

Major Project 05_0174
Preferred Project Report
Oyster Lease Dredging

Lease No. 80-178
Wallis Lake

Prepared For:

Mr Trevor Dent

August 2008



Environmental Planning, Assessment and Management

Orogen Pty Ltd
Suite 4 11 Manning Street
Tuncurry NSW 2428
tel 02 6555 3577
fax 02 655 3599
email mnc@orogen.com.au

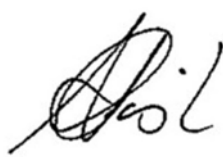
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Reviewed By:	<i>Tony Fish</i>
Position:	<i>Business Manager</i>
Signed:	
Date:	11 August 2008

Prepared By:	<i>Dr Justin Meleo</i>
Position:	<i>Project Manager</i>
Signed:	
Date:	11 August 2008

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Study Team

Member Name

Anthony Fish
Justin Meleo
Brett Campbell
Isaac Mamott
Eden Wyatt
Theresa Telfer
Stacey Tobin
Brett Miller
Greg Crisp
Suzanne Fiebig
Stuart McLachlan
Judith Cox

Orogen Pty Ltd
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Orogen Pty Ltd
Orogen Pty Ltd
Orogen Pty Ltd
Orogen Pty Ltd
Water Research Laboratory
McGlashan and Crisp Pty Ltd
Pacific Blue Design Pty Ltd
Environmental Results Pty Ltd
Holmes Air Sciences

Project Director
Project Manager
Ecologist
Botanist
Ecologist
Administration
Administration
Hydraulic Engineer
Surveyor
Aquatic Ecologist
Acoustic Engineer
Air Quality Engineer

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Introduction

1.1 Background

The Environmental Assessment for dredging of Oyster Lease No. 80—178 in Wallis Lake was placed on exhibition during November 2006 and referred to a number of Government Authorities for review and comment. During the exhibition and referral period the following submissions were received:

- Department of Lands, dated 29 November 2006;
- Department of Primary Industries, dated 29 November 2006, and 9 December 2006;
- Department of Natural Resources (undated);
- Department of Environment and Conservation, 16 February 2007;
- Great Lakes Council, 1 December 2006;
- Hunter Regional Development Committee, dated 17 January 2007; and
- Private submissions communicated in DOP email, dated 4 December 2006.

Following the exhibition period, the following additional correspondence was also received:

- Department of Primary Industries, dated 27 March 2007; and
- Department of Primary Industries, dated 21 February 2008.

A copy of these submissions is provided in **Appendix A**.

In addition, the Department of Planning has sought clarification of various issues throughout the life of the project. Responses to these queries are contained in this report and **Appendix B**.

As a consequence of the response to issues raised in this correspondence and in meetings with several of the Government Authorities, there have been a number of amendments to the project. This report presents the details of the amended project and details environmental impacts of the project, in light of changes to several of the project elements.

1.2 Scope of this Report

This report constitutes the Preferred Project Report (PPR). This PPR includes:

- A detailed response to the issues raised in the submissions;
- A detailed response to the issues raised in meetings;
- Detailed description of the project and its elements;
- Plans of the proposed development with design variations; and
- Revised Statement of Commitments.

Keys Issues

2.1 Key Issues Identification

Based on the submissions made by various Government Authorities to the exhibited EA document, the following key issues were identified as requiring further consideration:

- Location of pipeline in SEPP 14 area – following a meeting with the Department of Planning on 28 June 2007, the project was amended to exclude the pipeline from the SEPP 14 wetlands area; (refer Orogen letter of 11 July, 2007 – **Appendix B**)
- Dredging to depth of 2 m – following representations to the DPI, the DPI agreed that, in accordance with their documented policy, the lease could be dredged to a depth of 2 m below mean low water mark (approximately equal to – 2.5 m AHD) (DPI letter dated 27 March 2007);
- Seagrass loss mitigation – following a meeting with the DPI on 26 March 2008, the DPI agreed that transplanting of seagrass would not be required. An alternative of dredging one area of the lease to 1.5 m depth and leaving parts of the batter slopes free from oyster cultivation, in addition to an ‘environmental bond’, was agreed as an appropriate offset (refer Orogen letter of 27 March, 2008 – **Appendix B**).

A copy of the detailed responses to the submissions received, as well as responses to issues that have been raised after the exhibition period, are provided in **Appendix B**.

2.2 Issues Summary and Responses

Table 2.1 presents summary information in relation to the submissions received of all the issues raised during and after the public exhibition period and the response to the issue. It is not proposed to address these issues in detail in this report. Each of the issues has been adequately addressed in various responses to the Department of Planning, which are detailed in **Appendix B**. In summary, each of the issues raised has been responded to in detail. We submit that that the response to each of these issues has been adequate.

