



**Ports
Corporation**
of Queensland

Port of Hay Point Apron Areas and Departure Path Capital Dredging

Supplement to the Draft Environmental
Impact Statement

September 2005



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- A Consultation Strategy
- B Submissions on Draft EIS
- C Summary of comments at Public Information Session



1. Introduction

1.1 Purpose

The purpose of the Supplementary Report is to respond to issues raised during the public notification phase of the Draft Environmental Impact Statement (EIS) for the Port of Hay Point Apron Areas and Departure Path Capital Dredging project and to report on additional investigations undertaken since the release of the Draft EIS.

The Supplementary Report must be read in conjunction with the Draft EIS.

1.2 Public Notification

The Draft EIS was publicly notified on 2 August 2005 for a period of four weeks concluding on 30 August 2005. The public notification included notifications placed in The Weekend Australian and Courier Mail newspapers as well as the local Pioneer News and Mackay Daily Mercury. Copies of the Draft EIS were available for viewing at the State Library in Brisbane, Mackay Library in Mackay and Sarina Library in Sarina. The Draft EIS was also available for access via the Ports Corporation of Queensland, Department of State Development and Innovation and GHD project websites. Newsletters were distributed to the residents of Louisa Creek, Half Tide and Salonika on 9 August 2005 advising of where the community could access the documents.

A public information session was held at Louisa Creek, near the Port of Hay Point, on 13 August 2005. This session was advertised in the Pioneer News and Mackay Daily Mercury newspapers and in the newsletter distributed to residents as well as on notices placed at the local Hay Point shops.

2. Additional Investigations

2.1 Introduction

Consultations were held with Commonwealth and State agencies throughout the development of the Draft EIS and during the public notification. The following provides a summary of meetings undertaken with stakeholders:

- ▶ Department of the Environment and Heritage (DEH) and the Great Barrier Reef Marine Park Authority (GBRMPA) on 25 July 2005.
- ▶ GBRMPA on 30 August 2005.
- ▶ Environmental Protection Agency (EPA) on 9 August 2005, 11 August and 24 August 2005.
- ▶ Maritime Safety Queensland (MSQ) Regional Harbour Master (RHM) on 5 July 2005.
- ▶ Department of Primary Industries and Fisheries (DPIF) on 16 June 2005.
- ▶ Technical Advisory and Consultative Committee (TACC) on 11 March, 27 May and 12 August 2005.

As a result of these consultations, the following additional investigations were undertaken in response to specific comments or issues in relation to the Draft EIS.

2.2 Hydrodynamic Modelling

2.2.1 Overview

During discussions at the third meeting of the TACC it was agreed that three additional modelling scenarios for the dredging and disposal of dredged material would be undertaken. The purpose of modelling the additional scenarios was to assist in the development of a strategy to manage possible elevated turbidity conditions by providing analysis of alternate dredge strategies.

Table 2-1 summarise the scenarios modelled.

Table 2-1 Dredge scenarios for sediment modelling

ID	Scenario	Description	Comment
S1	Non-overflow dredging – east dumping	Dredging at the apron area and disposing of material at the east spoil.	Represents disposing in the eastern half of the spoil ground, but a 'worst case' scenario for that half of the spoil ground



ID	Scenario	Description	Comment
S2	Dredging at the Apron Area – east dumping	Dredging within apron area and disposal at the east spoil ground.	Apron area is closer to shoreline, and to identified areas of sensitivity. Approximately 80% of dredging works are proposed in the apron. Represents disposing in the eastern half of the spoil ground, but a 'worst case' scenario for that half of the spoil ground.
S3	Plume Decay	Stop dredging.	Stopping dredging once an elevated turbidity level is reached to determine the time for the sediment plume to decay to typical background concentrations.

The Hydrodynamic and Water Quality Modelling Report (included as Appendix F of the Draft EIS) defines spoil sites for modelling purposes. As shown in Figure 2–1 the spoil ground covers a large area of approximately 18 km². For the purposes of defining point source locations for modelling, the spoil ground was divided into two parts, east and west. A single point location was identified in each half to represent “worst case” conditions for dumping in that particular half of the spoil ground.

