be handled/stored/disposed of at the facility as well as the waste recovery goals for the facility; - how waste would be treated, stored and handled on site, and transported to and from the site; - waste water treatment quality objectives; and - the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Resource Recovery Strategy 2007 • **hazards and risk** - including a preliminary risk screening undertaken in accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33) and *Applying SEPP 33* (DoP, 2011), and if necessary, a Preliminary Hazard Analysis (PHA). • **soil and water** - including: – floodplain risk management, surface water, groundwater and stormwater management; – details of erosion and sediment controls; – soil and groundwater contamination management; and – acid sulphate soils management. • **air quality** – including an odour assessment in accordance with relevant Environment Protection Authority guidelines. The assessment must consider any potential impacts on nearby private receptors and measures to mitigate or manage these impacts. • **noise** – a noise assessment in accordance with relevant Environment Protection Authority Guidelines. The assessment must consider any potential impacts on nearby private receptors and measures to mitigate or manage these impacts. • **traffic and transport** – during construction and operation. • **flora and fauna** – including the potential impacts of the project on any threatened species, populations, ecological communities or their habitats. • **heritage** – including Aboriginal cultural heritage.

Environmental Planning Instruments	The EIS must assess the proposal against the relevant environmental planning instruments, including but not limited to • *Nambucca Local Environment Plan 2010;* • *State Environmental Planning Policy (Infrastructure) 2007;* • *State Environmental Planning Policy No 33 – Hazardous and Offensive Development;* • *State Environmental Planning Policy No 71 – Coastal Protection;* • *Mid North Coast Regional Strategy;* • *Floodplain Development Manual 2005;* • *Nambucca Shire Council Floodplain Risk Management Plan (2005);and* • Relevant development control plans and section 94 plans.
Guidelines	There are no specific guidelines for remediation and/or rehabilitation facilities. However, it is recommended that during the preparation of the EIS you consult the agency's EIS *Guideline - Landfilling.* This guideline is available for viewing on the departments website www.planning.nsw.gov.au
Consultation	During the preparation of the EIS, you must consult the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult with: • Department of Primary Industries; • NSW Environmental Protection Agency; • NSW Office of Environment and Heritage; • Nambucca Shire Council; and • The surrounding landowners and occupiers that are likely to be impacted by the proposal. Details of the consultations carried out and issues raised must be included in the EIS.

APPENDIX 2 – PROPOSED GREASE TRAP & OILY WATER TREATMENT FACILITY

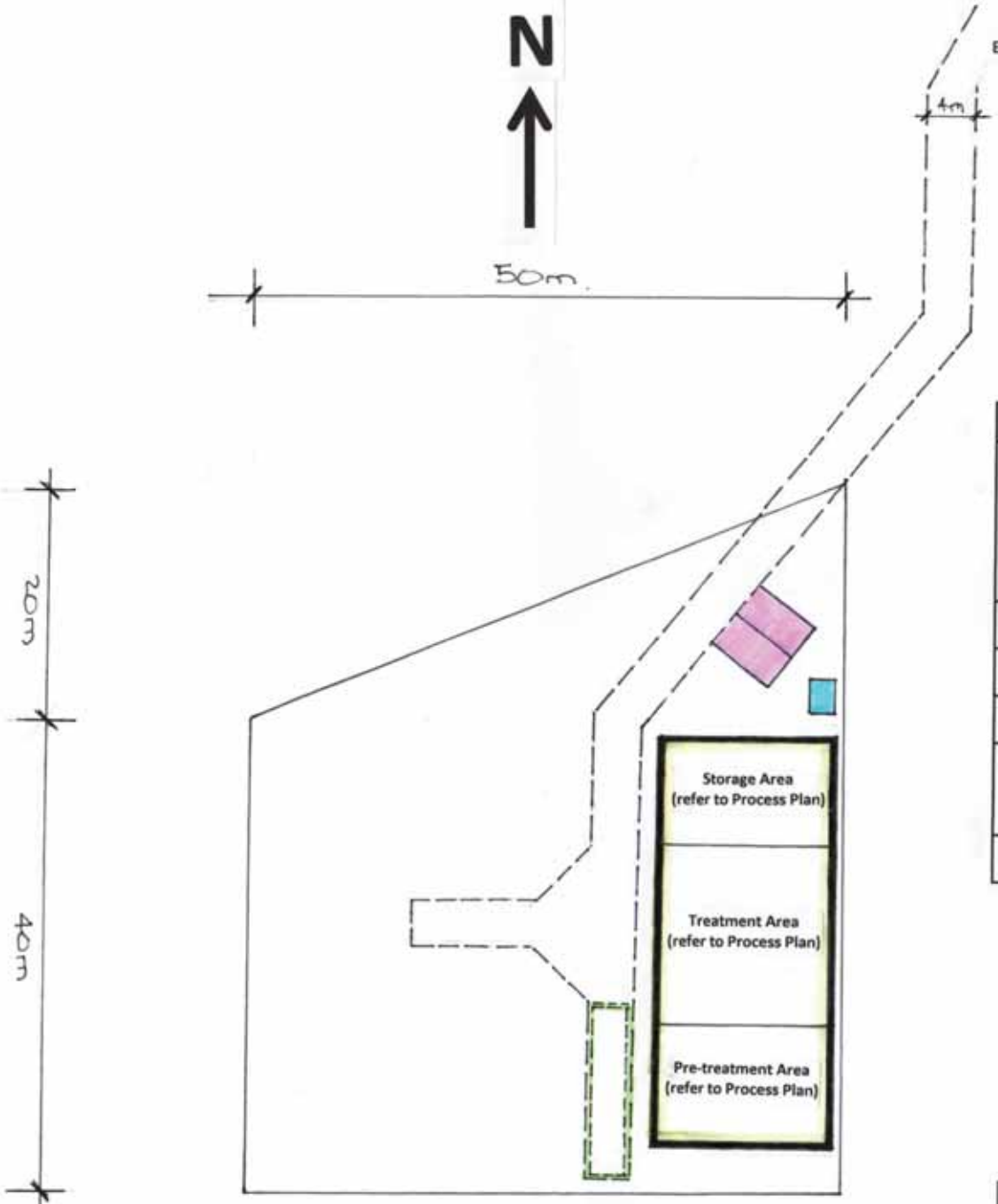


SITE PLAN

LEGEND	
---------	Footprint of Existing Macksville STP
	Site of Proposed Grease Trap and Oily Water Treatment Facility
	Site of Proposed Grease Trap and Oily Water Treatment Facility in the Context of the Existing STP

CONTEXT PLAN

SITE AND CONTEXT PLAN		
PROPOSED GREASE TRAP & OILY WATER TREATMENT FACILITY		
LOT 2 DP 538542 KELLY CLOSE, MACKSVILLE		
Date: 27 August 2013	Scale: As indicated	Issue: A

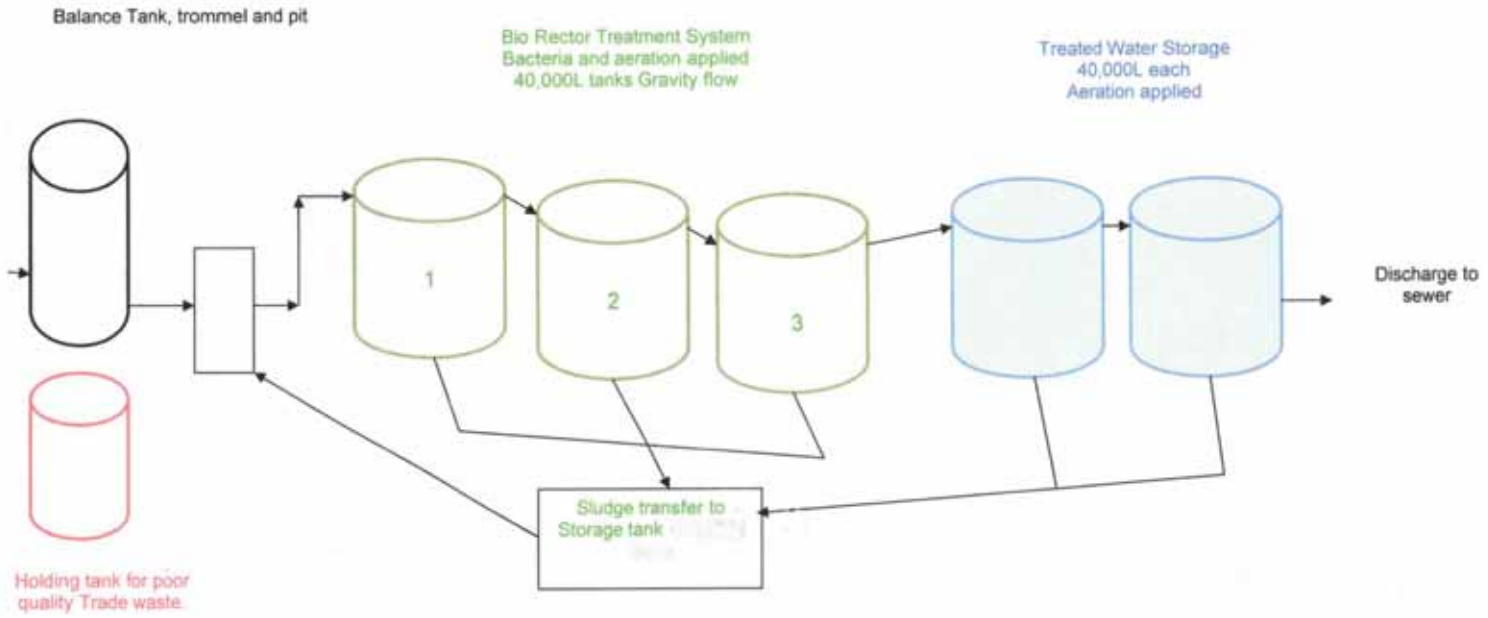


LAYOUT PLAN

LEGEND	
---------	Minimum 4m wide All Weather Access Road. Connects with existing Access Road Servicing Macksville STP. Includes Vehicle Manoeuvring to Allow for Forward Movement from Site
———	Proposed Security Fence and Access Gates
	Proposed Onsite Carparks
	Proposed Toilet
	Fully Bunded Wastewater Processing Area. Bund to provide for 110% of Liquid Storage Capacity
	Fully Bunded Wastewater Unloading Area

LAYOUT PLAN		
PROPOSED GREASE TRAP & OILY WATER TREATMENT FACILITY		
LOT 2 DP 538542 KELLY CLOSE, MACKSVILLE		
Date: 27 August 2013	Scale: As Indicated	Issue: A

WASTE WATER BIO REACTOR SYSTEM for LIQUID TRADE WASTE
Probiotic, Low Energy Aeration System (PLEAS)



Bio Reactor Notes; 1. Gravity flow system.. 2. Tank Dimensions: 3 x: 40,000L tanks Dia 4.5m x Hgt 2.8M	Title: Macksvile - Concept © For Earth Pty Ltd	FOR Earth Pty Ltd T: 0265814353 8/07/13 Status:

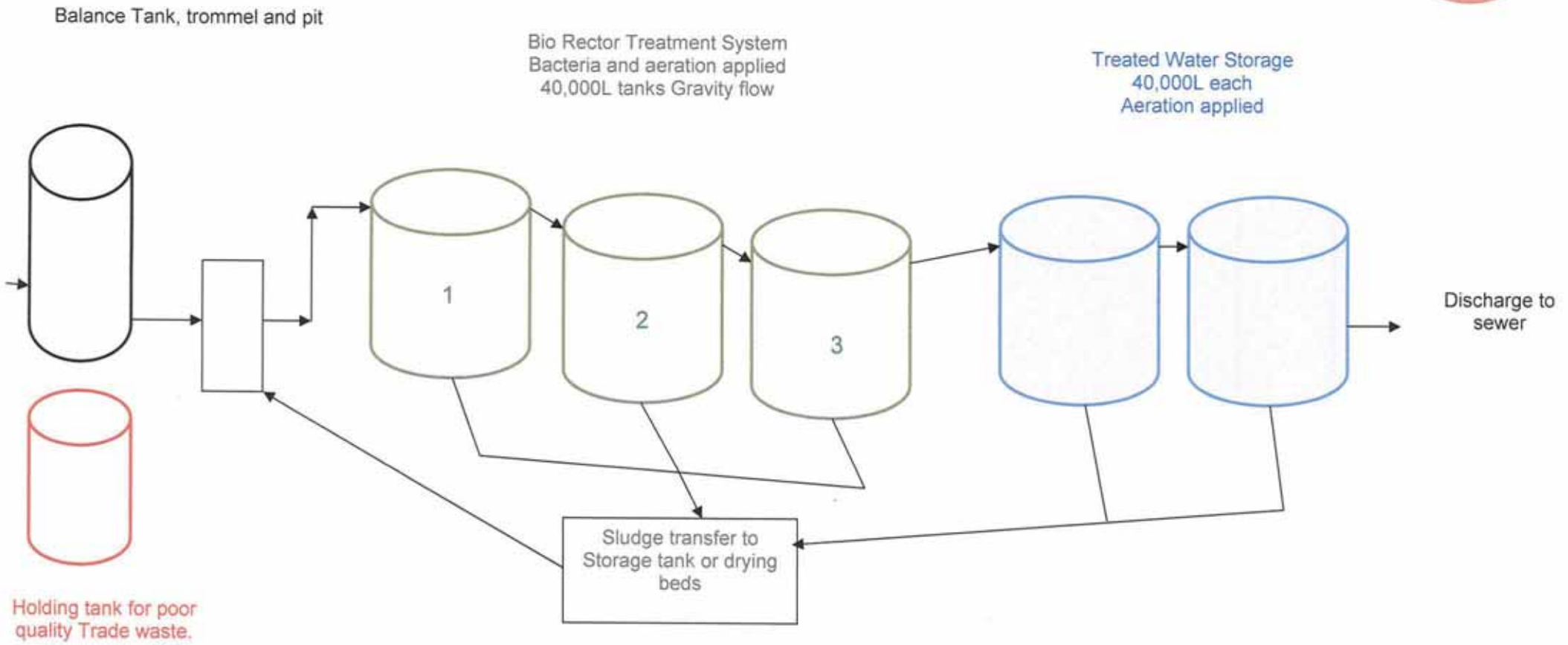
PROCESS PLAN

PROCESS PLAN		
PROPOSED GREASE TRAP & OILY WATER TREATMENT FACILITY		
LOT 2 DP 538542 KELLY CLOSE, MACKSVILLE		
Date: 27 August 2013	Scale: 1:400	Issue: A

APPENDIX 3 – NAMBUCCA SHIRE COUNCIL LIQUID TRADE WASTE POLICY

APPENDIX 4 – TRADE WASTE DISCHARGE EXAMPLES

WASTE WATER BIO REACTOR SYSTEM for LIQUID TRADE WASTE
Probiotic, Low Energy Aeration System (PLEAS)



Bio Reactor Notes; 1. Gravity flow system.. 2. Tank Dimensions: 3 x: 40,000L tanks Dia 4.5m x Hgt 2.8M	Title: Macksvile - Concept © For Earth Pty Ltd	FOR Earth Pty Ltd T: 0265814353 8/07/13 Status:

Waste Water & Odour Solutions

To: Mr. Troy Pemberton
J.R. Richard & Sons
Area Manager
King Fisher Rd
Port Macquarie NSW 2444

17/02/2012

From: Alan Mckibbin
For Earth Pty Ltd

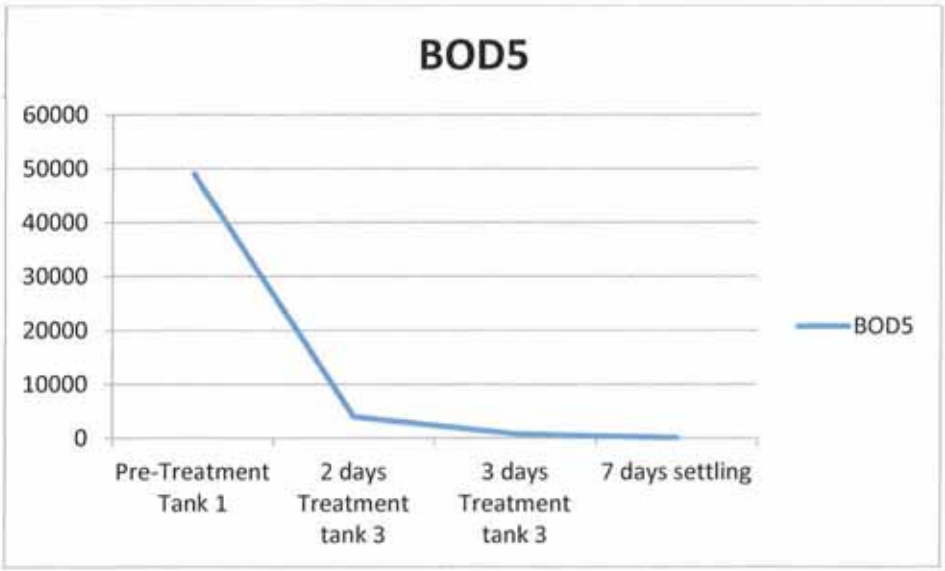
TRIAL REPORT

THREE TANK BIOREACTOR TRIAL ON AQUEOUS WASTE

Results

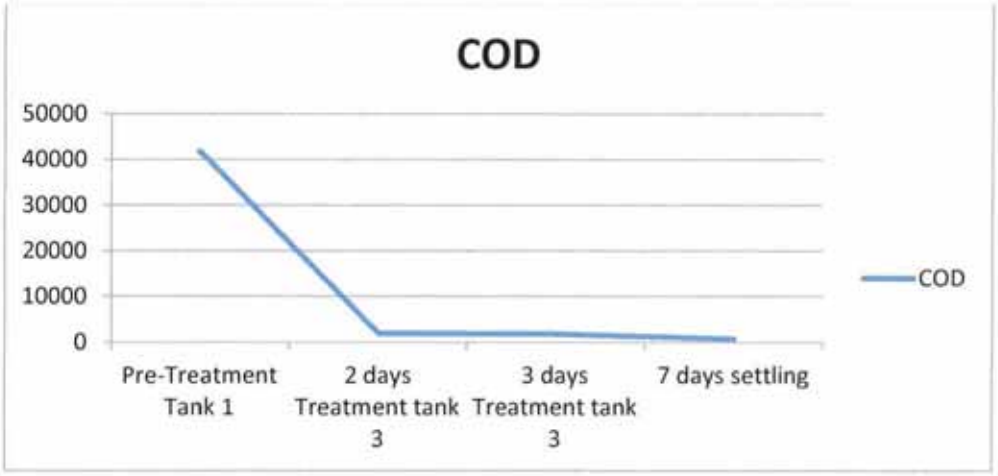
	Pre-Treatment Tank 1	2 days Treatment tank 3	3 days Treatment tank 3	% Reduction	7 days settling	% Reduction
BOD5	49000	4000	780	98.4%	71	99.9%
COD	41820	1937	1845	95.6%	730	98.2%
O & G	21600	0	30	99.0%	3	99.9%
TSS	27450	1938	520	98.0%	88	99.6%

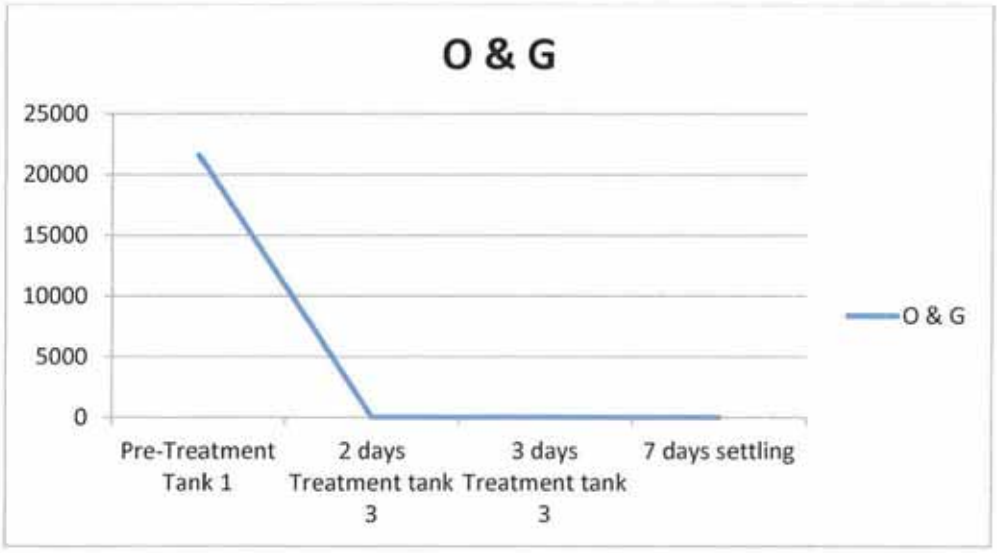
Graphs of results

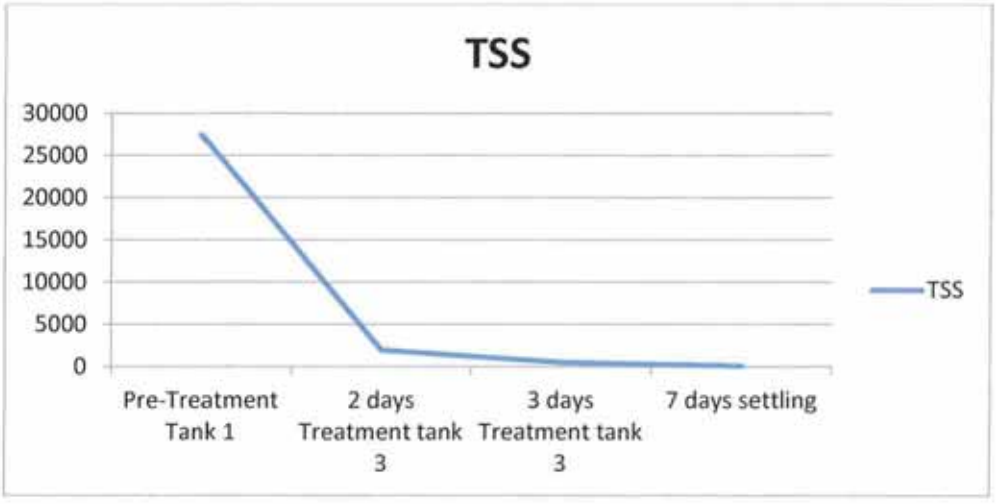


bay 2 cnr uralla & merrigal rds port macquarie nsw 2444
t/f: 612.6581 4353 m: 0417 694 844
e: alanm@forearth.com.au w: www.forearth.com.au

Waste Water & Odour Solutions





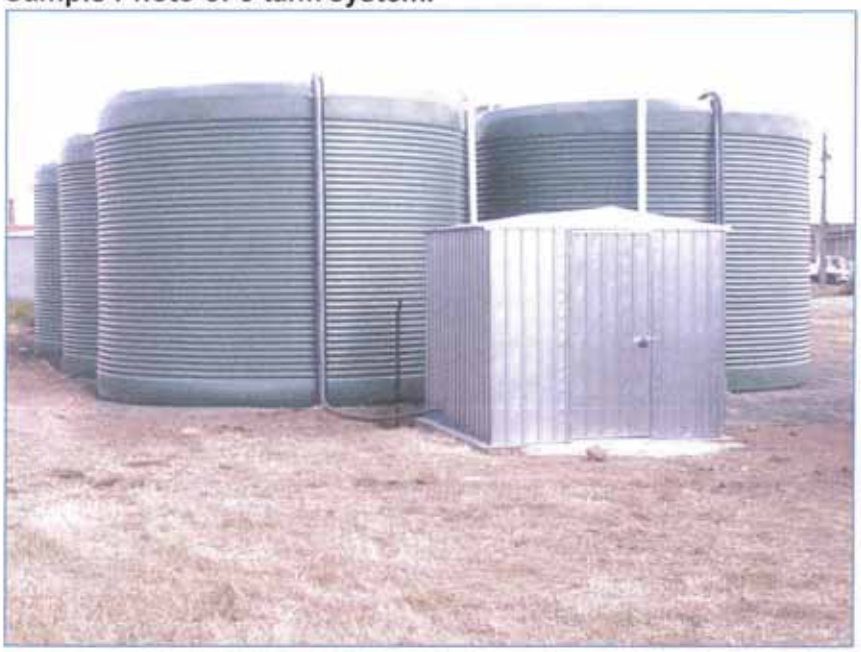


bay 2 cnr uralla & merrigal rds port macquarie nsw 2444
t/f: 612.6581 4353 m: 0417 694 844
e: alanm@forearth.com.au w: www.forearth.com.au

forearth

Waste Water & Odour Solutions

Sample Photo of 3 tank system.



Yours sincerely,

Alan Mckibbin

Managing Director

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444
t/f: 612.6581 4353 m: 0417 694 844
e: alanm@forearth.com.au w: www.forearth.com.au

PORT MACQUARIE HASTINGS

ENVIRONMENTAL LABORATORY

PO Box 84
Cnr Ocean Drive and Koala Street
Port Macquarie NSW 2444 Australia

Telephone (02) 6581 8810 Email: council@hastings.nsw.gov.au
Facsimile (02) 6581 8814 Website: www.hastings.nsw.gov.au

Quality Endorsed Company

Enquiries to: Maree Smith
Telephone: (02) 65818810
Fax: (02) 65818814
Reference: H07 4991/4993

13th December 2007

TO: Phil Waugh
Hastings Food Processing
43-45 Commerce Street
Wauchope NSW 2446

LABORATORY REPORT

Date Sampled : 28.11.07

Date Received : 28.11.07

Sample Description : Water – Tank

Method Reference : MET 017.2, APHA, (21st Ed) 2005, *Standards Methods for the Examination of Water and Waste Water.*

RESULT OF ANALYSIS

Laboratory ID	Sample Description	BOD_5 (mg L^{-1})	Total Oil and Grease (mg L^{-1})	Total Suspended Solids (mg L^{-1})
H07 4991	No. 1 Tank	2270	NA	415
H07 4992	No. 2 Tank	875	NA	80
H07 4993	No. 4 Tank	715	49	40

NA: Not Applicable

Please note: An invoice for these services will be forwarded to you in the near future.

M. Smith
Laboratory Manager

PRE-TREATMENT SYSTEMS

PROBIOTICS & LOW ENERGY AERATION

Three tank bio-reactor system – Ballarat Saleyard.

22/02/2012	Pre-Treatment	Post Treatment	Upper Limits
BOD5	490	140	500
Elct Cond	2900	1400	n/a
pH	7.11	7.1	
Susp Solids	280	680*	500
Tot Diss Solids	1800	780	1500

Note: client comment SS high likely due to non-biologicals transfer from upstream pit.

Tel: 02 65814353 www.forearth.com.au

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION of MATERIAL and SUPPLIER

Product Name: **FOR EARTH BIO PLUS ®**
Other Names: None
Recommended Use: Probiotic waste water treatment and odour control

Supplier: **For Earth Pty Ltd**
Address: **Bay 2 Corner Uralla and Merrigal Roads**
Port Macquarie NSW Australia 2444
Telephone: **(02) 6581 4353**

Emergency Telephone: **(02) 6581 4353** Monday to Friday 8.00 a.m. to 5.00 p.m.

2. HAZARDS IDENTIFICATION

Hazard Classification: Classified as **non-hazardous** according to the criteria of ASCC.

Hazard Category: None
Risk Phrases: None
Safety Phrases: None

3. COMPOSITION/INFORMATION on INGREDIENTS

Chemical Name	CAS No	Proportion (%w/w)
Carbohydrate		<10%
Live culture of non-pathogenic Bacteria (nitrogen cycle specific)		<10%
Perfume	Proprietary	<10%
Dye	Proprietary	<10%
Water	7732-18-5	>60%

4. FIRST AID MEASURES

FIRST AID

Swallowed: If swallowed, do NOT induce vomiting. Give a glass of water. Seek medical advice. For advice, contact a Poisons Information Centre (Phone Australia 131126) or a doctor.

Eye: If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.

Skin: If unwanted skin or hair contact occurs, remove contaminated clothing and flush skin and hair thoroughly with running water.

Inhaled: Remove the victim from the source of exposure to fresh air. Avoid becoming a casualty. Seek medical advice if effects persist.

ADVICE TO DOCTOR Treat symptomatically.

MATERIAL SAFETY DATA SHEET

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media: Water spray, foam, carbon dioxide or dry chemical powder.
Fire / Explosion Hazard: The product is non-combustible. However, the packaging material may burn to emit noxious fumes.
Precautions for fire fighters and special protection equipment: Fire Fighters should wear self-contained breathing apparatus to minimise risk of exposure to the fumes.
Hazchem Code: None.

6. ACCIDENTAL RELEASE MEASURES

Spills: Spills are slippery. Ensure adequate ventilation. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contamination. Contain the spill and prevent contamination into drains and waterways. Absorb with sand or other similar material. Collect and seal in properly labelled drums for disposal in an area approved by local authority by-laws. Wash excess with plenty of water.

7. HANDLING and STORAGE

Handling Advice: Keep containers closed at all times - check regularly for leaks or spills. Transport and store upright. Avoid eye contact and repeated or prolonged skin contact, and breathing in vapour or mist. Do not eat, drink or smoke in handling areas. Always remove contaminated clothing and wash hands before eating, drinking, smoking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

Storage Advice: Store in the original container, away from incompatible materials and foodstuffs. Keep containers closed when not in use to ensure contamination does not occur- check regularly for leaks. Do not combine part drums of the same product, as this may be a source of contamination. Store below 35 deg C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Standards: No value assigned for this specific material by ASCC.
Ventilation: Natural or local exhaust ventilation should be adequate under normal use conditions.
Keep containers closed when not in use.
Personal Protection: Protective equipment is recommended. PVC or nitrile rubber gloves, safety glasses and safety shoes. Observe good standards of hygiene and cleanliness. Trousers, long sleeved shirt and closed in safety footwear should be worn as a general precaution. Avoid breathing vapours or mist. If ventilation is inadequate or mist levels are high, respiratory protection may be required. Use a respirator or mask meeting the requirements of AS1715 or AS1716.

9. PHYSICAL and CHEMICAL PROPERTIES

Appearance:	Yellow liquid.
Odour:	Orangey odour.
pH (Neat)	6 – 8
S.G.:	1.05
Boiling Point (°C):	No information available.
Solubility:	The product is fully soluble in water.
Flash Point (°C):	No known fire hazard.

MATERIAL SAFETY DATA SHEET

10. STABILITY and REACTIVITY

Stability: Stable under normal conditions of use. The shelf life is 2 years.
Conditions To Avoid: Do not combine part drums of the product, as this may be a source of contamination.
Incompatible Materials: Cationic surfactants.
Hazardous Decomposition Products: The packaging material may burn to emit noxious fumes.
Hazardous Reactions: None known.

