



## ENVIRONMENTAL ASSESSMENT OF AMENDED PIPELINE ROUTE



### PIPELINE ROUTE BETWEEN WESTERN BOUNDARY LOT 20 DP1082482 AND CHINDERA ROAD

Australian Bay Lobster Producers Ltd  
Cudgen Bay Lobster Facility and Associated Pipeline

Prepared by MBR Environmental  
August 2008



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## Document Control

**Project Title:** Environmental Assessment: Amended Pipeline Route: Pipeline Route Between Western Boundary Lot 20 DP1082482 and Chinderah Road

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**Author:** Marc Walker

**Approved for Release by:** Marc Walker

### Description:

This Environmental Assessment has been prepared as part of an application (number 08-0038) to the NSW Department of Planning for approval to utilise a different pipeline route for part of the overall pipeline route previously approved by the department under DA-282-11-2004-i. This consent currently allows for an aquaculture development comprising Dreamtime Beach seawater intake at Kingscliff, seawater supply pipeline from the beach to Cudgen and a production facility at 355 Cudgen Road.

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# Declaration

Prepared under Part 3A of the Environmental Planning and Assessment Act, 1979 (as amended)

## Environmental Assessment prepared by:

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In respect of: Project Application

## Project Application

Applicant name: Australian Bay Lobster Producers Ltd  
Applicant address: 42 Campbell Street, Bowen Hills, Qld  
Land to be developed: Various (refer report)  
Proposed development: Installation of Pipeline(s)

**Environmental Assessment:** An Environmental Assessment (EA) is attached

**Certificate** I certify that I have prepared the content of this Environmental Assessment and to the best of my knowledge:

- It is in accordance with the Environmental Planning and Assessment Act and Regulation.
- It is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

Signature



Name Marc Walker

# Executive Summary

## Introduction

This Environmental Assessment considers the environmental impacts of an amendment of a section of pipeline supplying fresh seawater and over part of the route removing treated wastewater to an approved project to construct and operate a large-scale staged Aquaculture development.

The proposed development is identified as integrated development requiring consent from Council pursuant to the Roads Act. Likewise, the proposed development has been identified by Gazette as a Major Project development under the provisions of the Environmental Planning & Assessment Act 1979 (EP&A Act) and State Environmental Planning Policy (Major Projects) 2005. It is subject to the provisions of Part 3A of the EP&A Act and will subsequently require the consent of the Minister in order to proceed.

Since the project aspects associated with the amended pipeline route are very similar to the existing approved route for the overall project, this Environmental Assessment draws from previous work undertaken for the aquaculture facility and approved pipeline route and assesses the relevant aspects of the amended route and any impacts upon the findings of the original Statement of Environmental Effects associated with the existing approval.

## Need for the Project

The proposed development, a modification to a previously approved pipeline route, is essential to the progress of the aquaculture development which it serves. The aquaculture facility is a multi million dollar investment in the Tweed Shire which will create many jobs in the agribusiness sector. It was considered in the original Statement of Environmental Effects (Planit Consulting & Australian Fresh, 2004) that the proposal was a 'major employment generating industry' under State Environmental Planning Policy No. 34 – Major Employment Generating Industrial Development. The proposed amended pipeline route is a key component of the entire project.

The relocation of this section of pipeline will enable connection of the aquaculture facility to the new Kingscliff STP which was envisaged in the original Development Approval for the Bay Lobster facility. While the existing route is approved, continuing with the original proposal to locate these pipelines as approved would result in their having to be relocated in the future, resulting in a disruption of production at the Bay Lobster aquaculture facility and difficulties in planning and construction processes for the adjoining land users (ie: sand mine). ABLP discussed an alternative route with Council who agreed to the use of the nominated road reserve (Tweed Shire Council, pers.comm).

The pipelines will be laid within council controlled road reserves and private easements in a rural location ensuring minimal inconvenience to the public and are likely to have a minimal environmental impact, since the route includes only Council road reserve areas, most of which currently contain pipelines and roads.

Pipeline installation will include open trenching, such as that routinely undertaken by Councils along road reserves, and under-boring, often called *trenchless technology*, in areas such as water and road crossings, whereby a drilling head is driven through the ground without any surface disturbance other than the entry and exit locations.

Operation of the pipeline route will involve minimal works other than pipeline, fitting and any pump station inspections and maintenance works where required (expected to be very minimal). Generally the pipe material is chosen to avoid replacement over 20-50 years and fittings such as valves, connections and junctions are easily accessed for these routine inspections.

## Environmental Impacts

Environmental impacts associated with the proposed development have been examined in the context of the following: -

- Waste Generation;
- Fauna & Flora Impacts;
- Cultural Heritage Impacts;
- Socio Economic Impacts;
- Noise Impacts;
- Visual Impacts; and
- Traffic Impacts;

It can be concluded from the investigations carried out, that the proposed development will not result in any unwarranted or unnecessary adverse impacts upon the local environment and will not compromise the existing approval nor the findings of the original Statement of Environmental Effects undertaken to gain the original approval. It is expected that impacts will reduce compared to the existing approved route under DA-282-11-2004.i.



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# 1 Introduction

This Environmental Assessment Report (EA) in relation to Australian Bay Lobster Producers Ltd (ABLP) project at Cudgen / Kingscliff NSW is submitted to the Minister for Planning pursuant to Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) as a Major Development application under the direction of the Minister (refer Appendix H).

The report has been prepared by MBR Environmental on behalf of the proponent, ABLP. It is based on plans and supporting information provided by the proponent and describes the site, its environs and the proposed development. It includes an assessment of the proposal in accordance with the Director-General's Environmental Assessment requirements.

References to the 'project' or the 'proposed development' within this report will refer to the modified pipeline sections the subject of this assessment.

References to the 'original proposal' refer to the existing approved bay lobster facility and pipeline route (as per DA-282-11-2004.i) and the 'overall project' refers to the aquaculture facility and pipeline as a single entity.

## 1.1 Scope

Australian Bay Lobster Producers Ltd (ABLP) proposes to develop and operate an aquaculture facility at Cudgen, NSW. Associated with the development is a pipeline to deliver seawater to the site and a discharge pipe to join the new Kingscliff Sewage Treatment Plant (STP) discharge into the Tweed River. The location of the proposed aquaculture facility is shown below in Figure 1. and the existing approved pipeline route (in red) with the proposed modified sections subject to this report (in green) are shown in Figure 2.