Table 2.1 - Summary of Issues Raised By Authorities/General Public and Responses

Issue Raised By	Date	Summary Issues	Response Details
Department of Primary Industries	29.11.2006	<ul style="list-style-type: none">• Aquatic ecology impacts• Recreational fishing impacts• Hydrodynamic impacts• Dredge depth	Orogen letter dated 12.12.2006 (attached in Appendix B) Orogen letter dated 9.03.2007 (attached in Appendix B)

Table 2.1 - Summary of Issues Raised By Authorities/General Public and Responses

Issue Raised By	Date	Summary Issues	Response Details
	9.12.2006	<ul style="list-style-type: none"> Remediation strategy Environmental bond Independent project coordinator 	Orogen letter dated 19.04.2007 (attached in Appendix B)
	27.03.2007	Dredge depth	Orogen letter dated 19.04.2007 (attached in Appendix B)
	21.02.2008	<ul style="list-style-type: none"> Reconsideration of dredge depth Environmental bond reduction Floating basket infrastructure 	Orogen letter dated 27.03.2008 (attached in Appendix B)
Department of Environment and Conservation	16.02.2007	<ul style="list-style-type: none"> Threatened species Alternatives for pipeline and stockpile site Offsetting Leakages and spills Groundwater Fauna survey methods Adjoining development 	Orogen letter dated 23.02.2007 (attached in Appendix B)
Great Lakes Council	1.12.2006	<ul style="list-style-type: none"> Ecological survey and assessment Impact assessment adequacy Risk of serious harm Inadequate justification and mitigation 	Orogen letter dated 5.01.2007 (attached in Appendix B)
Department of Lands	29.11.2006	<ul style="list-style-type: none"> Landowner's consent Incorrect Figure Hydrodynamic impacts 	Orogen letter dated 12.12.2006 (attached in Appendix B)
Department of Natural Resources	Undated	<ul style="list-style-type: none"> Project justification Location of dredge area Dredge depth Hydrodynamics SEPP 14 wetland Mitigation measures Riparian vegetation Stormwater and flooding Groundwater 	Orogen letter dated 5.01.2007 (attached in Appendix B)
Hunter Regional Development Committee	17.01.2007	<ul style="list-style-type: none"> Access from site to be sealed 	No response provided
General Public	Email DoP 4.12.06	<ul style="list-style-type: none"> Various issues 	Orogen letter dated 12.12.2006 (attached in Appendix B)

Project Details and Design Changes

3.1 Project Details

In summary, the proposal is to dredge accumulated sands over oyster lease No. 80—178 and for the transportation, processing and stockpiling of sand material. The removal of these sands will facilitate oyster production on the lease, which at present is inhibited by the shallow depth of the lease. **Figure 3.1** shows the location of the project with respect to the surrounding area and affected cadastre.

The dredging operation will be located over:

- Oyster Lease No. 80—178.

The pipeline carrying dredged materials and return waters will be located over:

- Lots 101, 123, 124 and 125 DP 753207; and
- Bed of Wallis Lake and Wallamba River.

The stockpiling operation will be located over:

- Lots 59 and 101 DP 753207;
- Lot 12 DP 816473; and
- Lot 196 DP 1102427.

3.2 Oyster Lease

Figure 3.2 shows details of the oyster lease and proposed dredging operation details. A summary of the main features of the dredge operation on the lease are as follows:

- Oyster Lease No. 80—178;
- Lease area is 9.24 ha;
- 1.06 ha of the lease has been dredged previously. It is not proposed to dredge this area of the oyster lease; and
- The remaining 8.18 ha of the lease is subject to the proposal. The following works will be undertaken in this area of the lease:
 - In accordance with an agreement with the Department of Primary Industries (Orogen letter of 27 March 2008) 7,743 m² of the lease will be dredged to a depth of 1.5 m below mean low water

(**Figure 3.2**). Of this, one area, noted as area “1A” in the Aquatic Ecology report that accompanied the EA (Volume 2, Appendix A) will not be dredged, due to good quality seagrass coverage. This area covers 456 m². Consequently, and further to the agreement with the DPI, only 7,287 m² of the previously agreed 7,743 m² will be dredged to a depth of 1.5 m. This represents a reduction in the area of dredging, further to the agreement with the DPI, detailed in the letter of 27 March 2008.