11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Material Safety Data Sheet and the product label. Symptoms and effects that may arise if the product is mishandled and over exposure occurs are:

ACUTE EFFECTS

Swallowed: No adverse effects expected. May cause irritation if swallowed. Swallowing large amounts can result in nausea and vomiting
Eye: May cause irritation.
Skin: May cause irritation to skin with long and repeated contact.
Inhalation: Breathing in mist or aerosols may cause respiratory irritation.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: Avoid contaminating waterways.

13. DISPOSAL CONSIDERATIONS

Disposal: Avoid unauthorised discharge to sewer. The product is suitable for disposal by landfill through an approved agent. Incineration of this product is not recommended, as it is unlikely to adequately burn.

14. TRANSPORT INFORMATION

ROAD AND RAIL TRANSPORT: Not classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by Road and Rail.
UN Number: None
UN Proper Shipping Name: None
Class & Subsidiary Risk: None
Hazchem Code: None
Packaging Group: None
Segregation Dangerous Goods: None

15. REGULATORY INFORMATION

Poisons Schedule (AUST): None
Other: None.

MATERIAL SAFETY DATA SHEET

16. OTHER INFORMATION

None.

This MSDS summarises to our best knowledge, at the date of issue, the chemical health and safety hazards of the material and general guidance on how to handle the material in the workplace. Since For Earth cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.
If clarification or further information is needed, the user should contact For Earth.
For Earth's responsibility for the material as sold is subject to our standard terms and conditions, a copy of which is available on request.

DATE OF ISSUE: Monday 12th July, 2011. This MSDS replaces all other issues.

DAVID PENSINI
Building Certification and Environmental Services

16th December 2015

Nambucca Shire Council
PO Box 177
MACKSVILLE NSW 2447

Attention: Daniel Walsh

Dear Sir,

Re: Development Application for Grease Trap Wastewater Processing Facility – Lot 2 DP 538542 Kelly Close, Macksville (DA135/2015).

I refer to Councils request for additional information and wish to provide the following information in response;

1. **Air Impact Assessment (Odour Impacts) – NSW Environment Protection Authority**

It is noted that the NSW Environment Protection Authority in their letter to Nambucca Shire Council dated the 23rd October 2015 requested additional information regarding the odour impacts of the proposed development.

In this regard please find attached an odour impact assessment report which has been undertaken for the proposed development – refer to **Attachment 1**.

The odour impact assessment report addresses all issues raised by the EPA. Importantly the report finds;

It was found that the trommel is the main contributor to the overall predicted impacts from the proposed facility. It should be noted that the assessment predicts odour impacts on the single worst hour of meteorological conditions for odour dispersion. In reality, the trommel will only be operational for a short period when the more favourable meteorological conditions for odour dispersion are occurring. TOU feels the trommel predictions are unrealistic. Notwithstanding the above, the contour shows compliance with the 2 ou glc criteria for the town of Macksville. When the trommel is removed from the contour plot, the impacts from the proposed site are almost negligible.

It is therefore considered that the impacts of the proposed development on air quality are acceptable and within EPA and Council standards.

2. **Water Quality Impacts – NSW Department of Primary Industries**

It is noted that the NSW Department of Primary Industries in their letter to Nambucca Shire Council dated the 13th October 2015 requested additional information regarding a range of issues. Information in response to these issues is provided as follows;

3 Blair Street, Port Macquarie NSW 2444 – PO Box 5581, Port Macquarie NSW 2444 – Phone 0434 166 150 – Email kdpensini@bigpond.com
ABN 55 183 050 741

2.1 Wastewater Characterization

It is clarified that the proposed the proposed grease trap and oily water waste treatment facility will only process wastewaters which have been collected from grease traps/arrestors. A reference to oily waters in the development application documentation should only be taken as to mean waters containing oils and greases which have been collected from Council approved grease traps/arrestors.

Grease traps/arrestors are installed at many restaurants and food processing establishments to separate the cooking oils and animal fats from sewage flow. The oil and grease intercepted by grease traps are removed regularly to ensure the proper functioning of the grease traps.

The organic wastes processed by the proposed grease trap and oily water waste treatment facility would be obtained predominately from grease traps/arrestors at local restaurants and food preparation facilities. Collected wastewaters from grease traps/arrestors would therefore comprise rotted food solids in combination with fats, oils, and grease (FOG).

FOG wastewater will therefore be processed through the proposed grease trap and oily water waste treatment facility so as to provide for;

- A wastewater which is suitable for discharge to the Macksville Sewerage Treatment Plant (STP). In this regard the design, construction and operation of the proposed grease trap and oily water waste treatment facility will be such as to provide for a wastewater which meets the standards required by Nambucca Shire Councils Liquid Trade Waste Management Policy. Treated wastewater from the proposed grease trap and oily water waste treatment facility will be conveyed by sealed pipes to the Councils Macksville STP which immediately adjoins to the east of the proposed development.

  In this regard all wastewater discharged to the Macksville STP will meet Councils trade waste discharge standards at all times. Consequently the worst case wastewater characteristics following treatment at the grease trap and oily water waste treatment facility are provided for in Table 2 of Nambucca Shire Councils Liquid Trade Waste Management Policy – see **Attachment 2**.

- Apart from the generation of treated wastewater the operation of the proposed grease trap and oily water waste treatment facility will give rise to the generation of a minor quantity of sludge material which will either be recycled through the Bio Reactor Treatment System or immediately removed from the site and used as part of the commercial production of compost materials or for approved pasture improvement purposes. There will be no storage of solid waste materials from the treatment system onsite at any time.

Therefore the treatment of FOG wastewater as proposed is entirely consistent with similar aqueous waste treatment facilities/plants operating throughout NSW with the proprietary technology, (Probiotic Low Energy Aeration System (PLEAS)), which is proposed to be utilized currently being utilized at similar FOG wastewater treatment facilities at Coffs Harbour and Dubbo.

2.2 Use of Trade Waste Terminology

The interchanging of terminology within the EIS does not alter the relationship, context and application of Nambucca Shire Councils Liquid Trade Waste Management Policy to the proposed development.

Nambucca Shire Councils Liquid Trade Waste Management Policy represents the design, construction and operating parameters which are necessary for the proposed development in relation to the discharge of treated wastewaters to the reticulated sewerage system. In this regard the proposed development will meet the requirements of the Policy. This is regardless of the interchanging of the terminology used in the EIS.

In this regard it is anticipated that a condition of development approval would be imposed which requires that the operation of the proposed development comply with Nambucca Shire Councils Liquid Trade Waste Management Policy. Further it is noted that the need to obtain a number of construction and operational approvals from Nambucca Council and the NSW Department of Environment Climate Change and Water provide for a further assessment of the proposed development against the relevant requirements of Nambucca Shire Councils Liquid Trade Waste Management Policy.

2.3 Plant Performance Information – Appendix 2 of EIS

The intent of providing the information in Appendix 2 of the EIS was to demonstrate that the proprietary wastewater treatment technology which is proposed, (Probiotic Low Energy Aeration System (PLEAS)), is capable of performing in a manner which ensures that acceptable environmental outcomes are achieved including meeting the requirements of Nambucca Shire Councils Liquid Trade Waste Management Policy.

The information is proprietary in nature and meant to provide examples of the outcomes which can be expected of a Probiotic Low Energy Aeration System (PLEAS). In this regard actual system design will be undertaken, once development approval has been granted by Nambucca Shire Council, to reflect the specific operational parameters for the proposed grease trap and oily water waste treatment facility and the so as to reflect the requirements of Nambucca Shire Councils Liquid Trade Waste Management Policy.

Notwithstanding the above Nambucca Shire Councils Liquid Trade Waste Management Policy reflects the design, construction and operating parameters which are necessary for the proposed development in relation to the discharge of wastewaters from the proposed grease trap and oily water waste treatment facility to the reticulated sewerage system. In this regard the proposed development will meet the requirements of the Policy.

It is also noted that the proposed development is entirely consistent with similar aqueous waste treatment facilities operating throughout NSW with the proprietary technology which is proposed to be utilized currently being operated at similar facilities at Coffs Harbour and Dubbo.

Accordingly the plant performance information as provided is relevant in demonstrating that proposed development can be designed, constructed and operated in a manner which ensures

that acceptable environmental outcomes are achieved including meeting the requirements of Nambucca Shire Councils Liquid Trade Waste Management Policy.

It is noted that similar existing facilities in NSW are operating in a manner whereby reticulated sewerage discharge standards are being met and on this basis there is no uncertainty regarding the outcomes which will be achieved for the proposed development.

With this in mind please find attached operating information which has been submitted in support of the approval of a similar FOG wastewater treatment facility which is now serving the Dubbo area, refer to **Attachment 3**.

2.4 Impact of proposed development on water quality of the Nambucca River

It is noted that the proposed grease trap and oily water waste treatment facility does not propose or require any means of disposing of treated wastewater other than the discharge to the Macksville Sewerage Treatment Plant (STP) which is located immediately to the east of the proposed development. In this regard there will be no direct discharge of treated wastewater from the proposed grease trap and oily water waste treatment facility directly to the environment with the Macksville (STP) providing for further treatment and disposal of the wastewaters generated from the proposed development.

In this regard the Macksville STP provides for a centralized 5,500 EP Intermittently Decanted Extended Aeration (IDEA) system. Two stage chemical dosing is employed before and after the reactor to reduce phosphorous levels to meet sensitive waters criteria, see **Figure 1** below.

Following UV disinfection, the effluent is discharged to the Nambucca River via an EPA licensed discharge, (Environment Protection License No. 579), comprising a submerged pipeline approximately 60 m from southern bank off River Street and 20m west of the Nambucca Shire Depot.

Figure 1 – Mackville Sewerage Treatment Plant

A copy of the Environment Protection License for the Macksville Sewerage Treatment Plant which includes the discharge of treated effluent to the Nambucca River is provided as **Attachment 4**.

It is noted that the impact of the discharge of treated effluent from the Macksville Sewerage Treatment Plant to the Nambucca River has been the subject of environmental assessment as part of the augmentation of the Mackville STP with the practice found to be acceptable in terms of impact on the aquatic environment. It is further noted that the discharge of treated effluent from the Macksville Sewerage Treatment Plant to the Nambucca River is subject to compliance with specific effluent quantity and quality requirements which are imposed via the aforementioned Environment Protection License. The imposition of these license requirements reflects the parameters which are considered to be acceptable in minimizing the impact of the discharge of effluent from the STP on the aquatic environment of the Nambucca River.

Therefore the continued operation of the Mackville STP in accordance with the requirements of Environment Protection License No. 579 will provide for a level of impact on the aquatic environment which has been assessed as being acceptable.

The proposed discharge of 15,000 litres per week of treated wastewater from the proposed grease trap and oily water waste treatment facility to the Macksville Sewerage Treatment Plant will have no impact on the operating parameters of the STP nor the ability of the STP to produce effluent which meets the discharge standards required by the relevant Environment Protection License. In this regard an average daily discharge rate of approximately 2150 litres from the proposed grease trap and oily water waste treatment facility to the STP would be less than 0.1% of the average daily dry weather load on the STP. Likewise the weekly discharge from the proposed grease trap and oily water waste treatment facility would represents less than 0.02% of the weekly licensed discharge volume from the Mackville STP to the Nambucca River.

The impact of the proposed development on the operational performance of the Mackville STP is negligible and accordingly the impact of the proposed development on the aquatic environment of the Nambucca River will also be negligible in the context of the level of impact which has already been assessed as being acceptable in relation to the discharge of treated effluent to the river from the STP.

It is also noted that the technology, (Probiotic Low Energy Aeration System (PLEAS)), which is proposed to be utilized for the proposed grease trap and oily water waste treatment facility is accepted as being suitable for similar wastewater treatment facilities with approval having already been granted by relevant regulatory authorities for the utilization of the technology and the resultant discharge of treated wastewater to reticulated sewerage systems. Further, the PLEAS technology is being used to improve the operating performance of a number of sewerage treatment plants throughout NSW and it is understood that the PLEAS system has also been used as part of improving the operational performance of the Mackville STP. Accordingly the utilization of the PLEAS technology in conjunction with the proposed development is consistent with industry best practice with the proposed approach having already been assessed and deemed as an acceptable approach to the management of STP's.

As such the impact of proposed development on the operating performance of the Macksville STP and as a consequence the discharge of effluent to the Nambucca River will be well within the parameters which have already been accessed as being acceptable as a consequence of the operation of the Mackville STP.

3. EIS Declaration

Nambucca Shire Council has requested that the declaration on Page 2 of the EIS be amended to make reference to the preparation of the EIS being in accordance with Schedule 2 of the Environmental Planning and Assessment Regulation 2000.

Please find attached an amended declaration, refer to **Attachment 5**.

Should I be able to provide any further assistance please do not hesitate to contact me on 0434 166150.

Yours Faithfully,

David Pensini
David Pensini – Building Certification and Environmental Services

3 Blair Street, Port Macquarie NSW 2444 – PO Box 5581, Port Macquarie NSW 2444 – Phone 0434 166 150 – Email kdpensini@bigpond.com
ABN 55 183 050 741

ATTACHMENT 1 – ODOUR IMPACT ASSESSMENT

3 Blair Street, Port Macquarie NSW 2444 – PO Box 5581, Port Macquarie NSW 2444 – Phone 0434 166 150 – Email kdpensini@bigpond.com
ABN 55 183 050 741

ATTACHMENT 2 – NAMBUCCA SHIRE COUNCIL LIQUID TRADE WASTE MANAGEMENT POLICY DISCHARGE STANDARDS

ATTACHMENT 3 – PERFORMANCE INFORMATION (SIMILAR SYSTEM AT DUBBO NSW)

3 Blair Street, Port Macquarie NSW 2444 – PO Box 5581, Port Macquarie NSW 2444 – Phone 0434 166 150 – Email kdpensini@bigpond.com
ABN 55 183 050 741

ATTACHMENT 4 – ENVIRONMENT PROTECTION LICENSE NO. 579

ATTACHMENT 5 – AMENDED EIS DECLARATION

3 Blair Street, Port Macquarie NSW 2444 – PO Box 5581, Port Macquarie NSW 2444 – Phone 0434 166 150 – Email kdpensini@bigpond.com
ABN 55 183 050 741

SEPTIC TANK AND GREASE TRAP CLEANING SERVICES

Grease Trap and Oily Water Treatment Facility

Level Two Odour Impact Assessment

Macksville NSW

Final Report

December 2015

THE ODOUR UNIT (QLD) PTY LTD

ABN 87 102 255 765
ACN 102 255 765
Unit 2, 57 Neumann Rd
PO Box 365
CAPALABA, Qld 4157
P: +61 (0)7 3245 1700
F: + 61 (0)7 3245 1800
E: qldinfo@odourunit.com.au
W: www.odourunit.com.au

Project Number:

Report Revision		
Report Version	**Date**	**Description**
0.1	30/11/15	Draft report
1.0	8/12/2015	Final report issued to client
Report Preparation		
Report Prepared By: S. Munro		**Approved By:** T. Schulz
Report Title: Septic Tank and Grease Trap Cleaning Services – Macksville Grease Trap and Oily Water Treatment Facility Level Two Odour Impact Assessment		

CONTENTS

FIGURES & TABLES

FIGURES

TABLES

APPENDICES

1 INTRODUCTION

1.1 BACKGROUND

The Odour Unit Pty Ltd. (TOU) was commissioned by Septic Tank and Grease Trap Cleaning Services to carry out a level two odour impact assessment for a proposed grease trap and oily water treatment facility ("Facility") located at Macksville, NSW. The assessment was a NSW Planning and Infrastructure Director-General's requirement (DGR810) as part of an application for the establishment and operation of the Facility.

DGR810 states that an odour assessment is to be conducted in accordance with relevant Environmental Protection Authority (EPA) guidelines. The assessment must consider any potential impacts on nearby private receptors and measures to mitigate or manage these impacts.

According to NSW EPA's *Technical Framework: Assessment and management of odour from stationary sources in NSW 2006*, a level two assessment could be used for this situation. A level two odour impact assessment is a screening-level dispersion modelling technique, using worst-case input data, rather than site-specific data.

The odour dispersion modelling assessment was carried out using TOU's extensive waste water treatement plant (WWTP) odour emission rate database and experience in the field of waste water treatment. The WWTP database odour emission rates were matched to the relevant Facility process. The AUSPLUME modelling package (version 6.0) was used to estimate impacts from the proposed site.

This report documents the methodologies and findings of this odour dispersion modelling assessment.

1.2 SITE PLAN

The Facility is proposed to be located at Lot 2 DP 538542 Kelly Close, Macksville, NSW approximately 1 km east of the residential area of Macksville, NSW. Approximately 450 m to the north of the proposed site there is a small industrial/commercial area. Further residential dwellings are approximately 600 m north of the proposed site; these dwellings

border the Nambucca River. The Donnelly Welsh Playing Fields are located on the southern edge of Macksville approximately 720 m from the proposed site.

The proposed location has been outlined in yellow in **Figure 1.1**. **Figure 1.2** shows the proposed context plan. **Figure 1.3** shows the proposed site layout. The distance from the operational area to the nearest residence is approximately 350 metres. The surrounding topography is described as rural flat terrain.

1.3 SITE OPERATING HOURS

The waste water treatment process will operate continuously, in response to demand. Waste water deliveries will be confined to daylight hours between normal weekday business hours. Significant odour impacts from the delivery of waste water are not expected. It is understood that deliveries will occur approximately 3 per week.

Figure 1.1 – Site Location

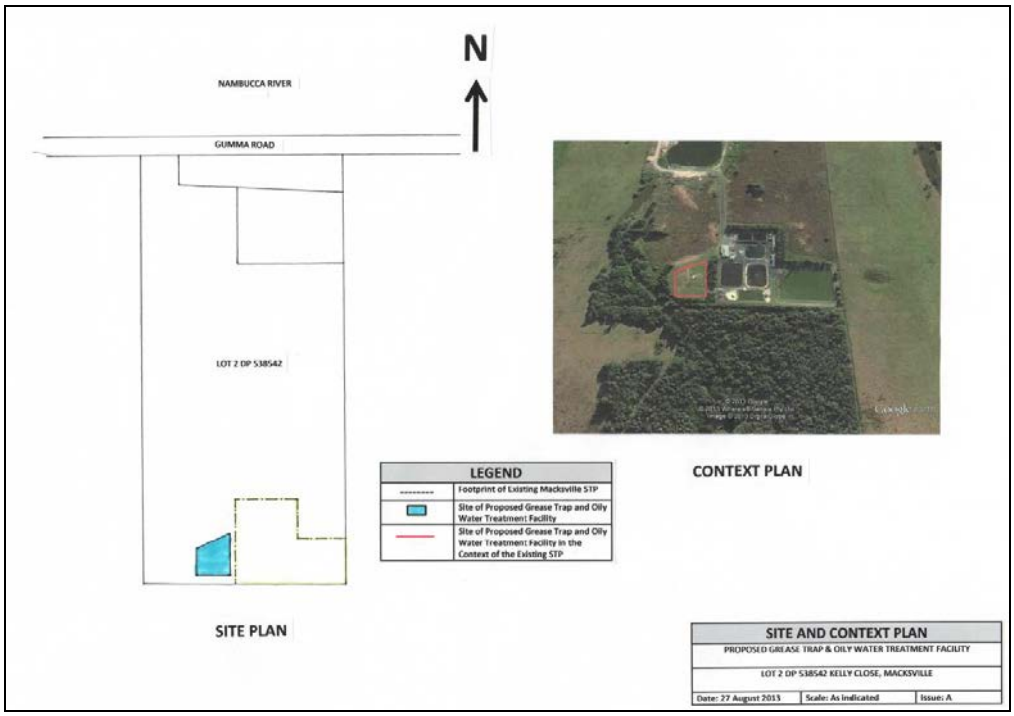


Figure 1.2 – Context plan

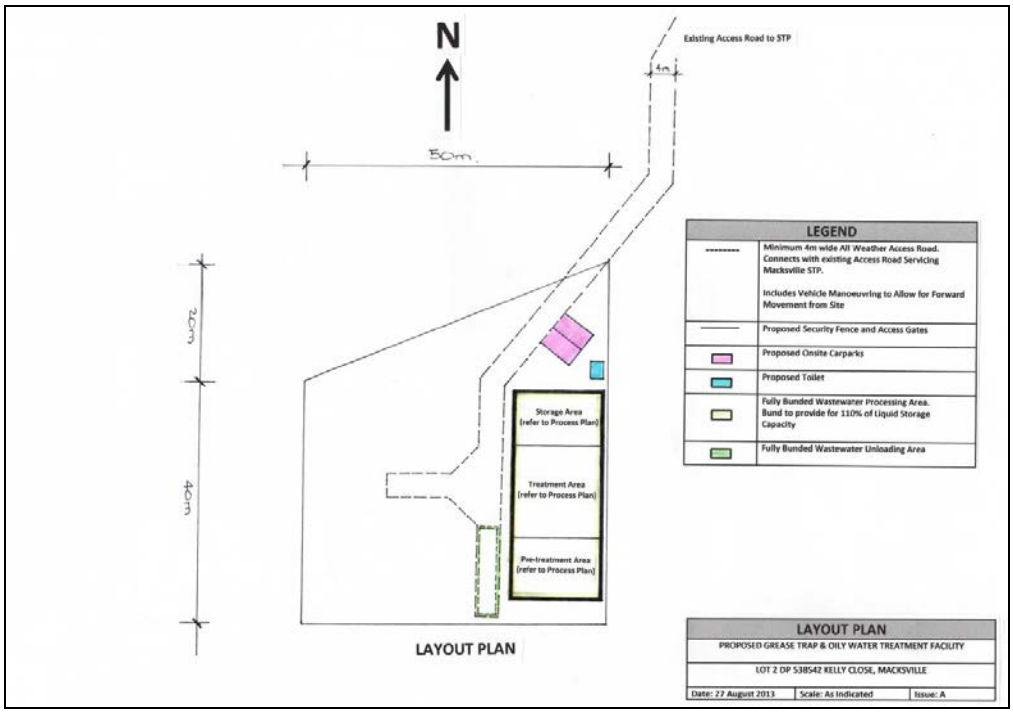


Figure 1.3 – Proposed Layout Plan

1.4 PROCESS DESCRIPTION

The proposed Facility is a probiotic, low energy aeration system where probiotic bacteria is dosed into the waste water to remove biological solids. The proposed system comprises of a balance tank, holding tank, trommel, pit, bioreactor tanks (x3), treated water storage tanks (x2) and a sludge storage tank. See **Figure 1.4** for a process plan. Grease trap and oily water will be transported to the proposed facility by truck with sealed tanks. The waste water will receive initial treatment in the balance tank and trommel before transferring to the bioreactor treatment system. Once bioreactor treatment is complete the treated waste water will be of a quality suitable for discharge to MSTP. Transfer of the waste water between the different stages is via a sealed transfer line.

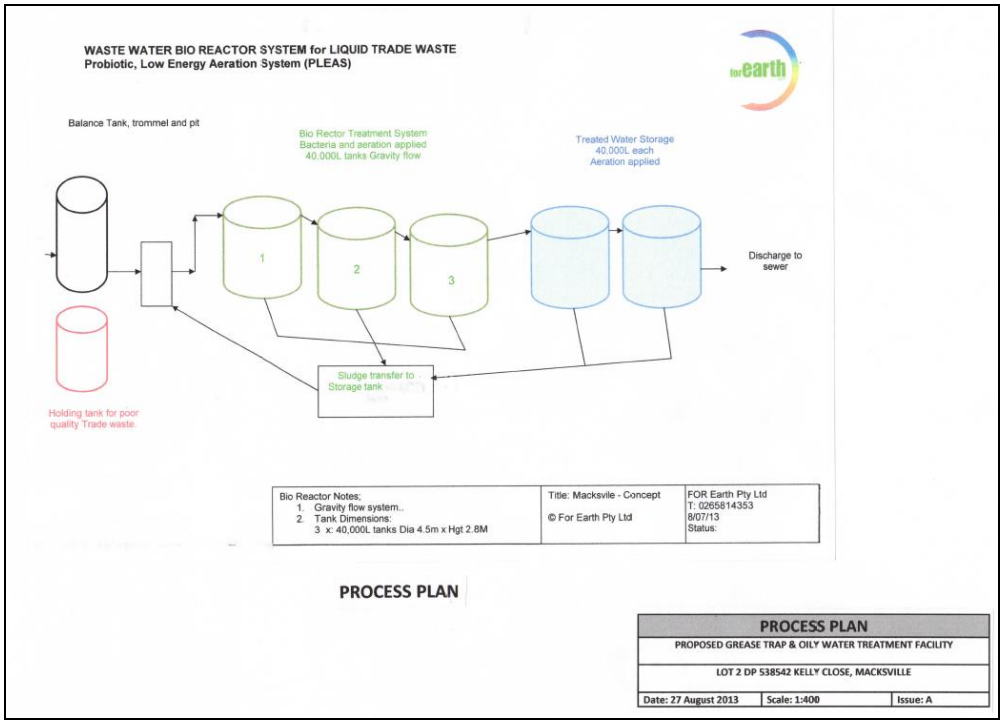


Figure 1.4 – Process Plan

The weekly processing of waste water will be approximately 15,000 litres however this is dependent on changing demands. The treated water is to be discharged to the Macksville Sewage Treatment Plant (MSTP).

1.4.1 Balance Tank

The balance tank a sealed tank that receives the initial delivery of waste water. The balance tank is not expected to contribute to off-site odour impacts.

1.4.2 Holding Tank

The holding tank is a sealed tank that stores liquid unsuitable for the proposed treatment facility. The unsuitable liquid is transferred off site. The holding tank is not expected to contribute to off-site odour impacts.

1.4.3 Trommel

The trommel is a rotating screen that removes unsuitable material from the waste water prior to treatment. This is not a constant process and is only operational during transfer of the waste water. TOU has been advised that the trommel will only be operational for 2 hours per day.

1.4.4 Pit

The pit is only utilised during transfer of waste water to the treatment process. As with the trommel this is not a constant process and is only operational during transfer of the waste water. For this application the pit operational hours has been set at 3 hours per day.

1.4.5 Sludge Storage Tank

The sludge storage tank collects sludge from various stages of the treatment process and stores it prior to the sludge being removed from site or discharged to the beginning of the treatment process for reprocessing. The sludge storage tank is a sealed tank is not expected to contribute to off-site odour impacts.

1.4.6 Bioreactor

The bioreactor stage of the treatment process consists of 3 x 40,000 litre tanks. The waste water is constantly aerated with the outlet air being discharged to atmosphere via multiple small openings in the top each of the tanks. For this application the tanks have been designated as area sources which will add to the conservatism of the model.

1.4.7 Treated Water Storage

The final stage of the waste water treatment process, the treated water is stored in 2 x 40,000 litre storage tanks. The treated water is aerated continuously and the outlet air is discharged to atmosphere via multiple small openings in the top each of the tanks. For this application the tanks have been designated as area sources which will add to the conservatism of the model.

2 METHODOLOGY

2.1 EMISSIONS INVENTORY

Actual measurements from sources of this specific nature were not available. As a result, the odour dispersion modelling assessment was carried out with use of odour emission rates (OERs) accessed from TOU's odour emission rate database and its extensive experience in this field. The OERs used in this application are relevant but have erred on the side of conservatism in the OER selection.

The data selected for the bioreactor tanks, treated water storage tanks and pit was sourced from municipal waste water treatment data. The upper quartile OERs for sources with similar characteristics were selected to eliminate any unusually high OERs that are a result of abnormal process conditions. The OERs calculated are shown in Error! Reference source not found.. A nominal OER for the grease trap and oily water trommel chosen using TOU's knowledge and experience from similar processes, see **Table 2.2**. Trommels are notoriously difficult to accurately sample and literature OER data is highly variable. The odour emission rate calculation tables are shown in **Appendix A**.

.

Table 2.1: SOER Input Data – Area Sources				
Process Location	**Database Process**	**Upper Quartile SOER ($ou.m^3/m^2/s$)**	**Peak to Mean 60 2.3**	**Peak to Mean 60 1.9**
Balance Tank (sealed tank)	N/A	N/A	N/A	N/A
Holding Tank (sealed tank)	N/A	N/A	N/A	N/A
Pit	WWTP Primary Treatment	8.15	18.74	15.5
Bioreactor Tank 1	WWTP Aerobic Bioreactor	0.46	1.06	0.87
Bioreactor Tank 2	WWTP Aerobic Bioreactor	0.46	1.06	0.87
Bioreactor Tank 3	WWTP Aerobic Bioreactor	0.46	1.06	0.87
Treated Water Storage 1	WWTP Aerobic Bioreactor	0.46	1.06	0.87
Treated Water Storage 2	WWTP Aerobic Bioreactor	0.46	1.06	0.87
Sludge Storage Tank (sealed tank)	N/A	N/A	N/A	N/A

Table 2.2: OER Input Data – Volume Source			
Process Location	**OER ($ou.m^3/s$)**	**Peak to Mean 60 2.3**	**Peak to Mean 60 1.9**
Trommel	1,000	2,300	N/A

2.2 METEOROLOGICAL DATASET

The worst-case meteorological screening data was prepared according to the methodology specified in Section 4.3 of *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*. Key variables used in the preparation were:

- Roughness length (Z_0) = 0.1 m
- Latitude (Φ) = 30.7 °
- Wind direction intervals = 1 °(range: 1 – 360 °)
- Temperature range = 8.9 °C and 29.6 °C

The maximum and minimum ambient temperatures used were the lowest monthly Decile 1 minimum and highest monthly Decile 9 maximum. This is considered a highly conservative representation of the temperature range experienced at the site.

2.3 NSW ODOUR CRITERIA AND DISPERSION MODEL GUIDELINES

Regulatory authority guidelines for odorous impacts of gaseous process emissions are not designed to satisfy a 'zero odour impact criteria', but rather to minimise the nuisance effect to acceptable levels of these emissions to a large range of odour sensitive receptors within the local community.

The odour impact assessment for this project has been carried out in accordance with the methods outlined by the NSW EPA documents:

> "*Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*" (2005), and
>
> "*Technical Framework: Assessment and Management of Odour from Stationary Sources in NSW*" (2006).

The EPA documents specify that the modelling for level two odour impact assessments upon which this study has been conducted be based on the use of:

- 100.0th percentile, maximum, dispersion model predictions;
- 1-hour averaging times with built–in peak-to-mean ratios to adjust the averaging time to a 1-second nose-response-time;
- The peak-to-mean ratio in the far-field for area sources for Pasquill-Gifford atmospheric stability classes A-D is 2.3 and E-F is 1.9.
- The peak-to-mean ratio in the far-field for volume sources for Pasquill-Gifford atmospheric stability classes A-F is 2.3.
- The far field distance is defined as typically greater than10 times the largest source dimension, either height or width
- The appropriate odour unit performance criterion, based on the population of the affected community in the vicinity of the development.