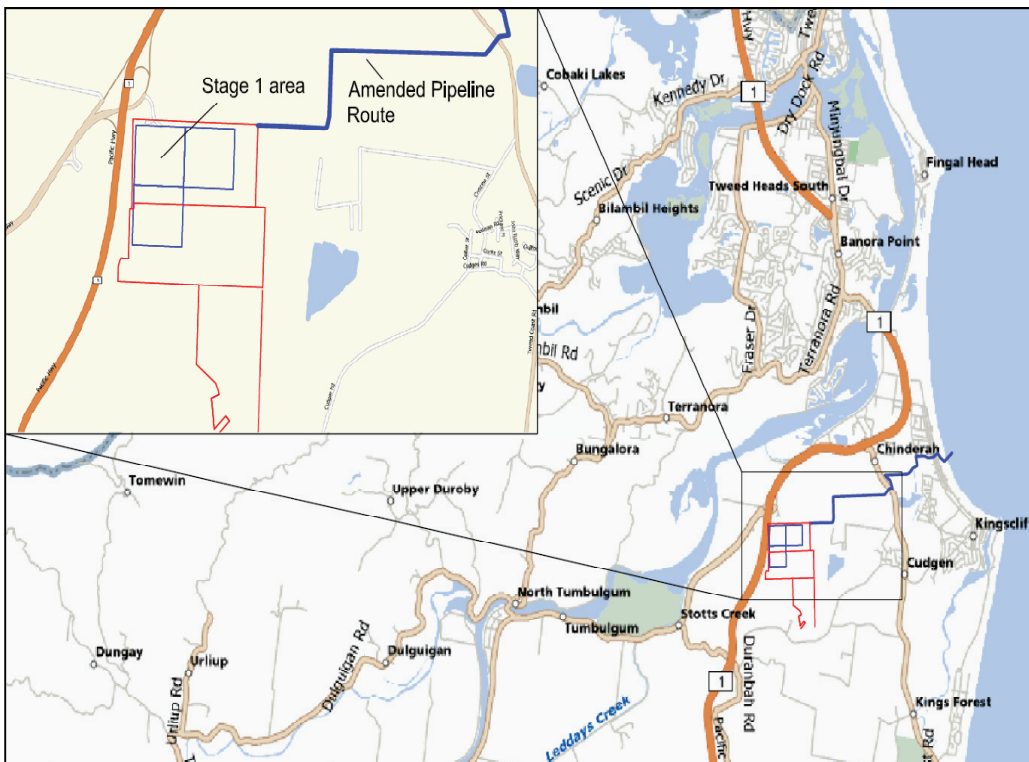


Figure 1 – Site Location

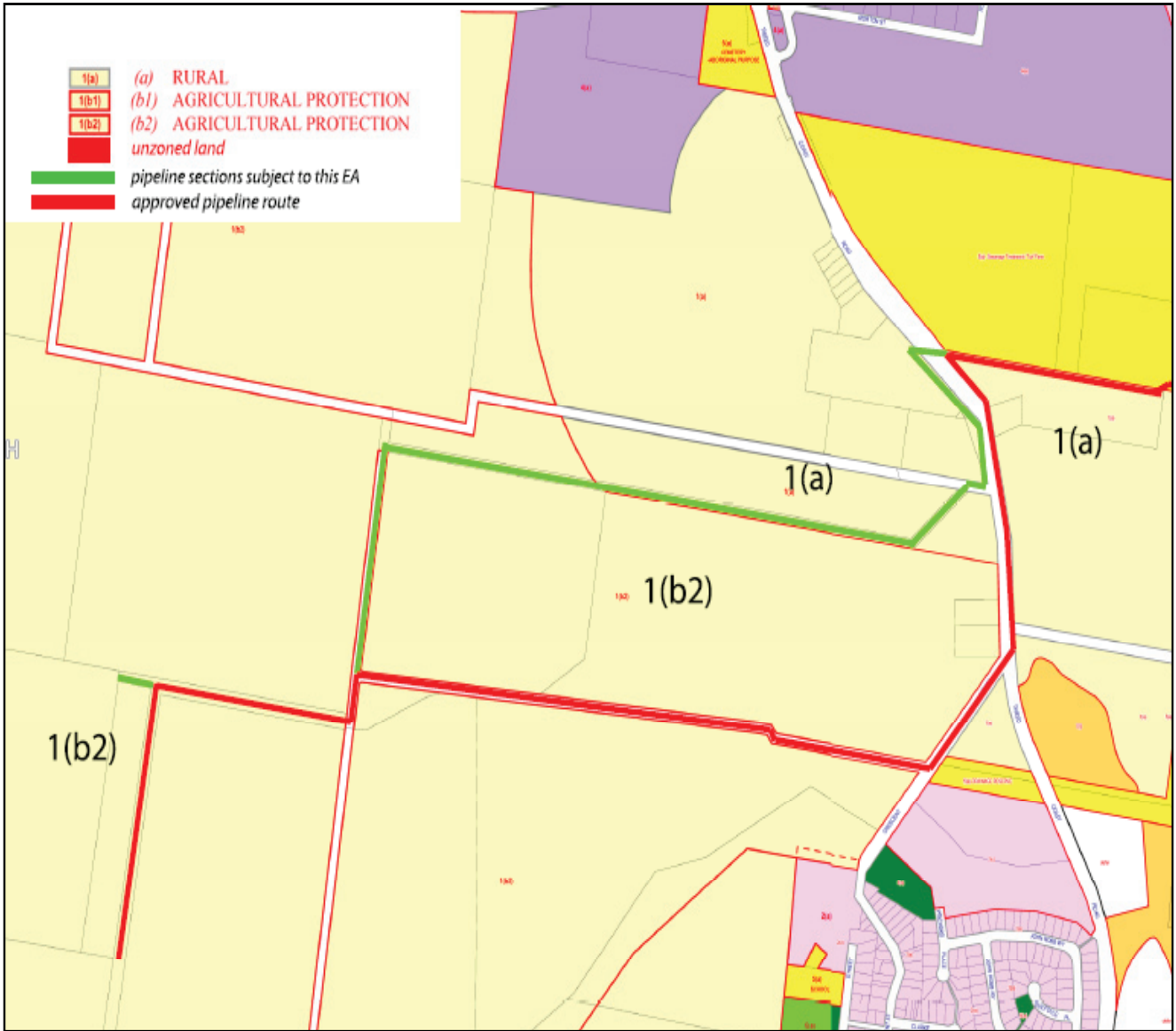


Figure 2: Location and Land zonings of existing approved route and proposed modified sections subject to this Environmental Assessment



## 2 Site Description and Location

### 2.1 Overview

The proposed development is located in the Tweed Shire (northern NSW) approximately 5 kilometres west of the township of Kingscliff, as shown in Figure 1.

The approved development (under DA-282-11-2004.i) involves the construction and operation of a commercial aquaculture facility on Lot 1 DP267742 and Lot 706 DP1000580 and works associated with road works and pipelines external to these sites.

### 2.2 Land zoning and Title

The route subject to this assessment covers a length of approximately 2.3km and covers zones 1(a), 1(b2) and unzoned Council road reserves. The land zoning maps from the Tweed Local Environment Plan are shown above in Figure 2.

Originally, the pipeline route included a section along the Chinderah Road reserve, crossing Chinderah Road and turning into Crescent Street and then following the 'un-named east-west' road to the 'unnamed north-south' road on the western boundary of lot 22 DP 1082435 as shown in red in Figure 2.

The proposed modified route sections involves crossing Chinderah Road and tracing a path along the northern boundaries of Lots 1 and 2 DP1107697 and Lot 1 DP1091576. Written agreement was obtained from these property owners to utilise an easement along this boundary for the purposes of the pipeline.