- In accordance with an agreement with the Department of Primary Industries (Orogen letter of 27 March 2008 – **Appendix B**), an area of 3,657 m², comprised of the areas of the majority of the batter slopes of the dredge envelope will not be subject to oyster cultivation (**Figure 3.2**). Combined with the [initially] agreed ‘reduced dredge depth’ area of 7,743 m² (see above), this equates to 1.14 ha, which is equivalent to the combined area of seagrass that would be removed by the dredging as reported in the EA. These two measures were agreed by the DPI (refer Orogen letter of 27 March, 2008 – **Appendix B**) to act as an offset for the temporary loss of seagrass habitat.
- **Figure 3.2** also shows areas within the lease area that will not be dredged within 10 m of mangrove habitat that fringes Oaky Island. This area is equal to 2,426 m².
- The remainder of the lease area will be subject to dredging to a depth of 2 m below mean low water.
- Therefore, the total area of dredging to a depth of 2 m within the lease area (excluding the 10 m setback from the mangrove area and the area of reduced dredging) is 7.1631 ha.
- Yield calculations exclude volumes of the internal dredge batters.

In summary, the area of the lease subject to dredging has been reduced from 8.18 ha (as reported in the EA) to 7.8918 ha. **Table 3.1** provides details of the areas to be dredged over the lease, including yield calculations. Based on information in **Table 3.1**, it is estimated that the total volume of dredged material will be approximately 149,000 m³.

3.2.1 Aquatic Ecology

The Department has requested details of the seagrass survey map and the lease area. **Figure 3.3** shows an overlay of the seagrass habitat map and the lease area. There is good general agreement between the habitat map boundaries and the lease boundaries, however there are some minor discrepancies due to error associated with the use of hand held GPS by the aquatic ecologist. Notwithstanding, **Figure 3.3** shows the habitat area to be retained (Area 1A), which is located within the area of reduced dredge depth (refer **Figure 3.2**). Area 1A will not be dredged.

Figure 3.3 also shows areas mapped as mangrove habitat. In defining the 10 m offset dredge exclusion area, **Figure 3.2** has relied upon aerial photography to determine the boundary, which is more accurate than the area of mangrove habitat plotted in **Figure 3.3**.

Table 3.1 - Dredge Details on Lease 80-178

Section of Lease	Dredge Depth (m)	Area (m ²)	Yield (m ³)
Reduced depth area (including Area 1A)	1.5	7287	10,931
Areas not to be dredged			
Within 10 m of mangroves	N/A	2426	0
(Area 1A)	N/A	456	0
Previously dredged	N/A	10,600	0
Remainder of lease area	2	71,631	143,262
Less batter volume (assume 3 m width, 2 m deep)			5,379
Subtotal			137,883
TOTAL		92,400	148,814

3.2.2 Batter Stability Around Oaky Island

The Department also requested further detail on the stability of the dredge batters in the vicinity of the mangrove areas of Oaky Island (email dated 23 July 2008). The following response is provided in relation to this request.

The dredge envelope is offset 10 m from any mangroves on Oaky Island. As shown in **Figure 3.2**, the majority of mangroves on Oaky Island are located outside of the oyster lease area. Consequently, the area within the lease that is affected by the offset (*ie.* will not be dredged) is minimal. In relation to stability of the batter slope, it is advised that the angle of repose of dry sand is 34°. The proposed internal dredge batter slope is equivalent to this angle. The angle of repose of sand underwater is, however, greater than 34°, due to the pressure exerted on the batter face by water.

The hydrodynamic assessment that accompanied the EA (Volume 2, Appendix H), concluded that there was no risk of erosion to Oaky Island as a result of the dredging and that localised effects may occur in the channels on either side of Native Dog Island, although these were expected to be insignificant. It is important to note that the hydraulic modelling assumed a vertical cut (*ie.* 90 °) of 2 m over the entire lease area (a worse case scenario compared to the internal batters proposed) and did not assume any setback from the mangroves. Further, in their submission review of the EA (**Appendix A**), the [then] DNR did not raise any issues with respect to stability of the internal dredge batters or risks to the stability of Oaky Island.

In light of the findings of the hydrodynamic modelling that there would be no risk of erosion to Oaky Island from the dredging and the proposed 10 m setback from Oaky Island, it is submitted that there is no risk to bed/bank stability in the region of the mangroves or Oaky Island.

3.3 Pipeline Route

The pipeline route is shown in **Figure 3.1**. Details of the pipeline are as follows:

- In river – 2,570 m; and
- On land – 1,630 m.

This includes measurement up to the furthest point in the oyster lease from the stockpile site (i.e. maximum length of pipeline is 4.2 km).

The pipeline route also includes three booster pumps, the locations of which are shown in **Figure 3.1**.