The impact assessment criteria (IAC) for complex mixtures of odours are designed to include receptors with a range of sensitivities. Therefore a statistical approach is used to determine the acceptable ground level concentration of odour at the nearest sensitive receptor. This criterion is determined by the following equation outlined in the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW 2005* (p. 37):

Impact assessment criterion (ou) = ($\log_{10}$ (population) - 4.5) / -0.6

Based on the equation above, **Table 2.3** outlines the odour performance criteria for six different affected population density categories, and is reproduced from the EPA's *Approved Methods* document. It states that higher odour concentrations are permitted in lower population density applications.

Table 2.3: Odour Performance Criteria under Various Population Densities	
Population of affected community	**Odour performance criterion (ou)**
Urban Area (≥ ~2000)	2.0
~500	3.0
~125	4.0
~30	5.0
~10	6.0
Single rural residence (≤ ~2)	7.0

Source: Department of Environment and Climate Change (NSW), 2005, Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales.

Based on the NSW EPA classification of population densities presented in **Table 1.2**, the odour performance criteria (OPC) adopted for this dispersion modelling and odour impact assessment study is **2 odour units (ground level concentration)** for the residential area of Macksville, NSW.

2.4 DISPERSION MODELLING

2.4.1 The Odour Dispersion Model

The odour dispersion modelling assessment was carried out using AUSPLUME Version 6.0, AUSPLUME is an EPA approved dispersion model and is considered by TOU as fit for the purpose of a level two odour impact assessment.

For this study, the air contaminant was odour and ground level concentrations in odour units (ou) have been projected.

2.4.2 Topographical Data and Land Use

Topographical data from the area of interest was extracted from high resolution 1 second SRTM Derived Smoothed Digital Elevation Model (DEM-S) version 1.0 ordered from Geoscience Australia. The DEM was processed into a 75 m x 74 m horizontal resolution grid file by Surfer Surface Mapping System. The grid file was then processed by the AUSPLUME file conversion utility into a compatible terrain file.

2.4.3 Gridded Receptor Configuration

The gridded receptors used in the model were configured as a Cartesian grid with receptors spaced at 75 m by 74 m intervals over a 5,190 m by 2,568 m domain. The gridded receptor values were based on the projected coordinate system *WGS 84 / UTM*

Zone 56S. The contour plots derived from the receptor grid were overlaid on a geo-referenced Google Earth satellite image.

2.4.4 Key Assumptions

The following key assumptions were made:

- The Facility will be operated continuously under best management practices;
- The balance tank, holding tank and sludge storage tank are sealed with minimal chance of fugitive emissions;
- The trommel and pit are modelled as continuous emission sources, however they are proposed to be only operational during times of waste water transfer;

2.4.5 Further Model Configurations

Further model configurations and output are available in the AUSPLUME text file outputs in **Appendix B.**

3 RESULTS

The odour modelling contour plot is shown below. Indicated on the plot are the projected ground level odour concentration contours at 100.0th percentile with 1-second averaging using worst case meteorological data. The red contour illustrates the predicted impacts from all sources whilst the green contour illustrates the predicted impact from all sources except the trommel.

The plot is presented below as the following figure:

- **Figure 3.1:** Projected Odour Contours

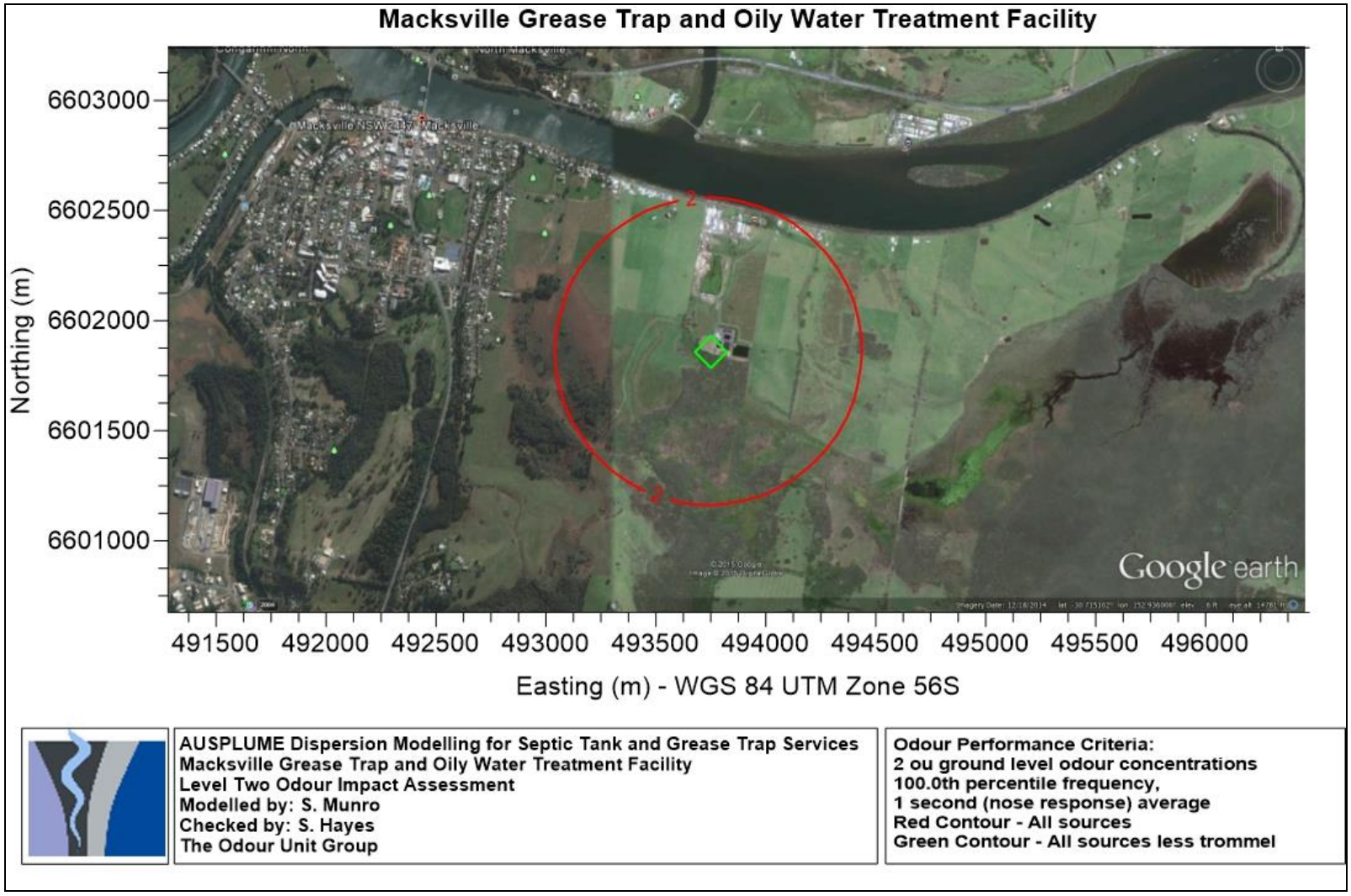


Figure 3.1: Projected Odour Contours

4 FINDINGS AND CONCLUSIONS

TOU was commissioned by Septic Tanks and Grease Trap Cleaning Service to carry out a level two odour impact assessment for a proposed grease trap and oily water treatment facility to be located at Macksville, NSW. A level two odour impact assessment is a screening-level dispersion modelling technique, using worst-case input data, rather than site-specific data. The odour performance criteria (OPC) adopted for the residential area of Macksville, NSW, is 2 odour units (ou). AUSPLUME was chosen as the appropriate model for this assessment.

The OER data used in the model were sourced from TOU's extensive database of municipal waste water treatment plants and experience. Trommels are difficult to assess for odour emissions with OER data from such sources highly variable and unreliable. As such, a conservative OER for the trommel was derived from TOU's experience.

It was found that the trommel is the main contributor to the overall predicted impacts from the proposed facility. It should be noted that the assessment predicts odour impacts on the single worst hour of meteorological conditions for odour dispersion. In reality, the trommel will only be operational for a short period when the more favourable meteorological conditions for odour dispersion are occurring. TOU feels the trommel predictions are unrealistic. Notwithstanding the above, the contour shows compliance with the 2 ou glc criteria for the town of Macksville. When the trommel is removed from the contour plot, the impacts from the proposed site are almost negligible.

The proposed low frequency and day time use of the trommel during normal operations should be factored into the decision making process. It would be prudent, however to ensure that the facility is operating to best management practices upon commissioning and that regular emissions testing and monitoring is established as part of a robust odour management plan. In the unlikely event that the trommel is problematic then measures would need to be put in place to remove the trommel from the process or capture and treat the process air from it.

5 REFERENCES:

- AS/NZS 4323.3, *Stationary source emissions – Determination of odour concentration by dynamic olfactometry,* 2001.
- David Pensini – Building and Environmental Services, 2015, *Environmental Impact Statement For The Establishment Of A Grease Trap And Oily Water Facility.*
- Department of Environment and Conservation NSW, January 2007, *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*
- Environment Protection Authority, 2006, *Technical framework (and notes): assessment and management of odour from stationary sources in NSW*. Department of Environment and Conservation, Sydney NSW.
- Environment Protection Authority, 2005, *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*, Department of Environment and Conservation, Sydney NSW.

SEPTIC TANK AND GREASE TRAP CLEANING SERVICES

Macksville Grease Trap and Oily Water Treatment Facility Level Two Odour Impact Assessment

---

Macksville NSW

Appendices

December 2015

Appendix A: AUSPLUME input and emission rates

Area Sources														
Source Description	**Source ID**	**X Coordinates**	**Y Coordinates**	**Initial Vertical Spead (m)**	**Height (m)**	**X-side length (m)**	**Y-side length (m)**	**Angle (degrees)**	**Surface Area (m^2)**	**Specific Odour Emission Rate ($ou.m^3/m^2/s$)**	**Odour Emission Rate ($ou.m^3/s$)**	**Peak Specific Odour Emission Rate - P/M60 2.3 ($ou.m^3/m^2/s$)**	**Peak Specific Odour Emission Rate - P/M60 1.9 ($ou.m^3/m^2/s$)**	**Comments**
Pit	Pit	493741	6601866	1	0	1.0	1.5	98	1.5	8.13	N/A	18.699	15.447	
Bioreactor Tank 1	BR1	493741	6601872	1	2.8	N/A	N/A	N/A	15.9	0.46	N/A	1.058	0.874	
Bioreactor Tank 2	BR2	493744	6601881	1	2.8	N/A	N/A	N/A	15.9	0.46	N/A	1.058	0.874	
Bioreactor Tank 3	BR3	493746	6601890	1	2.8	N/A	N/A	N/A	15.9	0.46	N/A	1.058	0.874	
Treated Water Storage 1	TW1	493751	6601870	1	2.8	N/A	N/A	N/A	15.9	0.46	N/A	1.058	0.874	
Treated Water Storage 2	TW2	493753	6601879	1	2.8	N/A	N/A	N/A	15.9	0.46	N/A	1.058	0.874	
Volume Sources														
Source Description	**Source ID**	**X Coordinates**	**Y Coordinates**	**Elevation (m)**	**Height (m)**	**Horz. Spread (m)**	**Vert Spread (m)**	**Angle (degrees)**	**Surface Area (m^2)**	**Specific Odour Emission Rate ($ou.m^3/m^2/s$)**	**Odour Emission Rate ($ou.m^3/s$)**	**Peak Odour Emission Rate - P/M60 2.3 ($ou.m^3/s$)**	**Peak Odour Emission Rate - P/M60 1.9 ($ou.m^3/s$)**	**Comments**
Trommel	Tr	493739	6601860	4	0.25	1	1	N/A	0.75	N/A	1,000	2300	N/A	

Appendix B: AUSPLUME text output files

1

Macksville, NSW

Concentration or deposition	Concentration
Emission rate units	OUV/second
Concentration units	Odour_Units
Units conversion factor	1.00E+00
Constant background concentration	0.00E+00
Terrain effects	Egan method
Smooth stability class changes?	No
Other stability class adjustments ("urban modes")	None
Ignore building wake effects?	No
Decay coefficient (unless overridden by met. file)	0.000
Anemometer height	10 m
Roughness height at the wind vane site	0.100 m
Averaging time for sigma-theta values	60 min.

DISPERSION CURVES

Horizontal dispersion curves for sources <100m high	Sigma-theta
Vertical dispersion curves for sources <100m high	Pasquill-Gifford
Horizontal dispersion curves for sources >100m high	Briggs Rural
Vertical dispersion curves for sources >100m high	Briggs Rural
Enhance horizontal plume spreads for buoyancy?	Yes
Enhance vertical plume spreads for buoyancy?	Yes
Adjust horizontal P-G formulae for roughness height?	Yes
Adjust vertical P-G formulae for roughness height?	Yes
Roughness height	0.100m
Adjustment for wind directional shear	None

PLUME RISE OPTIONS

Gradual plume rise?	Yes
Stack-tip downwash included?	Yes
Building downwash algorithm:	PRIME method.
Entrainment coeff. for neutral & stable lapse rates	0.60,0.60
Partial penetration of elevated inversions?	No
Disregard temp. gradients in the hourly met. file?	No

and in the absence of boundary-layer potential temperature gradients given by the hourly met. file, a value from the following table (in K/m) is used:

Wind Speed Category	Stability Class A	B	C	D	E	F
1	0.000	0.000	0.000	0.000	0.020	0.035
2	0.000	0.000	0.000	0.000	0.020	0.035
3	0.000	0.000	0.000	0.000	0.020	0.035
4	0.000	0.000	0.000	0.000	0.020	0.035
5	0.000	0.000	0.000	0.000	0.020	0.035

```
       6         0.000  0.000  0.000  0.000  0.020  0.035

 WIND SPEED CATEGORIES
 Boundaries between categories (in m/s) are:  1.54,  3.09,  5.14,  8.23, 10.80

 WIND PROFILE EXPONENTS: "Irwin Urban" values (unless overridden by met. file)

 AVERAGING TIMES
  1 hour
```

Macksville, NSW

SOURCE GROUPS

Group No.	Members						
1	BR1	BR2	BR3	TWS1	TWS2	PIT	TR
2	BR1	BR2	BR3	TWS1	TWS2		
3	PIT						
4	TR						
5	BR1	BR2	BR3	TWS1	TWS2	PIT	

Macksville, NSW

SOURCE CHARACTERISTICS

INTEGRATED CIRCULAR AREA SOURCE: BR1

X0(m)	Y0(m)	Ground El	Radius	No. Vertices	Ver. spread	Height
493741	6601872	4m	2m	20	1m	3m

Emission rates by stability and wind speed, in OUV/second per square metre:

Wind speeds (m/s):	< 1.5	1.5_ 3.1	3.1_ 5.1	5.1_ 8.2	8.2_10.8	>10.8
Stability A:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability B:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability C:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00

Stability D:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability E:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01
Stability F:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01

No gravitational settling or scavenging.

INTEGRATED CIRCULAR AREA SOURCE: BR2

X0(m)	Y0(m)	Ground El	Radius	No. Vertices	Ver. spread	Height
493744	6601881	4m	2m	20	1m	3m

Emission rates by stability and wind speed, in OUV/second per square metre:

Wind speeds (m/s):	< 1.5	1.5_ 3.1	3.1_ 5.1	5.1_ 8.2	8.2_10.8	>10.8
Stability A:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability B:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability C:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability D:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability E:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01
Stability F:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01

No gravitational settling or scavenging.

INTEGRATED CIRCULAR AREA SOURCE: BR3

X0(m)	Y0(m)	Ground El	Radius	No. Vertices	Ver. spread	Height
493746	6601890	4m	2m	20	1m	3m

Emission rates by stability and wind speed, in OUV/second per square metre:

Wind speeds (m/s):	< 1.5	1.5_ 3.1	3.1_ 5.1	5.1_ 8.2	8.2_10.8	>10.8
Stability A:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability B:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability C:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability D:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability E:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01
Stability F:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01

No gravitational settling or scavenging.

INTEGRATED CIRCULAR AREA SOURCE: TWS1

X0(m)	Y0(m)	Ground El	Radius	No. Vertices	Ver. spread	Height
493751	6601870	4m	2m	20	1m	3m

Emission rates by stability and wind speed, in OUV/second per square metre:

Wind speeds (m/s):	< 1.5	1.5_ 3.1	3.1_ 5.1	5.1_ 8.2	8.2_10.8	>10.8
Stability A:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability B:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability C:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability D:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability E:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01
Stability F:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01

No gravitational settling or scavenging.

INTEGRATED CIRCULAR AREA SOURCE: TWS2

X0(m)	Y0(m)	Ground El	Radius	No. Vertices	Ver. spread	Height
493753	6601879	4m	2m	20	1m	3m

Emission rates by stability and wind speed, in OUV/second per square metre:

Wind speeds (m/s):	< 1.5	1.5_ 3.1	3.1_ 5.1	5.1_ 8.2	8.2_10.8	>10.8
Stability A:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability B:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability C:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability D:	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00	1.06E+00
Stability E:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01
Stability F:	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01	8.70E-01

No gravitational settling or scavenging.

INTEGRATED AREA SOURCE: PIT

X0(m)	Y0(m)	Ground El	Length X	Length Y	Or. Angle	Ver. spread	Height
493741	6601866	4m	2m	1m	98deg	1m	0m

Emission rates by stability and wind speed, in OUV/second per square metre:

Wind speeds (m/s):	< 1.5	1.5_ 3.1	3.1_ 5.1	5.1_ 8.2	8.2_10.8	>10.8
Stability A:	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01
Stability B:	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01
Stability C:	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01
Stability D:	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01	1.87E+01
Stability E:	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01
Stability F:	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01	1.55E+01

No gravitational settling or scavenging.

VOLUME SOURCE: TR

X(m)	Y(m)	Ground Elevation	Height	Hor. spread	Vert. spread
493739	6601860	4m	0m	1m	1m

Emission rates by stability and wind speed, in OUV/second:

Wind speeds (m/s):	< 1.5	1.5_ 3.1	3.1_ 5.1	5.1_ 8.2	8.2_10.8	>10.8
Stability A:	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03
Stability B:	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03
Stability C:	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03
Stability D:	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03
Stability E:	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03
Stability F:	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03	2.30E+03

No gravitational settling or scavenging.

1

Macksville, NSW

RECEPTOR LOCATIONS

The Cartesian receptor grid has the following x-values (or eastings):

491286.m	491360.m	491435.m	491510.m	491584.m	491659.m	491734.m
491809.m	491883.m	491958.m	492033.m	492107.m	492182.m	492257.m
492331.m	492406.m	492481.m	492555.m	492630.m	492705.m	492779.m
492854.m	492929.m	493004.m	493078.m	493153.m	493228.m	493302.m
493377.m	493452.m	493526.m	493601.m	493676.m	493750.m	493825.m
493900.m	493974.m	494049.m	494124.m	494199.m	494273.m	494348.m
494423.m	494497.m	494572.m	494647.m	494721.m	494796.m	494871.m
494945.m	495020.m	495095.m	495169.m	495244.m	495319.m	495394.m
495468.m	495543.m	495618.m	495692.m	495767.m	495842.m	495916.m
495991.m	496066.m	496140.m	496215.m	496290.m	496364.m	496439.m

and these y-values (or northings):

6600591.m	6600666.m	6600740.m	6600815.m	6600889.m	6600964.m	6601038.m
6601113.m	6601187.m	6601262.m	6601336.m	6601411.m	6601485.m	6601560.m
6601634.m	6601709.m	6601783.m	6601858.m	6601932.m	6602007.m	6602081.m
6602156.m	6602230.m	6602305.m	6602379.m	6602454.m	6602528.m	6602603.m
6602677.m	6602752.m	6602826.m	6602901.m	6602975.m	6603050.m	6603124.m

---

METEOROLOGICAL DATA : NSW EPA LEVEL 1 METFILE Macksville A z0-0.1 AnZ-10
L

---

1 Peak values for the 100 worst cases (in Odour_Units)
Averaging time = 1 hour; Source group No. 1

Rank	Value	Time Recorded hour,date	Coordinates (* denotes polar)
1	5.18E+02	03,28/01/02	(493750, 6601858, 0.0)
2	5.18E+02	03,29/09/04	(493750, 6601858, 0.0)
3	5.17E+02	20,30/01/02	(493750, 6601858, 0.0)
4	5.17E+02	20,01/10/04	(493750, 6601858, 0.0)
5	5.14E+02	10,25/01/02	(493750, 6601858, 0.0)
6	5.14E+02	10,26/09/04	(493750, 6601858, 0.0)
7	5.12E+02	13,02/02/02	(493750, 6601858, 0.0)
8	5.12E+02	13,04/10/04	(493750, 6601858, 0.0)
9	5.06E+02	17,22/01/02	(493750, 6601858, 0.0)
10	5.06E+02	17,23/09/04	(493750, 6601858, 0.0)
11	5.02E+02	06,05/02/02	(493750, 6601858, 0.0)
12	5.02E+02	06,07/10/04	(493750, 6601858, 0.0)
13	4.94E+02	24,19/01/02	(493750, 6601858, 0.0)
14	4.94E+02	24,20/09/04	(493750, 6601858, 0.0)
15	4.89E+02	23,07/02/02	(493750, 6601858, 0.0)
16	4.89E+02	23,09/10/04	(493750, 6601858, 0.0)
17	4.79E+02	07,17/01/02	(493750, 6601858, 0.0)
18	4.79E+02	07,18/09/04	(493750, 6601858, 0.0)
19	4.72E+02	16,10/02/02	(493750, 6601858, 0.0)
20	4.72E+02	16,12/10/04	(493750, 6601858, 0.0)
21	4.59E+02	14,14/01/02	(493750, 6601858, 0.0)
22	4.59E+02	14,15/09/04	(493750, 6601858, 0.0)
23	4.51E+02	09,13/02/02	(493750, 6601858, 0.0)
24	4.51E+02	09,15/10/04	(493750, 6601858, 0.0)
25	4.37E+02	21,11/01/02	(493750, 6601858, 0.0)
26	4.37E+02	21,12/09/04	(493750, 6601858, 0.0)
27	4.28E+02	02,16/02/02	(493750, 6601858, 0.0)
28	4.28E+02	02,18/10/04	(493750, 6601858, 0.0)
29	4.13E+02	04,09/01/02	(493750, 6601858, 0.0)
30	4.13E+02	04,10/09/04	(493750, 6601858, 0.0)
31	4.03E+02	19,18/02/02	(493750, 6601858, 0.0)
32	4.03E+02	19,20/10/04	(493750, 6601858, 0.0)
33	3.86E+02	11,06/01/02	(493750, 6601858, 0.0)
34	3.86E+02	11,07/09/04	(493750, 6601858, 0.0)
35	3.75E+02	12,21/02/02	(493750, 6601858, 0.0)
36	3.75E+02	12,23/10/04	(493750, 6601858, 0.0)
37	3.58E+02	18,03/01/02	(493750, 6601858, 0.0)
38	3.58E+02	18,04/09/04	(493750, 6601858, 0.0)
39	3.47E+02	17,27/01/02	(493750, 6601858, 0.0)
40	3.47E+02	17,28/09/04	(493750, 6601858, 0.0)
41	3.47E+02	05,24/02/02	(493750, 6601858, 0.0)
42	3.47E+02	05,26/10/04	(493750, 6601858, 0.0)
43	3.47E+02	10,30/01/02	(493750, 6601858, 0.0)
44	3.47E+02	10,01/10/04	(493750, 6601858, 0.0)
45	3.46E+02	24,24/01/02	(493750, 6601858, 0.0)
46	3.46E+02	24,25/09/04	(493750, 6601858, 0.0)

47	3.45E+02	03,02/02/02	(493750, 6601858, 0.0)
48	3.45E+02	03,04/10/04	(493750, 6601858, 0.0)
49	3.43E+02	07,22/01/02	(493750, 6601858, 0.0)
50	3.43E+02	07,23/09/04	(493750, 6601858, 0.0)
51	3.41E+02	20,04/02/02	(493750, 6601858, 0.0)
52	3.41E+02	20,06/10/04	(493750, 6601858, 0.0)
53	3.38E+02	14,19/01/02	(493750, 6601858, 0.0)
54	3.38E+02	14,20/09/04	(493750, 6601858, 0.0)
55	3.36E+02	13,07/02/02	(493750, 6601858, 0.0)
56	3.36E+02	13,09/10/04	(493750, 6601858, 0.0)
57	3.31E+02	21,16/01/02	(493750, 6601858, 0.0)
58	3.31E+02	21,17/09/04	(493750, 6601858, 0.0)
59	3.29E+02	01,01/01/02	(493750, 6601858, 0.0)
60	3.29E+02	01,02/09/04	(493750, 6601858, 0.0)
61	3.29E+02	06,10/02/02	(493750, 6601858, 0.0)
62	3.29E+02	06,12/10/04	(493750, 6601858, 0.0)
63	3.24E+02	04,14/01/02	(493750, 6601858, 0.0)
64	3.24E+02	04,15/09/04	(493750, 6601858, 0.0)
65	3.21E+02	23,12/02/02	(493750, 6601858, 0.0)
66	3.21E+02	23,14/10/04	(493750, 6601858, 0.0)
67	3.18E+02	22,26/02/02	(493750, 6601858, 0.0)
68	3.18E+02	22,28/10/04	(493750, 6601858, 0.0)
69	3.14E+02	11,11/01/02	(493750, 6601858, 0.0)
70	3.14E+02	11,12/09/04	(493750, 6601858, 0.0)
71	3.11E+02	16,15/02/02	(493750, 6601858, 0.0)
72	3.11E+02	16,17/10/04	(493750, 6601858, 0.0)
73	3.04E+02	18,08/01/02	(493750, 6601858, 0.0)
74	3.04E+02	18,09/09/04	(493750, 6601858, 0.0)
75	3.00E+02	09,18/02/02	(493750, 6601858, 0.0)
76	3.00E+02	09,20/10/04	(493750, 6601858, 0.0)
77	3.00E+02	08,29/12/01	(493750, 6601858, 0.0)
78	3.00E+02	08,30/08/04	(493750, 6601858, 0.0)
79	2.92E+02	01,06/01/02	(493750, 6601858, 0.0)
80	2.92E+02	01,07/09/04	(493750, 6601858, 0.0)
81	2.89E+02	15,01/03/02	(493750, 6601858, 0.0)
82	2.89E+02	15,31/10/04	(493750, 6601858, 0.0)
83	2.88E+02	02,21/02/02	(493750, 6601858, 0.0)
84	2.88E+02	02,23/10/04	(493750, 6601858, 0.0)
85	2.80E+02	08,03/01/02	(493750, 6601858, 0.0)
86	2.80E+02	08,04/09/04	(493750, 6601858, 0.0)
87	2.75E+02	19,23/02/02	(493750, 6601858, 0.0)
88	2.75E+02	19,25/10/04	(493750, 6601858, 0.0)
89	2.71E+02	15,26/12/01	(493750, 6601858, 0.0)
90	2.71E+02	15,27/08/04	(493750, 6601858, 0.0)
91	2.66E+02	15,31/12/01	(493750, 6601858, 0.0)
92	2.66E+02	15,01/09/04	(493750, 6601858, 0.0)
93	2.62E+02	12,26/02/02	(493750, 6601858, 0.0)
94	2.62E+02	12,28/10/04	(493750, 6601858, 0.0)
95	2.60E+02	08,04/03/02	(493750, 6601858, 0.0)
96	2.60E+02	08,03/11/04	(493750, 6601858, 0.0)
97	2.59E+02	04,28/01/02	(493750, 6601858, 0.0)
98	2.59E+02	04,29/09/04	(493750, 6601858, 0.0)

99	2.58E+02	21,30/01/02	(493750, 6601858, 0.0)
100	2.58E+02	21,01/10/04	(493750, 6601858, 0.0)

---

1 Peak values for the 100 worst cases (in Odour_Units)
Averaging time = 1 hour; Source group No. 2

Rank	Value	Time Recorded hour,date	Coordinates (* denotes polar)
1	8.06E-01	18,14/08/02	(493750, 6601858, 0.0)
2	8.06E-01	18,15/04/05	(493750, 6601858, 0.0)
3	8.05E-01	01,12/08/02	(493750, 6601858, 0.0)
4	8.05E-01	01,13/04/05	(493750, 6601858, 0.0)
5	8.05E-01	11,17/08/02	(493750, 6601858, 0.0)
6	8.05E-01	11,18/04/05	(493750, 6601858, 0.0)
7	8.04E-01	08,09/08/02	(493750, 6601858, 0.0)
8	8.04E-01	08,10/04/05	(493750, 6601858, 0.0)
9	8.03E-01	04,20/08/02	(493750, 6601858, 0.0)
10	8.03E-01	04,21/04/05	(493750, 6601858, 0.0)
11	8.01E-01	15,06/08/02	(493750, 6601858, 0.0)
12	8.01E-01	15,07/04/05	(493750, 6601858, 0.0)
13	7.99E-01	21,22/08/02	(493750, 6601858, 0.0)
14	7.99E-01	21,23/04/05	(493750, 6601858, 0.0)
15	7.96E-01	22,03/08/02	(493750, 6601858, 0.0)
16	7.96E-01	22,04/04/05	(493750, 6601858, 0.0)
17	7.94E-01	14,25/08/02	(493750, 6601858, 0.0)
18	7.94E-01	14,26/04/05	(493750, 6601858, 0.0)
19	7.91E-01	05,01/08/02	(493750, 6601858, 0.0)
20	7.91E-01	05,02/04/05	(493750, 6601858, 0.0)
21	7.88E-01	07,28/08/02	(493750, 6601858, 0.0)
22	7.88E-01	07,29/04/05	(493750, 6601858, 0.0)
23	7.87E-01	17,12/05/01	(493750, 6601932, 0.0)
24	7.87E-01	17,12/01/04	(493750, 6601932, 0.0)
25	7.86E-01	24,09/05/01	(493750, 6601932, 0.0)
26	7.86E-01	24,09/01/04	(493750, 6601932, 0.0)
27	7.85E-01	12,29/07/02	(493750, 6601858, 0.0)
28	7.85E-01	12,30/03/05	(493750, 6601858, 0.0)
29	7.81E-01	24,30/08/02	(493750, 6601858, 0.0)
30	7.81E-01	24,01/05/05	(493750, 6601858, 0.0)
31	7.81E-01	10,15/05/01	(493750, 6601932, 0.0)
32	7.81E-01	10,15/01/04	(493750, 6601932, 0.0)
33	7.77E-01	19,26/07/02	(493750, 6601858, 0.0)
34	7.77E-01	19,27/03/05	(493750, 6601858, 0.0)
35	7.76E-01	07,07/05/01	(493750, 6601932, 0.0)
36	7.76E-01	07,07/01/04	(493750, 6601932, 0.0)
37	7.72E-01	17,01/01/00	(493750, 6601858, 0.0)
38	7.72E-01	17,02/09/02	(493750, 6601858, 0.0)
39	7.68E-01	02,24/07/02	(493750, 6601858, 0.0)
40	7.68E-01	02,25/03/05	(493750, 6601858, 0.0)