As with the modelling scenarios developed for the Draft EIS, the model assumed a single large dredge (capacity of 18,000 m³) operating in the vicinity of the apron.

In contrast to the modelling undertaken for the Draft EIS (where dumping was simulated at the west spoil ground), the turbidity plumes were generated from disposal at the east spoil ground. This locates the point sources furthest from the environmentally sensitive areas in an area where currents tend to move the plume seaward of sensitive habitats, within the operational limits of disposal within the eastern side of the spoil ground. The purpose of these scenarios is to indicate how various management scenarios would impact turbidity levels.

2.2.2 Non-overflow Dredging – East Dumping (Scenario S1)

The model was run for a period of 50 days. The results of the modelling are presented in Figure 2–2 and Figure 2-3 followed by discussion.

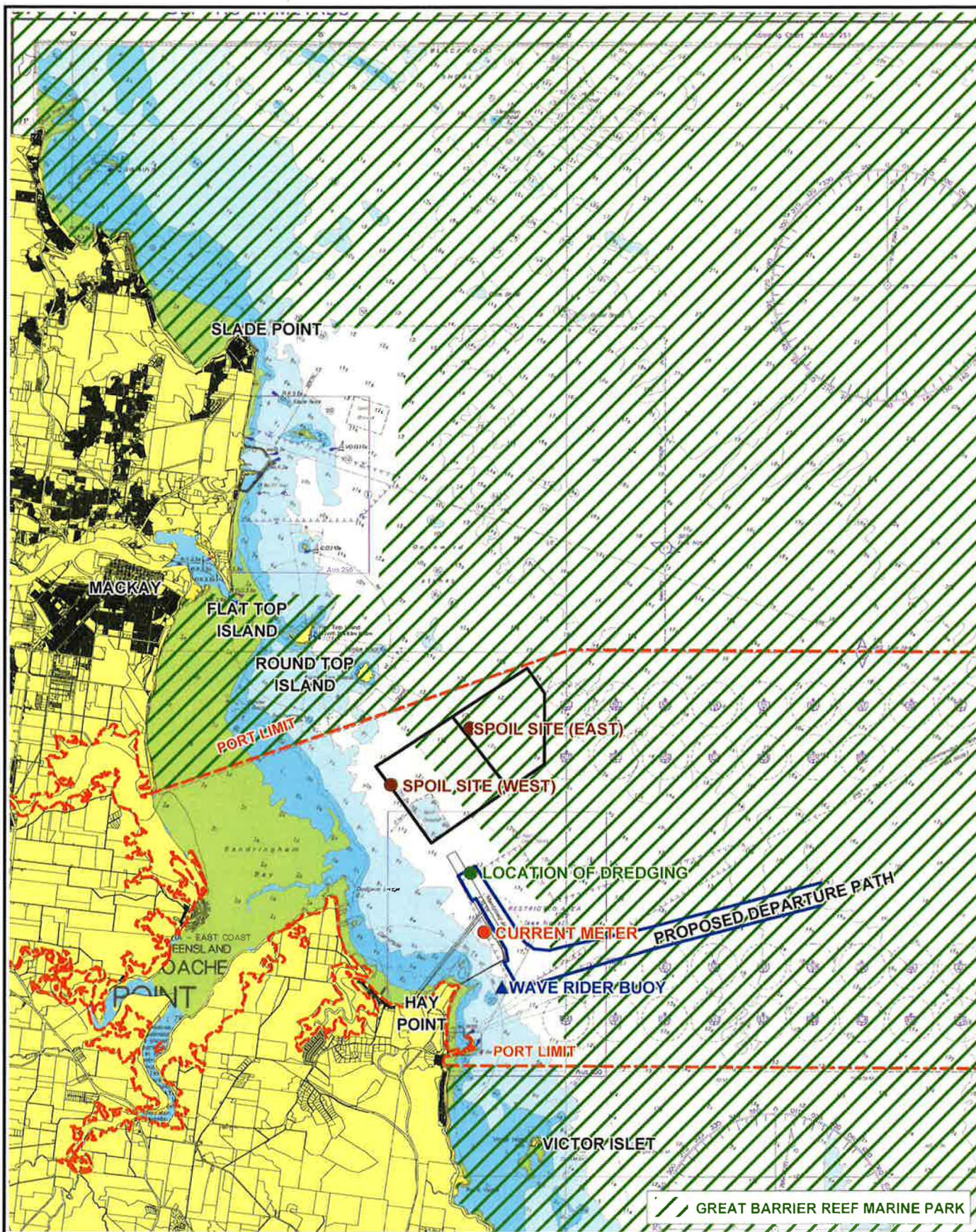
Figure 2–2 shows an initial build-up of suspended sediment concentration for the initial period from commencement of dredging and spoil disposal. After 13 days, peak concentrations are reached with the trend repeated for subsequent spring and neap tide cycles. The peak concentrations around Round Top Island (approximately 15 mg/L) are highest during spring tide when the plume extent is most significant. The suspended sediment concentration appears to reach equilibrium (i.e. consistent peak concentrations) after approximately 29 days.