The proposed route differs from what was proposed in the EA. Originally, part of the pipeline route was located in a SEPP 14 wetland (No. 590). Following discussions with the Department of Planning, it was decided to remove the pipeline from this SEPP 14 wetland area. In addition the number of booster pumps has been reduced from four (as originally detailed in the EA) to three.

An assessment of impacts of relocating the pipeline back into the Wallamba River was provided to the Department in letters from Orogen dated 11 July and 17 July 2007 (**Appendix B**). In summary, relocation of this section of the pipeline will not create any additional impacts over and above the description provided in the EA and Appendix G of the EA.

3.4 Stockpile Site

The location and layout of the stockpile site is shown in **Figure 3.4**. Details of the stockpile site are as follows:

- Located over Lots 59 and 101 DP 753207, Lot 12 DP 816473 and Lot 196 DP 1102427;
- Total working area is 7.63 ha;
- Two ponds proposed for dewatering and settling;
- Pond 1 (dewatering) – volumetric capacity of 45 ML, excluding 1 m of freeboard; and
- Pond 2 (settling of fines – volumetric capacity of 18.4 ML, excluding 1 m of freeboard.

Operation of the stockpile site remains unchanged, as set out in Section 2.4 of the EA.

Figure 3.4 shows areas of the site that will be specifically set aside for stockpiling of dry sand. The total area of the site set aside for stockpiling of sand is approximately 2.34 ha. Sand will be stored in these

areas as required for dispatch offsite. It is proposed to stockpile approximately 60 % of the extracted material on site in these areas, however, sand will be continually sold and dispatched from the site as the dredge operation progresses. Hence, the areas of the site set aside for the stockpiling of sand do not need to be of sufficient size to accommodate 90,000 m³ of sand. After this, Pond 1 will be the main stockpile area. These areas will be managed to prevent the loss of sand (**Section 3.4.3**).

The Department has requested further details on the dewatering/settling ponds. These are provided in **Section 3.4.1**.

The area of the stockpile site was estimated and reported in the EA as approximately 6 ha. The EA provided a map which defined an exclusive area for the stockpile site, however, this map did not include the area around the internal haul road. Following a request from the Department, further information was provided to the Department on the working area of the stockpile site (refer Orogen letters dated 2 August 2007 and 31 October 2007 – **Appendix B**). This letter of 31 October 2007 also provided a map with an outline of the working area, which was reported as 4.539 ha.

A review of this map has revealed an error in reporting the size of the working area. While there has been no change to the outline of the stockpile site working area shown in this map, the correct size is now reported as 7.63 ha. Note that this (reported) increase in area does not change the assessment of impact reported in correspondence of 31 October 2007. This is because the assessment was undertaken on the physical area covered by the outline. The error in reporting the size of the working area is of no consequence in this regard. Hence, the correction of this error has not resulted in the identification of any additional clearing and as such, it will not result in any increase in impacts over and above that which were assessed and reported in the EA and the correspondence referred to above. Therefore, no additional impact assessment is required.

3.4.1 Ponds Operation

Approximate pond volumes (excluding 1 m freeboard) were reported in the EA as follows:

- Pond 1 – 50,400 m³
- Pond 2 – 12,350 m³

The revised approximate pond volumes (excluding 1 m freeboard) are now reported as:

- Pond 1 – 45,017 m³
- Pond 2 – 18,369 m³

In total, the revised pond volumes represent an increase of 636 m³. It is submitted that this increase in volumetric capacity (approximately 1 %) is negligible and will not create any impacts over and above those assessed and reported in the EA. Further, the ponds are located in cleared areas of the site and Pond 2 is located further from residential areas compared to the location detailed in the EA. The amendments to the pond sizing do not create any impacts over and above those assessed and reported

in the EA. Therefore, no additional impact assessment is required. Details of the ponds are provided in **Table 3.2**.

Table 3.2 - Dewatering and Settling Ponds Details

Parameter	Pond 1	Pond 1
Width (m)	100	60
Length (m)	175	130
Area (m ²) (top of wall)	17,500	7,800
Top wall height (m)	4	4
Volume (m ³) (top of wall)	63,400	26,640
Freeboard (m)	1	1
Volume (m ³) (excl. freeboard)	45,017	18,369
Storage (days)	16 (sand and water) 49 (sand only)	10 (water only)
Freeboard Volume (m ³)	18,383	8,271

Predicted upper limits of extraction rates were reported in the EA as follows:

- 5,500 m³ sand/week (916.7 m³/day) (assume 6 day week); and
- 11,000 m³ water/week (1833.3 m³/day) (assume 6 day week).