The pipeline then follows Council's road reserve to the Kingscliff STP (between Lots 20 and 21 DP1082482 on the south and Lot 33 DP7482 on the north). It continues along the northern and western boundaries of the STP (Lot 20 DP1082482) to link up with the approved route at the western end of the un-named east-west road. The use of this easement is also subject to an existing agreement with Council.

A short section along the road reserve on the northern boundary of Lot 2 DP529569 will join with ABLP's site (Lot 1 DP267742) and replace the remaining approved route along the 'un-named north-south road' on the western boundary of Lot 22 DP1082435.

This section was part of lot 2 DP 529569 (privately owned land) when DA-282-11-2004.i was being prepared so the original pipeline route avoided this land by following an unnamed north south road reserve on the lots eastern boundary. The northern section of lot 2 DP 529569 has since been purchased by Tweed Shire Council.

Refer to Figures 1 and 2 above for the proposed changes.

### 2.3 Topography

The site lies in the lower reaches of Tweed River approximately 10 km south of the river mouth at Tweed Heads. It is located on a broad flat floodplain at approximately 1.0m AHD and is bounded generally on the west and north by the Tweed River, by the Pacific Ocean and the foreshore of Kingscliff to the east, and by Cudgen Plateau to the south. Cudgen Village is located on Cudgen Plateau, a remnant basalt plateau where its base reaches less than 0.5 kilometres from south east of the property and the edge of the floodplain.

The topography of the proposed modified route is regionally gentle though the route adjoins drains, embankments and will have areas adjacent to the pipeline route that are of a steeper slope. Works will generally be undertaken on flat areas.

## 2.4 Vegetation and Habitat

The length of pipeline between Chinderah Road and the new Kingscliff STP occurs over an existing dirt road, with the pipe to be laid next to existing pipe work. As such, this section does not cross through any native vegetation or habitat areas. Land around the boundary of the Kingscliff STP site which is to contain the pipeline consists of cleared agricultural land containing native and exotic grass and shrub species, with a line of Swamp Oak (*Casuarina glauca*) along a section close to the northern boundary. Generally, the proposed pipeline section is clear of woody vegetation (Tweed Shire Council, pers.comm).

Assessment of flora and fauna communities and habitat values undertaken as part of the original Statement of Environmental Effects for the overall project (flora and fauna assessment report attached in Appendix E) and the EIS for the new Kingscliff STP (GHD, 2002) found no threatened species or communities recorded in either Commonwealth or State legislation within the study area. This study area includes the proposed amended route.

## 2.5 Surrounding Development

The project is surrounded by mainly agricultural land used in the past and to some extent presently as cane farming land other than the new Kingscliff STP to the south and east of part of the proposed route. Residences are sparse in the area of the pipeline, the residences closest to the route along Chinderah Road being party to an agreement with ABLP allowing the use of an easement along their boundary for the pipeline.

## 2.6 Project Background and Description

The proponent of the proposed development, Australian Bay Lobster Producers Ltd (ABLP) has an extensive history in the aquaculture industry and currently operates an export-oriented operation incorporating a collaborative research and production facility on Bribie Island in Queensland. Due to advances in technology and a marked increase in demand and efficiencies, the operation was no longer viable out of this location and therefore an alternative site was chosen.

ABLP applied for and was granted a development approval from the NSW Department of Planning in December 2005 (DA-282-11-2004.i) for an aquaculture development in the Tweed shire, comprising Dreamtime Beach seawater intake, seawater supply pipeline from the beach to Cudgen and a production facility at 355 Cudgen Road.

The pipelines indicated in the approval carried fresh seawater from Kingscliff to Cudgen and returning pipes carried treated waste seawater to the existing Kingscliff Sewage Treatment Plant (STP) outfall pipe and sewage to the STP for treatment.

Part of the approved pipeline route is along the unnamed east-west road joining Crescent Street to the Tweed Valley Way off ramp of the new Pacific Highway. This road was utilised since at the time the original Development Application was prepared it was the only road reserve leading to the STP. However, in the time that has elapsed since the application was lodged, a new STP for Kingscliff has been constructed to the north of the unnamed east-west road and road reserves for Tweed Shire Council pipelines have been created.



A Development Approval has been granted for a sand mine on land to the south of the east-west road, which led to a further application to expand the sand mine that, if successful, will result in the relocation of part of the unnamed east-west road as well as of ABLP's pipelines if they lie in that road reserve.

Since the ABLP pipelines have yet to be constructed it seems logical to change the pipelines route to avoid future difficulties for all concerned. Submissions to the Department of Planning indicated that a new Development Application was required, which was designated as a Major Project by the Minister. An application was lodged on 20 February 2008 along with a Preliminary Environmental Assessment report. Director-General's requirements were made available on 2 April 2008.

## 2.7 Summary of Modified Route

The pipeline route which is the subject of this Environmental Assessment consists of two parts, the main (approx. 2 kilometre) section begins when the approved pipeline (from DA-282-11-2004.i) meets Chinderah Road and is as follows;

- Across Chinderah Road to the West;
- South along the northern boundaries of Lots 1 and 2 DP1107697 and Lot 1 DP1091576 (approximately 480m);
- west along the unnamed road reserve on northern boundary of lot 20 DP 1082482 and lot 21 DP 1082482 (approximately 1200m); and
- south on the unnamed road reserve on the western boundary of lot 20 DP 1082482 (approx 480m).

The second part (approximately 76 metres) is along the unnamed east west road, beginning at the eastern boundary of lot 1 DP 267742 and ending proximal to the western boundary of lot 22 DP 1082435.

The proposed pipeline route will take the path of existing cleared and disturbed areas for most of its path along existing access roads to the new Kingscliff STP and the un-named road extending east from Melaleuca Road.

Other sections along the northern and western boundaries of the Kingscliff STP site will traverse areas largely cleared of native vegetation.

No vegetation will be removed from undisturbed areas during the process of laying the proposed intake and return pipes other than potentially some minor shrub and individual trees along the route, as well as removal of turf.

The proposed pipeline route will cross a number of water crossings, and may require the physical attachment of the pipe to existing services crossing over a drain located close to Chinderah Road. The proposed pipeline may be visible at this point, with the remainder being located beneath the ground surface.

Any other agricultural drain crossings along the pipeline route will incorporate under boring or *trenchless technology* as the preferred means of laying which will avoid any disturbance to the water, bed and flora and fauna within the drains.

Concept design details of the pipeline trenching work are shown in Appendix B.

Essentially, the two methods to be used for pipeline installation include:

- Open trenching, such as that routinely undertaken by Councils along road reserves. This involves digging out the trench (to approximately 1m wide x 1m deep), stockpiling material temporarily to the side, laying pipes (50-200mm diameter plastic materials) including suitable bedding material and backfilling as soon as possible; and
- under-boring, often called *trenchless technology*, whereby a drilling head is driven through the ground without any surface disturbance other than the entry and exit locations. Water is pumped through the drill apparatus and spoil is filtered out and the water recycled on-site back into the drilling operation.

Treatment for acid sulfate soils (ie: liming) and erosion and sediment control is undertaken concurrently with these works.