Figure 2-3 shows the plume covering a significant area of the coast after 29 days of dredging and spoil disposal (spring tide), representing a worst case scenario for Round Top Island. The majority of the plume is at a concentration of less than 10 mg/L (approximately 30% of the adopted average concentration of 30 mg/L at the dredging site, and significantly less than the maximum concentration predicted in the vicinity of the dredge). Whilst the plume is likely to be highly visible because of the naturally high clarity of waters in the area, the concentrations of suspended sediment will be quite low and within those that are naturally experienced during elevated sea states and spring tidal currents.

For non-overflow dredging, the model suggests that predicted peak suspended sediment concentrations at Round Top Island are significantly lower (15 mg/L) when dumping occurs at the east spoil ground in comparison to dumping at the west ground (>35 mg/L). In this case, because the time at which the peak occurs is different, a comparison of extent is not valid (i.e. the tides are at different phases, and hence the distribution of the plume is also different). Irrespective, the dump only scenario relying on the eastern spoil ground would appear likely to generate lower suspended sediment concentrations at Round Top Island during calm conditions.

This may represent a mitigation measure available for the spring tide when sediment concentrations near Round Top Island are predicted to be highest.



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Source Information: PCQ and Chart AUS 249, Australia East-Coast Approaches to Hay Point to Mackay.