Pond 1 therefore has sufficient volume to cater for approximately 16 days of dredging (sand and water) or 49 days (sand only). Pond 2 has sufficient volume for 10 days inflow of water from dredging operations. Therefore, in theory, Pond 1 could accommodate up to 8 weeks of continuous dredging, without the need to remove sediment from the system, provided water could be discharged at an appropriate rate from Pond 2. In practice, however, dredged material will be continually removed from Pond 1 and upon reaching accepted quality criteria, water in Pond 2 would be discharged back to the Wallamba River, most likely every two or three days.

Pond 2 will be lined with plastic to ensure that all water entering the pond is retained. Water entering Pond 1 will be directed to a sump area through contouring of the base of the pond (approx. 5 % slope), where it will be pumped directly to Pond 2. This will provide for continuous pumping of incoming water out of Pond 1. Based on an inflow rate of 0.2 ML hr⁻¹, spread over the area of Pond 1 (17,500 m²), this equates to a daily (9 hour day) depth of 103 mm day⁻¹. Infiltration of water through the base of Pond 1 will be negligible, given that the base will be comprised of insitu silts and clays to depth of approximately 1 – 1.5 m, with saturated hydraulic conductivity (K_{sat}) typically in the order of < 10 mm

day. Therefore the removal of saline water from Pond 1 will be instantaneous and will not have any appreciable impact of increasing groundwater salinity in the vicinity of the site.

The ponds have been designed to have sufficient volume to cater for storm events. As the ponds will be turkey-nest, storm water entry to the ponds is restricted to direct rainfall only. Accommodation volumes after one week of dredging prior to discharge or sediment removal are provided in **Table 3.3**, which shows a comparison between the accommodation volume (or depth) of each pond after one weeks storage of dredged material and various worst-case scenario storm events. Note that design of the detention ponds would normally be required to accommodate a 10 or 20 year ARI 2 hour storm event.

Data presented in **Table 3.3** indicates that if all slurry entering the ponds is retained after one week's continuous dredging, there is up to 9 times the volume required in Pond 1 to accommodate a 100 year ARI 24 hour storm, while Pond 2 has sufficient depth to accommodate 4 times the volume of this storm event. It is important to note that these depths do not take into account the 1 m of freeboard available within each pond. Accommodation volumes above freeboard are a factor of approximately 4 for each pond above this storm event.

Table 3.3 - Comparison of Accommodation Volume of Ponds and Design Storm Events

	Pond 1	Pond 2
Dry volume (m ³) *	45,017	18,369
Volume used after 1 week (m ³)	5,500 (sedm. only)	11,000 (water only)
Accommodation volume * after 1 week storage (m ³)	39,517	7,369
Accommodation depth * after 1 week storage (m)	2.63	1.20
10 year ARI 2 hour storm depth (m) **	0.071	
20 year ARI 2 hour storm depth (m) **	0.081	
20 year ARI 24 hour storm depth (m) **	0.218	
50 year ARI 24 hour storm depth (m) **	0.257	
100 year ARI 24 hour storm depth (m) **	0.288	
Accommodation factor for 100 Year ARI 24 hour storm depth (below freeboard)	9.14	4.18
Accommodation factor for 100 Year ARI 24 hour storm depth (above freeboard)	3.83	3.97

NB: * Excludes 1 m freeboard ** ARR (1987) values taken from Hallidays Point

The 100 year and 50 year ARI 24 hour storm intensity scenarios presented above are highly unlikely to occur and represent a worst case scenario. The design of the ponds system is over-engineered to cater for what would normally be considered a reasonable storm event contingency (ie. 10 – 20 year ARI 2

hour storm intensity), though can also accommodate extreme, highly unlikely events (*ie.* 50 year and 100 year ARI events).

Maintenance of the settling pond sizes and their sizing will be adaptively managed in response to a regular review of the performance of the system (detention times required prior to discharge and inflow rates). This may result in alteration to the configuration of the ponds (eg. reduction in ponds size if material is being removed, and/or waters are being returned quicker than expected).

3.4.2 Separation of Fines, Settlement and Dewatering

Based on the results of the geotechnical investigations reported in the EA, the material to be dredged contains on average, 6 % fines. When it reaches the stockpile site, the slurry will be pumped into a series of settling ponds, where the coarse fraction will settle out quickly. Sand will be allowed to dewater (possibly up to several days depending on meteorological conditions) before being removed from the pond and placed in stockpiles within the site. Sand will be removed progressively from Pond 1 using an excavator and stockpiled on site. A front end loader and truck will be used to move sand material around the site into stockpile locations.