## 3 Planning Framework

### 2.8 Justification

The proposed development, a modification to a previously approved pipeline route, is essential to the progress of the aquaculture development which it serves. The aquaculture facility is a multi-million dollar investment in the Tweed Shire which will create many jobs in the agribusiness sector. It was considered in the original Statement of Environmental Effects (Planit Consulting & Australian Fresh, 2004) that the proposal was a 'major employment generating industry' under State Environmental Planning Policy No. 34 – Major Employment Generating Industrial Development. The proposed amended pipeline route is a key component of the entire project.

The relocation of this section of pipeline will enable connection of the aquaculture facility to the new Kingscliff STP which was envisaged in the original Development Approval for the Bay Lobster facility. Continuing with the existing route as approved would likely result in their having to be relocated in the future, resulting in a disruption of production at the Bay Lobster aquaculture facility and difficulties in planning and construction processes for the adjoining land users (ie: sand mine). ABLP discussed an alternative route with Council and the preferred route, subject to this Environmental Assessment, was agreed upon. Council gave permission to ABLP to use the nominated road reserve (Tweed Shire Council, pers.comm).

The pipelines will be laid within council controlled road reserves and an easement on private land subject to written agreement in a rural location ensuring minimal inconvenience to the public. The works likely to have a minimal environmental impact, since the route includes mainly road reserve areas, most of which currently contain pipelines and roads and the operational component of this section will be minimal, only requiring maintenance as would be the case for the other Council pipelines along this route.

### 3.1 Commonwealth Matters

Commonwealth matters include the requirements under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999), for the protection of 'matters of national environmental significance' which include:

- World heritage properties;
- Ramsar wetlands of international importance;
- Nationally threatened animal and plant species and ecological communities;
- Internationally protected migratory species;
- Commonwealth marine areas; and
- Nuclear Actions.

Under the EPBC Act, approval of the Commonwealth Minister for the Environment is required for actions that may have a significant impact on matters of national environmental significance. As noted in the Flora and Fauna assessment for the overall project (Appendix E) and the Environmental Impact Statement for the new Kingscliff STP (GHD, 2002), no matters of national environmental significance are associated with, or will be impacted by, the proposed development. These assessments include the area subject to the amended pipeline route.

### 3.2 NSW State Legislation

#### *Coastal Protection Act 1979 and the Coastal Protection Regulation 2004*

No works are required within the coastal zone that is below the mean high water mark (as is the case for the pumping station at Dreamtime Beach, previously approved). As such, the provisions of this Act do not apply.



### ***Environmental Planning & Assessment Act, 1979***

Section 75B(1) of the EP&A Act makes provision for ‘major projects’ to be identified by order of the Minister published in the Gazette. Direction of the Minister was given on 6 November 2007, included in Appendix H, and is therefore a major project under the provisions of the Environmental Planning & Assessment Act 1979 (EP&A Act) and State Environmental Planning Policy (Major Projects) 2005, and subject to the provisions of Part 3A of the EP&A Act.

The modified pipeline route sections (the ‘project’) is not designated development under Part 1 of Schedule 3 of the Environmental Planning & Assessment Regulation 2000. It does, however, constitute “integrated development” pursuant to Section 91 of the EP&A Act due to a requirement for:

- approval from local council under the Roads Act 1994.

A Scheduled Development Works licence under the Protection of the Environment Operations Act 1997 to undertake works leading to the operation of a scheduled activity (the aquaculture facility) will be required for works associated with the development of the facility and pipeline works associated with that project. However, this Environmental Assessment and associated development approval (no 08-038) consider the amended pipeline section only.

Therefore, it is considered that a Scheduled Development Works licence is not required, other than as part of satisfying the provisions and conditions of DA-282-11-2004.i for the overall development and remainder of the pipeline since construction of the amended pipeline route will occur in conjunction with the remainder of the existing approved route.

Note that Tweed Shire Council has agreed to ABLP locating the pipeline(s) within the easement (Tweed Shire Council, pers.comm).

In these circumstances, the consent authority will consult with the ‘integrated’ authorities during the development assessment process, and prior to determination of the application, these authorities must advise the consent authority whether or not approval would be issued and what the general terms of their approval would be.

### ***Fisheries Management Act 1994, Water Management Act 2000 and Water Act 1912***

The proposed modified pipeline route will include a number of drainage channel crossings. No disturbance to any of these drainage channels will occur since these crossings will involve either fixing to an existing bridge structure or boring under the channels avoiding interfering with the bed, waters, flora and fauna of any of these waters. Therefore, no permit or approval will be required under the above acts.

## **3.3 State Environmental Planning Policies**

### ***State Environmental Planning Policy No. 14 – Coastal Wetlands***

Ensures coastal wetlands are preserved and protected for environmental and economic reasons. The policy applies to local government areas outside the Sydney metropolitan area that front the Pacific Ocean. The policy identifies over 1300 wetlands of high natural value from Tweed Heads to Broken Bay and from Wollongong to Cape Howe. Land clearing, levee construction, drainage work or filling may only be carried out within these wetlands with consent. Such development also requires an environmental impact statement to be lodged with a development application.

The proposed amended pipeline route does not impact on any designated SEPP 14 Coastal wetlands.

***State Environmental Planning Policy No. 26 – Littoral Rainforest***

Protects littoral rainforests, a distinct type of rainforest well suited to harsh salt-laden and drying coastal winds. The policy requires that the likely effects of proposed development be thoroughly considered in an environmental impact statement. The policy applies to 'core' areas of littoral rainforest as well as a 100 metre wide 'buffer' area surrounding these core areas, except for residential land and areas to which SEPP No. 14 - Coastal Wetlands applies. Eighteen local government areas with direct frontage to the Pacific Ocean are affected, from Tweed in the north to Eurobodalla in the south.

The proposed modified pipeline route does not impact on any designated SEPP 26 littoral rainforest.

***State Environmental Planning Policy (Major Projects) 2005***

This replaces the SEPP No. 34 – Major Employment Generating Industrial Development which applied to the overall development at the time of the original application.

Normally the SEPP (Major Projects) 2005 would not apply to this development. However, as noted in Section 3.2 above, Direction of the Minister was given on 6 November 2007 (included in Appendix H) to declare this project a 'major project' under the provisions of the Environmental Planning & Assessment Act 1979 (EP&A Act) and this SEPP. The project assessment is therefore subject to the provisions of Part 3A of the EP&A Act.

***State Environmental Planning Policy No. 44 – Koala Habitat***

In summary, this policy requires a plan of management to be prepared and approved by the Director General of the Department of Infrastructure, Planning and Natural Resources before Council may consent to development within core Koala habitat areas.

The proposal does not impact upon core koala habitat and the SEPP does not specifically apply to this development.

***State Environmental Planning Policy No. 62 - Sustainable Aquaculture***

State Environmental Planning Policy No. 62 is the principal environmental planning instrument controlling development for the purposes of aquaculture in NSW. Pursuant to Clause 6(1), this policy prevails in the event of any inconsistency with another environmental planning instrument, inclusive of the Tweed Local Environmental Plan 2000.