Port of Hay Point Capital Dredging

Location of Spoil Ground Point Sources for Modelling

Figure 2-1



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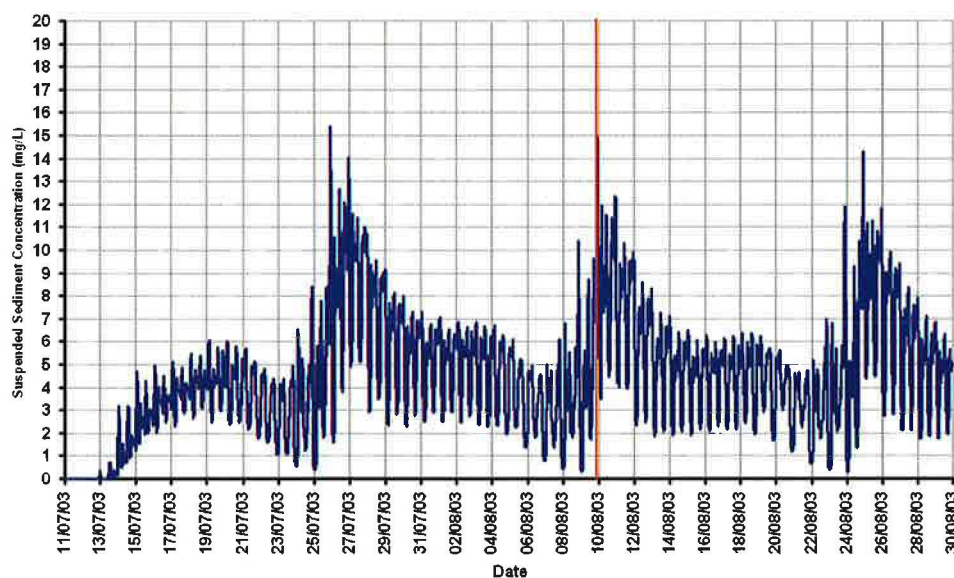
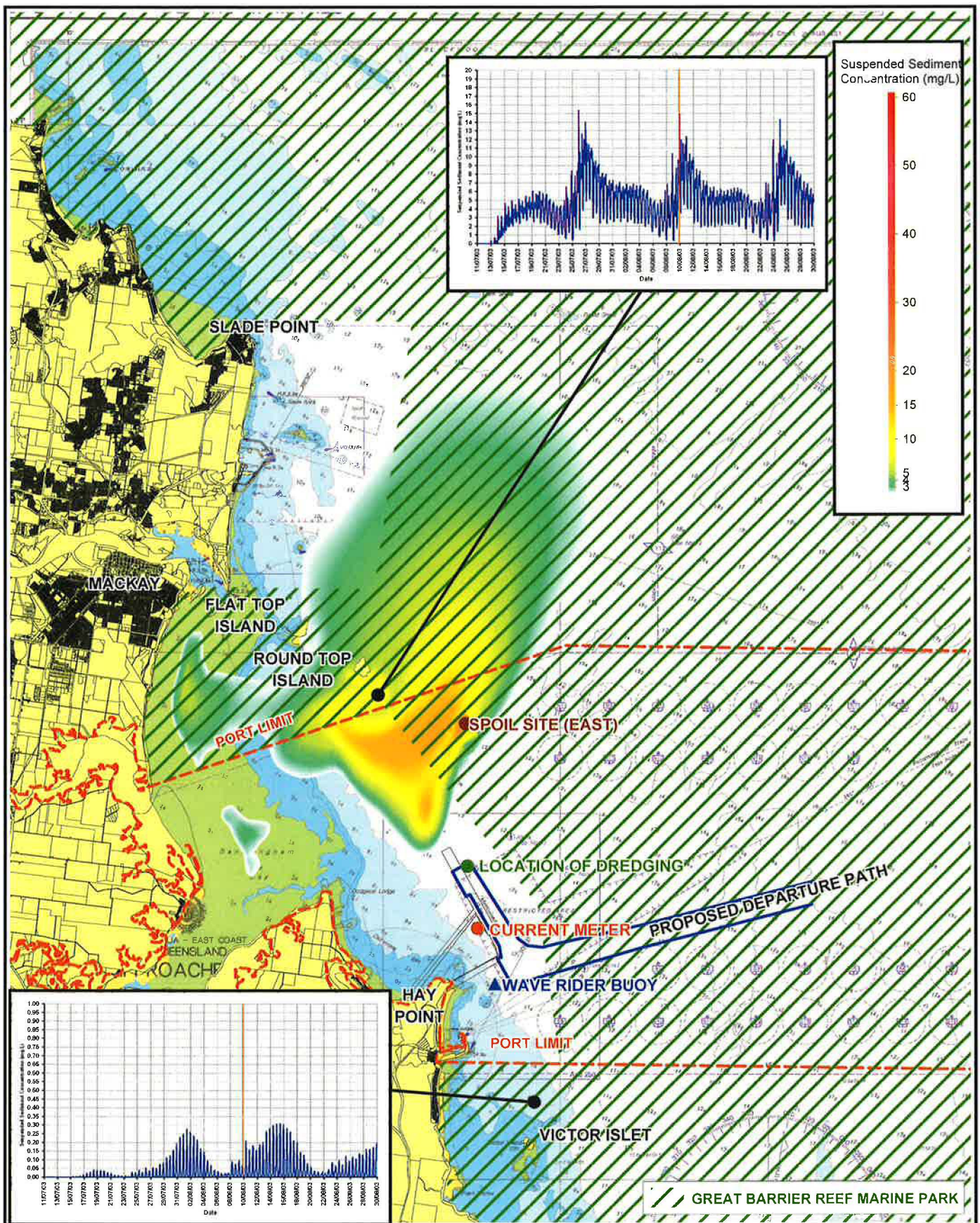


Figure 2-2 Suspended sediment concentration in vicinity of Round Top Island (Scenario S1)



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Source Information: PCQ and Chart AUS 249, Australia East-Coast Approaches to Hay Point to Mackay.