41	7.66E-01	03,18/05/01	(493750, 6601932, 0.0)
42	7.66E-01	03,18/01/04	(493750, 6601932, 0.0)
43	7.63E-01	10,04/01/00	(493750, 6601858, 0.0)
44	7.63E-01	10,05/09/02	(493750, 6601858, 0.0)
45	7.60E-01	14,04/05/01	(493750, 6601932, 0.0)
46	7.60E-01	14,04/01/04	(493750, 6601932, 0.0)
47	7.58E-01	09,21/07/02	(493750, 6601858, 0.0)
48	7.58E-01	09,22/03/05	(493750, 6601858, 0.0)
49	7.51E-01	03,07/01/00	(493750, 6601858, 0.0)
50	7.51E-01	03,08/09/02	(493750, 6601858, 0.0)
51	7.48E-01	16,18/07/02	(493750, 6601858, 0.0)
52	7.48E-01	16,19/03/05	(493750, 6601858, 0.0)
53	7.45E-01	22,11/05/01	(493750, 6601932, 0.0)
54	7.45E-01	22,11/01/04	(493750, 6601932, 0.0)
55	7.45E-01	05,09/05/01	(493750, 6601932, 0.0)
56	7.45E-01	05,09/01/04	(493750, 6601932, 0.0)
57	7.44E-01	20,20/05/01	(493750, 6601932, 0.0)
58	7.44E-01	20,20/01/04	(493750, 6601932, 0.0)
59	7.40E-01	15,14/05/01	(493750, 6601932, 0.0)
60	7.40E-01	15,14/01/04	(493750, 6601932, 0.0)
61	7.40E-01	12,06/05/01	(493750, 6601932, 0.0)
62	7.40E-01	12,06/01/04	(493750, 6601932, 0.0)
63	7.39E-01	20,09/01/00	(493750, 6601858, 0.0)
64	7.39E-01	20,10/09/02	(493750, 6601858, 0.0)
65	7.36E-01	23,15/07/02	(493750, 6601858, 0.0)
66	7.36E-01	23,16/03/05	(493750, 6601858, 0.0)
67	7.36E-01	21,01/05/01	(493750, 6601932, 0.0)
68	7.36E-01	21,01/01/04	(493750, 6601932, 0.0)
69	7.31E-01	08,17/05/01	(493750, 6601932, 0.0)
70	7.31E-01	08,17/01/04	(493750, 6601932, 0.0)
71	7.30E-01	19,03/05/01	(493750, 6601932, 0.0)
72	7.30E-01	19,03/01/04	(493750, 6601932, 0.0)
73	7.27E-01	03,13/05/01	(493750, 6601932, 0.0)
74	7.27E-01	03,13/01/04	(493750, 6601932, 0.0)
75	7.25E-01	13,12/01/00	(493750, 6601858, 0.0)
76	7.25E-01	13,13/09/02	(493750, 6601858, 0.0)
77	7.24E-01	06,13/07/02	(493750, 6601858, 0.0)
78	7.24E-01	06,14/03/05	(493750, 6601858, 0.0)
79	7.23E-01	20,15/05/01	(493750, 6601932, 0.0)
80	7.23E-01	20,15/01/04	(493750, 6601932, 0.0)
81	7.22E-01	15,11/08/02	(493750, 6601858, 0.0)
82	7.22E-01	15,12/04/05	(493750, 6601858, 0.0)
83	7.22E-01	22,08/08/02	(493750, 6601858, 0.0)
84	7.22E-01	22,09/04/05	(493750, 6601858, 0.0)
85	7.21E-01	05,06/08/02	(493750, 6601858, 0.0)
86	7.21E-01	05,07/04/05	(493750, 6601858, 0.0)
87	7.21E-01	10,10/05/01	(493750, 6601932, 0.0)
88	7.21E-01	10,10/01/04	(493750, 6601932, 0.0)
89	7.21E-01	08,14/08/02	(493750, 6601858, 0.0)
90	7.21E-01	08,15/04/05	(493750, 6601858, 0.0)
91	7.20E-01	12,03/08/02	(493750, 6601858, 0.0)
92	7.20E-01	12,04/04/05	(493750, 6601858, 0.0)

93	7.20E-01	01,17/08/02	(493750, 6601858, 0.0)
94	7.20E-01	01,18/04/05	(493750, 6601858, 0.0)
95	7.18E-01	19,31/07/02	(493750, 6601858, 0.0)
96	7.18E-01	19,01/04/05	(493750, 6601858, 0.0)
97	7.18E-01	01,20/05/01	(493750, 6601932, 0.0)
98	7.18E-01	01,20/01/04	(493750, 6601932, 0.0)
99	7.17E-01	18,19/08/02	(493750, 6601858, 0.0)
100	7.17E-01	18,20/04/05	(493750, 6601858, 0.0)

---

1 Peak values for the 100 worst cases (in Odour_Units)
Averaging time = 1 hour; Source group No. 3

Rank	Value	Time Recorded hour,date	Coordinates (* denotes polar)
1	2.18E+01	09,19/04/02	(493750, 6601858, 0.0)
2	2.18E+01	09,19/12/04	(493750, 6601858, 0.0)
3	2.16E+01	02,22/04/02	(493750, 6601858, 0.0)
4	2.16E+01	02,22/12/04	(493750, 6601858, 0.0)
5	2.16E+01	16,16/04/02	(493750, 6601858, 0.0)
6	2.16E+01	16,16/12/04	(493750, 6601858, 0.0)
7	2.09E+01	19,24/04/02	(493750, 6601858, 0.0)
8	2.09E+01	19,24/12/04	(493750, 6601858, 0.0)
9	2.08E+01	23,13/04/02	(493750, 6601858, 0.0)
10	2.08E+01	23,13/12/04	(493750, 6601858, 0.0)
11	1.98E+01	12,27/04/02	(493750, 6601858, 0.0)
12	1.98E+01	12,27/12/04	(493750, 6601858, 0.0)
13	1.97E+01	06,11/04/02	(493750, 6601858, 0.0)
14	1.97E+01	06,11/12/04	(493750, 6601858, 0.0)
15	1.83E+01	05,30/04/02	(493750, 6601858, 0.0)
16	1.83E+01	05,30/12/04	(493750, 6601858, 0.0)
17	1.82E+01	13,08/04/02	(493750, 6601858, 0.0)
18	1.82E+01	13,08/12/04	(493750, 6601858, 0.0)
19	1.66E+01	22,02/05/02	(493750, 6601858, 0.0)
20	1.66E+01	22,01/01/05	(493750, 6601858, 0.0)
21	1.64E+01	20,05/04/02	(493750, 6601858, 0.0)
22	1.64E+01	20,05/12/04	(493750, 6601858, 0.0)
23	1.46E+01	15,05/05/02	(493750, 6601858, 0.0)
24	1.46E+01	15,04/01/05	(493750, 6601858, 0.0)
25	1.45E+01	03,03/04/02	(493750, 6601858, 0.0)
26	1.45E+01	03,03/12/04	(493750, 6601858, 0.0)
27	1.26E+01	08,08/05/02	(493750, 6601858, 0.0)
28	1.26E+01	08,07/01/05	(493750, 6601858, 0.0)
29	1.25E+01	10,31/03/02	(493750, 6601858, 0.0)
30	1.25E+01	10,30/11/04	(493750, 6601858, 0.0)
31	1.09E+01	10,19/04/02	(493750, 6601858, 0.0)
32	1.09E+01	10,19/12/04	(493750, 6601858, 0.0)
33	1.08E+01	03,22/04/02	(493750, 6601858, 0.0)
34	1.08E+01	03,22/12/04	(493750, 6601858, 0.0)

35	1.08E+01	17,16/04/02	(493750, 6601858, 0.0)
36	1.08E+01	17,16/12/04	(493750, 6601858, 0.0)
37	1.07E+01	01,11/05/02	(493750, 6601858, 0.0)
38	1.07E+01	01,10/01/05	(493750, 6601858, 0.0)
39	1.05E+01	17,28/03/02	(493750, 6601858, 0.0)
40	1.05E+01	17,27/11/04	(493750, 6601858, 0.0)
41	1.05E+01	20,24/04/02	(493750, 6601858, 0.0)
42	1.05E+01	20,24/12/04	(493750, 6601858, 0.0)
43	1.04E+01	24,13/04/02	(493750, 6601858, 0.0)
44	1.04E+01	24,13/12/04	(493750, 6601858, 0.0)
45	9.92E+00	23,18/04/02	(493750, 6601858, 0.0)
46	9.92E+00	23,18/12/04	(493750, 6601858, 0.0)
47	9.90E+00	13,27/04/02	(493750, 6601858, 0.0)
48	9.90E+00	13,27/12/04	(493750, 6601858, 0.0)
49	9.88E+00	16,21/04/02	(493750, 6601858, 0.0)
50	9.88E+00	16,21/12/04	(493750, 6601858, 0.0)
51	9.87E+00	06,16/04/02	(493750, 6601858, 0.0)
52	9.87E+00	06,16/12/04	(493750, 6601858, 0.0)
53	9.84E+00	07,11/04/02	(493750, 6601858, 0.0)
54	9.84E+00	07,11/12/04	(493750, 6601858, 0.0)
55	9.73E+00	09,24/04/02	(493750, 6601858, 0.0)
56	9.73E+00	09,24/12/04	(493750, 6601858, 0.0)
57	9.71E+00	13,13/04/02	(493750, 6601858, 0.0)
58	9.71E+00	13,13/12/04	(493750, 6601858, 0.0)
59	9.48E+00	02,27/04/02	(493750, 6601858, 0.0)
60	9.48E+00	02,27/12/04	(493750, 6601858, 0.0)
61	9.46E+00	20,10/04/02	(493750, 6601858, 0.0)
62	9.46E+00	20,10/12/04	(493750, 6601858, 0.0)
63	9.16E+00	06,30/04/02	(493750, 6601858, 0.0)
64	9.16E+00	06,30/12/04	(493750, 6601858, 0.0)
65	9.15E+00	19,29/04/02	(493750, 6601858, 0.0)
66	9.15E+00	19,29/12/04	(493750, 6601858, 0.0)
67	9.12E+00	03,08/04/02	(493750, 6601858, 0.0)
68	9.12E+00	03,08/12/04	(493750, 6601858, 0.0)
69	9.08E+00	14,08/04/02	(493750, 6601858, 0.0)
70	9.08E+00	14,08/12/04	(493750, 6601858, 0.0)
71	8.79E+00	18,13/05/02	(493750, 6601858, 0.0)
72	8.79E+00	18,12/01/05	(493750, 6601858, 0.0)
73	8.74E+00	12,02/05/02	(493750, 6601858, 0.0)
74	8.74E+00	12,01/01/05	(493750, 6601858, 0.0)
75	8.70E+00	10,05/04/02	(493750, 6601858, 0.0)
76	8.70E+00	10,05/12/04	(493750, 6601858, 0.0)
77	8.63E+00	24,25/03/02	(493750, 6601858, 0.0)
78	8.63E+00	24,24/11/04	(493750, 6601858, 0.0)
79	8.28E+00	23,02/05/02	(493750, 6601858, 0.0)
80	8.28E+00	23,01/01/05	(493750, 6601858, 0.0)
81	8.26E+00	05,05/05/02	(493750, 6601858, 0.0)
82	8.26E+00	05,04/01/05	(493750, 6601858, 0.0)
83	8.21E+00	17,02/04/02	(493750, 6601858, 0.0)
84	8.21E+00	17,02/12/04	(493750, 6601858, 0.0)
85	8.20E+00	21,05/04/02	(493750, 6601858, 0.0)
86	8.20E+00	21,05/12/04	(493750, 6601858, 0.0)

87	7.73E+00	22,07/05/02	(493750, 6601858, 0.0)
88	7.73E+00	22,06/01/05	(493750, 6601858, 0.0)
89	7.67E+00	24,30/03/02	(493750, 6601858, 0.0)
90	7.67E+00	24,29/11/04	(493750, 6601858, 0.0)
91	7.65E+00	04,18/04/02	(493750, 6601858, 0.0)
92	7.65E+00	04,18/12/04	(493750, 6601858, 0.0)
93	7.63E+00	21,20/04/02	(493750, 6601858, 0.0)
94	7.63E+00	21,20/12/04	(493750, 6601858, 0.0)
95	7.63E+00	11,15/04/02	(493750, 6601858, 0.0)
96	7.63E+00	11,15/12/04	(493750, 6601858, 0.0)
97	7.57E+00	14,23/04/02	(493750, 6601858, 0.0)
98	7.57E+00	14,23/12/04	(493750, 6601858, 0.0)
99	7.56E+00	18,12/04/02	(493750, 6601858, 0.0)
100	7.56E+00	18,12/12/04	(493750, 6601858, 0.0)

---

1 Peak values for the 100 worst cases (in Odour_Units)
Averaging time = 1 hour; Source group No. 4

Rank	Value	Time Recorded hour,date	Coordinates (* denotes polar)
1	5.18E+02	03,28/01/02	(493750, 6601858, 0.0)
2	5.18E+02	03,29/09/04	(493750, 6601858, 0.0)
3	5.17E+02	20,30/01/02	(493750, 6601858, 0.0)
4	5.17E+02	20,01/10/04	(493750, 6601858, 0.0)
5	5.14E+02	10,25/01/02	(493750, 6601858, 0.0)
6	5.14E+02	10,26/09/04	(493750, 6601858, 0.0)
7	5.12E+02	13,02/02/02	(493750, 6601858, 0.0)
8	5.12E+02	13,04/10/04	(493750, 6601858, 0.0)
9	5.06E+02	17,22/01/02	(493750, 6601858, 0.0)
10	5.06E+02	17,23/09/04	(493750, 6601858, 0.0)
11	5.02E+02	06,05/02/02	(493750, 6601858, 0.0)
12	5.02E+02	06,07/10/04	(493750, 6601858, 0.0)
13	4.94E+02	24,19/01/02	(493750, 6601858, 0.0)
14	4.94E+02	24,20/09/04	(493750, 6601858, 0.0)
15	4.89E+02	23,07/02/02	(493750, 6601858, 0.0)
16	4.89E+02	23,09/10/04	(493750, 6601858, 0.0)
17	4.79E+02	07,17/01/02	(493750, 6601858, 0.0)
18	4.79E+02	07,18/09/04	(493750, 6601858, 0.0)
19	4.72E+02	16,10/02/02	(493750, 6601858, 0.0)
20	4.72E+02	16,12/10/04	(493750, 6601858, 0.0)
21	4.59E+02	14,14/01/02	(493750, 6601858, 0.0)
22	4.59E+02	14,15/09/04	(493750, 6601858, 0.0)
23	4.51E+02	09,13/02/02	(493750, 6601858, 0.0)
24	4.51E+02	09,15/10/04	(493750, 6601858, 0.0)
25	4.37E+02	21,11/01/02	(493750, 6601858, 0.0)
26	4.37E+02	21,12/09/04	(493750, 6601858, 0.0)
27	4.28E+02	02,16/02/02	(493750, 6601858, 0.0)
28	4.28E+02	02,18/10/04	(493750, 6601858, 0.0)

29	4.13E+02	04,09/01/02	(493750, 6601858, 0.0)
30	4.13E+02	04,10/09/04	(493750, 6601858, 0.0)
31	4.02E+02	19,18/02/02	(493750, 6601858, 0.0)
32	4.02E+02	19,20/10/04	(493750, 6601858, 0.0)
33	3.86E+02	11,06/01/02	(493750, 6601858, 0.0)
34	3.86E+02	11,07/09/04	(493750, 6601858, 0.0)
35	3.75E+02	12,21/02/02	(493750, 6601858, 0.0)
36	3.75E+02	12,23/10/04	(493750, 6601858, 0.0)
37	3.58E+02	18,03/01/02	(493750, 6601858, 0.0)
38	3.58E+02	18,04/09/04	(493750, 6601858, 0.0)
39	3.47E+02	17,27/01/02	(493750, 6601858, 0.0)
40	3.47E+02	17,28/09/04	(493750, 6601858, 0.0)
41	3.47E+02	05,24/02/02	(493750, 6601858, 0.0)
42	3.47E+02	05,26/10/04	(493750, 6601858, 0.0)
43	3.47E+02	10,30/01/02	(493750, 6601858, 0.0)
44	3.47E+02	10,01/10/04	(493750, 6601858, 0.0)
45	3.46E+02	24,24/01/02	(493750, 6601858, 0.0)
46	3.46E+02	24,25/09/04	(493750, 6601858, 0.0)
47	3.45E+02	03,02/02/02	(493750, 6601858, 0.0)
48	3.45E+02	03,04/10/04	(493750, 6601858, 0.0)
49	3.43E+02	07,22/01/02	(493750, 6601858, 0.0)
50	3.43E+02	07,23/09/04	(493750, 6601858, 0.0)
51	3.41E+02	20,04/02/02	(493750, 6601858, 0.0)
52	3.41E+02	20,06/10/04	(493750, 6601858, 0.0)
53	3.38E+02	14,19/01/02	(493750, 6601858, 0.0)
54	3.38E+02	14,20/09/04	(493750, 6601858, 0.0)
55	3.36E+02	13,07/02/02	(493750, 6601858, 0.0)
56	3.36E+02	13,09/10/04	(493750, 6601858, 0.0)
57	3.31E+02	21,16/01/02	(493750, 6601858, 0.0)
58	3.31E+02	21,17/09/04	(493750, 6601858, 0.0)
59	3.29E+02	01,01/01/02	(493750, 6601858, 0.0)
60	3.29E+02	01,02/09/04	(493750, 6601858, 0.0)
61	3.29E+02	06,10/02/02	(493750, 6601858, 0.0)
62	3.29E+02	06,12/10/04	(493750, 6601858, 0.0)
63	3.24E+02	04,14/01/02	(493750, 6601858, 0.0)
64	3.24E+02	04,15/09/04	(493750, 6601858, 0.0)
65	3.20E+02	23,12/02/02	(493750, 6601858, 0.0)
66	3.20E+02	23,14/10/04	(493750, 6601858, 0.0)
67	3.18E+02	22,26/02/02	(493750, 6601858, 0.0)
68	3.18E+02	22,28/10/04	(493750, 6601858, 0.0)
69	3.14E+02	11,11/01/02	(493750, 6601858, 0.0)
70	3.14E+02	11,12/09/04	(493750, 6601858, 0.0)
71	3.10E+02	16,15/02/02	(493750, 6601858, 0.0)
72	3.10E+02	16,17/10/04	(493750, 6601858, 0.0)
73	3.04E+02	18,08/01/02	(493750, 6601858, 0.0)
74	3.04E+02	18,09/09/04	(493750, 6601858, 0.0)
75	3.00E+02	08,29/12/01	(493750, 6601858, 0.0)
76	3.00E+02	08,30/08/04	(493750, 6601858, 0.0)
77	2.99E+02	09,18/02/02	(493750, 6601858, 0.0)
78	2.99E+02	09,20/10/04	(493750, 6601858, 0.0)
79	2.92E+02	01,06/01/02	(493750, 6601858, 0.0)
80	2.92E+02	01,07/09/04	(493750, 6601858, 0.0)

81	2.88E+02	15,01/03/02	(493750, 6601858,	0.0)
82	2.88E+02	15,31/10/04	(493750, 6601858,	0.0)
83	2.87E+02	02,21/02/02	(493750, 6601858,	0.0)
84	2.87E+02	02,23/10/04	(493750, 6601858,	0.0)
85	2.80E+02	08,03/01/02	(493750, 6601858,	0.0)
86	2.80E+02	08,04/09/04	(493750, 6601858,	0.0)
87	2.74E+02	19,23/02/02	(493750, 6601858,	0.0)
88	2.74E+02	19,25/10/04	(493750, 6601858,	0.0)
89	2.71E+02	15,26/12/01	(493750, 6601858,	0.0)
90	2.71E+02	15,27/08/04	(493750, 6601858,	0.0)
91	2.66E+02	15,31/12/01	(493750, 6601858,	0.0)
92	2.66E+02	15,01/09/04	(493750, 6601858,	0.0)
93	2.61E+02	12,26/02/02	(493750, 6601858,	0.0)
94	2.61E+02	12,28/10/04	(493750, 6601858,	0.0)
95	2.60E+02	08,04/03/02	(493750, 6601858,	0.0)
96	2.60E+02	08,03/11/04	(493750, 6601858,	0.0)
97	2.59E+02	04,28/01/02	(493750, 6601858,	0.0)
98	2.59E+02	04,29/09/04	(493750, 6601858,	0.0)
99	2.58E+02	21,30/01/02	(493750, 6601858,	0.0)
100	2.58E+02	21,01/10/04	(493750, 6601858,	0.0)

---

1 Peak values for the 100 worst cases (in Odour_Units)
Averaging time = 1 hour; Source group No. 5

Rank	Value	Time Recorded hour,date	Coordinates (* denotes polar)	
1	2.18E+01	09,19/04/02	(493750, 6601858,	0.0)
2	2.18E+01	09,19/12/04	(493750, 6601858,	0.0)
3	2.16E+01	02,22/04/02	(493750, 6601858,	0.0)
4	2.16E+01	02,22/12/04	(493750, 6601858,	0.0)
5	2.16E+01	16,16/04/02	(493750, 6601858,	0.0)
6	2.16E+01	16,16/12/04	(493750, 6601858,	0.0)
7	2.09E+01	19,24/04/02	(493750, 6601858,	0.0)
8	2.09E+01	19,24/12/04	(493750, 6601858,	0.0)
9	2.08E+01	23,13/04/02	(493750, 6601858,	0.0)
10	2.08E+01	23,13/12/04	(493750, 6601858,	0.0)
11	1.98E+01	12,27/04/02	(493750, 6601858,	0.0)
12	1.98E+01	12,27/12/04	(493750, 6601858,	0.0)
13	1.97E+01	06,11/04/02	(493750, 6601858,	0.0)
14	1.97E+01	06,11/12/04	(493750, 6601858,	0.0)
15	1.83E+01	05,30/04/02	(493750, 6601858,	0.0)
16	1.83E+01	05,30/12/04	(493750, 6601858,	0.0)
17	1.82E+01	13,08/04/02	(493750, 6601858,	0.0)
18	1.82E+01	13,08/12/04	(493750, 6601858,	0.0)
19	1.66E+01	22,02/05/02	(493750, 6601858,	0.0)
20	1.66E+01	22,01/01/05	(493750, 6601858,	0.0)
21	1.64E+01	20,05/04/02	(493750, 6601858,	0.0)
22	1.64E+01	20,05/12/04	(493750, 6601858,	0.0)

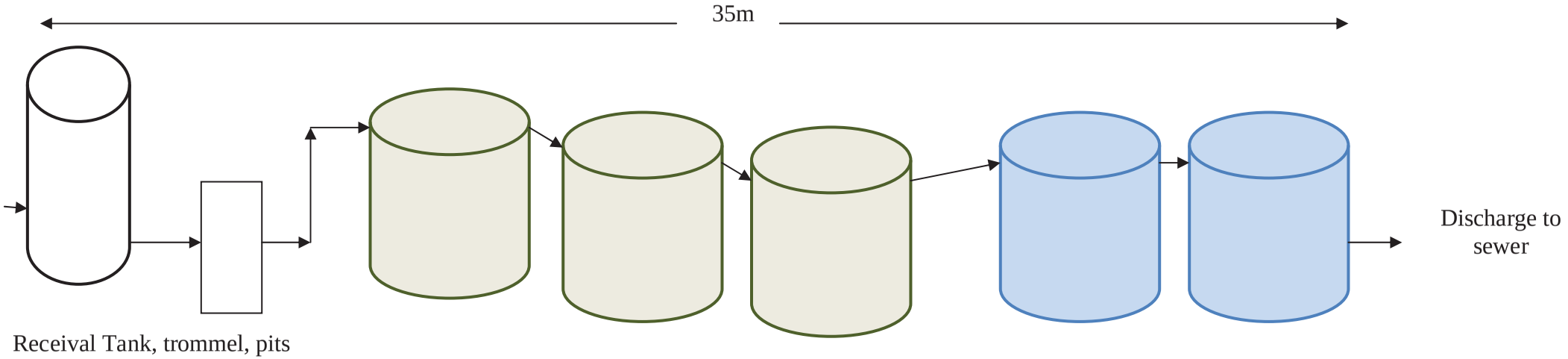
23	1.46E+01	15,05/05/02	(493750, 6601858, 0.0)
24	1.46E+01	15,04/01/05	(493750, 6601858, 0.0)
25	1.45E+01	03,03/04/02	(493750, 6601858, 0.0)
26	1.45E+01	03,03/12/04	(493750, 6601858, 0.0)
27	1.26E+01	08,08/05/02	(493750, 6601858, 0.0)
28	1.26E+01	08,07/01/05	(493750, 6601858, 0.0)
29	1.25E+01	10,31/03/02	(493750, 6601858, 0.0)
30	1.25E+01	10,30/11/04	(493750, 6601858, 0.0)
31	1.09E+01	10,19/04/02	(493750, 6601858, 0.0)
32	1.09E+01	10,19/12/04	(493750, 6601858, 0.0)
33	1.08E+01	03,22/04/02	(493750, 6601858, 0.0)
34	1.08E+01	03,22/12/04	(493750, 6601858, 0.0)
35	1.08E+01	17,16/04/02	(493750, 6601858, 0.0)
36	1.08E+01	17,16/12/04	(493750, 6601858, 0.0)
37	1.07E+01	01,11/05/02	(493750, 6601858, 0.0)
38	1.07E+01	01,10/01/05	(493750, 6601858, 0.0)
39	1.05E+01	17,28/03/02	(493750, 6601858, 0.0)
40	1.05E+01	17,27/11/04	(493750, 6601858, 0.0)
41	1.05E+01	20,24/04/02	(493750, 6601858, 0.0)
42	1.05E+01	20,24/12/04	(493750, 6601858, 0.0)
43	1.04E+01	24,13/04/02	(493750, 6601858, 0.0)
44	1.04E+01	24,13/12/04	(493750, 6601858, 0.0)
45	9.93E+00	23,18/04/02	(493750, 6601858, 0.0)
46	9.93E+00	23,18/12/04	(493750, 6601858, 0.0)
47	9.90E+00	13,27/04/02	(493750, 6601858, 0.0)
48	9.90E+00	13,27/12/04	(493750, 6601858, 0.0)
49	9.89E+00	16,21/04/02	(493750, 6601858, 0.0)
50	9.89E+00	16,21/12/04	(493750, 6601858, 0.0)
51	9.88E+00	06,16/04/02	(493750, 6601858, 0.0)
52	9.88E+00	06,16/12/04	(493750, 6601858, 0.0)
53	9.84E+00	07,11/04/02	(493750, 6601858, 0.0)
54	9.84E+00	07,11/12/04	(493750, 6601858, 0.0)
55	9.75E+00	09,24/04/02	(493750, 6601858, 0.0)
56	9.75E+00	09,24/12/04	(493750, 6601858, 0.0)
57	9.72E+00	13,13/04/02	(493750, 6601858, 0.0)
58	9.72E+00	13,13/12/04	(493750, 6601858, 0.0)
59	9.51E+00	02,27/04/02	(493750, 6601858, 0.0)
60	9.51E+00	02,27/12/04	(493750, 6601858, 0.0)
61	9.46E+00	20,10/04/02	(493750, 6601858, 0.0)
62	9.46E+00	20,10/12/04	(493750, 6601858, 0.0)
63	9.18E+00	19,29/04/02	(493750, 6601858, 0.0)
64	9.18E+00	19,29/12/04	(493750, 6601858, 0.0)
65	9.16E+00	06,30/04/02	(493750, 6601858, 0.0)
66	9.16E+00	06,30/12/04	(493750, 6601858, 0.0)
67	9.12E+00	03,08/04/02	(493750, 6601858, 0.0)
68	9.12E+00	03,08/12/04	(493750, 6601858, 0.0)
69	9.08E+00	14,08/04/02	(493750, 6601858, 0.0)
70	9.08E+00	14,08/12/04	(493750, 6601858, 0.0)
71	8.79E+00	18,13/05/02	(493750, 6601858, 0.0)
72	8.79E+00	18,12/01/05	(493750, 6601858, 0.0)
73	8.77E+00	12,02/05/02	(493750, 6601858, 0.0)
74	8.77E+00	12,01/01/05	(493750, 6601858, 0.0)

75	8.70E+00	10,05/04/02	(493750, 6601858,	0.0)
76	8.70E+00	10,05/12/04	(493750, 6601858,	0.0)
77	8.63E+00	24,25/03/02	(493750, 6601858,	0.0)
78	8.63E+00	24,24/11/04	(493750, 6601858,	0.0)
79	8.30E+00	05,05/05/02	(493750, 6601858,	0.0)
80	8.30E+00	05,04/01/05	(493750, 6601858,	0.0)
81	8.28E+00	23,02/05/02	(493750, 6601858,	0.0)
82	8.28E+00	23,01/01/05	(493750, 6601858,	0.0)
83	8.21E+00	17,02/04/02	(493750, 6601858,	0.0)
84	8.21E+00	17,02/12/04	(493750, 6601858,	0.0)
85	8.20E+00	21,05/04/02	(493750, 6601858,	0.0)
86	8.20E+00	21,05/12/04	(493750, 6601858,	0.0)
87	7.77E+00	22,07/05/02	(493750, 6601858,	0.0)
88	7.77E+00	22,06/01/05	(493750, 6601858,	0.0)
89	7.71E+00	04,18/04/02	(493750, 6601858,	0.0)
90	7.71E+00	04,18/12/04	(493750, 6601858,	0.0)
91	7.70E+00	21,20/04/02	(493750, 6601858,	0.0)
92	7.70E+00	21,20/12/04	(493750, 6601858,	0.0)
93	7.68E+00	11,15/04/02	(493750, 6601858,	0.0)
94	7.68E+00	11,15/12/04	(493750, 6601858,	0.0)
95	7.67E+00	24,30/03/02	(493750, 6601858,	0.0)
96	7.67E+00	24,29/11/04	(493750, 6601858,	0.0)
97	7.64E+00	14,23/04/02	(493750, 6601858,	0.0)
98	7.64E+00	14,23/12/04	(493750, 6601858,	0.0)
99	7.61E+00	18,12/04/02	(493750, 6601858,	0.0)
100	7.61E+00	18,12/12/04	(493750, 6601858,	0.0)

APPENDIX C

forEarth Technical Information

WASTE WATER BIO REACTOR SYSTEM
Probiotic, Low Energy Aeration System (PLEAS)



Bio Reactor Notes;

1. Gravity flow system..
2. Tank Dimensions:
   3 x: 40,000L tanks Dia 4.5m x Hgt 2.8M

Title: Dubbo Plant - Concept	FOR Earth Pty Ltd T: 0265814353 18/02/13 Status:

ODOUR ELIMINATION – WASTE WATER BIOREMEDIATION – SOIL BIOREMEDIATION

PROBIOTICS & LOW ENERGY AERATION SYSTEMS

COMPANY INFO
About Us
Contact
Testimonials
Media
Trade Shows
EXPERTISE
Wastewater
Odour
Case Studies
Test Results
PRODUCTS
Septics
Products
Order

FOR EARTH PTY LTD
PO BOX 616,
PORT MACQUARIE
AUSTRALIA NSW 2444.