The Statement of Environmental Effects for the proposed developed (Planit Consulting & Australian Fresh, 2004) found the proposal satisfied the minimum performance criteria under clause 7 of the SEPP for the overall project (refer Appendix I). It is considered that, while the amended pipeline route application the subject of this Environmental Assessment does not involve aquaculture development as such, Part 5A(1) states that the policy applies to 'aquaculture development' meaning 'development' for the purposes of aquaculture. Since the amended section of the pipeline is integral to the development of the approved aquaculture facility, it is considered that the SEPP applies to this development.

The analysis shown in Appendix I defined the overall development as Class 2 aquaculture development which is not designated development but which is advertised development for the purposes of the EP&A Act.

The amended pipeline route does not change in any way the findings detailed in Appendix I as it relates to the overall project.



### ***State Environmental Planning Policy No. 71 - Coastal Protection***

SEPP 71 applies to land within the 'coastal zone'. The land subject to the modified pipeline route is located more than 1km from the coast (approximately 1.4km); therefore the provisions of SEPP 71 would not apply to the proposed modified pipeline sections.

## **3.4 Regional Environmental Plans and Policies**

### **3.4.1 North Coast Regional Environment Plan 1998 (NCREP)**

#### ***Clause 12 Development control—impact of development on agricultural activities***

Prior to issuing development consent authority must consider the likely impact of the proposed development on the use of adjoining or adjacent agricultural land and whether or not the development will cause a loss of prime crop or pasture land. The proposed development is not located on land that is considered to be prime crop or pasture.

In terms of adjoining agricultural uses the overall aquaculture farm is not out of character with the area and will not compromise the continued operations of the adjoining and surrounding cane and melaleuca farms or the horticultural or grazing activities on adjoining properties. The amended pipeline route will have an even smaller effect and will not utilise land zoned for agricultural use other than small sections already given over to road easements.

It is considered the project is consistent with the provisions of the clause

### ***Clause 29A Development control—natural areas and water catchment***

The provision of Clause 29A require Council to consider the following prior to issuing consent:

- (1) The council must not grant consent for the clearing of natural vegetation in environmental protection, scenic protection or escarpment preservation zones unless it is satisfied that:
  - (a) the wildlife habitat will not be significantly disturbed by the proposed development, and
  - (b) the scenery will not be adversely affected by the proposed development, and
  - (c) an erosion and sediment control plan will be implemented which will successfully contain on the site any erosion or sediment caused by the proposed development.
- (2) In this clause, clearing of natural vegetation means:
  - (a) the removal of the majority of the vegetation, ground cover, topsoil or flora (other than noxious weeds, or trees which are dead, dangerous, exotic or propagated for horticultural purposes) within an area in excess of 1 hectare, or
  - (b) the reduction of the canopy or the population of any one tree species in excess of 20 per cent within an area in excess of 1 hectare, but does not include such removal or reduction within 3 metres of the boundary of land in different ownership or occupation for constructing or maintaining a fence, or
  - (c) within 0.5 metre of the common boundary of land in different ownership or occupation to allow a registered surveyor to survey the boundary.

In this regard the pipeline is not located on land within an environmental protection, scenic protection or escarpment preservation zone.

### ***Clause 32B Development control—coastal lands***

The proposed development is not located on land which is located within the Coastal Zone since it is located more than 1km from the coast and therefore NSW Coastal Policy 1997 does not apply.

### ***Clause 33 Coastal Hazard Area***

As noted above, the proposed development is not located within the Coastal Zone and therefore Clause 33 does not apply.

### ***Clause 81 Development Adjacent to the Ocean or the Waterway***

The provisions of Clause 81 state inter alia: -

- (1) The council shall not consent to a development application for development on land within 100 metres of the ocean or any substantial waterway unless it is satisfied that:
  - a) there is a sufficient foreshore open space which is accessible and open to the public within the vicinity of the proposed development,
  - b) buildings to be erected as part of the development will not detract from the amenity of the waterway, and
  - c) the development is consistent with the principles of any foreshore management plan
- (2) Nothing in subclause (1) affects privately owned rural land where the development is for the purpose of agriculture applying to the area.

The proposed pipeline does not alter the overall project compliance with these clauses. In particular, the development is not close enough to the coast to be designated 'coastal development' and will involve the clearing of at best minimal amounts of native vegetation, which would be consistent with the original proposal for the overall development.

It is also expected to result in a lessening of impacts to adjoining users since:

- Less pipeline will be laid in public roads;
- The sand mine proponent will not be inconvenienced by the existing proposed route along the un-named east-west road; and
- Tweed Shire Council has agreed to locate the pipeline within the easement (Tweed Shire Council, pers.comm).

## **3.5 Local Environmental Plans**

### ***Tweed Local Environmental Plan (LEP)***

The modified section of the pipeline route is to be carried out within the following statutory zones: -

- 1a) Rural Land
- 1(b2) Agricultural Protection; and
- unzoned road reserves.

The proposed development is defined as Animal Establishment which is permissible with consent in both the 1(a) and 1(b2) zones. Development in unzoned land requires consent under the Tweed LEP 2000, the objectives of Part 3 clause 13 of which (Development of uncoloured land on the zone map) are:

- to enable the control of development on unzoned land.
- to ensure that development of unzoned land is compatible with surrounding development and zones.
- to ensure that development of certain waters takes account of environmental impacts and other users of the waters.



The section states that in deciding whether to issue consent the consent authority must consider the following:

- (a) whether the proposed development is compatible with development permissible in the adjoining zone and the character and use of existing development in the vicinity, and
- (b) in the case of unzoned land that is below the mean high-water mark of the ocean or an estuary, bay, lake or river:
  - (i) whether or not the proposed development would alienate the use of the waters of the ocean, estuary, bay, lake or river from recreational uses or from commercial fishing and, if so, whether there is sufficient area in the locality for those uses to mitigate the adverse effect of the proposed development on those uses,
  - (ii) the provisions of any coastal, estuary or river plan of management in force from time to time that applies to the unzoned land or land in the vicinity, and
  - (iii) any impact the proposed development may have on the natural environment.

The present use of the proposed modified route section is primarily as a Council pipeline and road easement, with little vegetative cover. It is considered that the proposed use of a similar pipeline trench within the easement is consistent with the present use of the land and has no impact upon any waters due to small excavation depths if the proposed erosion and sediment controls described later in this report are adopted.

The pipeline will not be laid within land that is below mean high-water mark.

The pipeline route traverses Class 2 Acid Sulphate Soils as identified under the Tweed Local Environmental Plan 2000. The pipeline will have a maximum depth of less than 1m below ground level and will therefore not require approval. However, ABLP have committed to undertaking the project utilising appropriate testing and treatment under an Acid Sulfate Soils Management Plan to appropriately manage any potential environmental harm from all aspects of the proposal.

It is considered the proposed pipeline does not prejudice the provisions of the clause and is therefore permissible with consent. Any water crossings will be undertaken so as to effectively minimise the impacts by utilising a policy of no disturbance of waterways utilising boring technology and potentially one point where the pipe(s) will be fixed to a bridge crossing.