Port of Hay Point Capital Dredging
Sediment Plume After 29 Days of Non-overflow Dredging Worst Condition for Round Top Island Dumping at Spoil Site (East) During Spring Tide Cycle

Figure 2-3



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2.2.3 Dredging at the Apron Area – East Dumping (Scenario S2)

The model was run for a period of 50 days. The results of the modelling are presented in Figure 2–4 to Figure 2-7 followed by discussion.

The figures are summarised below:

- ▶ Figure 2–4 Suspended sediment concentration in vicinity of Round Top Island
- ▶ Figure 2–5 Suspended sediment concentration in vicinity of Victor Islet
- ▶ Figure 2–6 Worst condition for Round Top Island dredging at apron and dumping at spoil site east during spring tide cycle
- ▶ Figure 2–7 Worst condition for Victor Islet dredging at apron and dumping at spoil site east during spring tide cycle

Figures 2-4 and 2-5 are time history plots at a single location, whereas Figures 2-6 and 2-6 illustrate a single instant in time, but over the entire study area.

Figure 2–4 and Figure 2-5 show an initial build-up of suspended sediment concentration from commencement of dredging and spoil disposal. After 15 days, peak concentrations are reached with the trend repeated for subsequent spring and neap tide cycles. The peak concentrations around Round Top Island (approximately 29 mg/L) and Victor Islet (approximately 11 mg/L) are highest during spring tide when the plume extent is most significant.

Figure 2-6 shows the plume covering a significant area of the coast after 31 days of dredging and spoil disposal (spring tide), representing a worst case scenario. However, the majority of the plume is at a concentration of less than 10 mg/L (approximately 30% of the adopted average concentration of 30 mg/L at the dredging site). Whilst the plume is likely to be highly visible because of the naturally high clarity of waters in the area, the concentrations of suspended sediment will be quite low and within those that are naturally experienced during elevated sea states and spring tidal currents.

The maximum concentration predicted at Round Top Island for the period of simulation would be of the order of 29 mg/L. The longest continuous time period for which the concentration remains above 20 mg/L is 4 hours during a spring tide phase. However, most of the time concentrations are less than 20 mg/L and would only exceed 20 mg/L for a period of less than 4 hours.

Figure 2-7 demonstrates the plume at its most southerly reach during a spring tide. The maximum concentration predicted at Victor Islet was of the order of 11 mg/L. The longest continuous time period for which the concentration remains above 10 mg/L is 2 hours during spring tide. Most of the time, the concentrations are less than 10 mg/L or would only exceed 10 mg/L for a period of less than 2 hours.

A comparison of results suggests that there is a slight beneficial impact on suspended sediment plumes when dumping at the eastern site rather than the western site. The worst condition for Round Top Island remains unchanged with respect to time, at 31 days of dredging. However, the sediment concentrations show a slight improvement



when compared to the case where the sediment is disposed at the western spoil ground. Dumping at the eastern spoil ground marginally reduces the maximum sediment concentration at Round Top Island from 32 mg/L (dumping at west site) to 29 mg/L (dumping at east site).

A comparison of the plumes for each spoil ground scenario also shows lower concentrations along the western side of the plume, near the coast, and to the northeast of Round Top Island. In both locations, the plume concentrations illustrated in Figure 2–6 are in excess of 10 mg/L when sediment is disposed in the west spoil ground, while when dumping at the east site, concentrations are below 10 mg/L.