Tel: 61 2 65 814353
Mob: 0417 694 844

BIOLOGICAL WASTE WATER & ODOUR SOLUTIONS

PROBIOTIC, LOW ENERGY AERATION SYSTEM ™

For Earth specialise in the following waste water treatment processes.

- Biological sludge removal
- Biological septicity treatment
- Biological algae control
- Biological nutrient removal
- Biological odour control
- Low energy aeration systems

PROBIOTIC BACTERIA PRODUCTS

For Earth Supply a range of Bacteria products to target specific waste water from residential and industrial sources. Each For Earth biological product contains large volumes of selected natural occurring bacteria that target specific organic waste types. The products bacteria are selected to improve the BNR process of your waste water treatment system. By dosing our bacteria product into your anaerobic, anoxic or aerobic zones you will achieve improved Nitrogen or phosphorus reductions and reduce biological solids within the plant. Our products come in liquid form with a 24 month shelf life and have proven to be an essential tool for any waste water plant operator.

LOW ENERGY AERATION

For Earth low energy aeration is designed to complement our bacteria range of products which contain strict aerobe and facultative anaerobes. Our aeration is also very energy efficient and adaptable to any waste water retention area. The aeration is floated on the surface with diffused air set at sub surface levels creating an aerobic surface zone. The aeration is used in many innovative solutions as listed below.

- Converting anaerobic sludge storage lagoons into aerobic sludge digesters. Significantly reducing sludge loads on plants.
- Aerating tertiary pond discharge areas to promote biological phosphorus uptake and polishing of final water.
- Aerating of sludge storage lagoons to promote phosphorus uptake and contain P within the lagoon
- Aerating odorous waste water ponds/tanks to eliminated odour.
- Aeration to reduce algae issues
- Replacing high energy consuming mechanical aeration.

SUPPORT & SERVICE

For Earth work closely with each client to develop a biological solution for overloaded and poorly designed waste water retention systems. We liaise with EPA, Councils and Consultants to assist clients with their projects. For Earth have many proven successes in various industries which have unique waste water issues to deal with.
Your Industry has a For Earth solution;

SEWERAGE TREATMENT PLANTS

Most STP's are under serious stress from overloading. Many were designed for smaller populations and less industry waste water. General consensus with Council staff is that the quality of modern day influent is very detrimental to having high volumes of quality bacteria occurring naturally to deal with the loading in their plant and ponds. For Earth have developed methods to deal with common STP problems such as Algae, biological desludging, digesters, aeration, odour, improving discharged water quality etc. These solutions can be adapted to your current systems and are low cost and energy efficient.

LANDFILLS – Waste Recovery Centres

For Earth are successfully treating leachate water from landfill sites. We are developing the 'wet landfill system' which recycles treated leachate to the landfill face to biologically accelerate the treatment and breakdown of the landfill and odour elimination. The process is being used on open and capped landfills.

FOOD PROCESSING INDUSTRIES

For Earth have developed onsite pre-treatment systems that reduce organic loadings considerably for discharged treated water to sewerage. Loads based charging for discharged waste water will be introduced Australia wide and these charges will increase forcing management to improve/implement on site pre-treatment systems. For Earth have simply low cost solutions that can be adapted to existing systems or developed from scratch. Funding is available.
Other areas of For Earth expertise;

- Soil Bioremediation
- Landfill leachate water
- Septic & Grease trap
- Composting
- Saleyards and truck wash systems
- Golf Courses
- Wetland, Aquifer systems
- Bio Reactor systems
- Algae
- Lakes & Ponds

ODOUR ELIMINATION – WASTE WATER BIOREMEDIATION – SOIL BIOREMEDIATION

PROBIOTICS & LOW ENERGY AERATION SYSTEMS

COMPANY INFO
About Us
Contact
Testimonials
Media
Trade Shows
EXPERTISE
Wastewater
Odour
Case Studies
Test Results
PRODUCTS
Septics
Products
Order

FOR EARTH PTY LTD
PO BOX 616,
PORT MACQUARIE
AUSTRALIA NSW 2444.

Tel: 61 2 65 814353
Mob: 0417 694 844

WASTEWATER

SEWERAGE LANDFILL FEEDLOTS SEPTICS PONDS PIG FARMS DAIRIES WINERIES RESTAURANTS FUN PARKS COMPOST

With the use of our products you will be able to reduce the following wastewater problem areas to below legal regulatory levels – Biochemical Oxygen Demand, Chemical Oxygen Demand, Total Suspended Solids, Oils & Grease, Total Biological Phosphorous, Nitrates, Nitrites, Ammonia, Faecal Coliforms and Odour. (see Test Results)

All businesses and households produce wastewater of some kind. The content of the wastewater varies from industry to industry. Depending on the content and quality, this wastewater can be discharged directly into the local areas sewerage or water mains or it has to be held in retention areas for treatment before being discharge or taken away for further treatment. The key element in breaking down human, animal and organic waste in wastewater treatment is having high quality, large volumes of beneficial bacteria. Typical retention areas are effluent ponds, catchment ponds, septic tanks and greasetraps.

Industry goal is to recycle this wastewater or improve it to a suitable standard that it can be used for irrigation, wash downs, dust suppression etc. For Earth has enabled industries to achieve this goal with the use of Pro-biotic beneficial bacteria.

Some industries such as the waste landfill industry are successfully recycling their wastewater (Leachate) and adding our beneficial bacteria products to create what is commonly referred to as a 'Bio-reactor'. The cost savings are enormous, as they no longer need to purchase water or pay for the removal of wastewater. In addition they are reducing ammonia levels and eliminating toxic odours much to the relief of site staff and surrounding residents. (see Case Studies and Test Results).

Wastewater Ponds

In the past and currently in some areas farmers and food processors that produced a lot of animal and organic waste dispose of this waste in 'Anaerobic' waste ponds. (Anaerobic means that the ponds are not oxygenated). This was due to there being no power available and no neighbours for miles to smell the odour.. These ponds generally crust up on the surface and are only 70% efficient in processing waste.

Due to urban sprawl, increased output and the use of caustic cleaning chemicals many industries that use these waste ponds are under much pressure to improve the efficiency of their waste pond system. Aerobic ponds (oxygenated) if correctly designed are up to 95% efficient.

For a waste water pond to be at a high level of efficiency it needs aeration and beneficial bacteria suitable for the waste.

Industry began introducing aerations systems such as the commonly found surface paddle wheel type. This type of aeration is expensive, high-energy consumption and maintenance headaches.

Industry also developed methods of increasing bacteria colonies in their ponds such as throwing a dead kangaroo into a pond and the more scientific method of culturing their own bacteria. Culturing bacteria is very time consuming and expensive and not always be efficient in quality and quantity of bacteria produced. The biggest dilemma with culturing bacteria is that it never could be stored unless freeze dried (expensive and mixed results).

For Earth, Australia now have developed the science to keep high quality specific beneficial bacteria dormant in liquid suspension. This has solved the problem for industry in having a high quality inexpensive beneficial bacteria supply that they can store and use when needed.

For Earth Pty Ltd realised that the aeration issue needed to be improved to really solve the wastewater issue in ponds. For Earth have developed a low energy highly efficient aeration system using Industrial type air stones. As a waste pond requires aerobic bacteria activity on the surface levels we have developed our system to be 1 mtr deep below the surface. This creates an oxygenated blanket across the pond which aerobic bacteria thrive in breaking down surface solids and eliminating odours. This also allows the anaerobic bacteria to continue the job of attacking the sludge at the bottom of the pond. An added bonus is that we also reduce the high-energy bills as we only use 1 hp air blowers instead of 20 hp motors.

The results of the combined bacteria and aeration system have been way beyond expectation.

For Earth supplies a large array of industrial type cleaning and sanitising products that are supportive of the beneficial bacteria. These replace the caustic chemicals being used that kill the bacteria in the waste ponds.

BIOLOGICAL SLUDGE REMOVAL

Shane Mckibbin – For Earth Pty Ltd

Over the past six years For Earth has been developing biological systems to accelerate the removal of nutrients and solids from wastewater systems.

For Earth has successfully developed the Probiotic Low Energy Aeration System™ which biologically removes sludge from sewerage treatment plants' sludge storage lagoons and tanks.

The system involves the use of sub-surface aeration and also automated application of a bacteria product For Earth Bio™ which is surface sprayed at set periods. With the introduction of specific bacteria into an aerated zone, substantial biological sludge reduction is achieved within the sludge storage lagoon. The cost savings being achieved by council engineers and operators has been substantial.

Coffs Harbour Council which installed the For Earth system in August 2009 has enjoyed cost savings which have been presented in a technical paper. The paper outlines the successful results achieved at the Woolgoolga Sewerage Treatment Plant that was under considerable sludge load.

Initially the Probiotic Low Energy Aeration System was used to desludge an offline sludge storage lagoon and then this lagoon was placed online with supernate flowing into sludge storage lagoon number two. Some of the operational and costs savings outlined in the paper are as follows.

- Production of dry sludge decreased by 47%
- Sludge handling costs reduced by $1,400 per week
- Treated sludge transferred to drying beds dewaters in approx 10 days which was previously 3-4 weeks.
- The postponement of a $1.5M centrifuge sludge augmentation system.
- Considerable odour reductions
- Coffs Harbour Council have extended the use of the For Earth system to three other sewerage treatment facilities.

The For Earth Biological Sludge Removal System has been taken onboard by many councils throughout NSW. The high cost of mechanical removal, dewatering and transport of the dried sludge can vary from $100 to $150 per cubic metre of sludge. The For Earth system costs approximately $5 per cubic metre. The capital cost of the automated bacteria dosing system and low energy aeration system is minimal and there is very little maintenance required. The dosing and aeration system can be retrofitted to any tank, lagoon or retention area and also easily relocated. The For Earth system is especially useful in plastic poly-lined ponds as mechanical sludge removal can damage the lining. Also the system has advantages in location where heavy machinery cannot gain access.

The For Earth system of biological sludge removal has become an accepted sludge removal process and we are seeing council engineers and operators adapt the technology to catch balance tanks, extended aeration tanks, tertiary ponds, sale yard effluent ponds, landfill leachate ponds and decommissioning of tanks and ponds.

The Probiotic Low Energy Aeration System has also successfully gained project funding by clients through the Department of Environment Climate Change, Department Primary Industry and Enviro Fund due to the environmental benefit of reduced carbon footprints through energy savings.

For further information visit www.forearth.com.au or email shanem@forearth.com.au.

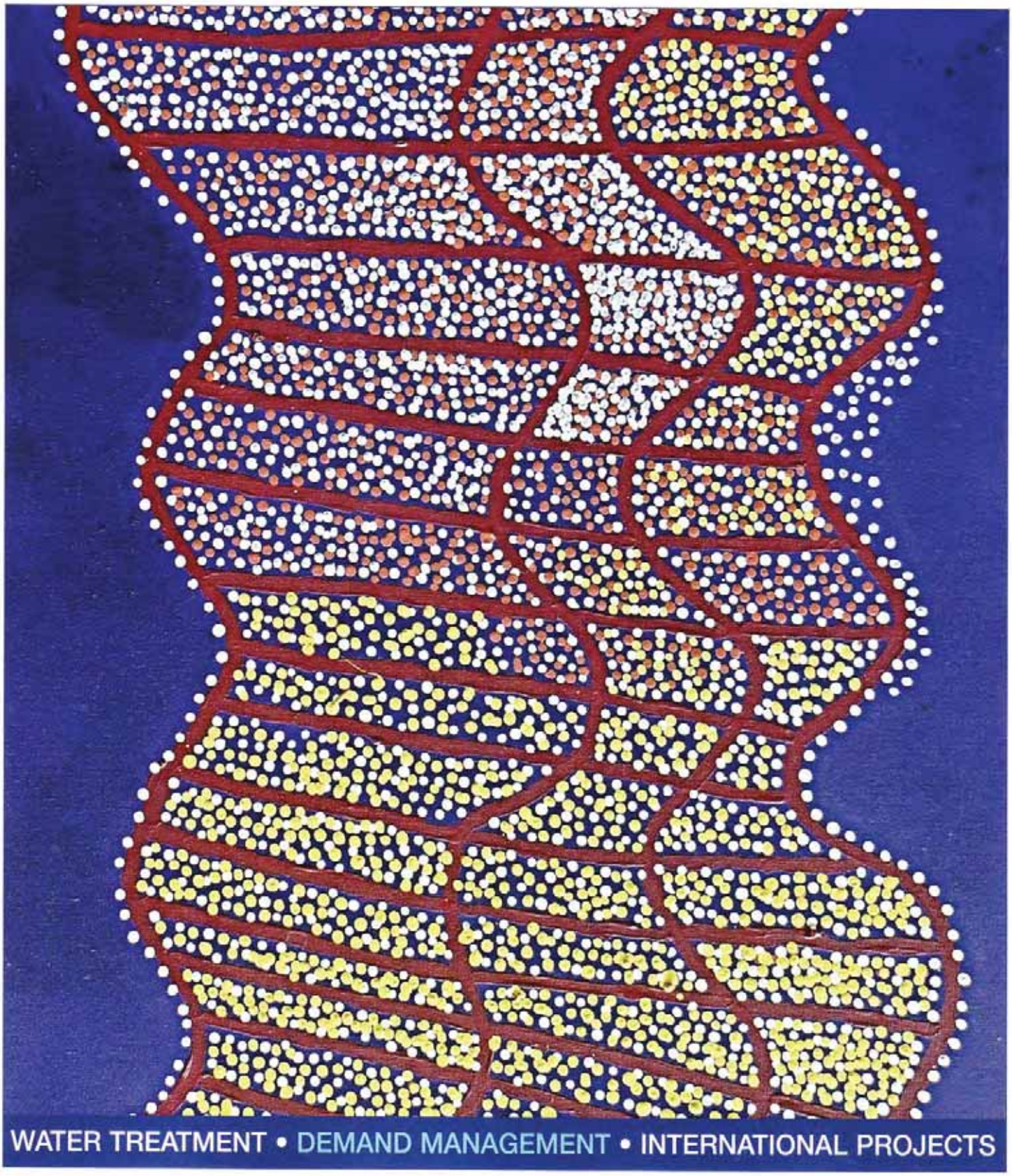
SURPRISING RESULTS FROM ECOLINE STUDY

A study by Simmonds and Bristow has demonstrated the Ecoline system, the world's first commercial electrochemical system capable of disinfecting fresh water, also produces

Volume 37 No 5 AUGUST 2010

water

JOURNAL OF THE AUSTRALIAN WATER ASSOCIATION



WATER TREATMENT • DEMAND MANAGEMENT • INTERNATIONAL PROJECTS

PRINT POST APPROVED PP 225517/00008

range of oxidants to more effectively l bacteria in fresh water.

The independent analysis of the oline system demonstrated chlorine presented 44% of the total oxidants oduced. The remaining 56% of idants are stronger than chlorine and hieve a even greater disinfection fect.

The results confirmed the Ecoline's bility to effectively treat drinking water nd revealed unexpectedly high oxidant vels making it even more ideal for astewater sterilisation than nticipated.

Elena Gosse, director of Australian novative Systems, said this was xciting news for the wastewater dustry.

"Achieving maximum kill rate of acteria is essential in the wastewater dustry and the Ecoline system is roving why electrochemical isinfection offers superior performance chlorine only systems," Elena Gosse aid.

"While chlorine is able to kill bacteria, xidants not only kill the bacteria, but ain the cell structure and deactivate iruses," she said.

"More research needs to be done into which oxidants are being generated and responsible for such significant kill rates, but based on existing evidence they include chlorine dioxide, hydrogen peroxide and ozone.

"We are also doing studies in conjunction with some Queensland councils at their wastewater sites and we are looking forward to those results," Ms Gosse said.

She said the study was not intended to examine the oxidant levels, but the results were a pleasing outcome.

"We were focused on the chlorine generation levels with varying voltage and the by-products of the sterilisation," said Ms Gosse.

"We have also learned we can produce more chlorine with less power and confirmed any undesirable by-products are well below Australian drinking standards," she said.

"This study has reaffirmed the Ecoline's chlorine production is ideal for drinking water, but even better than we anticipated for waste water management because of the unexpectedly high oxidant levels," Ms Gosse said.

The Ecoline system is the world's first commercial electrochemical sterilisation system capable of treating fresh water. The system does not require any salt or chemicals to be added, it makes and regulates the chlorine levels needed to sterilise fresh water, eliminating the risks involved with manual chemical handling, transport, storage and dosing.

It is a cleaner, greener and safer system to sterilise fresh water.

The system can be used for any water sterilisation application including drinking water, wastewater, recycled water, grey water, sewerage, irrigation, food processing plants, reverse osmosis, desalination, swimming pools, water features, cooling towers, spas and Jacuzzis.

The Ecoline system can be retrofitted to any water treatment system. It is an on-site, in-line chlorine generation plant capable of producing chlorine and other oxidants in fresh water from the small amount of natural salts and minerals present in the water.

For further information www.aiswater.com.au, info@aiswater.com.au, Telephone: 07 3396 5222, Facsimile: 07 3393 3441.

FOR EARTH BIO PLUS ®

USING THE SCIENCE OF PROBIOTICS TO SOLVE ODOUR & WASTE WATER PROBLEMS

BIOLOGICAL ODOUR AND SLUDGE REMOVAL

For Earth Bio Plus is used in the following areas;

- **Odour reductions at Pumping stations (H2S)**
- **Fats, Oils and Grease removal from Pumping stations and piping.**
- **Sewage Plant inlet works dosing to reduce odours, provide sufficient levels of bacteria in the plant and reduce sludge loads to drying beds.**

What is FOR EARTH BIO PLUS?

For Earth Bio Plus® is a selection of specific beneficial bacteria **native** to wastewater and selected for their durability in harsh and toxic conditions and also their appetite for waste nutrients commonly found in human, animal and green waste. The beneficial bacteria are specific to the Nitrogen Cycle, and are 'first generation' as cultured directly from laboratory conditions. This means the user gets maximum regenerations prior to the bacteria experiencing 'lysis'. The beneficial bacteria are held dormant in liquid form and can be stored for 2 years. By adding Bio Plus to your overloaded waste water system, you will dramatically accelerate the Biological Nutrient Removal (BNR) and inturn considerably reduce the following waste water parameters; Fats, Oils, grease, BOD, COD, suspended solids, Nitrites, Nitrates, Ammonia, Nitrogen, Algae and faecal Coliform. Significant odour reduction also occurs (H2S) and pipe narrowing will also be reduced.

What Type of Industries use Bio Plus?

- Council Waste Water Treatment Systems
- Liquid Trade Waste plants
- Abattoirs
- Fertiliser manufactures
- Landfills
- Septics
- Feedlots
- Food Processing

Aabove: Bacteria dosing cabinet at pumping station

How is Bio Plus applied?

For Earth Bio Plus is typically dosed automatically via the use of dosing pumps that are set to dose at specific times of the day. Operators simply need to change the product drum as scheduled. For Earth can supply a range of dosing systems to suit all budgets.

Bay 2, Cnr Uralla & Merrigal Rd, Port Macquarie NSW 2444
T: 02 65814353 F: 02 65814353 E: shanem@forearth.com.au , www.forearth.com.au

FOR EARTH BIO PLUS ®

USING THE SCIENCE OF PROBIOTICS TO SOLVE ODOUR & WASTE WATER PROBLEMS

Do I need Aeration?

For Earth Bio Plus is very effective on its own but with overloaded waste water systems, aeration will improve and accelerate biological nutrient removal.

For Earth specialise in low cost, low energy use but highly efficient aeration systems. Bio Plus contains beneficial bacteria that require oxygen (aerobic) to regenerate and also beneficial bacteria that do not require oxygen (anaerobic).

Our aeration system places an aerobic blanket in the top level of your waste pond and an anaerobic level in the bottom levels. By doing this the aerobic top level quickly deals with fresh incoming wastes and floating odorous waste while the anaerobic level deals with bottom sludge but isn't disturbed by aeration and odours are kept to a minimum.

With the combination of For Earth Bio Plus and our aeration systems our clients have been able to achieve dramatic results beyond expectations.

Bacteria Dosing Cabinet and aeration pumps

Pre treatment of trade waste prior to discharge to sewer.

Important product information;

- For Earth bio plus has AQIS Approval.
- There are no solvents or enzymes in this product.
- Bio is 100% bio degradable and environmentally friendly.
- We have various independent reports and trials papers on our products.

Further Information

Shane Mckibbin: Manager mob: 0429 838 443 email: shanem@forearth.com.au

FOR EARTH BIO PLUS ®

USING THE SCIENCE OF PROBIOTICS TO SOLVE ODOUR & WASTE WATER PROBLEMS

Bay 2, Cnr Uralla & Merrigal Rd, Port Macquarie NSW 2444
T: 02 65814353 F: 02 65814353 E: shanem@forearth.com.au , www.forearth.com.au

IOA No 11855

AQIS APPROVAL OF CHEMICAL COMPOUND FOR USE IN EXPORT REGISTERED MEAT ESTABLISHMENTS

COMMONWEALTH OF AUSTRALIA
EXPORT CONTROL ACT 1982
EXPORT MEAT ORDERS

INSTRUMENT OF APPROVAL FOR CHEMICAL COMPOUND

I, Dean Traynor, delegate of the Secretary, pursuant to order 128 of the Prescribed Goods (General) Orders hereby approve for use in export registered meat establishments the chemical compound known as **For Earth Bio Plus** which is supplied by For Earth Pty Ltd. Subject to the conditions specified in the following Schedule. Please note this IOA is only valid at export registered meat establishments. When using the above product all manufacturer's recommendations must be observed.

SCHEDULE

The chemical compound is approved under **Category 22 Odour Neutralising Agent.** This compound must not be used for any other purpose within an export registered meat establishment.

- The chemical compound shall be manufactured, labelled and contain directions for use in accordance with the details supplied by the applicant in the application for approval dated 20th November 2008.

- The person to whom this approval is granted shall notify the Secretary of any proposed alteration of formulation, labelling or directions for use of the chemical compound, and shall not effect any such alterations without receiving notification of approval from the Secretary.

- **A compound for use in areas containing inedible prescribed goods, non-processing areas or exterior areas for us in odour control, provided it is not used to mask oudours resulting from unsanitary conditions and any characteristic odous do not penetrate into areas containing edible prescribed goods. Intended for use around external bins and drains etc. Not for inside use.**

- This approval is not to be construed as an indication that the Secretary has tested the efficacy of the chemical compound nor as an endorsement of the chemical compound.

- The person to whom this approval is granted shall not use the approval in any form of advertising or on any label unless the wording or display has been approved, in writing, by the Secretary.

- This approval may be revoked at any time
  (a) if any of the conditions made by this approval are not complied with; or
  (b) if the circumstances in which this approval was made change.

- Unless revoked, this approval will expire automatically on the 12th December 2013.

DATED THIS Twelfth day of December 2008

Dean Traynor

APPLICATION FEE
$200.00
PAID

WATER SERVICES ASSOCIATION
OF AUSTRALIA

Alan Mckibbin
Managing Director
For Earth Pty Ltd

Bay 2, No 1 Merrigal Rd
Port Macquarie NSW 2444
Australia.

Dear Alan
Thank you for meeting with me on the 14th November. During the meeting we discussed the various applications of the For Earth product range and the requirements of the Water Services Associations, trade waste product appraisal program.

The program is designed to be a national scheme to assess the conformance of trade waste pre-treatment products used in a commercial application. The commercial applications are those applications that do not have a specifically managed trade waste discharge agreement, which is the case for industrial applications. At present the products covered by the program include:

- Passive grease arrestors,
- Active grease separators
- In sink and in floor basket arrestors,
- Oily water separators
- General purpose pits, and
- Biological additives for use in passive grease arrestors

My understanding of our meeting was that the application of your biological additive product was for use in a trade waste management facility as part of a treatment process prior to discharge to sewer. The view of WSAA in this application of your product is considered as an industrial application and subject to a negotiated industrial discharge agreement between the approval authority and the company involved. Given this interpretation of the application of your product a WSAA product appraisal is not required.

I hope that this clarification is of assistance. Please feel free to contact me should you or your client require further clarification.

Sincerely

Grant Leslie

Grant Leslie
Business Manager
Water Services Association of Australia

MELBOURNE OFFICE
LEVEL 8, 469 LATROBE STREET
MELBOURNE VIC 3000
PO BOX 13172
LAW COURTS VIC 8010
TEL: 03 9606 0678 FAX: 03 9606 0376

ABN: 54 117 907 285
www.wsaa.asn.au

SYDNEY OFFICE
LEVEL 30, 9 CASTLEREAGH STREET
SYDNEY NSW 2001
GPO BOX 915
SYDNEY NSW 2001
TEL: 02 9221 5966 FAX: 02 9221 5977

FOR EARTH SAMPLE CLIENT LIST **Biological Product users.**

	Application						
Council	**Pump Station**	**Inlet Dosing**	**Sludge Ponds**	**Tertiary Ponds**	**Tradewaste**	**Landfill**	**Saleyard**
PMHC							
Kempsey							
Nambucca							
Bellingen							
Coffs Harbour							
Tweed							
Kyogle							
Moree							
Gunnedah							
Guyra							
Mudgee							
S.A Water							
South Gippsland Water							
Westernport Water							
Tamworth Council							
Clarence Valley							
Cootamundra							

Waste Water & Odour Solutions

To: Mr. Troy Pemberton
J.R. Richard & Sons
Area Manager
King Fisher Rd
Port Macquarie NSW 2444

17/02/2012

From: Alan Mckibbin
For Earth Pty Ltd

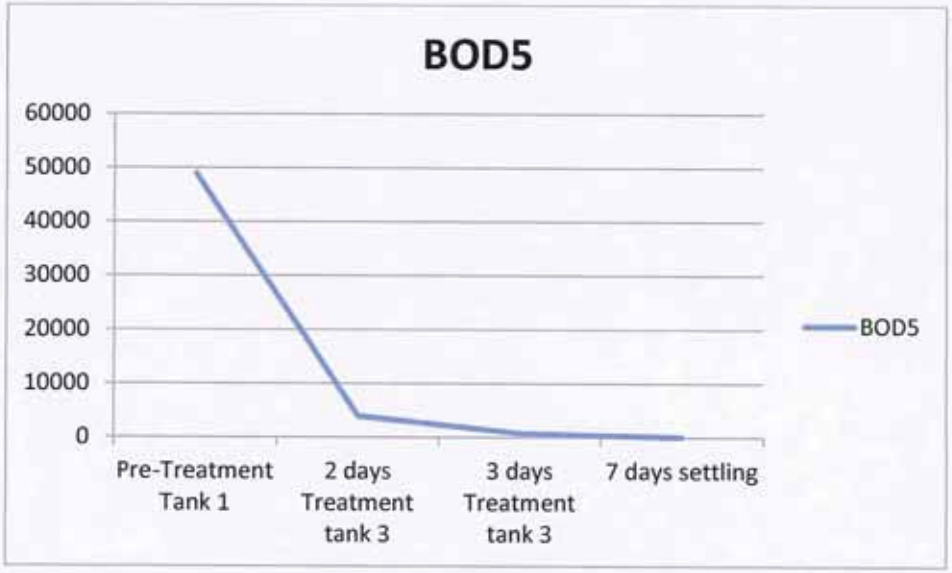
TRIAL REPORT

THREE TANK BIOREACTOR TRIAL ON AQUEOUS WASTE

Results

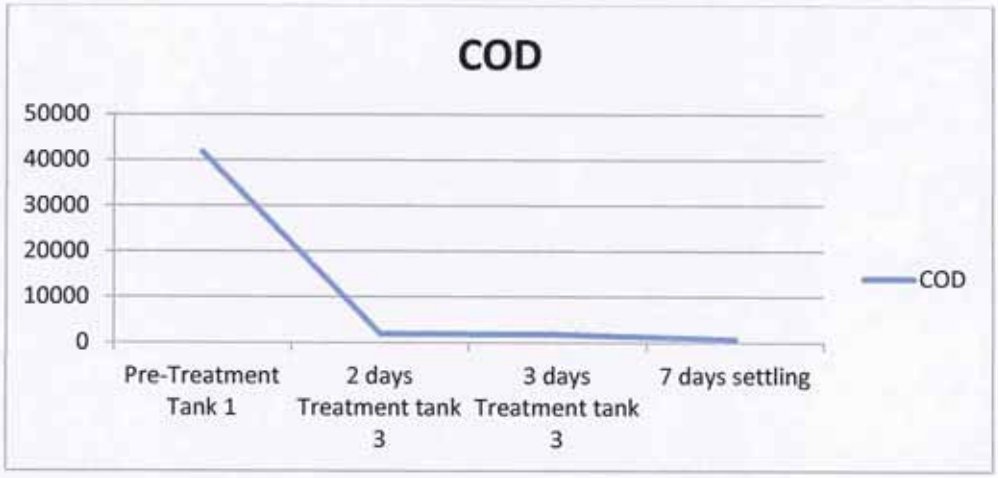
	Pre-Treatment Tank 1	2 days Treatment tank 3	3 days Treatment tank 3	% Reduction	7 days settling	% Reduction
BOD5	49000	4000	780	98.4%	71	99.9%
COD	41820	1937	1845	95.6%	730	98.2%
O & G	21600	0	30	99.0%	3	99.9%
TSS	27450	1938	520	98.0%	88	99.6%