# 4 Environmental Assessment

## 4.1 Introduction

The scope of environmental issues is associated in this Environmental Assessment with the section of the pipeline route proposed to be modified. Specifically, it aims to identify the key environmental impacts and mitigation measures for the pipeline route sections that were not approved under the previous development approval DA-282-11-2004.i. The proposed changes are described as:

1. relocating an approximately 2.0 km section from the unnamed east-west road into road reserves created for the new Kingscliff STP; and
2. relocating an approximately 76 metre section from the unnamed north-south road reserve on the western boundary of lot 22 DP 1082435 to the unnamed east-west road across the northern boundary of lot 2 DP 529569

This section is structured so that both impacts and mitigation measures are discussed within the following phases:

- Excavation, installation and construction associated with the pipeline
- Commissioning and operation of the pipeline

However not all issues raised will be relevant to every phase of the development.

## 4.2 Director-General's Requirements

The Director-General's requirements for this Environmental Assessment are as follows in Table 1 below.

Table 1: Director General's requirements and location within this report

Director-General's Requirement	Location with EA Report
Executive summary	iv
Detailed written description and graphical representation of the project including the: <ul style="list-style-type: none"> <li>- need for the project including its relationship to the approved aquaculture facility (DA-282-11-2004.i);</li> <li>- alternatives considered;</li> <li>- plans of any building or engineering works; and</li> <li>- various components and stages of the project.</li> </ul>	iv, 2, Appendix A, Appendix B 2 2.8 Appendix A, B 2
Consideration of any relevant statutory provisions, including whether the project is consistent with the objects of the Environmental Planning and Assessment Act 1979	3
A general overview of the environmental impacts of the project, identifying the key issues for further assessment, and taking into consideration the issues raised during consultation;	4
A detailed assessment of the key issues specified below, and any other significant issues identified in the general overview of environmental impacts of the project (see above), which includes: <ul style="list-style-type: none"> <li>- a description of the existing environment;</li> <li>- an assessment of the potential impacts of the project including cumulative impacts;</li> <li>- a description of the measures that would be implemented to avoid, minimise, mitigate, manage and/or monitor the impacts of the project;</li> </ul>	4 2 4 5



Director-General's Requirement	Location with EA Report
A draft statement of commitments, outlining environmental management, mitigation and monitoring measures;	5
A conclusion justifying the project, taking into consideration the environmental impacts of the project, the suitability of the site, and any social, economic and/or environmental benefits that may arise as a result of the project;	6
A table indicating where each of the Director-General's requirements have been addressed in the EA and appendices; and	4.2
A signed statement from the author of the Environmental Assessment certifying that the information contained in the report is neither false nor misleading	i
Key Issues	
Construction – including:	
- details of the construction methodology/activities and scheduling;	2
- erosion and sediment control;	4.5, 5
- surface water/groundwater management;	4.7, 5
- soils including management of acid sulfate soils;	4.5, 5
- traffic management;	4.4
- noise and air quality management;	4.10
- waste;	4.11
- procedures to protect, relocate or repair any public infrastructure damaged during the construction of the pipeline; and	4.8
- procedures to consult with the community during the construction period	5, Appendix D
Operation - including details of maintenance requirements and ongoing management and monitoring during operation	4, 5

### 4.3 Flora and Fauna

The length of pipeline between Chinderah Road / Tweed Valley Way and the new Kingscliff STP occurs over an existing dirt road, with the pipe to be laid next to existing pipe work. As such, this section does not cross through any native vegetation or habitat areas. Land around the boundary of the Kingscliff STP site which is to contain the pipeline consists of cleared agricultural land containing native and exotic grass and shrub species.

A line of Swamp Oak (*Casuarina glauca*) exists along a section close to the northern boundary and along the western boundary associated with the drainage channels in these locations (Tweed Shire Council, pers. comm).

An assessment of survey drawings undertaken by Hutch Engineering Surveys Pty Ltd in June 2007 (shown in Appendix A), discussions with Tweed Shire Council, ground-truthing and aerial photography assessment indicates that there may exist the potential need to disturb isolated plants along the route though no significant vegetation clearing is likely to be required. Generally, the proposed pipeline section is clear of woody vegetation.

Assessment of flora and fauna communities and habitat values undertaken as part of the original proposal (Planit Consulting & Australian Fresh, 2004) (Flora and Fauna assessment attached in Appendix E) and the EIS for the new Kingscliff STP (GHD, 2002) found no threatened species or communities recorded in either Commonwealth or State legislation within the study area. The modified route will only inhabit existing private land easements under agreement and Council road reserves.

An analysis of the proposed DRAFT Tweed Vegetation Management Plan Tweed Local Environment Plan maps do not change the pipeline land zonings described in Section 2.2 of this report.

Further, the Draft Tweed Local Environmental Plan 2000, Amendment No.21 Catchment Management Map shows areas of Bushland, non-bushland and drainage lines in the Tweed Shire. The proposed pipeline route passes through non-bushland areas on the map throughout its entire passage, though it passes to the south of a Bushland strip north of the new Kingscliff STP comprising Swamp Oak (*Casuarina glauca*) tree species. The pipeline will not pass through this area nor will removal or damage to trees be required in this area.

Another area of bushland is located close (to the north) of the entrance to the road reserve from Chinderah Road, however this does not intrude onto the road reserve (used currently as a road) and no harm will occur to the vegetation in this area.

#### 4.4 Traffic, access and parking

The amendment to the pipeline route does not change the operations to the main aquaculture site which is the focus of traffic and parking constraints during operation. Access to the amended pipeline route will be via the existing Council access to the new Kingscliff STP and other un-named roads in the area during construction and traffic numbers during this stage are expected to be minimal.

Impacts from traffic and parking and associated with site access are expected to be minimal during construction and will be limited to maintenance vehicles only during operation. No further investigation or assessment for traffic or access to the site or pipeline is proposed.

#### 4.5 Soils

##### *Acid Sulfate Soils*

The complete length of the proposed modified pipeline section is identified as travelling through Class 3 Acid Sulfate Soils as indicated by the Acid Sulfate Soil Planning Maps shown in Appendix C. ABLP plans to excavate to 1000mm maximum depth for laying pipeline. Accordingly, no consent from Council will be required pursuant to Clause 35 of the Tweed Local Environmental Plan (works in Class 3 soils less than 1m depth or do not lower ground water level below 1m depth). Concept details of trenching standards are provided for review (Appendix B).

Sampling undertaken by Tweed Shire Council along the road reserve to the new Kingscliff STP indicated a low level of actual and potential acidity in surface soils. However, this exceeded the criteria in some locations outlined in the NSW Acid Sulfate Soils Manual (ASSMAC, 1998). Potential impact from acid sulfate soils will need to be managed in excavations to avoid possible environmental harm occurring, particularly relating to acid drainage to nearby drainage channels. An acid sulfate soils investigation will proceed along the intended route prior to excavation to determine any liming requirements and a management plan will be developed to treat the soils either during excavation outlined as part of an Acid Sulfate Soils Management Plan for the project.



### ***Sediment and erosion control***

The excavating of trenches, bedding of pipelines and back filling of trenches may involve some potential for loss of sediment from the construction area. Erosion of the site shall be minimised and sedimentation shall be controlled so as to not adversely impact surrounding drains, creeks or surrounding areas.

This will be achieved by:

- limiting traffic on disturbed areas
- careful management of stockpiles
- sediment control structures such as sediment traps and sediment fencing/control

An erosion and sediment control plan will be prepared for the development.