Areas proposed for stockpiles will be located over Lots 101, Lot 59, 196 and Lot 12 (**Figure 3.4**). The individual sand stockpiles will be monitored to ensure that they remain in a moist condition to avoid the potential for wind blown loss of material. If dry and windy conditions dictate, stockpiles will be watered using a water truck.

Following delivering of the dredge slurry to Pond 1, excess water (or supernatant) will be pumped into a separate settling pond (Pond 2). Once settled, the excess waters will be returned to the Wallamba River via a return pipeline, after satisfying appropriate turbidity and pH requirements stipulated by the consent conditions. The dewatered sands and silts will then be stockpiled and sold to market on-demand.

Methods for settling of the fines will vary depending upon the quality of the supernatant entering Pond 2. It is expected that there will be variations in the concentrations of suspended sediment depending on location of the dredge at the time. Therefore, treatment methods will vary. In some instances, no treatment may be required. Other treatment methods may include the use of 'floc blocks' at the discharge point into the pond, addition of flocculating agent into the settling pond, or possibly direct injection of flocculating agent into the transfer pipe between Pond 1 and Pond 2. The amount of flocculation agent used will depend upon incoming water quality (*ie.* turbidity) and the criteria set by the DECC in the conditions of consent.

Hence, it is not possible to determine an exact residence time of supernatant in Pond 2 at this stage, particularly given that the DECC criteria for pH and turbidity of return waters is not known. It is expected, however, that the residence time for water in the Pond 2 will be up to several days. As discussed previously (**Section 3.4.1**), there is sufficient capacity in Pond 2 to manage the return waters and ensure that there are no unnecessary delays to dredging.

While the EA indicated that an expected period of 7 months would be sufficient to dredge all materials, in reality, there will be down time as a result of factors including, for example, weather, timing of tides, river flow conditions, equipment breakdowns/maintenance and timing of oyster operations on adjacent lease areas. Further, the reduction in the number of booster pumps to three (a total of four were reported in the EA) will mean that daily dredge volumes may be less than reported, as the slurry may need to consist of a slightly lower proportion of sand to accommodate the longer distances between pumps. These details, however, will be determined by the manufacturer's specifications which vary depending on the make and model of pump. Notwithstanding, it is expected that the period of extraction operations will be complete within two years from commencement of dredging.

3.4.3 Fines Management

Fine fraction materials will be incorporated into the stockpiles of sand material, as well as being collected periodically from Pond 2. It will be necessary to ensure that this material is contained and not exported off site during heavy rainfall events.

All sand stockpiles will be enclosed by appropriately sized silt mesh fencing to ensure that any fine material washed out of the stockpiles is trapped and remains on site. Similarly, fine material extracted from Pond 2 will be stockpiled and if in sufficient volume, sold as soil conditioning mix (otherwise it would be incorporated back into the sand stockpiles via mechanical mixing). This material will also be enclosed by appropriately sized silt mesh fencing to ensure that the fines are trapped and remain on site.

3.4.4 Traffic

The Department has requested further detail on traffic volumes and requested the nomination of draft traffic limits (vehicle movements) for operation of the stockpile site.

The EA reported estimates for traffic generation based on a conservative estimate of demand from the stockpile operation up to 75,000 t of sand per annum. Assumptions for traffic generation estimates were reported as:

- 50 weeks operation per year;
- Six day week; and
- Maximum load of 33 – 40 tonnes per truck (truck and superdog or B-double).

Given these assumptions, up to six outward truck movements would be expected to be generated per day (12 two-way trips).

Analysis undertaken for the intersection of Grey Gum Road and The Lakes Way at these levels indicated that the intersection operation would not be compromised. A sensitivity analysis was undertaken whereby traffic generation was doubled, to take account of the likely scenario of smaller trucks hauling from the site.

The sensitivity analysis presented indicated that even with a doubling of traffic generation from 12 to 24 two way traffic movements, the operation of the intersection would not be compromised. It is noted that the RTA Hunter Regional Development Committee raised no issues with the traffic analysis, nor made recommendations regarding limits.

Based on the above discussion, draft traffic limits proposed for the stockpile site operation are 24 two-way daily traffic movements. It is requested that the Department impose these limits as a condition of consent on the project.

3.5 Amendments to the Project and Impacts Summary

Amendments/clarifications to the project and the assessment of potential impacts associated with these changes are provided in **Table 3.4**. All other impacts of the project as described in the EA remain unchanged.

In summary, the assessment of the project amendments indicates that there will be no increase in the anticipated impact of the project. The amendments are minor and do not involve changes that require any detailed level of assessment. As such, it is submitted that this documentation does not require additional referral to Government Authorities nor re-exhibition.