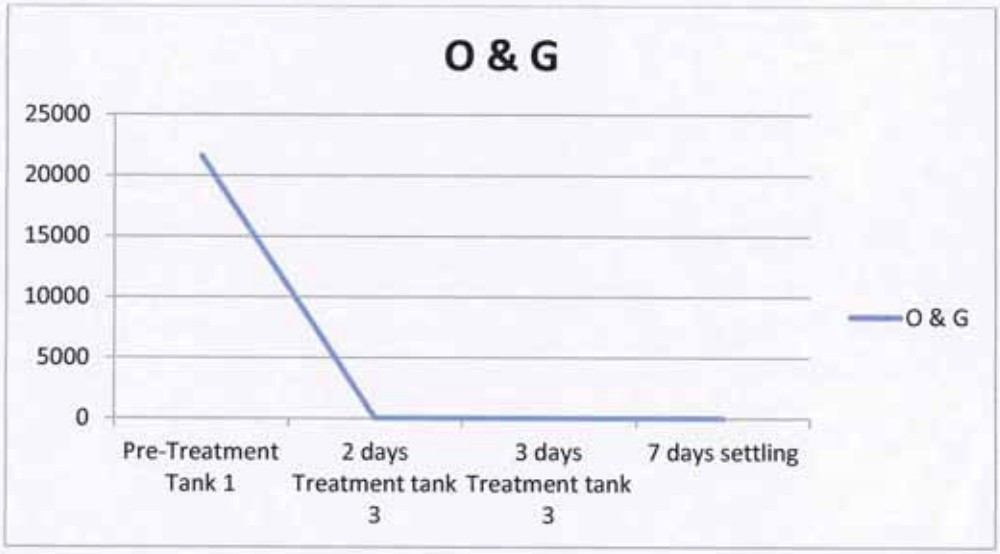
Graphs of results

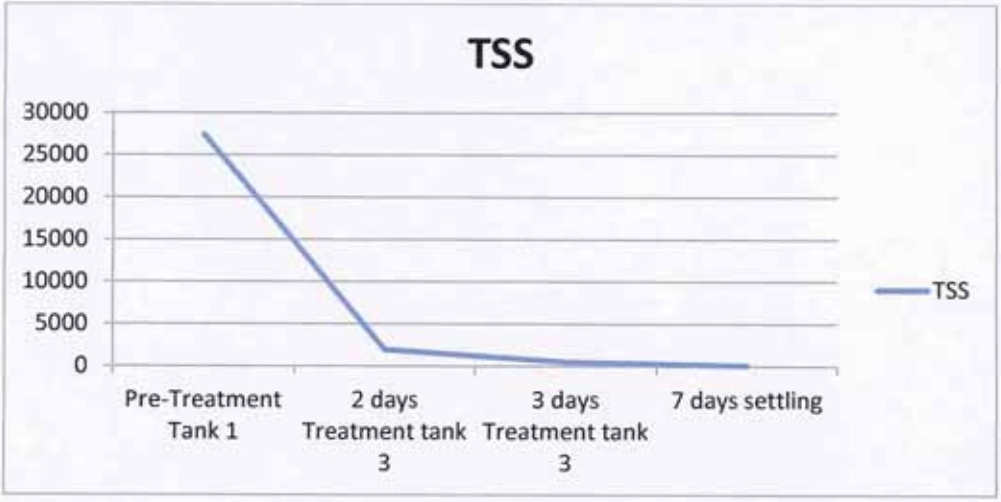


bay 2 cnr uralla & merrigal rds port macquarie nsw 2444
t/f: 612.6581 4353 m: 0417 694 844
e: alanm@forearth.com.au w: www.forearth.com.au

Waste Water & Odour Solutions



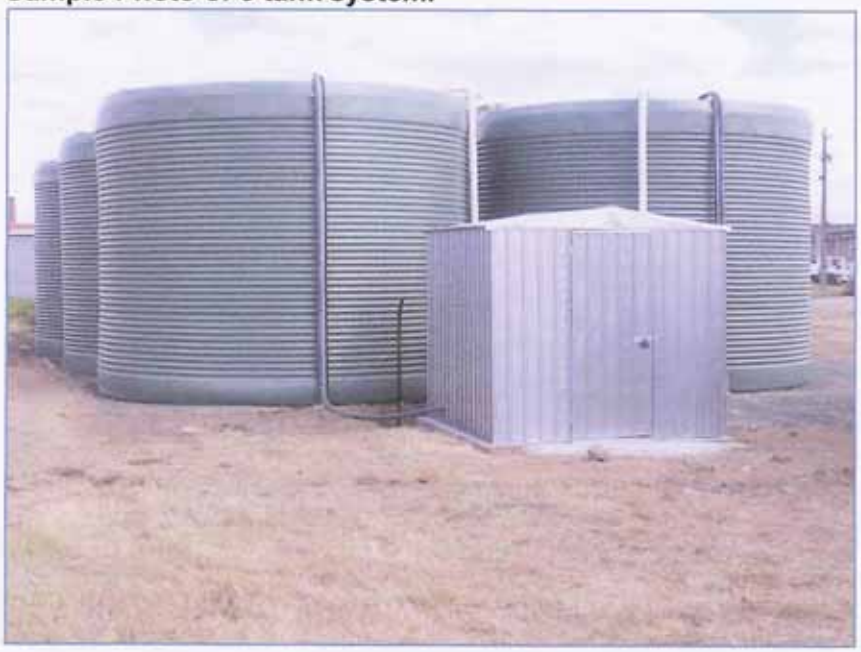




bay 2 cnr uralla & merrigal rds port macquarie nsw 2444
t/f: 612.6581 4353 m: 0417 694 844
e: alanm@forearth.com.au w: www.forearth.com.au

Waste Water & Odour Solutions

Sample Photo of 3 tank system.



Yours sincerely,

Alan Mckibbin

Managing Director

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444
t/f: 612.6581 4353 m: 0417 694 844
e: alanm@forearth.com.au w: www.forearth.com.au

PORT MACQUARIE HASTINGS

ENVIRONMENTAL LABORATORY

PO Box 84
Cnr Ocean Drive and Koala Street
Port Macquarie NSW 2444 Australia

Telephone (02) 6581 8810 Email: council@hastings.nsw.gov.au
Facsimile (02) 6581 8814 Website: www.hastings.nsw.gov.au

Quality System
Quality Endorsed Company

Enquiries to: Maree Smith
Telephone: (02) 65818810
Fax: (02) 65818814
Reference: H07 4991/4993

13th December 2007

TO: Phil Waugh
Hastings Food Processing
43-45 Commerce Street
Wauchope NSW 2446

LABORATORY REPORT

Date Sampled : 28.11.07

Date Received : 28.11.07

Sample Description : Water – Tank

Method Reference : MET 017.2, APHA, (21st Ed) 2005, *Standards Methods for the Examination of Water and Waste Water.*

RESULT OF ANALYSIS

Laboratory ID	Sample Description	BOD_5 ($mg\ L^{-1}$)	Total Oil and Grease ($mg\ L^{-1}$)	Total Suspended Solids ($mg\ L^{-1}$)
H07 4991	No. 1 Tank	2270	NA	415
H07 4992	No. 2 Tank	875	NA	80
H07 4993	No. 4 Tank	715	49	40

NA: Not Applicable

Please note: An invoice for these services will be forwarded to you in the near future.

M. Smith
Laboratory Manager

Waste Water & Odour Solutions

Bioaugmentation – Water Quailty and Odour Improvement.

Coffs Harbour Grease Trap Services

Coffs Harbour Grease Trap Services is privately owned and operated.

The business is located next to the new Coffs Harbour Sewage Plant and final water is discharge to the Coffs STP after water quality checks.

The owner approached For Earth in 2009 as he was recieving odour complaints and his discharge water quality was above desired levels.

The Plant comprises of inlet screening and storage tanks for solids and water separation.

Since applying bacteria product, **For Earth Bio Plus®** on a scheduled dosing system odours have significantly reduced and water quality is below discharge levels.

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444 Australia
t/f: 612.6581 4353 m: 0429 838 443
e: shanem@forearth.com.au w: www.forearth.com.au

PRE-TREATMENT SYSTEMS

PROBIOTICS & LOW ENERGY AERATION

Three tank bio-reactor system – Ballarat Saleyard.

22/02/2012	Pre-Treatment	Post Treatment	Upper Limits
BOD5	490	140	500
Elct Cond	2900	1400	n/a
pH	7.11	7.1	
Susp Solids	280	680*	500
Tot Diss Solids	1800	780	1500

Note: client comment SS high likely due to non-biologicals transfer from upstream pit.

Tel: 02 65814353 www.forearth.com.au

Waste Water & Odour Solutions

NATIONAL PARK – Lake Keepit
Probiotic, Low Energy Aeration System

Biological sludge removal and Odour Control

Lake Keepit sewage system consisting of tanks in series that periodically transfer to onsite sewerage plant. The system was very overloaded during peak holiday periods so management decided to upgrade by adding the For Earth air stone aeration to specific tanks and also automatically apply bacteria product at specific locations.

For Earth low energy aeration and automated bacteria dosing installed.

Above: Amenities block and black/grey water tank.

- Aeration installed into chambers 2 & 3.
- Automated bacteria application to chamber 1 in lockable cabinet.
- Tank collects discharge from laundry, toilets and Campervan black/grey water. High solids and grease/fats content.

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444 Australia
t/f: 612.6581 4353 m: 0429 838 443
e: shanem@forearth.com.au w: www.forearth.com.au

Waste Water & Odour Solutions

Left:

Kiosk

Lockable cabinet housing bacteria product and dosing pump that automatically applies bacteria to Kiosk collection tank inflow.

Left:

Onsite Treatment plant

Old air compressor removed and replaced with For Earth low energy aeration technology.

Bacteria product automatically applied.

Reference;

Scott Taylor – Manager Lake Keepit National Park

For Earth Contact:

Shane Mckibbin (Manager)

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444 Australia
t/f: 612.6581 4353 m: 0429 838 443
e: shanem@forearth.com.au w: www.forearth.com.au

REFERENCE

BIO-AUGMENTATION OF SEWAGE PLANT.

Location: **Perisher Ski Tube, Australia, NSW.**
Operator Michael O'Rance
Client: Perisher Blue
Product: For Earth Bio®

I have been using For Earth Bio for the past 2½ years since taking over the role as Waste Water Treatment Plant Supervisor @ The Ski Tube, Perisher NSW.

Our treatment plant is unusual in that we have to feed the plant in summer, as we only have a handful of maintenance staff on-site, then as we enter the ski season, we receive peak flows and loadings just as our temperature drops in our aeration tank. It's not uncommon to go for 12 -14 weeks with temps @ 7 Deg C or below.

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444 Australia
t/f: 612.6581 4353 m: 0429 838 443
e: shanem@forearth.com.au w: www.forearth.com.au

When I started using For Earth Bio, it was to help break down the sludge in our digester. We have a small digester of only 12kL capacity, and this used to require pumping out and disposal off-site every 2 – 3 weeks during the ski season and a couple of times in the summer as well. The cost of this was constantly increasing, and it was becoming increasingly difficult to find someone to accept the waste, usually being tanker trucked from Jindabyne up to Goulburn. Now we pump out once per year, and only in summer, when we schedule in routine maintenance and drop all the tanks for annual cleaning and inspections.

The supernatant from the digester is pumped back to an inlet well and then into the aerated balance tank. Whilst most is clear liquor, there is some light, thin sludge that does get returned to the head of the works. This has actually worked out to be a benefit, as it seeds the influent with fresh bacteria, which in turn has kept ammonia levels in the balance tank to around 40mg/L. Compared to readings prior to dosing For Earth of 60+mg/L, and peaks of over 80mg/L. This has reduced the ammonia loading on the aeration tank.

Another way I utilise For Earth Bio is seeding up the plant as we enter the ski season. Previously, I would bring in 2 loads of sludge from another treatment plant in the area, this incurred the cost of having a tanker truck pick up and deliver the sludge. 2 seasons ago, the tanker truck had been used previously to pump out a storm water interceptor at a petrol station and had not been flushed out properly. They then picked up sludge from a nearby treatment plant, and when they pumped the sludge into the ski tube treatment plant, they also pumped a lot of diesel and oil into the aeration tank. Since then, I wait until the opening weekend of the ski season and dose up the aeration tank with For Earth Bio. This has worked very well, and it is cheaper and safer than relying on an outside contractor.

The vast majority of our influent comes from toilet blocks and there is very little domestic waste flowing to the plant. This, combined with extreme cold temps in the aeration tank, has meant that in the past we've had troubles with our ammonia levels not being reduced sufficiently. I have found that dosing For Earth Bio over the aeration tank during the air on period has been of great benefit. If, upon testing I find that we have a spike in the ammonia levels, usually 1 – 2L of For Earth Bio dosed over the treatment tank is enough, and I find that on testing the next day I normally get a significant drop in the reading. Sometimes it may require on-going dosing over a few days, or an increase in the amount dosed to get the level right down to where I'm happy with it.

So far, I've had very positive results on a couple of fronts using For Earth bacteria product. If you would like any further information, I can be contacted through the guys @ For Earth.

Michael O'Rance

Waste Water Treatment Plant Supervisor

Perisher Blue

Waste Water & Odour Solutions

PROBIOTICS & LOW ENERGY AERATION
Biological sludge removal and water quality improvement

Singleton Saleyard truckwash effluent and stormwater collection pond.

Water Test at Singleton Saleyards Pond 6				
Test Parameters	**Pre Treatment**	**Post Treatment**	**Unit**	**EPA Objective - Hunter River**
	Dec-11	Feb-12		
BOD5 - total	**59**	**20**	mg/L	30
pH	**7.79**	**7.56**	-	9
Suspended Solids	**106**	**23**	mg/L	50
Total Kjelhahl Nitrogen	**23**	**3.4**	mg/L N	30
Total Phosphorus	**13.9**	**8.3**	mg/ L P	15

For Earth Saleyard Projects

Install Date	SALEYARD NAME	Location	Managers
16/08/2011	Cooma Livestock Exchange	Cooma	Cooma Council
1/02/2012	Central Victorian Livestock Exchange	Ballarat	Regional Infrastructure
28/10/2009	Central Tablelands Livestock Exch.	Carcoar	Regional Infrastructure
3/08/2010	Central West Livestock Exch.	Forbes	Forbes Shire Council
17/07/2008	Gunnedah Saleyard	Gunnedah	Gunnedah Council
22/09/2011	Northern Vic Livestock Exch	Wadonga	Regional Infrastructure

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444
t/f: 612.6581 4353 m: 0417 694844
e: shanem@forearth.com.au w: www.forearth.com.au

Waste Water & Odour Solutions

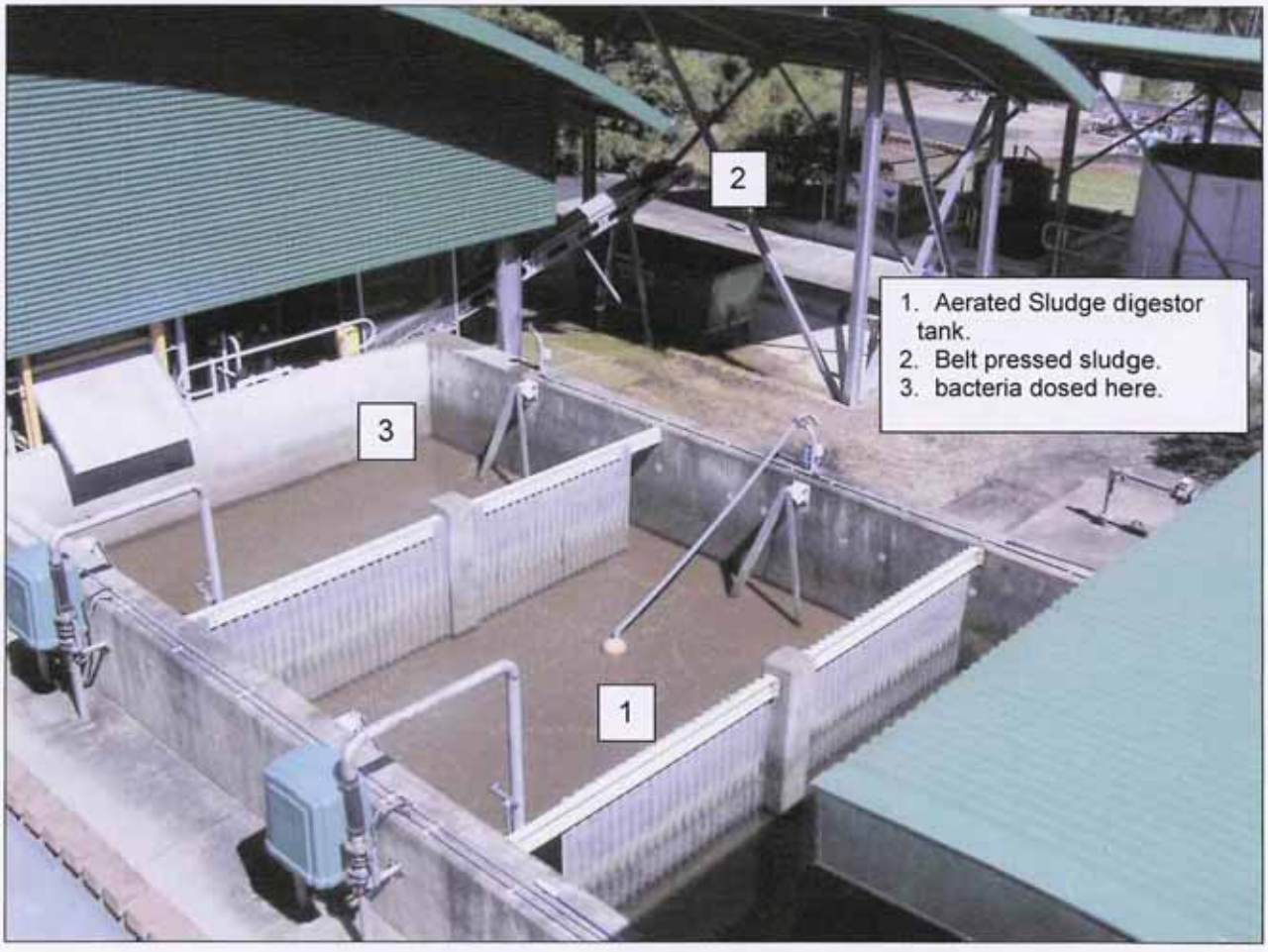
Biological Nutrient Removal (BNR) Sewage Plant.

Biological sludge reduction and Odour Control

Moonee BNR Sewage Plant Process: Inlet works (screening, grit removal), BNR Tank (anoxic, aerobic & anaerobic zones) clarifier, aerated sludge digestor tank, belt pressed sludge.

The Moonee BNR plant prior to the dosing of **For Earth Bio®** was producing 16 cubic metres of belt pressed sludge per week which was stored in skip bins and sent to landfill. Council Manager approached For Earth to advise on improved biological process to reduce sludge load within the plant and therefore reduce dewatered sludge disposal costs that were increasing.

Plant Operator commenced dosing 1 ltr per day of bacteria into the aerobic sludge digestor which after 3 months has resulted in a reduction of 6 – 8 cubic metres of belt pressed sludge production per week. Addition improvement to BNR tanks and clarifier with improved settling.. Considerable reduction in odour.



Details: Dry weather flow 1meg/day, Plant HRT 48 hours.

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444 Australia
t/f: 612.6581 4353 m: 0429 838 443
e: shanem@forearth.com.au w: www.forearth.com.au

Waste Water & Odour Solutions

LOW ENERGY AERATION
Telegraph Point Membrane Filtration Water Treatment Plant

Aeration of Water to improve Dissolved Oxygen Levels

Client Feedback

The dissolved oxygen levels in the tank increased from 55% to 88% within 15 minutes of the installation. After a further hour it increased to 98%. Checked Tuesday morning after continuous operation DO at 96%. We have now installed a relay to control the system. System will operate in conjunction with the raw water pumps feeding the plant. This will allow adequate aeration time while the WTP is operating and also eliminate the risk of low water levels in the tank exposing the air stones during back wash cycles.
We will continue to monitor the balance tank and retic system. I'll let you know how we go.

Danny Roberts
Water Treatment Technical Officer

Port Macquarie-Hastings Council

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444
t/f: 612.6581 4353 m: 0417 694844
e: shanem@forearth.com.au w: www.forearth.com.au

Waste Water & Odour Solutions

For Earth Aeration for Potable Water Supply Dam

Algae control & Destratification

Kyogle Council had an issue with their potable water dam experiencing algae blooms and stratification. Council engineer Graham Kennet designed an aeration system using For Earth air stones and compressed air system (200kpa) to drop the air stones subsurface levels 2 – 8m deep.

System has been installed for 2 years and algae has not occurred since installation.

Aeration line suspended by stainless cable. Air stones set at various depths to follow dam bottom.

Air Compressor

bay 2 cnr uralla & merrigal rds port macquarie nsw 2444 Australia
t/f: 612.6581 4353 m: 0429 838 443
e: shanem@forearth.com.au w: www.forearth.com.au

GENERAL CONDITIONS OF THIS CONSENT

Development is to be in accordance with approved plans

1. The development is to be implemented in accordance with the plans and supporting documents endorsed with the Council stamp, dated TBC, and set out in the following table except where modified by any conditions of this consent.

Plan Title/Supporting Document	Dwg. No	Prepared by	Dated
Environmental Impact Statement	-	David Pensini	July 2015
Site and Context Plan	DA-01	-	27 August 2013
Layout Plan	DA-02	-	27 August 2013
Process Plan	DA-03	-	27 August 2013
Letter from David Pensini and attachments		David Pensini	16 December 2015

In the event of any inconsistency between conditions of this development consent and the plans/ supporting documents referred to above, the conditions of this development consent prevail.

Discharge of Wastewater

2. Wastewater from the development must be discharged into the adjoining sewage treatment plant in accordance with an approval granted under section 68 of the Local Government Act 1993.

A lockable valve and magnetic flow meter shall be provided within the existing fenced area of the sewage treatment plant prior to the point of discharge. All wastewater to be discharged into the sewage treatment plant must be tested and discharged under the supervision of Council.

An inspection point suitable for taking representative samples shall be provided immediately prior to the point where the liquid trade waste enters the sewerage system and/or mixes with domestic sewage from the premises.

Waste Water Quality

3. The chemical concentration of wastewater discharged from the development shall not exceed:

- pH levels outside the range of 7.0 to 9.0 at all times.
- BOD and suspended solids concentration in excess of 300 mg/L at any time.
- Chemical Oxygen Demand (COD) in excess of 600 mg/L for BODs less than 100 mg/L, otherwise the COD shall not exceed the BODs concentration by more than 3 times.
- Total Dissolved Solids in excess of 4000 mg/L.
- Ammonia (as N) in excess of 50 mg/L at any time.
- Total Kjeldahl Nitrogen (TKN) in excess of 100 mg/L at any time.
- Total oil and grease in excess of 100 mg/L at any time.
- Petroleum Hydrocarbons (non-flammable) in excess of 30 mg/L.

Sampling

4. Representative samples of the effluent from each batch shall be collected and tested with respect to pH, BOD, COD, Total Suspended Solids, Total Oil & Greases, Ammonia(as N), Total Dissolved Solids, Total Kjeldahl Nitrogen and Total Petroleum Hydrocarbons.

The discharge shall not commence without Council's review of the sampling results.

The sample analysis tests shall be carried out only by laboratories that hold National Association of Testing Authorities (NATA) registration for the class of test(s) or specific test(s)

specified in the trade waste approval or by a laboratory acceptable to Council. Tests shall be carried out by using analytical methods indicated in the Australian Sewage Quality Management Guidelines, June 2012, WSAA.

Sludge

5. Sludge resulting from treatment of the waste shall be removed from the premises by a licensed contractor.

EPA General Terms of Approval

6. In accordance with Section 91 of the *Environmental Planning and Assessment Act 1979* the following conditions are required to be consistent with the General Terms of Approval issued by the NSW Environment Protection Authority (EPA):

    a. Works must not commence until a licence has been obtained from the EPA in accordance with section 43 of the Protection of the Environment Operations Act 1997.

    b. The development must be undertaken in accordance with the general terms of approval issued by the EPA on 10 March 2016 and attached to this consent.

DPI Water General Terms of Approval

7. In accordance with Section 91 of the *Environmental Planning and Assessment Act 1979* the following conditions are required to be consistent with the General Terms of Approval issued by the NSW Department of Primary Industries – Water (DPI Water):

    a. Works must not commence until a controlled activity approval has been obtained from the NSW Department of Primary Industries – Water (DPI Water) and a copy of the approval has been provided to Council.

    Advice: Application forms for the controlled activity approval are available from DPI Water's website: www.water.nsw.gov.au Water licensing > Approvals > Controlled activities.

    b. The consent holder must prepare or commission the preparation of an Erosion and Sediment Control Plan. All plans must be prepared by a suitably qualified person and submitted to the DPI Water for approval prior to any controlled activity commencing. The plans must be prepared in accordance with DPI Waters guidelines located at www.water.nsw.gov.au/Water-Licensing/Approvals.

    c. The consent holder must (i) carry out any controlled activity in accordance with approved plans and (ii) construct and/or implement any controlled activity by or under the direct supervision of a suitably qualified professional and (iii) when required, provide a certificate of completion to DPI Water.

    d. The consent holder must carry out a maintenance period of two (2) years after practical completion of all controlled activities, rehabilitation and vegetation management in accordance with a plan approved by the DPI Water.

    e. The consent holder must reinstate waterfront land affected by the carrying out of any controlled activity in accordance with a plan or design approved by the DPI Water.

    f. The consent holder must ensure that no materials or cleared vegetation that may (i) obstruct flow, (ii) wash into the water body, or (iii) cause damage to river banks; are left on waterfront land other than in accordance with a plan approved by DPI Water.

    g. The consent holder must establish all erosion and sediment control works and water diversion structures in accordance with a plan approved by DPI Water. These works and structures must be inspected and maintained throughout the working period and must not be removed until the site has been fully stabilised.

h. The consent holder must ensure that (i) river diversion, realignment or alteration does not result from any controlled activity work and (ii) bank control or protection works maintain the existing river hydraulic and geomorphic functions, and (iii) bed control structures do not result in river degradation other than in accordance with a plan approved by DPI Water.

THE FOLLOWING CONDITIONS ARE TO BE COMPLIED WITH PRIOR TO ANY BUILDING OR CONSTRUCTION WORKS COMMENCING

Water and Sewerage Section 68 approval required

8. An approval under Section 68 of the Local Government Act 1993 to connect to Council's infrastructure for water supply and sewerage and to discharge trade waste into Council's sewer must be obtained from Council.

Driveway and Car Parking Plans

9. Plans and specifications that indicate vehicular access from the site boundary to the proposed parking space(s) and manoeuvring details must be submitted to and approved by Council. The access road must not encroach within the existing fenced area containing Councils sewage treatment plant. Vehicular access must be in accordance with AS 2890.1-2004: Parking facilities, Part 1: Off-street Car Parking No 1 and Councils Development Control Plan. Plans are to include the following items:

    a. Pavement description (minimum 4m wide all weather access track);
    b. Site conditions affecting the access;
    c. Existing and design levels;
    d. Cross sections every 20 metres (The batter of the access track must of sufficient grade for an errant vehicle to be able to recover, alternatively install a roadside traffic barrier)
    e. Drainage (pipes, pits etc.);
    f. Turning paths; and
    g. Line marking and signs.

    The plans must be in compliance with Council's Adopted Engineering Standards.

Contributions and Certificate of Compliance

10. Prior to the commencement of works the developer/consent holder will have to be eligible to obtain a Section 307 Certificate of Compliance under the Water Management Act 2000. To be eligible, the developer/consent holder will have to pay the contributions set out in the following table to Council.

Public service	No of Equivalent Tenements	Contribution Rate (Amount per ET)	Contribution Levied	Date until which Contribution rate is applicable
Water	1	$12,568.00	$12,568.00	June 2016
Sewer	5.357	$7,063.00	$37,836.49	June 2016
TOTAL			**$50,404.49**	**June 2016**

The contributions payable will be adjusted in accordance with relevant plan and the amount payable will be calculated on the basis of the contribution rates that are applicable at the time of payment.

Flood Planning Level

11. The flood planning level for this development is 3.493m AHD. Detailed plans and specifications must be submitted to and approved by Council prior to the commencement of works which illustrate the processing area at or above the flood planning level and demonstrate that the development will be capable of withstanding flood velocities during a PMF event (0.5-1m/s).

Importation of fill

12. Prior to the importation of any fill to the subject land, suitable evidence is to be provided to the satisfaction of Council demonstrating that all fill imported to the site is virgin excavated natural material (VENM) as defined by the *Protection of the Environment Operations Act 1997*. This may require the material to be sampled and analysed for potential contaminants by a NATA accredited laboratory.

Setback from Sewage Treatment Plant Fence

13. The developments setback (excluding driveway access) to the existing chain wire fence on the western side of the existing sewage treatment plant must be increased to 15m in order to maintain existing access in and around the existing plant.

    An amended site plan is to be submitted to and approved by Council prior to the commencement of works.

Detailed Plans

14. Detailed plans of the proposal including all pipework, valves and meters shall be submitted to Council for approval prior to works commencing. This is to include a lockable valve and magnetic flow meter within the existing fenced area of the sewage treatment plant prior to the point of discharge.

    The final system design must be substantially the same as that approved under this development consent.

Erosion & Sediment Measures

15. Erosion and sedimentation controls are to be in place in accordance with Managing Urban Stormwater - Soils and Construction Vol 1, 4th Edition prepared by Landcom and Development Control Plan (Erosion and Sediment Control) 2009.

    Note: Council may impose on-the-spot fines for non-compliance with this condition.

Erection of Signs

16. A sign must be erected on site in a prominent position containing the information prescribed by Clause 98A (2) of the Environmental Planning & Assessment Regulation 2000 being the name, address and telephone number of the Principal Certifying Authority for the work, and name of the principal contractor for the work and telephone number on which that person may be contacted outside working hours, and stating that unauthorised entry to the site is prohibited. This sign must be maintained on site while work is being carried out and removed when the work has been completed.

THE FOLLOWING CONDITIONS ARE TO BE COMPLIED WITH DURING CONSTRUCTION

Approved Plans to Remain on Site

17. A copy of the approved plans, details and specifications must remain at the site at all times during construction.

Building Code of Australia

18. All building work must be carried out in accordance with the requirements of the Building Code of Australia as in force on the date the application for the relevant construction certificate was made.

Construction times

19. Any works involving the generation of noise which extends beyond the boundary of the land, other than works required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm, shall only be carried out between 7:00 am and 6:00 pm Monday to Saturday inclusive. No works shall occur on public holidays.

    The builder/site manager is responsible to instruct and control sub-contractors regarding the hours of work

Construction Noise

20. All feasible and reasonable work practices shall be implemented to minimise construction noise exceeding the noise management level in accordance with the NSW Interim Construction Noise Guideline (55dB(A). In the event construction noise will exceed the guideline limit, all potentially impacted residents must be notified of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.

Construction dust suppression

21. All necessary works are to be undertaken to control dust pollution from the site.

    These works must include, but are not limited to:

    a restricting topsoil removal;
    b regularly and lightly watering dust prone areas (note: prevent excess watering as it can cause damage and erosion;
    c alter or cease construction work during periods of high wind;
    d erect green or black shade cloth mesh or similar products 1.8m high around the perimeter of the site.

Builders rubbish to be contained on site

22. All builders rubbish is to be contained on the site in a 'Builders Skips' or an enclosure. Building materials are to be delivered directly onto the development site. Footpaths, road reserves and public reserves are to be maintained clear of rubbish, building materials and all other items.