### **4.6 Heritage and aboriginal archaeology**

An assessment of the indigenous and cultural heritage values of terrain to be potentially impacted by the proposed development was assessed by Davies Heritage Consultants Pty Ltd (Appendix F). This report identified that although there are Native Title Claims within the Tweed Shire, none have been lodged over the area where the proposed development will be located.

A search of the New South Wales National Parks and Wildlife Service's Aboriginal Heritage Information Management System (AHIMS) has shown that six known Indigenous sites are currently recorded in the area. Five of the sites are located to the north and north east, while another is located to the east of the present study area. None of the sites are under threat of impact from the proposed development.

The above report recommended that should future activities associated with the proposed Aquaculture Development (including the sea water intake pipeline), uncover anything which may be interpreted as Aboriginal in origin, work in the vicinity of the find should cease immediately and the developer should inform the Department of Conservation (NSW), Coffs Harbour and the Tweed Byron Local Aboriginal Land Council as soon as possible for further discussion and negotiation.

The provisions of the National Parks and Wildlife Act of 1974 states that it is illegal to damage, deface or destroy a relic without written permission of the Director of the Service. Those failing to report a discovery and those responsible for the damage or destruction occasioned by unauthorised removal or alteration to a site or to archaeological material maybe prosecuted under the National Parks and Wildlife Act 1974.

It was also recommended that should the route of the proposed sea water intake pipeline as provided to Davies Heritage Consultants be altered or should further pipelines be proposed, a cultural heritage survey of any changes or additions associated with the project must be undertaken by a qualified archaeologist and representative of the Tweed Byron LALC.

Considering the pipeline route amendment still encompasses the same land identified within the development area and includes lands assessed by GHD (2002) for the Kingscliff STP as having no heritage locations or items, no further assessment for cultural heritage and indigenous values for the site is required unless possible Aboriginal artefacts are uncovered during excavation.

## 4.7 Aquatic Ecosystems and Drainage Channels

The intended modified route is bordered by drainage channels in some areas. ABLP will manage erosion and sediment loss from the site and keeping machinery and workers out of drainage channels to minimise impacts to these areas. No clearing or damage to aquatic flora and fauna is expected to occur due to these activities.

While waterway crossings will be required, this will not require approval under the Fisheries Management Act 1994 for damage to aquatic flora and/or fauna since construction will utilise trenchless technology to bore under drainage channels.

## 4.8 Utilities

The proposed amended pipeline route involves following Council's new sewer pipe easement to the Kingscliff STP. While design plans have been sourced from Council as to the whereabouts of these services, ground-truthing and locating of these services will be undertaken to the satisfaction of Council prior to excavation commencing. No go zones will be marked to avoid damage to existing utilities and, as required under condition 6.5 of the existing approval (DA-282-11-2004.i) any damage caused to public infrastructure as a result of the development will be repaired to the satisfaction of Council (or the relevant utility provider).

The telecommunications, rail, road, air, river, water supply, electricity or gas, drainage utilities within the proposed allotments and road reserves are not considered to be impacted on as part of this application for pipeline route amendment due to the proposed management measures outlined above.

## 4.9 Air quality

As determined by previous sampling, the soil in the area to be excavated for the pipeline will be predominantly sand; therefore there is a reduced likelihood of nuisance dust being produced from this material.

Further, the alteration of the pipeline route is not expected to increase the potential impact from dust or other pollution to air compared to the existing approved pipeline route. In addition, it has been estimated that the earthworks component of the pipeline will take approximately 12 weeks in total for the pipeline including the amended route proposed.

The creation of dust will occur for only a fraction of the proposed earthworks time and it seems unlikely that the dust will have a significant impact on the air quality to the surrounding area should appropriate management controls be in place during earthworks and construction.

Dust from the earthworks and construction shall be managed to prevent nuisance to neighbouring properties and degradation to air quality by:

- Ensuring disturbed surfaces and excavated fill are watered to minimise dust generation during dry and windy conditions;
- Limiting traffic on disturbed areas;
- Ensuring material stockpiles are covered or otherwise stabilised if in place for more than 20 days; and
- Ensuring any trucks and other equipment leaving the site are clean and have dust covers in place
- Ceasing earthworks where wind speed exceeds about 10m/s (36km/hr), work shall cease unless the Site Manager certifies that dust controls are operating effectively and air quality does not cause a nuisance.

## 4.10 Noise

The Department of Environment and Climate Change's (DECC) Industrial Noise Policy represents the New South Wales Government's guidelines and criteria in addressing the noise impacts of industry during the operation of development. It aims to balance the need for industrial activity with the desire for quiet within the community.



This policy does not apply to construction noise and the operational phase of the pipeline will not create any intrusive noise onto any nearby sensitive receptors.

For noise emanating from construction works, the DECC recognises that higher levels of noise are likely to be tolerated by the community for relatively short duration construction activities. The DECC's Environmental Noise Control Manual (ENCM) recommends that the  $L_{A10(15\text{minute})}$  noise levels arising from a construction site and measured within the curtilage of an occupied noise-sensitive premises (ie at boundary or within 30 m of dwelling, whichever is the lesser) should not exceed the levels indicated in Table 2.

These noise goals are consistent with community reaction to construction noise. As stated in the original Statement of Environment Effects the earthworks and pipeline installation for this stage of the amended pipeline route is likely to occur for 3 to 4 weeks.

**Table 2: Recommended DECC Noise Goals for Construction Works**

Period of Noise Exposure	$L_{A90(15\text{ minute})}$ Construction Noise Goal
Cumulative noise exposure period not exceeding 4 weeks	$L_{A90(15\text{ minute})}$ plus 20 dBA
Cumulative noise exposure period of between 4 weeks and 26 weeks	$L_{A90(15\text{ minute})}$ plus 10 dBA
Cumulative noise exposure period longer than 26 weeks	$L_{A90(15\text{ minute})}$ plus 5 dBA

#### 4.10.1 Operation Equipment and Silencing

During construction, the types of plant equipment operating may include a 30t excavator, bobcat, grader and dozer. It is expected that the increase in any traffic related noise (such as trucks using roads to enter and leave the site) is negligible considering the fill will be backfilled into the trenches once the pipe is installed.

All practical measures should be used to silence construction equipment, particularly in instances where extended hours of operation are required.

#### 4.10.2 Hours of Construction

The earthworks and construction activities are only proposed during the day (7am to 6pm) period. The guidelines recommend confining permissible work times as outlined in Table 2. Where it is necessary for construction works to be undertaken outside the preferred daytime construction hours, the condition normally applied is that  $LA10(15\text{minute})$  noise levels emitted by the works should not exceed the  $LA90$  level during the relevant evening or night-time period by a margin of more than 5 dBA, independent of the duration of the construction activity.