For Victor Islet, the worst condition is achieved after 33 days of dredging. The maximum concentration remains of the order of 11 mg/L for dumping at either the east or west side of the spoil ground. Repositioning the dump site from west to east of the spoil ground would have little mitigation benefits for Victor Islet.

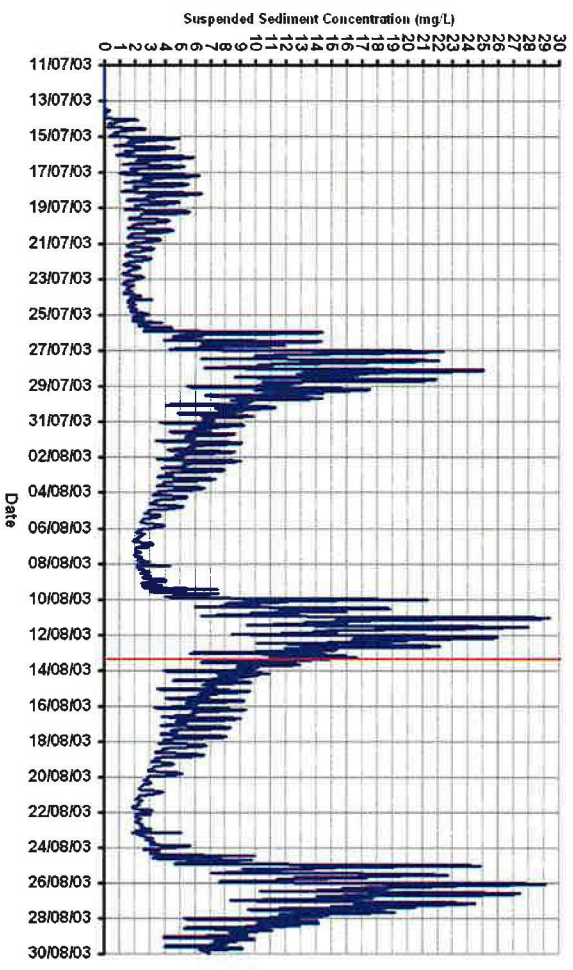