Maintenance of sediment and erosion control measures

23. Sediment and erosion control measures must be maintained at all times until the site has been stabilised by permanent vegetation cover or hard surface.

THE FOLLOWING CONDITIONS ARE TO BE COMPLIED WITH PRIOR TO THE COMMENCEMENT OF USE

Works to be completed

24. All of the works indicated on the plans and granted/required by this consent, including any other consents that are necessary for the completion of this development, are to be completed and approved by Council prior to the commencement of use.

Vehicular Access

25. The driveway and parking areas are to be constructed in accordance with the approved plans.

Sewer and water to be connected

26. Sewer and water supply is to be connected to the development in accordance with an approval granted under Section 68 of the Local Government Act 1993.

Toilet Facilities

27. The toilet building must not be more than 3m in height and must be connected to a public sewer. If the building is not a relocatable structure or is to be located on footings, works must not commence unless a construction certificate is issued by the principal certifying authority (PCA). Such a structure must not be occupied unless an occupation certificate is issued by the PCA.

Bushfire Protection

28. The following conditions are required for compliance with Section 79BA of the *Environmental Planning and Assessment Act 1979*:

(a) Asset Protection Zones
At the commencement of building works and for the life of the development, the area of land illustrated on the layout Plan shall be managed as an inner protection area as outlined within Section 4.1.3 and Appendix 5 of 'Planning for Bushfire Protection 2006' and the NSW Rural Fire Service's document 'Standards for Asset Protection Zones'.

Advice: *An inner protection area must provide a tree canopy cover of less than 15% and be located greater than 2 metres from any part of the roofline of a dwelling. Garden beds of flammable shrubs are not to be located under trees and not be closer than 10 metres from an exposed window or door. Trees must have lower limbs removed up to a height of 2 metres above the ground. Grass must be maintained below 100mm.*

(b) Water and Utilities
Water, electricity and gas are to comply with section 4.1.3 of 'Planning for Bushfire Protection 2006'.

(c) Landscaping
Landscaping to the site is to comply with the principles of Appendix 5 of 'Planning for Bushfire Protection 2006'.

Certification

29. Certification that the proposal has been implemented in accordance with the manufactures specifications must be provided to Council prior to the commencement of use.

REASONS FOR CONDITIONS

- To ensure that the proposed development:
  (a) achieves the objectives of the *Environmental Planning and Assessment Act 1979*;
  (b) complies with the provisions of all relevant Environmental Planning Instruments;
  (c) is consistent with the aims and objectives of Council's Development Control Plans, Codes and Policies.

- To meet the increased demand for public amenities and services attributable to the development in accordance with Section 94 of the *Environmental Planning and Assessment Act 1979* and Section 64 of the *Local Government Act 1993*.

- To ensure the protection of the amenity and character of land adjoining and in the locality of the proposed development.

- To minimise any potential adverse environmental, social or economic impacts of the proposed development.

- To ensure that all traffic, car parking and access requirements arising from the development are addressed.

- To ensure the development does not conflict with the public interest.

OTHER APPROVALS

The following Section 68 Approvals have been issued with this consent:	Nil
Integrated Development:	Yes – s91 water Management Act 2000 s43 Protection of the Environment Operations Act 1997

General Terms of Approval - Issued

Notice No: 1537341

Administrative conditions

Note: Mandatory conditions for all general terms of approval

A1. Information supplied to the EPA

A1.1 Except as expressly provided by these general terms of approval, works and activities must be carried out in accordance with the proposal contained in:

- the development application DA 2015/135 submitted to Nambucca Shire Council on 31 August 2015;
- any environmental impact statement "Environmental Impact Statement for the establishment & operation of a grease trap and oily water processing facility at Lot 2 DP 538542, Kelly Close, Macksville" (July 2015) relating to the development; and
- all additional documents supplied to the EPA in relation to the development, including the response letter from David Pensini dated 16 December 2015, and its attachments.

A2. Fit and Proper Person

A2.1 The applicant must, in the opinion of the EPA, be a fit and proper person to hold a licence under the Protection of the Environment Operations Act 1997, having regard to the matters in s.83 of that Act.

Limit conditions

L1. Pollution of waters

L.1.1 Except as may be expressly provided by a licence under the Protection of the Environment Operations Act 1997 in relation of the development, section 120 of the Protection of the Environment Operations Act 1997 must be complied with in and in connection with the carrying out of the development.

L2. Waste

L2.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.

Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below.

Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.

Code	Waste	Description	Activity	Other Limits
K110	Grease trap waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste processing (non-thermal treatment of waste)	The total quantity of waste processed at the premises must not exceed 750,000 litres per annum.

L3. Noise limits

L3.1 Noise from the premises must not exceed a noise limit of 35 (LAeq, 15 minute) dB(A) at any residence, except as expressly provided by these general terms of approval.

L3.2 Noise from the premises is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise limit in this licence.

Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy.

The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

L3.3 The noise emission limits identified in the noise limits table in this licence apply under meteorological conditions of wind speed up to 3 metres per second at 10 metres above ground level, and temperature inversion conditions.

Hours of operation

L3.4 All construction work at the premises must only be conducted between 7am and 6pm Mondays to Fridays, and 8am to 1pm Saturdays. No construction work is permitted on Sundays or public holidays without prior approval from Nambucca Shire Council and prior notification of potentially affected residents.

L3.5 Activities at the premises, other than construction work, may only be carried on between normal business hours, being 9am and 5pm Mondays to Fridays.

L3.6 This condition does not apply to the delivery of material outside the hours of operation permitted by condition L3.4 or L3.5, if that delivery is required by police or other authorities for safety reasons; and/or the operation or personnel or equipment are endangered. In such circumstances, prior notification is provided to the EPA and affected residents as soon as possible, or within a reasonable period in the case of emergency.

L3.7 The hours of operation specified in conditions L3.4 and L3.5 may be varied with written consent if the EPA is satisfied that the amenity of the residents in the locality will not be adversely affected.

Operating conditions

O1. Odour

Potentially offensive odour

O1.1 No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

Meteorological monitoring

O1.2 The licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

Parameter	Units of measure	Frequency	Averaging Period	Sampling Method
Rainfall	mm/hour	continuous	1 hour	AM-4
Sigma theta	degrees	continuous	10 minute	AM-2 and AM-4
Siting				AM-1
Temperature at 2 metres	kelvin	continuous	10 minute	AM-4
Total solar radiation	watts per square metre	continuous	10 minute	AM-4
Wind Direction at 10 metres	degrees	continuous	10 minute	AM-2 and AM-4
Wind Speed at 10 metres	metres per second	continuous	10 minute	AM-2 and AM-4

O2. Dust

O2.1 Activities occurring at the premises must be carried out in a manner that will minimise emissions of dust from the premises.

O2.2 Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.

O3. Stormwater/sediment control - Construction Phase

O3.1 An Erosion and Sediment Control Plan (ESCP) must be prepared and implemented. The plan must describe the measures that will be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities. The ESCP should be prepared in accordance with the requirements for such plans outlined in *Managing Urban Stormwater: Soils and Construction* (available from the Office of Environment & Heritage website).

O4. Stormwater/sediment control - Operation Phase

O4.1 Stormwater must be managed such that sediment laden water or surface pollutants (e.g. spilled liquid wastes, treated wastewater, or other materials required for operation of the facility) do not leave the premises.

O5. Waste management

O5.1 All liquid wastes onsite must be stored within a suitably bunded area. Bunds on the premises must be constructed and maintained in accordance with the relevant Australian Standard/s.

O5.2 Waste water from activities such as vehicle wash out or tank cleaning must be disposed of at a facility that can lawfully receive the waste(s).

O5.3 Any vehicle wash out at the premises must be undertaken in a suitably bunded area.

O6. Emergency response

O6.1 The licensee must maintain, and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises. The licensee must keep the incident response plan on the premises at all times. The incident response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. The licensee must develop a Pollution Incident Response Management Plan in accordance with the requirements in Part 5.7A of the Protection of the Environment Operations (POEO) Act 1997 and POEO regulations.

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by the EPA's general terms of approval, or a licence under the Protection of the Environment Operations Act 1997, in relation to the development or in order to comply with the load calculation protocol must be recorded and retained as set out in conditions M1.2 and M1.3.

M1.2 All records required to be kept by the licence must be:

in a legible form, or in a form that can readily be reduced to a legible form;

kept for at least 4 years after the monitoring or event to which they relate took place; and

produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected: the date(s) on which the sample was taken;

the time(s) at which the sample was collected;

the point at which the sample was taken; and

the name of the person who collected the sample.

Reporting conditions

R1.1 The applicant must provide an annual return to the EPA in relation to the development as required by any licence under the Protection of the Environment Operations Act 1997 in relation to the development. In the return the applicant must report on the annual monitoring undertaken (where the activity results in pollutant discharges), provide a summary of complaints relating to the development, report on compliance with licence conditions and provide a calculation of licence fees (administrative fees and, where relevant, load based fees) that are payable. If load based fees apply to the activity the applicant will be required to submit load-based fee calculation worksheets with the return.

Special Conditions

E1. Financial Assurance

E1.1 A financial assurance in the form of an unconditional and irrevocable and on demand guarantee from a bank, building society or credit union operating in Australia as 'Authorised Deposit-taking Institutions' under the *Banking Act 1959* of the Commonwealth of Australia and supervised by the Australian Prudential Regulatory Authority (APRA) must be provided to the EPA within a timeframe to be determined. The financial assurance must be in favour of the EPA in the amount of (to be determined). The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence.

E1.2 The licensee must provide to the EPA, along with the original counterpart guarantee, confirmation in writing that the financial institution providing the guarantee is subject to supervision by the Australian Prudential Regulatory Authority (APRA).

E1.3 The financial assurance must contain a term that provides that any money claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.

E1.4 The financial assurance must be maintained during the operation of the facility and thereafter until such time as the EPA is satisfied the premises is environmentally secure.

E1.5 The financial assurance must be replenished by the full amount claimed or realised if the EPA has claimed on or realised the financial assurance or any part of it to undertake a work or program required to be carried out by the licence which has not been undertaken by the licence holder.

E1.6 The EPA may require an increase in the amount of the financial assurance at any time as a result of reassessment of the total likely costs and expenses of rehabilitation of the premises.

E1.7 The licensee must provide to the EPA the original counterpart guarantee within five working days of the issue of:

a) the financial assurance required by condition E1.1, and

b) the adjusted financial assurance as required by condition E1.3 and E1.6

E1.8 The EPA may claim on a financial assurance under s303 of the POEO Act if a licensee fails to carry out any work or program required to comply with the conditions of this licence.

E2. Environmental Obligations of Licensee (Works & Programs)

E2.1 While the licensee's premises are being used for the purpose to which the licence relates, the licensee must:

a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.

b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given by the EPA.

c) Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.

E2.2 In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee (whether or not the premises continue to be used for the purposes to which the licence relates) must:

a) make all efforts to contain all firewater on the licensee's premises,

b) make all efforts to control air pollution from the licensee's premises,

c) make all efforts to contain any discharge, spill or run-off from the licensee's premises,

d) make all efforts to prevent flood water entering the licensee's premises,

e) remediate and rehabilitate any exposed areas of soil and/or waste,

f) lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of,

g) at the request of the EPA monitor groundwater beneath the licensee's premises and its potential to migrate from the licensee's premises,

h) at the request of the EPA monitor surface water leaving the licensee's premises; and

i) ensure the licensee's premises is secure.

E2.3 After the licensee's premises cease to be used for the purpose to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:

a) remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises; and

b) rehabilitate the site, including conducting an assessment of and if required remediation of any site contamination.

E3. Odour Audit

E3.1 By 12 months from the commencement of operations the proponent must submit an odour audit report to the EPA's Head Waste Compliance Coffs Harbour. The odour audit report must address the following:

a) A summary of odour complaints received and actions taken to reduce odour emissions where complaints are verified;

b) Benchmark the design and management practices at the facility against industry best practice for minimising odour emissions. This should include, but not be limited to, the use of meteorological monitoring to avoid operation of the trommel during adverse dispersion conditions;

c) Using the results of (a) and (b), if it is identified that the facility requires additional odour mitigation measures the report must include:

- Proposed mitigation works and/or management practices to ensure that odour is minimised as far as is practicable; and
- A timetable for the implementation of these works.

Notice No: 1537341

Attachment – Mandatory Conditions for all EPA licences

Administrative conditions

Other activities

(To be used on licences with ancillary activities)

This licence applies to all other activities carried on at the premises, including:

- **N/A**

Operating conditions

Activities must be carried out in a competent manner

Licensed activities must be carried out in a competent manner.

This includes:

a. the processing, handling, movement and storage of materials and substances used to carry out the activity; and

b. the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

Maintenance of plant and equipment

All plant and equipment installed at the premises or used in connection with the licensed activity:

a. must be maintained in a proper and efficient condition; and

b. must be operated in a proper and efficient manner.

Monitoring and recording conditions

Recording of pollution complaints

The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

The record must include details of the following:

- the date and time of the complaint;
- the method by which the complaint was made;
- any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- the nature of the complaint;

- the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken by the licensee, the reasons why no action was taken.

The record of a complaint must be kept for at least 4 years after the complaint was made.

The record must be produced to any authorised officer of the EPA who asks to see them.

Telephone complaints line

The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

This condition does not apply until 3 months after this condition takes effect.

Reporting conditions

Annual Return documents

What documents must an Annual Return contain?

The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

a. Statement of Compliance; and

b. Monitoring and Complaints Summary.

A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

An Annual Return must be prepared in respect of each reporting, except as provided below

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Where this licence is transferred from the licensee to a new licensee,

a. the transferring licensee must prepare an annual return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and

b. the new licensee must prepare an annual return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an annual return in respect of the period commencing on the first day of the reporting period and ending on

a. in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or

b. in relation to the revocation of the licence – the date from which notice revoking the licence operates.

Deadline for Annual Return

The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

(Licences with assessable pollutants)
Where the licensee is unable to complete a part of the Annual Return by the due date because the licensee was unable to calculate the actual load of a pollutant due to circumstances beyond the licensee's control, the licensee must notify the EPA in writing as soon as practicable, and in any event not later than the due date.

The notification must specify:

a. the assessable pollutants for which the actual load could not be calculated; and

b. the relevant circumstances that were beyond the control of the licensee.

Licensee must retain copy of Annual Return

The licensee must retain a copy of the annual return supplied to the EPA for a period of at least 4 years after the annual return was due to be supplied to the EPA.

Certifying of Statement of Compliance and Signing of Monitoring and Complaints Summary

Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

a. the licence holder; or

b. by a person approved in writing by the EPA to sign on behalf of the licence holder.

A person who has been given written approval to certify a Statement of Compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review this licence.

Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act

Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.

The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Written report

Where an authorised officer of the EPA suspects on reasonable grounds that:

a. where this licence applies to premises, an event has occurred at the premises; or

b. where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,

and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

The request may require a report which includes any or all of the following information:

a. the cause, time and duration of the event;

b. the type, volume and concentration of every pollutant discharged as a result of the event;

c. the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; and

d. the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;

e. action taken by the licensee in relation to the event, including any follow-up contact with any complainants;

f. details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event;

g. any other relevant matters.

The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

General conditions

Copy of licence kept at the premises or on the vehicle or mobile plant

A copy of this licence must be kept at the premises or on the vehicle or mobile plant to which the licence applies.

The licence must be produced to any authorised officer of the EPA who asks to see it.

The licence must be available for inspection by any employee or agent of the licensee working at the premises or operating the vehicle or mobile plant.

Protection of the Environment Operations Act 1997

General Terms of Approval - Issued

Notice No: 1537341

The General Manager

Macksville NSW 2447

Attention: Mr Daniel Walsh

Notice Number	1537341
File Number	EF15/14934
Date	10-Mar-2016

Re: Integrated Development Application - Development Application No. 2015/135 - Proposed Grease Trap and Oily Waters Treatment Facility on Lot 2, DP 538542, Kelly Close, Macksville.

Issued pursuant to Section 91A(2) Environmental Planning and Assessment Act 1979

I refer to the development application and accompanying information provided for the Grease Trap and Oily Waters Treatment Facility received by the Environment Protection Authority (EPA) on 10 September 2015, and additional requested information received on 22 December 2015.

EPA has reviewed the information provided and has determined that it is able to issue a licence for the proposal, subject to a number of conditions. The applicant will need to make a separate application to EPA to obtain this licence.

The general terms of approval for this proposal are provided at attachment A. If Nambucca Shire Council grants development consent for this proposal these conditions should be incorporated into the consent.

These general terms relate to the development as proposed in the documents and information currently provided to EPA. In the event that the development is modified either by the applicant prior to the granting of consent or as a result of the conditions proposed to be attached to the consent, it will be necessary to consult with EPA about the changes before the consent is issued. This will enable EPA to determine whether its general terms need to be modified in light of the changes.

In assessing the proposal EPA has also identified a number of environmental issues that Nambucca Shire Council may wish to consider in its overall assessment of the application:

1. The construction noise assessment in the Environmental Impact Statement (EIS) for the proposal refers to an incorrect noise level objective of Rating Background Level ("RBL") + 20dB(A). Table 2 of the NSW Interim Construction Noise Guideline ("ICNG") (DECC 2009), identifies a noise management level ($L_{Aeq\ (15\ min)}$) for residential receivers of RBL + 10dB, measured at the property boundary closest to the

proposal or at the most noise affected location within 30m of the residence if the boundary is further than 30m from the residence. At and above this level residences are considered noise affected.

Using the RBL adopted by the proposal, the noise management level ("NML") should therefore be 55dB(A). Two of the typical construction equipment identified in the EIS are predicted to exceed the NML. Therefore, in accordance with the ICNG, the proponent should:

- apply all feasible and reasonable work practices to meet the noise affected level, and
- inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.

2. The EPA notes that the EIS advises the proposal's final system design will not be undertaken until after the proposal receives development approval. The EPA therefore recommends that the final system design must be substantially the same as described in the EIS and further information supplied. Otherwise, the EPA requests the opportunity to review the final design and vary these general terms of agreement as appropriate.

If you have any questions, or wish to discuss this matter further please contact Scott Hunter on 02 6659 8282.

Yours sincerely

Scott Hunter

Acting Unit Head

Waste & Resources - Waste Management

(by Delegation)

General Terms of Approval - Issued

Notice No: 1537341

Administrative conditions

Note: Mandatory conditions for all general terms of approval

A1. Information supplied to the EPA

A1.1 Except as expressly provided by these general terms of approval, works and activities must be carried out in accordance with the proposal contained in:

- the development application DA 2015/135 submitted to Nambucca Shire Council on 31 August 2015;
- any environmental impact statement "Environmental Impact Statement for the establishment & operation of a grease trap and oily water processing facility at Lot 2 DP 538542, Kelly Close, Macksville" (July 2015) relating to the development; and
- all additional documents supplied to the EPA in relation to the development, including the response letter from David Pensini dated 16 December 2015, and its attachments.

A2. Fit and Proper Person

A2.1 The applicant must, in the opinion of the EPA, be a fit and proper person to hold a licence under the Protection of the Environment Operations Act 1997, having regard to the matters in s.83 of that Act.

Limit conditions

L1. Pollution of waters

L.1.1 Except as may be expressly provided by a licence under the Protection of the Environment Operations Act 1997 in relation of the development, section 120 of the Protection of the Environment Operations Act 1997 must be complied with in and in connection with the carrying out of the development.

L2. Waste

L2.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.

Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below.

Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.

Code	Waste	Description	Activity	Other Limits
K110	Grease trap waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste processing (non-thermal treatment of waste)	The total quantity of waste processed at the premises must not exceed 750,000 litres per annum.

L3. Noise limits

L3.1 Noise from the premises must not exceed a noise limit of 35 (LAeq, 15 minute) dB(A) at any residence, except as expressly provided by these general terms of approval.

L3.2 Noise from the premises is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise limit in this licence.

Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy.

The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

L3.3 The noise emission limits identified in the noise limits table in this licence apply under meteorological conditions of wind speed up to 3 metres per second at 10 metres above ground level, and temperature inversion conditions.

Hours of operation

L3.4 All construction work at the premises must only be conducted between 7am and 6pm Mondays to Fridays, and 8am to 1pm Saturdays. No construction work is permitted on Sundays or public holidays without prior approval from Nambucca Shire Council and prior notification of potentially affected residents.

L3.5 Activities at the premises, other than construction work, may only be carried on between normal business hours, being 9am and 5pm Mondays to Fridays.

L3.6 This condition does not apply to the delivery of material outside the hours of operation permitted by condition L3.4 or L3.5, if that delivery is required by police or other authorities for safety reasons; and/or the operation or personnel or equipment are endangered. In such circumstances, prior notification is provided to the EPA and affected residents as soon as possible, or within a reasonable period in the case of emergency.

L3.7 The hours of operation specified in conditions L3.4 and L3.5 may be varied with written consent if the EPA is satisfied that the amenity of the residents in the locality will not be adversely affected.

Operating conditions

O1. Odour

Potentially offensive odour

O1.1 No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

Notice No: 1537341

Meteorological monitoring

O1.2 The licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency, specified opposite in the other columns.

Parameter	Units of measure	Frequency	Averaging Period	Sampling Method
Rainfall	mm/hour	continuous	1 hour	AM-4
Sigma theta	degrees	continuous	10 minute	AM-2 and AM-4
Siting				AM-1
Temperature at 2 metres	kelvin	continuous	10 minute	AM-4
Total solar radiation	watts per square metre	continuous	10 minute	AM-4
Wind Direction at 10 metres	degrees	continuous	10 minute	AM-2 and AM-4
Wind Speed at 10 metres	metres per second	continuous	10 minute	AM-2 and AM-4

O2. Dust

O2.1 Activities occurring at the premises must be carried out in a manner that will minimise emissions of dust from the premises.

O2.2 Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.

O3. Stormwater/sediment control - Construction Phase

O3.1 An Erosion and Sediment Control Plan (ESCP) must be prepared and implemented. The plan must describe the measures that will be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities. The ESCP should be prepared in accordance with the requirements for such plans outlined in *Managing Urban Stormwater: Soils and Construction* (available from the Office of Environment & Heritage website).

O4. Stormwater/sediment control - Operation Phase

O4.1 Stormwater must be managed such that sediment laden water or surface pollutants (e.g. spilled liquid wastes, treated wastewater, or other materials required for operation of the facility) do not leave the premises.

O5. Waste management

O5.1 All liquid wastes onsite must be stored within a suitably bunded area. Bunds on the premises must be constructed and maintained in accordance with the relevant Australian Standard/s.

O5.2 Waste water from activities such as vehicle wash out or tank cleaning must be disposed of at a facility that can lawfully receive the waste(s).

O5.3 Any vehicle wash out at the premises must be undertaken in a suitably bunded area.

O6. Emergency response

O6.1 The licensee must maintain, and implement as necessary, a current Pollution Incident Response Management Plan (PIRMP) for the premises. The licensee must keep the incident response plan on the premises at all times. The incident response plan must document systems and procedures to deal with all types of incidents (e.g. spills, explosions or fire) that may occur at the premises or that may be associated with activities that occur at the premises and which are likely to cause harm to the environment. The licensee must develop a Pollution Incident Response Management Plan in accordance with the requirements in Part 5.7A of the Protection of the Environment Operations (POEO) Act 1997 and POEO regulations.

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by the EPA's general terms of approval, or a licence under the Protection of the Environment Operations Act 1997, in relation to the development or in order to comply with the load calculation protocol must be recorded and retained as set out in conditions M1.2 and M1.3.

M1.2 All records required to be kept by the licence must be:

in a legible form, or in a form that can readily be reduced to a legible form;

kept for at least 4 years after the monitoring or event to which they relate took place; and

produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected: the date(s) on which the sample was taken;

the time(s) at which the sample was collected;

the point at which the sample was taken; and

the name of the person who collected the sample.

Reporting conditions

R1.1 The applicant must provide an annual return to the EPA in relation to the development as required by any licence under the Protection of the Environment Operations Act 1997 in relation to the development. In the return the applicant must report on the annual monitoring undertaken (where the activity results in pollutant discharges), provide a summary of complaints relating to the development, report on compliance with licence conditions and provide a calculation of licence fees (administrative fees and, where relevant, load based fees) that are payable. If load based fees apply to the activity the applicant will be required to submit load-based fee calculation worksheets with the return.

Special Conditions

E1. Financial Assurance

E1.1 A financial assurance in the form of an unconditional and irrevocable and on demand guarantee from a bank, building society or credit union operating in Australia as 'Authorised Deposit-taking Institutions' under the *Banking Act 1959* of the Commonwealth of Australia and supervised by the Australian Prudential Regulatory Authority (APRA) must be provided to the EPA within a timeframe to be determined. The financial assurance must be in favour of the EPA in the amount of (to be determined). The financial assurance is required to secure or guarantee funding for works or programs required by or under this licence.

E1.2 The licensee must provide to the EPA, along with the original counterpart guarantee, confirmation in writing that the financial institution providing the guarantee is subject to supervision by the Australian Prudential Regulatory Authority (APRA).

E1.3 The financial assurance must contain a term that provides that any money claimed can be paid to the EPA or, at the written direction of the EPA, to any other person.

E1.4 The financial assurance must be maintained during the operation of the facility and thereafter until such time as the EPA is satisfied the premises is environmentally secure.

E1.5 The financial assurance must be replenished by the full amount claimed or realised if the EPA has claimed on or realised the financial assurance or any part of it to undertake a work or program required to be carried out by the licence which has not been undertaken by the licence holder.

E1.6 The EPA may require an increase in the amount of the financial assurance at any time as a result of reassessment of the total likely costs and expenses of rehabilitation of the premises.

E1.7 The licensee must provide to the EPA the original counterpart guarantee within five working days of the issue of:

a) the financial assurance required by condition E1.1, and

b) the adjusted financial assurance as required by condition E1.3 and E1.6

E1.8 The EPA may claim on a financial assurance under s303 of the POEO Act if a licensee fails to carry out any work or program required to comply with the conditions of this licence.

E2. Environmental Obligations of Licensee (Works & Programs)

E2.1 While the licensee's premises are being used for the purpose to which the licence relates, the licensee must:

a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.

b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given by the EPA.

c) Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.

Notice No: 1537341

E2.2 In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee (whether or not the premises continue to be used for the purposes to which the licence relates) must:

a) make all efforts to contain all firewater on the licensee's premises,

b) make all efforts to control air pollution from the licensee's premises,

c) make all efforts to contain any discharge, spill or run-off from the licensee's premises,

d) make all efforts to prevent flood water entering the licensee's premises,

e) remediate and rehabilitate any exposed areas of soil and/or waste,

f) lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of,

g) at the request of the EPA monitor groundwater beneath the licensee's premises and its potential to migrate from the licensee's premises,

h) at the request of the EPA monitor surface water leaving the licensee's premises; and

i) ensure the licensee's premises is secure.

E2.3 After the licensee's premises cease to be used for the purpose to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:

a) remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises; and

b) rehabilitate the site, including conducting an assessment of and if required remediation of any site contamination.

E3. Odour Audit

E3.1 By 12 months from the commencement of operations the proponent must submit an odour audit report to the EPA's Head Waste Compliance Coffs Harbour. The odour audit report must address the following:

a) A summary of odour complaints received and actions taken to reduce odour emissions where complaints are verified;

b) Benchmark the design and management practices at the facility against industry best practice for minimising odour emissions. This should include, but not be limited to, the use of meteorological monitoring to avoid operation of the trommel during adverse dispersion conditions;

c) Using the results of (a) and (b), if it is identified that the facility requires additional odour mitigation measures the report must include:

- Proposed mitigation works and/or management practices to ensure that odour is minimised as far as is practicable; and
- A timetable for the implementation of these works.

Notice No: 1537341

Attachment – Mandatory Conditions for all EPA licences

Administrative conditions

Other activities

(To be used on licences with ancillary activities)

This licence applies to all other activities carried on at the premises, including:

- **N/A**

Operating conditions

Activities must be carried out in a competent manner

Licensed activities must be carried out in a competent manner.

This includes:

a. the processing, handling, movement and storage of materials and substances used to carry out the activity; and

b. the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

Maintenance of plant and equipment

All plant and equipment installed at the premises or used in connection with the licensed activity:

a. must be maintained in a proper and efficient condition; and

b. must be operated in a proper and efficient manner.

Monitoring and recording conditions

Recording of pollution complaints

The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

The record must include details of the following:

- the date and time of the complaint;
- the method by which the complaint was made;
- any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- the nature of the complaint;

- the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- if no action was taken by the licensee, the reasons why no action was taken.

The record of a complaint must be kept for at least 4 years after the complaint was made.

The record must be produced to any authorised officer of the EPA who asks to see them.

Telephone complaints line

The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

This condition does not apply until 3 months after this condition takes effect.

Reporting conditions

Annual Return documents

What documents must an Annual Return contain?

The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

a. Statement of Compliance; and

b. Monitoring and Complaints Summary.

A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

An Annual Return must be prepared in respect of each reporting, except as provided below

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Where this licence is transferred from the licensee to a new licensee,

a. the transferring licensee must prepare an annual return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and

b. the new licensee must prepare an annual return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an annual return in respect of the period commencing on the first day of the reporting period and ending on

a. in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or

b. in relation to the revocation of the licence – the date from which notice revoking the licence operates.

Deadline for Annual Return

The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

(Licences with assessable pollutants)
Where the licensee is unable to complete a part of the Annual Return by the due date because the licensee was unable to calculate the actual load of a pollutant due to circumstances beyond the licensee's control, the licensee must notify the EPA in writing as soon as practicable, and in any event not later than the due date.

The notification must specify:

a. the assessable pollutants for which the actual load could not be calculated; and

b. the relevant circumstances that were beyond the control of the licensee.

Licensee must retain copy of Annual Return

The licensee must retain a copy of the annual return supplied to the EPA for a period of at least 4 years after the annual return was due to be supplied to the EPA.

Certifying of Statement of Compliance and Signing of Monitoring and Complaints Summary

Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

a. the licence holder; or

b. by a person approved in writing by the EPA to sign on behalf of the licence holder.

A person who has been given written approval to certify a Statement of Compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review this licence.

Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act

Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.

The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

Written report

Where an authorised officer of the EPA suspects on reasonable grounds that:

a. where this licence applies to premises, an event has occurred at the premises; or

b. where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,

and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

The request may require a report which includes any or all of the following information:

a. the cause, time and duration of the event;

b. the type, volume and concentration of every pollutant discharged as a result of the event;

c. the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; and

d. the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;

e. action taken by the licensee in relation to the event, including any follow-up contact with any complainants;

f. details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event;

g. any other relevant matters.

The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

General conditions

Copy of licence kept at the premises or on the vehicle or mobile plant

A copy of this licence must be kept at the premises or on the vehicle or mobile plant to which the licence applies.

The licence must be produced to any authorised officer of the EPA who asks to see it.