**Table 3: Preferred DECC Daytime Construction Hours**

Day	Preferred Construction Hours
Monday to Friday	7:00 am to 6:00 pm
Saturdays	7:00 am to 1:00 pm (if inaudible at residences). Otherwise, 8:00 am to 1:00 pm
Sundays or Public Holidays	No construction

#### 4.10.3 Noise assessment

Based on the investigations and assessments conducted in the original Statement of Environment Effects as found in the Noise Assessment (attached in Appendix G) the following are items are noted based on the amendment to the pipeline route:

- no additional sensitive receptors are identified for operational noise
- construction works are approximately 980m to sensitive receptor 'Location 2' and further away from other identified sensitive receptors (270m less than predicted than the previous layout).

Based on the results of the initial noise assessment, and the results obtained from this, it is expected that the identified sensitive locations will not be adversely affected by the proposed route amendment of the pipeline. As per the original Statement of Environment Effects there are no specific noise control measures required during the construction, however the Preferred DECC Daytime Construction Hours and the following specific noise limits for this stage of works apply.

#### 4.11 Waste Management

Regulations under the Protection of the Environment Operations Act 1997 define liquid and non-liquid waste types into different classes, depending on their likely impacts on the environment. The generated waste for the proposed pipeline amendment will occur for a short period and intermittently during construction. Types of waste that may be generated during the construction include piping, plastic sheeting, packaging, general refuse and wastes from workers. The excavated fill will be backfilled and therefore no excess fill is expected to be generated for disposal offsite. Should potential contaminated fill be identified during excavation works, a suitably qualified consultant shall assess the requirement for any remediation works and/or offsite disposal requirements.

Any metal that is not reusable will be sent for recycling. All re-useable or recyclable packaging shall be returned to the supplier where possible. The general refuse will be collected in suitable bins on-site during the construction phases and disposed of as per general waste to landfill. Any contaminated refuse (i.e. paint cans, glue containers, solvent containers, sealant tubes etc) will also be collected and disposed of as contaminated refuse to landfill.

Waste minimisation goals shall be included in all contracts and induction procedures with appropriate management for waste minimisation occur during the construction phase, it is unlikely that the types of waste generated during the construction of the pipeline will impact on the environment.

#### 4.12 Socio-Economic Assessment

The amended pipeline route passes through land largely of an agricultural land use, with new sand mine developments proposed and the new Kingscliff STP adjacent to the route. However, the pipeline has a small footprint, and occupies only existing easement agreements and road reserve areas, linking to the approved route at either end and close to the site of the proposed aquaculture facility.

It is considered that the social impacts from the development will reduce compared to the existing approved route since:

- Less pipeline will be laid alongside public roads (ie: approximately 330m less pipeline laid adjacent to Chinderah Road);
- The sand mine proponent will not be inconvenienced by the existing proposed route along the un-named east-west road; and
- ABLP has existing agreements with Tweed Shire Council and private residences to locate the pipeline within the road reserve and easement along Chinderah Road respectively.

#### 4.13 Light nuisance

The earthworks and construction activities are only proposed during the day (7am to 6pm) period and thus lighting nuisance will not be a problem to nearby sensitive receptors.

#### 4.14 Visual impact

Since works associated with the proposed route modification will mostly occur away from public roads and will result in a lessening of the pipe length within public road areas, the visual impacts due to construction activities will be lessened. During operation, the pipeline will not be visible other than a possible water crossing attached under a bridge (with existing utilities likewise attached).



## 5 Statement of commitments

ABLP has developed a Construction Environmental Management Plan for Stage 1A of the development, an outline of which is included in Appendix D. This is intended as a living document to be updated prior to new stages and aspects of the overall development being undertaken or approved. This document will be updated to include the relevant aspects identified within this assessment, incorporating the following broad management concepts:

### ***Erosion and Sediment Control***

Control of erosion on the site and sediment loss from the site will be undertaken according to the requirements of Tweed Shire Council and in regards to Landcom's Managing Urban Stormwater: Soils and Construction (Landcom, 2004). The overall approach will be to:

- minimise the period of time erodible material is exposed;
- fit sediment fencing downslope of construction areas where sensitive environments or water bodies / drainage channels are in close proximity to works;
- ensure stockpiles are fitted with diversion channels / bunds upslope and sediment fencing downslope, and that they are covered or otherwise stabilised if in place for long periods of time.

### ***Acid Sulfate Soils Management***

The general approach will be to undertake, in discussions with Council, a testing regime along the proposed pipeline route and incorporating lime treatment into excavation works to avoid the necessity of treatment areas and soil movement off-site.

### ***Noise Management***

Noise management will entail limiting working hours and times, and ensuring vehicles, plant and machinery associated with the development are fitted with the required noise minimising equipment according to the NSW EPA's Environmental Noise Control Manual.

### ***Vegetation Management***

Prior to excavation and construction commencing, all approvals from relevant agencies will be obtained for the removal of vegetation if required. A vegetation management plan will include measures to identify vegetation that needs assessment for removal permits prior to clearing, including any removal or disturbance as part of waterway crossings.

### ***Utilities Management***

A management plan describing general actions to be undertaken for ground-truthing and locating of services (undertaken to the satisfaction of Council) will be developed to be implemented prior to excavation commencing. No go zones will be marked to avoid damage to existing utilities.

### ***Waste Management***

A waste management plan will include provisions for the collection and disposal of general waste from construction activities. This is expected to be minimal since the works will be progressing along the pipeline route rather than located in a single location. However, the management plan will detail provisions for reducing, reusing and recycling waste including appropriate waste classification as per the DECC's Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes.

### ***General Environmental Management, Awareness and Review***

The CEMP contains procedures for effective communication, reporting, review and oversight of development works including a risk assessment of impacts and aspects, legislative and permit requirements, contractor management and procedures for community consultation. Appendix D shows the table of contents for the CEMP which will be updated to include the relevant aspects of the pipeline construction process. The CEMP document is currently under review by the Department of Planning for approval for Stage 1A.

### *Operation of Pipeline*

Operation of the pipeline route will involve minimal works other than pipeline, fitting and any pump station inspections and maintenance works where required (expected to be very minimal). Generally the pipe material is chosen to avoid replacement over 20-50 years and fittings such as valves, connections and junctions are easily accessed for these routine inspections.

## 6 Conclusion

For reasons outlined within this report, the need to carry out the proposed works is justified and is of a significant benefit, both to ABLP and to surrounding land owners. In addition, the proposed development can be demonstrably carried out without the creation of adverse impacts. The proposed aquaculture facility and associated pump stations and pipeline works will be complete with best practice environmental and operational safeguards and will be constructed and operated in accord with all relevant standards.

The modification of the pipeline route does not increase the impact on the social, biological or economic environment compared to the existing approved route and will result overall in a minimal environmental impact.

## 7 References

ASSMAC (1998). *NSW Acid Sulfate Soils Manual*. NSW Acid Sulfate Soils Management Advisory Committee, August 1998.

GHD (2002) *Environmental Impact Statement* for the Kingscliff Wastewater Treatment Plant.

Landcom (2004). *Managing Urban Stormwater, Soils and Construction* 4th Edition, March 2004.

Planit Consulting & Australian Fresh (2004) *Statement of Environmental Effects: Proposed Aquaculture Development & Water Supply Works. Prepared For Australian Bay Lobster Producers Pty Ltd* By Australian Fresh Research & Development Corporation Pty Ltd In Association With Planit Consulting Pty Ltd, 20 October 2004.