Table 3.4 - Project Amendments/Clarification and Impact Assessment

Project Element	Amendment/Clarification	Impact Assessment
Oyster Lease	<ul style="list-style-type: none"> Reduction in overall area subject to dredging from 8.18 ha to 7.8918 ha Reduction in dredge depth from 2 m to 1.5 m over 0.7287 ha of lease area 0.3657 ha of lease area will not be subject to oyster cultivation Two areas with no dredging: <ul style="list-style-type: none"> Area 1A (identified in the Aquatic Ecology report of EA) (456 m²); and 10 m exclusion zone placed around mangroves on Oaky Island (0.2426 ha) 	<ul style="list-style-type: none"> In summary, the only amendment to the dredge plan as reported in the EA is the agreement to reduce the depth of dredging in one area of the lease. The other change relates to leaving parts of the lease free from oyster cultivation. These amendments are a direct result of discussions with the DPI. These amendments will not lead to an increase in environmental impact in comparison to impacts outlined in the EA. The changes represent a reduction in the project footprint and therefore a commensurate reduction in potential impacts of the project.
Pipeline Route	<ul style="list-style-type: none"> Removal of section of pipeline route from SEPP 14 wetland area Commensurate additional pipeline in Wallamba River 	<ul style="list-style-type: none"> The removal of a section of pipeline from the SEPP 14 wetland area represents a reduction in potential impacts on this environment. <p>The additional length of pipeline in the Wallamba River will not lead to an increase in environmental impact (refer Section 3.3).</p>

Table 3.4 - Project Amendments/Clarification and Impact Assessment

Project Element	Amendment/Clarification	Impact Assessment
Stockpile Site	<ul style="list-style-type: none"> Location and sizing of dewatering/settling ponds EA reported stockpile site working area as approximately 6 ha. Actual area 7.63 ha. (Note: This amended area was misreported as 4.539 ha in correspondence to the Department (refer Section 3.4) Upper limit of 24 two way daily traffic movements 	<ul style="list-style-type: none"> The combined changes to the ponds have resulted in an increase in capacity (below freeboard) of 636 m³ or 1 %. This change is considered to be negligible. No additional clearing of vegetation is required to accommodate these changes over and above that which was assessed in the EA. Therefore the overall footprint of the ponds on the site has not increased. Pond 2 has been moved further away from residences located to the north east of the site. This would reduce any potential noise impacts assessed and reported in the EA. The impact of the change in location and sizing of the dewatering/settling ponds is therefore considered negligible. The original estimate of stockpile site working area of approximately 6 ha did not include the haul route within the site. The amended stockpile site working area includes the area of Lot 12 and 196 around the haul route. Amendment of the area of the site set aside for the operation does not require additional clearing of vegetation, nor does it materially increase the area of the site on which truck and other vehicle movements would be occurring. The impact of the change in area of the stockpile site is therefore considered negligible. Sensitivity analysis presented in the EA suggested that this level of traffic movement would not adversely affect the surround local traffic conditions, nor the intersection of Grey Gum Road and The Lakes Way. The impact of the proposed traffic limits are therefore considered negligible.

Statement of Commitments

4.1 Statement of Commitments

A revised Statement of Commitments has been prepared based on the amendments to the project and responses provided by Orogen to submissions on the project (**Appendix B**). Details are provided in **Table 4.1**.

Table 4.1 - Statement of Commitments

Issue	Commitment
Hydrodynamics and sediment transport	<ul style="list-style-type: none"> Entire dredge area to be marked (buoys) to ensure dredge is kept within confines of lease area. Maximum dredge depth of 2.0 m below mean low water in this area of the lease. Area of reduced depth (1.5 m) dredging to be marked (buoys). Maximum dredge depth of 1.5 m below mean low water in this area of the lease. Hydro-survey on completion of dredging to confirm dredge extents and volume calculation for royalty payment to Department of Lands.
Flooding	<ul style="list-style-type: none"> An emergency management plan would be prepared that details warning and emergency procedures for personnel and plant. This plan would form part of the EMS for the project. Threats from flooding would be monitored by daily weather checks and warnings from the Bureau of Meteorology. During flood events where the water level increases to a height greater than 150 mm above normal high tide slack water, the dredging would suspended until such time as water receded to a depth suitable for operations.
Water Quality Management (Wallamba River)	<ul style="list-style-type: none"> Dredge log to be kept detailing observations of turbidity in and around dredge head. Dredging to cease upon turbidity being observed and investigations and remedial actions taken if necessary to prevent further leakages/turbidity events. Proposed that discharge waters to be released only when pH is between 6.5 – 8.5 and turbidity is < 30 NTU. Pipeline to be monitored daily and joints checked for wear and potential leaks. Dredging to cease if leaks detected and not re-commence until leaks rectified. All fittings would be bunded on the refuelling barge so that any spills would be isolated and prevented from entering the estuary. All refuelling barges/vehicles will be fitted with EPA-approved spill kits.
Water Quality Management (Stockpile Site)	<ul style="list-style-type: none"> Measurements of pH and turbidity in discharge pond to be recorded prior to release of waters.