The licence must be available for inspection by any employee or agent of the licensee working at the premises or operating the vehicle or mobile plant.

Department of Primary Industries
Water

Contact: Vanessa Sultmann
Phone: 02 6676 7382
Fax: 02 6676 7388
Email: vanessa.sultmann@dpi.nsw.gov.au
Our ref: 30 ERM2015/0911
Our file: 2015-0394
Your ref: DA2015/0135

The General Manager
Nambucca Shire Council
PO Box 177
Macksville NSW 2447

Attention: Daniel Walsh

29 September 2015

Dear Sir/Madam

Re: Integrated Development Referral – General Terms of Approval
Dev Ref: DA2015/0135
Description of proposed activity: Grease Trap and Oily Water Processing Facility
Site location: 20 Gumma Road, Macksville

I refer to your recent letter regarding an integrated Development Application (DA) proposed for the subject property. Attached, please find DPI Water's (formerly the NSW Office of Water) General Terms of Approval (GTA) for works requiring a controlled activity approval under the *Water Management Act 2000* (WM Act), as detailed in the subject DA.

Please note Council's statutory obligations under section 91A (3) of the *Environmental Planning and Assessment Act 1979* (EPA Act) which requires a consent, granted by a consent authority, to be consistent with the general terms of any approval proposed to be granted by the approval body.

If the proposed development is approved by Council, DPI Water requests that these GTA be included (in their entirety) in Council's development consent. Please also note the following:

- DPI Water should be notified if any plans or documents are amended and these amendments significantly change the proposed development or result in additional works on waterfront land (which includes (i) the bed of any river together with any land within 40 metres inland of the highest bank of the river, or (ii) the bed of any lake, together with any land within 40 metres of the shore of the lake, or (iii) the bed of any estuary, together with any land within 40 metres inland of the mean high water mark of the estuary).
- Once notified, DPI Water will ascertain if the amended plans require review or variation/s to the GTA. This requirement applies even if the proposed works are part of Council's proposed consent conditions and do not appear in the original documentation.
- DPI Water should be notified if Council receives an application to modify the development consent and the modifications change any activities on waterfront land.
- DPI Water requests notification of any legal challenge to the consent.

As the controlled activity to be carried out on waterfront land cannot commence before the applicant applies for and obtains a controlled activity approval, DPI Water recommends the following condition be included in the development consent:

"The Construction Certificate will not be issued over any part of the site requiring a controlled activity approval until a copy of the approval has been provided to Council".

The attached GTA are not the controlled activity approval. The applicant must apply (to DPI Water) for a controlled activity approval **after consent** has been issued by Council **and before** the commencement of any work or activity on waterfront land.

Finalisation of a controlled activity approval can take up to eight (8) weeks from the date DPI Water receives all documentation (to its satisfaction). Applicants must complete and submit (to the undersigned) an application form for a controlled activity approval together with any required plans, documents, the appropriate fee and security deposit or bank guarantee (if required by the Office or Water) and proof of Council's development consent.

Application forms for the controlled activity approval are available from the undersigned or from DPI Water's website:
www.water.nsw.gov.au Water licensing › Approvals › Controlled activities

DPI Water requests that Council provide a copy of this letter to the applicant.

DPI Water also requests that Council provides DPI Water with a copy of the determination for this development application as required under section 91A (6) of the EPA Act.

Yours Sincerely

Patrick Phalow
Senior Water Regulation Officer
Water Regulatory Operations, Water Regulation, North & North Coast
NSW Department of Primary Industries – DPI Water

General Terms of Approval

for work requiring a controlled activity approval under s91 of the *Water Management Act 2000*

Number	Condition	File No: 2015-0394
Site Address:	20 Gumma Road, Macksville	
DA Number:	DA2015/0135	
LGA:	Nambucca Shire Council	
Plans, standards and guidelines		
1	These General Terms of Approval (GTA) only apply to the controlled activities described in the plans and associated documentation relating to DA2015/0135 and provided by Council. Any amendments or modifications to the proposed controlled activities may render these GTA invalid. If the proposed controlled activities are amended or modified DPI Water (formerly the NSW Office of Water) must be notified to determine if any variations to these GTA will be required.	
2	Prior to the commencement of any controlled activity (works) on waterfront land, the consent holder must obtain a Controlled Activity Approval (CAA) under the Water Management Act from DPI Water. Waterfront land for the purposes of this DA is land and material in or within 40 metres of the top of the bank or shore of the river identified.	
3	The consent holder must prepare or commission the preparation of: (i) Erosion and Sediment Control Plan	
4	All plans must be prepared by a suitably qualified person and submitted to the NSW Office of Water for approval prior to any controlled activity commencing. The plans must be prepared in accordance with DPI Water's guidelines located at www.water.nsw.gov.au/ Water-Licensing/Approvals.	
5	The consent holder must (i) carry out any controlled activity in accordance with approved plans and (ii) construct and/or implement any controlled activity by or under the direct supervision of a suitably qualified professional and (iii) when required, provide a certificate of completion to DPI Water.	
Rehabilitation and maintenance		
6	The consent holder must carry out a maintenance period of two (2) years after practical completion of all controlled activities, rehabilitation and vegetation management in accordance with a plan approved by the DPI Water.	
7	The consent holder must reinstate waterfront land affected by the carrying out of any controlled activity in accordance with a plan or design approved by the DPI Water.	
Reporting requirements		
8	N/A	
Security deposits		
9	N/A	
Access-ways		
10	N/A	
11	N/A	
Bridge, causeway, culverts, and crossing		

Number	Condition	File No: 2015-0394
12	N/A	
13	N/A	
Disposal		
14	The consent holder must ensure that no materials or cleared vegetation that may (i) obstruct flow, (ii) wash into the water body, or (iii) cause damage to river banks; are left on waterfront land other than in accordance with a plan approved by DPI Water.	
Drainage and Stormwater		
15	N/A	
16	N/A	
Erosion control		
17	The consent holder must establish all erosion and sediment control works and water diversion structures in accordance with a plan approved by DPI Water. These works and structures must be inspected and maintained throughout the working period and must not be removed until the site has been fully stabilised.	
Excavation		
18	N/A	
19	N/A	
Maintaining river		
20	The consent holder must ensure that (i) river diversion, realignment or alteration does not result from any controlled activity work and (ii) bank control or protection works maintain the existing river hydraulic and geomorphic functions, and (iii) bed control structures do not result in river degradation other than in accordance with a plan approved by DPI Water.	
21	N/A	
River bed and bank protection		
22	N/A	
23	N/A	
Plans, standards and guidelines		
24	N/A	
25	N/A	
26	N/A	
27	N/A	
Groundwater		
28	N/A	
END OF CONDITIONS		

Department of Primary Industries
Water

Our Ref. No.: 2007-0638

Mr Michael Coulter
General Manager
Nambucca Shire Council
PO Box 177
MACKSVILLE NSW 2447

Attention: Mr Jason O'Donnell

19 October 2015

Dear Mr Coulter

Reference is made to Council's emails of 8 September and 13 October 2015 regarding the development application by Tony Gordon Septic for a grease trap waste treatment facility and the proposed discharge of liquid trade waste from the above facility to Council's Macksville sewerage system.

The applicant has advised that only grease trap waste (and no oily water) will be treated at the above facility. The screened grease trap waste is proposed to be treated in a three tank bioreactor system dosed with air and a product containing bacteria (ForEarth Bio Plus). Sampling data from a similar site where this product is in use has been provided by the applicant. While these sampling results indicate significant reduction in BOD, Total Oil and Greases and Total Suspended Solids in three days, the performance of this bioreactor system has been inconsistent in a similar facility at Dubbo. Therefore, DPI Water will require sampling of each batch of treated grease trap waste prior to discharge (refer Condition 23 in Attachment A). The sampling requirements may be reviewed if consistent effluent quality is demonstrated.

Accordingly, Council is advised that concurrence is granted to Council's interim approval, for a two year period, for the discharge of liquid trade waste from the grease trap waste facility at the Tony Gordon Septic premises to Council's Macksville sewerage system subject to Council:

- Ensuring that all of the conditions set out in Attachment A, are included in the final approval.

Should you have any queries about the above matter please contact Anand Namdeo on 9842 8518.

Yours sincerely

for Glenn George
A/Director
Urban Water

Attachment A

Conditions of approval

Name and business address of Applicant: Tony Gordon Septic, 20 Gumma Rd Macksville

Type of Business: Grease Trap Waste Treatment Facility

Tony Gordon Septic (The Applicant) has applied to Council to discharge liquid trade waste from the premises to Council's sewerage system. Council has granted approval subject to the conditions set out below:

1. a. The Applicant must comply with all applicable Acts, regulations, by laws, proclamations and orders and with any lawful direction or orders given by or for the Council or any other competent authority.
   (Reason: Requirement to comply with all applicable government legislation)

   b. The work that will be carried out under the General Conditions of Approval shall be implemented and operated in compliance with the *Work Health & Safety Act 2011* and Plumbing Code of Australia, Australian Standards AS3500, Part 2, Sanitary Plumbing and Drainage and Council requirements.
   (Reason: Government requirement for compliance with applicable standards and legislation)

   c. If a liquid trade waste agreement is applicable to this approval then this approval will commence from the date a liquid trade waste agreement is signed.
   (Reason: Requirement for legal considerations)

   d. Term of the Approval

   Commencement date: **<Council to insert>**

   Duration: 2 Years

   This approval has a duration period as specified above except where the approval is terminated by the Council or the applicant. Conditions may however be varied during this period.
   (Reason: Pursuant to section 103 of the Local Government Act)

   e. Hours during which discharge is permitted:

Monday to Friday	07:00 AM to 07:00 PM
Saturday	**<Council to insert>**
Sunday	**<Council to insert>**

   (Reason: DPI Water and Council requirement to ensure acceptance capacity of the sewerage system and for auditing purposes)

2. The maximum daily discharge shall not exceed 3 kL/d.
   The maximum instantaneous discharge rate shall not exceed **<Council to insert>** L/s or L/h.
   (Reason: Requirement pursuant to Clause 32 of the Local Government (General) Regulation 2005)

3. Detergent, if used, shall be biodegradable
   (Reason: Protection of the environment and to ensure treatability of the waste)

4. The composition of the liquid trade waste shall comply with that approved. A new application shall be made if the quantity and/or quality of the liquid trade waste are to be varied.

(Reason: Requirement pursuant to Clause 32 of the Local Government (General) Regulation 2005)

5. The equipment for the treatment of the liquid trade waste is to be kept clean and maintained in an efficient condition to the satisfaction of the Council and must not be modified without the approval in writing of the Council.

(Reason: DPI Water and Council requirement to ensure compliance with the conditions of approval)

6. An inspection point suitable for taking representative samples shall be provided immediately prior to the point where the liquid trade waste enters the sewerage system and/or mixes with domestic sewage from the premises.

(Reason: DPI Water and Council requirement to permit sampling and compliance auditing of liquid trade waste)

7. If, in the opinion of the Council, the liquid trade waste being discharged does not comply with the conditions contained herewith or is adversely affecting the performance of the sewage treatment plant, the sewerage system, or the ecological system in the waters, land or area receiving sewage treatment works effluent, the company shall forthwith, on receipt of notice in writing from Council to this effect, take remedial action by modifying the characteristics of the liquid trade waste, reducing the amount of the liquid trade waste or ceasing to discharge the liquid trade waste as directed by notice from Council.

(Reason: DPI Water and Council requirement for compliance with the conditions of approval, protection of the sewerage system and the environment)

8. The following substances shall not be included in the liquid trade waste:

- organochlorine weedicides, fungicides, pesticides, herbicides and substances of a similar nature and/or wastes arising from the preparation of these substances
- organophosphorus pesticides and/or waste arising from the preparation of these substances
- any substances liable to produce noxious or poisonous vapours in the sewerage system
- organic solvents and mineral oil
- any flammable or explosive substances
- discharges from 'Bulk Fuel Depots'
- chromate from cooling towers
- natural or synthetic resins, plastic monomers, synthetic adhesives, rubber and plastic emulsions
- roof, rain, surface, seepage or ground water, unless specifically permitted (clause 137A of the *Local Government (General) Regulation 2005*)
- solid matter

- any substance assessed as not suitable to be discharged to the sewerage system
- waste liquids that contain pollutants at concentrations which inhibit the sewage treatment process – refer *Australian Sewage Quality Management Guidelines, June 2012*, WSAA
- any other substances listed in a relevant regulation.

(Reason: Statutory provision in Local Government Act Section 638 and DPI Water and Council requirement for protection of the sewerage system, safety of workers and the environment)

9. All liquid trade waste pre-treatment systems and any substance which could adversely affect the sewerage system, the environment or safety of people must be contained in bunded areas so that any leaks, spillages, and/or overflows cannot drain by gravity to the sewerage and/or stormwater systems. Wastewater collected within the bunded area shall not be directly discharged into the sewerage systems without appropriate pre-treatment.

(Reason: DPI Water and Council requirement for protection of the sewerage system and safety of workers and pursuant to Section 89 (3a) of the Local Government Act 1993 for protection of the environment)

10. Measures shall be taken to prevent the ingress of stormwater into the sewerage system. Areas where stormwater may become contaminated should be bunded.

(Reason: DPI Water and Council requirement to prevent overflows and overloading of the sewerage system)

11. All liquid trade waste shall pass through screens, a solid settlement pit and a three tank bioreactor system before being discharged to the sewerage system.

(Reason: DPI Water and Council requirement to limit loading on the sewerage system and pre-treatment system)

12. Measures shall be taken to prevent spillage of chemicals, oil, diesel, and any other product used. Any spillage, if occurring, shall be recovered/removed by using dry cleaning methods and not be discharged into the sewerage system.

(Reason: DPI Water and Council requirement to protect the sewerage system and worker health and safety

13. Flow measurement using a magnetic flow meter shall be provided. Daily total discharge shall be recorded.

(Reason: DPI Water and Council requirement for due diligence, compliance auditing, monitoring and sampling purposes

14. The pH of the liquid trade waste shall be maintained within the range of 7.0 to 9.0 at all times.

(Reason: Extremes of pH can adversely affect biological treatment processes and may cause the release of toxic gases in sewer. Low pH causes corrosion of sewer structures)

15. The BOD_5 concentration shall not exceed 300 mg/L at any time.

(Reason: DPI Water and Council requirement to limit loading on the sewerage system)

16. The suspended solids concentration shall not exceed 300 mg/L at any time.

(Reason: DPI Water and Council requirement to limit loading on the sewerage system)

17. The Chemical Oxygen Demand (COD) shall not exceed 600 mg/L for BOD_5 less than 100 mg/L, otherwise the COD shall not exceed the BOD_5 concentration by more than 3 times.

(Reason: DPI Water and Council requirement to prevent the discharge of non-biodegradable waste and to ensure treatability of the proposed liquid trade waste)

18. The concentration of Total Dissolved Solids shall not exceed 4000 mg/L.

(Reason: DPI Water and Council requirement for effluent management options (reduces the opportunity for reuse) and protection of the receiving aquatic environment)

19. The concentration of Ammonia (as N) shall not exceed 50 mg/L at any time.

(Reason: DPI Water and Council requirement for protection of the sewerage system and worker health and safety)

20. The concentration of Total Kjeldahl Nitrogen (TKN) shall not exceed 100 mg/L at any time.

(Reason: DPI Water and Council requirement for protection of the sewerage system and the environment)

21. The concentration of total oil and grease shall not exceed 100 mg/L at any time.

(Reason: DPI Water and Council requirement to prevent sewer blockages)

22. The concentration of Petroleum Hydrocarbons (non-flammable) shall not exceed 30 mg/L.

(Reason: DPI Water and Council requirement for protection of worker health and safety, the sewerage system and the receiving aquatic environment)

23. Representative samples of the effluent from each batch shall be collected and tested with respect to pH, BOD, COD, Total Suspended Solids, Total Oil & Greases, Ammonia(as N), Total Dissolved Solids, Total Kjeldahl Nitrogen and Total Petroleum Hydrocarbons.

    The discharge shall not commence without Council's review of the sampling results.

    The sampling frequency may be reviewed 3 months after the commencement of the discharge.

(Reason: Requirement pursuant to Section 89 (3a) of the Local Government Act 1993 and Council requirement for protection of the environment, worker health and safety and to ensure treatability of the waste)

24. The sample analysis tests shall be carried out only by laboratories that hold National Association of Testing Authorities (NATA) registration for the class of test(s) or specific test(s) specified in the trade waste approval or by a laboratory acceptable to DPI Water. Tests shall be carried out by using analytical methods indicated in the *Australian Sewage Quality Management Guidelines, June 2012*, WSAA. The results of the chemical analysis shall be forwarded to the Council and DPI Water for review as soon as available from the laboratory. The analysis records are to be retained by the discharger for the specified period of 3 years.

(Reason: DPI Water and Council requirement to ensure the integrity of any sampling analysis results are not compromised and due diligence concerns are satisfied)

25. Solids shall be removed from the settlement pit and the collection sump regularly for off-site disposal and not discharged into the sewerage system.
(Reason: DPI Water and Council requirement to limit loading on the sewerage system)

26. Sludge resulting from treatment of the waste shall be removed from the premises by a licensed contractor.
(Reason: DPI Water and Council requirement to protect the sewerage system and EPA requirement for waste disposal)

27. A log book shall be kept detailing the following items:
- Date of waste receival
- Address of premises from where waste was collected
- Volume of waste received
- Date of discharge
- Volume of waste discharged
- Sampling analysis results.

The log book is to be made available to a Council and DPI Water officer upon request.
(Reason: DPI Water and Council requirement to protect the sewerage system, environment and health and safety of workers)

28. A contingency plan and a due diligence program are to be submitted to Council within three (3) months and six (6) months respectively of commencement of the approval from Council.
(Reason: DPI Water and Council requirement to ensure that adequate contingency measures are in place to address potentially hazardous situation)

NSW GOVERNMENT Health

North Coast Public Health
Covering both Mid North Coast & Northern NSW Local Health Districts

12 October 2015 04/282

Mr Daniel Walsh
Senior Town Planner
Nambucca Shire Council
c/- council@nambucca.nsw.gov.au

Dear Mr Walsh

RE: DEVELOPMENT APPLICATION 2015/135 – WASTE TREATMENT FACILITY

Thank you for the opportunity to have input into the above proposed designated development. The following information is provided to assist in the consideration of the development application.

Nambucca Shire Council and the Northern Joint Regional Planning Panel are strongly encouraged to consider:

1. whether another alternate location within NSC was considered for the site of this waste treatment facility. Whilst siting the facility next to the existing sewage treatment plant may seem logical, the proximity to the wetland, the river and within a 1:100 flood zone, would make the site not the ideal first preference. With the expected increase in frequency and severity of high rainfall events and floods, there is potential for this development to cause adverse effects to the neighbouring properties, wetland and community.
2. the potential impacts from the above/below ground location of the components of the waste treatment facility. The EIS did not clearly state which components of the facility are above or below ground. With a shallow water table, a neighbouring wetland and a river that floods, the strength of the construction & reinforcement of above ground tanks, and the siting of any below ground storage components, is important to ensure the minimisation of any effects of high rainfall events or floods. It is unclear in the documentation exactly what components are included in the 'bunded process hardstand area' and whether this is adequate.
3. that a condition of approval of this development be that a site specific plan for flood and emergency management be developed and implemented (NSC 2005 Floodplain Risk Management Plan).
4. that a condition of approval of this development be that a pest management plan that incorporates at least rodent and mosquito management is developed and implemented.

Should you require any further clarification of the above, please contact me on 65882750.

Yours faithfully

Kerryn Lawrence
Senior Environmental Health Officer

North Coast Public Health (Covering both MNC and NNSW Local Health Districts)
Hosted by Mid North Coast Local Health District
ABN 57 946 356 658

Morton Street, Port Macquarie NSW 2444
PO Box 126, Port Macquarie NSW 2444
Tel 02 6588 2750 Fax 02 6588 2837
NSW Public Health Unit Telephone Access Line: 1300 066 055 (bh)
Website http://mnclhd.health.nsw.gov.au/about/north-coast-public-health/

NSW GOVERNMENT | Department of Primary Industries

OUT15/28322

Mr Daniel Walsh
Senior Town Planner
Nambucca Shire Council
PO Box 177
Macksville NSW 2447

Dear Mr Walsh

SEPP 62 response regarding proposed Water Treatment Facility 20 Gumma Road Macksville.

Thank you for referring the above development application to Fisheries NSW, a division of the NSW Department of Primary Industries, in accordance with SEPP 62 – Sustainable Aquaculture.

There are numerous Priority Oyster Aquaculture Areas (POAAs) located in The Nambucca River. POAAs are mapped and described in the NSW Oyster Industry Sustainable Aquaculture Strategy (OISAS). This strategy also details the agreed water quality needs of the oyster industry. OISAS can be accessed at: http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/oysters/industry/industry-strategy.

Fisheries NSW has reviewed the Environmental Impact Statement prepared by David Pensini, Building Certification and Environmental Services (July 2015) for the subject development and has the following comments:

1. The EIS fails to characterise the inflow to and outflow from the plant. The source of the input wastewater and its chemical composition should be characterised. This characterisation should identify any chemicals that are not listed in the *Nambucca Shire Council Liquid Trade Waste Management Policy, 2009*, that are likely to be in the wastewater by virtue of its source. Also, details of the chemical composition of the waste plant outflow should similarly be detailed. This information is required to assess the design performance and risk of the proposed treatment plant.

2. It is recommended that the EIS consistently refer to the *Nambucca Shire Council Liquid Trade Waste Management Policy, 2009,* rather than interchanging terms such as 'Councils trade waste discharge standards' and 'Nambucca Shire Council Trade Waste Disposal Policy'.

3. The information provided in Appendix 2 of the EIS is of little use as it is not interpreted, has no context in relation to the proposed plant and most of the

Fisheries NSW – Port Stephens Fisheries Institute
Locked Bag 1, NELSON BAY NSW 2315
Tel: 02 4916 3836 Fax: 02 4981 9074 www.dpi.nsw.gov.au ABN: 72 189 919 072

data supplied has no units. It is noted that the trial report dated 17/02/2012 to Mr Troy Pemberton indicates a 2 log reduction in TSS and COD, a 3 log reduction in BOD5 and a 4 log reduction in O&G. However the other results provided indicate, at best, a 1 log reduction and several results that either exceed or are very close to the *Nambucca Liquid Trade Waste Management Policy 2009* guideline limits for acceptance of liquid trade wastes into the sewerage system.

4. The Nambucca STP discharges into the Nambucca River in close proximity and upstream of the oyster harvest areas and is therefore considered a high risk to the sanitary water quality required by the oyster industry. It is noted that the proposed treatment plant adds unspecified bacteria to aid the waste treatment process. The EIS fails to provide any analysis or statement on the sanitary quality of the effluent wastewater, any impact it may have on the sanitary quality of the STP effluent and subsequently any adverse impact this may have on the sanitary water quality of the Nambucca River.

Please contact Tim Gippel (Senior Policy Officer Aquaculture) on 02 49163823 if you require any further information.

Yours sincerely

Ian Lyall
Manager Aquaculture
Date: 13 October 2015

File No: NTH15/00097
Your Ref: DA2015/135

The General Manager
Nambucca Shire Council
PO Box 177
MACKSVILLE NSW 2447

Attention: Daniel Walsh – Senior Town Planner

Dear Sir / Madam,

DA2015/135 Septic & Grease Trap Water Treatment Facility, Lot 2 DP 538543 Kelly Close, Macksville

I refer to your letter of 4 September 2015 requesting comment from Roads and Maritime Services in relation to the abovementioned development application.

Roads and Maritime has reviewed the referred application and has no objection as the development is not considered to impact on the safety and efficiency of a classified road.

The proposed development is located on the boundary of the approved alignment for the Warrell Creek to Nambucca Pacific Highway Upgrade Project. All access to the development is it to be via Kelly Close.

It would be appreciated if Council could forward a copy of the Notice of Determination for our records. Should you require any further comment please contact Matt Adams, Acting Manager Land Use Assessment on (02) 6640 1362 or via email at: development.northern@rms.nsw.gov.au.

Yours faithfully

30 September 2015
for Liz Smith
Acting Network & Safety Manager, Northern Region

Nambucca Shire Council

Enquiries to: Daniel Walsh
Phone: 6568 0259
Our Ref: DA 2015/135

27 October 2015

Tony Gordon Septic Tanks
PO Box 591
MACKSVILLE NSW 2447

Dear Sir

DEVELOPMENT APPLICATION 2015/135
WATER TREATMENT FACILITY
LOT: 2 DP: 538542 20 GUMMA ROAD, MACKSVILLE

Reference is made to the above mentioned development application. To enable full assessment of the proposal, the following additional items must be provided to Council within 30 days from the date of this letter:

1. Council is not in a position to determine the development application because general terms of approval from the NSW Environment Protection Authority (EPA) have not been received. You are required to submit the odour assessment referred to in the attached letter from the EPA in order for the development application to be given further consideration.

2. You are required to address the matters raised in the attached letter from the NSW Department of Primary Industries.

3. The declaration on page 2 of the submitted Environmental Impact Statement (EIS) is to be amended to state that the EIS has been prepared in accordance with schedule 2 of the Environmental Planning and Assessment Regulation 2000.

It is requested that the information be clearly marked with your application number, **DA 2015/135**.

Should you require any further information, please contact me on 65680259 or daniel.walsh@nambucca.nsw.gov.au.

Yours faithfully

Daniel Walsh
SENIOR TOWN PLANNER

Protection of the Environment Operations Act 1997

General Terms of Approval - Refused

Notice No:1534996

Nambucca Shire Council

MACKSVILLE NSW 2447

Attention: Daniel Walsh

Notice Number	1534996
File Number	EF15/14934
Date	23-Oct-2015

Re: Nambucca Shire Council - Integrated Development Application No. 2015/135 - Water Treatment Facility - Lot 2 DP 538542, 20 Gumma Road, Macksville

Issued pursuant to Section 91A(2) Environmental Planning and Assessment Act 1979

I refer to the development application and accompanying information provided for the Nambucca Shire Council ("Council") Integrated Development Application No. 2015/135 - Water Treatment Facility - Lot 2 DP 538542, 20 Gumma Road, Macksville ('the Premises") received by the Environment Protection Authority (EPA) on 10 September 2015.

I also note the advice by phone from Council's Daniel Walsh on 21 October 2015 that no public submissions were received for this proposal.

EPA has reviewed the information provided and has determined that it will be unable to issue an environment protection licence for the proposal as currently presented for the following reasons:

Air Impact Assessment

The Director Generals Requirements for this proposal required an odour assessment be undertaken in accordance with the EPA's *Approved Method for the Modelling and Assessment of Air Pollutants in NSW (DEC, 2006), Approved Methods for the Sampling and Analysis of Air Pollutants (DEC, 2006) and Assessment and Management of Odour from Stationary Sources in NSW.* However, the EIS does not contain any assessment of odour impacts from the proposal. A level one odour assessment is required as the proposal is to process up to 15,000 litres of grease trap waste per week. The EIS does not contain enough information to confidently state that no odour impacts would occur as a result of the proposal.

The following additional information is required:

- A description of the material being accepted, the exact nature of those materials and what odours are expected;

- A description the processes that would cause odour;
- A description of the odour from those processes;
- Describe how this odour would be mitigated throughout the various operational stages of the proposal.

EPA would, however, be prepared to review its determination should the applicant provide the additional information specified above.

If you have any questions, or wish to discuss this matter further please contact Scott Hunter on (02) 6659 8282 or at scott.hunter@epa.nsw.gov.au

Yours sincerely

Helen Mulligan

Unit Head Waste Compliance

Waste & Resources - Waste Management

(by Delegation)

NSW GOVERNMENT | Department of Primary Industries

OUT15/28322

Mr Daniel Walsh
Senior Town Planner
Nambucca Shire Council
PO Box 177
Macksville NSW 2447

Dear Mr Walsh

SEPP 62 response regarding proposed Water Treatment Facility 20 Gumma Road Macksville.

Thank you for referring the above development application to Fisheries NSW, a division of the NSW Department of Primary Industries, in accordance with SEPP 62 – Sustainable Aquaculture.

There are numerous Priority Oyster Aquaculture Areas (POAAs) located in The Nambucca River. POAAs are mapped and described in the NSW Oyster Industry Sustainable Aquaculture Strategy (OISAS). This strategy also details the agreed water quality needs of the oyster industry. OISAS can be accessed at: http://www.dpi.nsw.gov.au/fisheries/aquaculture/publications/oysters/industry/industry-strategy.

Fisheries NSW has reviewed the Environmental Impact Statement prepared by David Pensini, Building Certification and Environmental Services (July 2015) for the subject development and has the following comments:

1. The EIS fails to characterise the inflow to and outflow from the plant. The source of the input wastewater and its chemical composition should be characterised. This characterisation should identify any chemicals that are not listed in the *Nambucca Shire Council Liquid Trade Waste Management Policy, 2009*, that are likely to be in the wastewater by virtue of its source. Also, details of the chemical composition of the waste plant outflow should similarly be detailed. This information is required to assess the design performance and risk of the proposed treatment plant.

2. It is recommended that the EIS consistently refer to the *Nambucca Shire Council Liquid Trade Waste Management Policy, 2009,* rather than interchanging terms such as 'Councils trade waste discharge standards' and 'Nambucca Shire Council Trade Waste Disposal Policy'.

3. The information provided in Appendix 2 of the EIS is of little use as it is not interpreted, has no context in relation to the proposed plant and most of the

Fisheries NSW – Port Stephens Fisheries Institute
Locked Bag 1, NELSON BAY NSW 2315
Tel: 02 4916 3836 Fax: 02 4981 9074 www.dpi.nsw.gov.au ABN: 72 189 919 072

data supplied has no units. It is noted that the trial report dated 17/02/2012 to Mr Troy Pemberton indicates a 2 log reduction in TSS and COD, a 3 log reduction in BOD5 and a 4 log reduction in O&G. However the other results provided indicate, at best, a 1 log reduction and several results that either exceed or are very close to the *Nambucca Liquid Trade Waste Management Policy 2009* guideline limits for acceptance of liquid trade wastes into the sewerage system.

4. The Nambucca STP discharges into the Nambucca River in close proximity and upstream of the oyster harvest areas and is therefore considered a high risk to the sanitary water quality required by the oyster industry. It is noted that the proposed treatment plant adds unspecified bacteria to aid the waste treatment process. The EIS fails to provide any analysis or statement on the sanitary quality of the effluent wastewater, any impact it may have on the sanitary quality of the STP effluent and subsequently any adverse impact this may have on the sanitary water quality of the Nambucca River.

Please contact Tim Gippel (Senior Policy Officer Aquaculture) on 02 49163823 if you require any further information.

Yours sincerely

Ian Lyall
Manager Aquaculture
Date: 13 October 2015