Table 4.1 - Statement of Commitments

Issue	Commitment
	<ul style="list-style-type: none"> • Daily inspections of the dredge pipe and return waters pipe by personnel to identify signs of potential breakage. • Lime will be kept on site for the management of return waters. Management of potential acid sulfate soils during the dredging process will be based on ensuring that pH of return waters meets appropriate criteria set in the Conditions of Consent prior to discharge to the Wallamba River. • Appropriately sized silt mesh fencing to be placed around the base of all sand stockpiles to prevent the potential for offsite export of fine fraction material during heavy rainfall events. • Appropriately sized silt mesh fencing to be placed around the base of all fine fraction (extracted from Pond 2) stockpiles to prevent the potential for offsite export of fine fraction material during heavy rainfall events.
Air Quality	<ul style="list-style-type: none"> • Vegetation removal undertaken either during damp conditions or when the winds are not from the southwest. • Cover all loads leaving the site to prevent wind blowing dust from trucks during transit. • Stockpiles to be kept in a moist condition to minimise wind blown and traffic generated dust. • All roads and trafficked areas to be watered to minimise dust generation. • Proposed maximum limit of 24 two way daily traffic movements from the stockpile site.
Aquatic Ecology	<ul style="list-style-type: none"> • 10 m exclusion zone around mangroves on Oaky Island to be marked (buoys). No dredging to occur in this area. • Area 1A as defined in Figure 3.2 to be marked (buoys). No dredging to occur in this area. • Prior to dredging all other seagrass areas to be dredged will be searched for presence of Hairy Pipefish. If found, pipefish will be relocated. • Regeneration of seagrass to be monitored as specified in EMS.
Terrestrial Ecology	<ul style="list-style-type: none"> • Pipeline route to be inspected quarterly to ensure no impacts on surrounding vegetation communities and reported in an annual report for the project. • Pre clearing surveys. • Clearing supervision. • Pipe to be elevated in Wallum Froglet and Eastern Chestnut Mouse habitat.
Noise	<ul style="list-style-type: none"> • Noise from the dredge will be attenuated so that the sound power level is limited to 97 dB(A).

Table 4.1 - Statement of Commitments

Issue	Commitment
	<ul style="list-style-type: none"> • Three-sided, 3 m high noise walls be erected around the return waters pump and the booster pump (shown in the noise map) to reduce noise levels to the appropriate environmental noise goal. • Noise walls to be erected prior to commissioning of pumps. • Plant and equipment will be maintained in good working order to reduce noise emissions. • Dredge and stockpile operations to be restricted to proposed operating hours. Booster Pump 3 will be soundproofed with a barrier to direct noise away from Lakeside Village.
Landuse	<ul style="list-style-type: none"> • Dredging will not occur should it be determined that poor water quality is having an impact on adjacent oyster harvesting areas, based on data collected during routine water quality and meat quality testing undertaken during September. • The pipeline route would be flagged to notify all boat traffic of the presence of the pipeline.
Indigenous Cultural Heritage	<ul style="list-style-type: none"> • Should any items of indigenous cultural heritage be uncovered during the project, work in the area would cease immediately and the area cordoned off. A representative of the Forster LALC and a NPWS representative would be contacted to provide advice regarding appropriate action.
Traffic/Transportation/Road Use	<ul style="list-style-type: none"> • Upper limit of 24 two way daily traffic movements from the site. • No truck haulage outside of normal working hours. • Avoid compression braking in proximity of residences. • Cover loads, ensure all tailgates are secured to eliminate rattling noises. • Site access to Grey Gum Road to be sealed.
Monitoring	<ul style="list-style-type: none"> • Environmental Management Strategy prepared incorporating details of all proposed safeguards and mitigation measures. • Twelve monthly Audit Report or AEMR to Department of Planning reviewing all facets of the operation.

Appendix A

SUBMISSIONS RECEIVED ON PUBLIC EXHIBITION OF
ENVIRONMENTAL ASSESSMENT

Appendix B

RESPONSES TO SUBMISSIONS AND ISSUED RAISED