Figure 2-4 Suspended sediment concentration in vicinity of Round Top Island

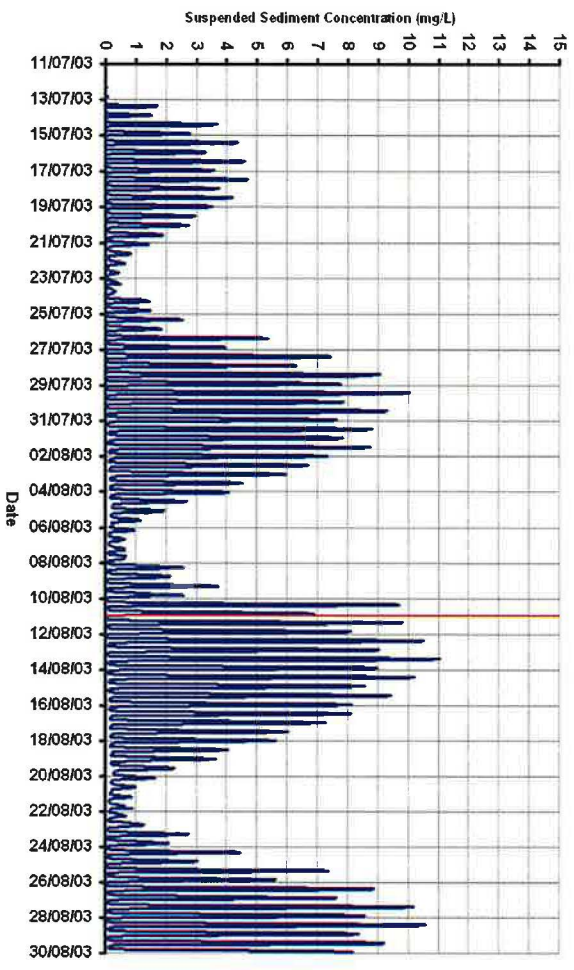
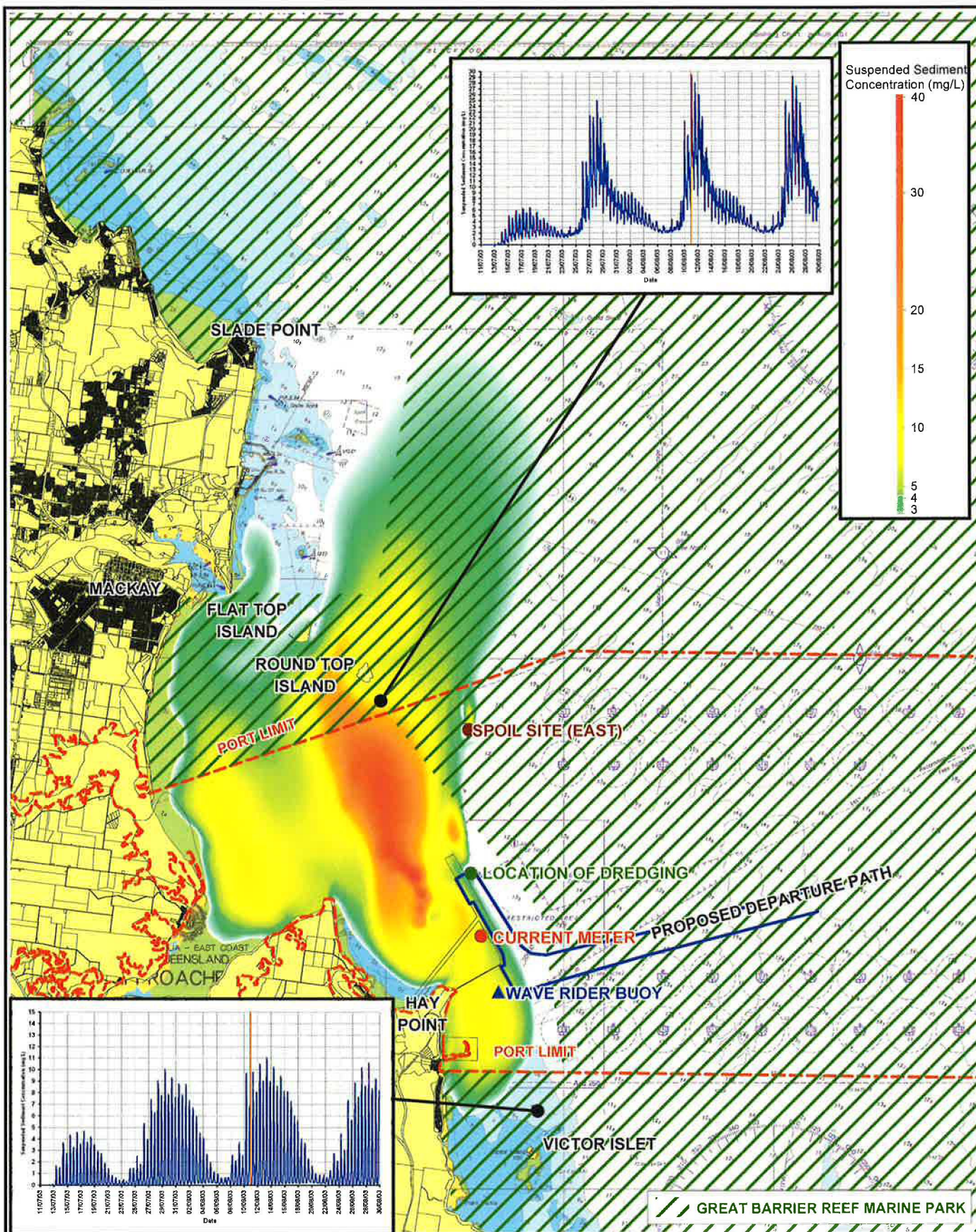


Figure 2-5 Suspended sediment concentration in vicinity of Victor Islet



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Source Information: PCQ and Chart AUS 249, Australia East-Coast Approaches to Hay Point to Mackay.

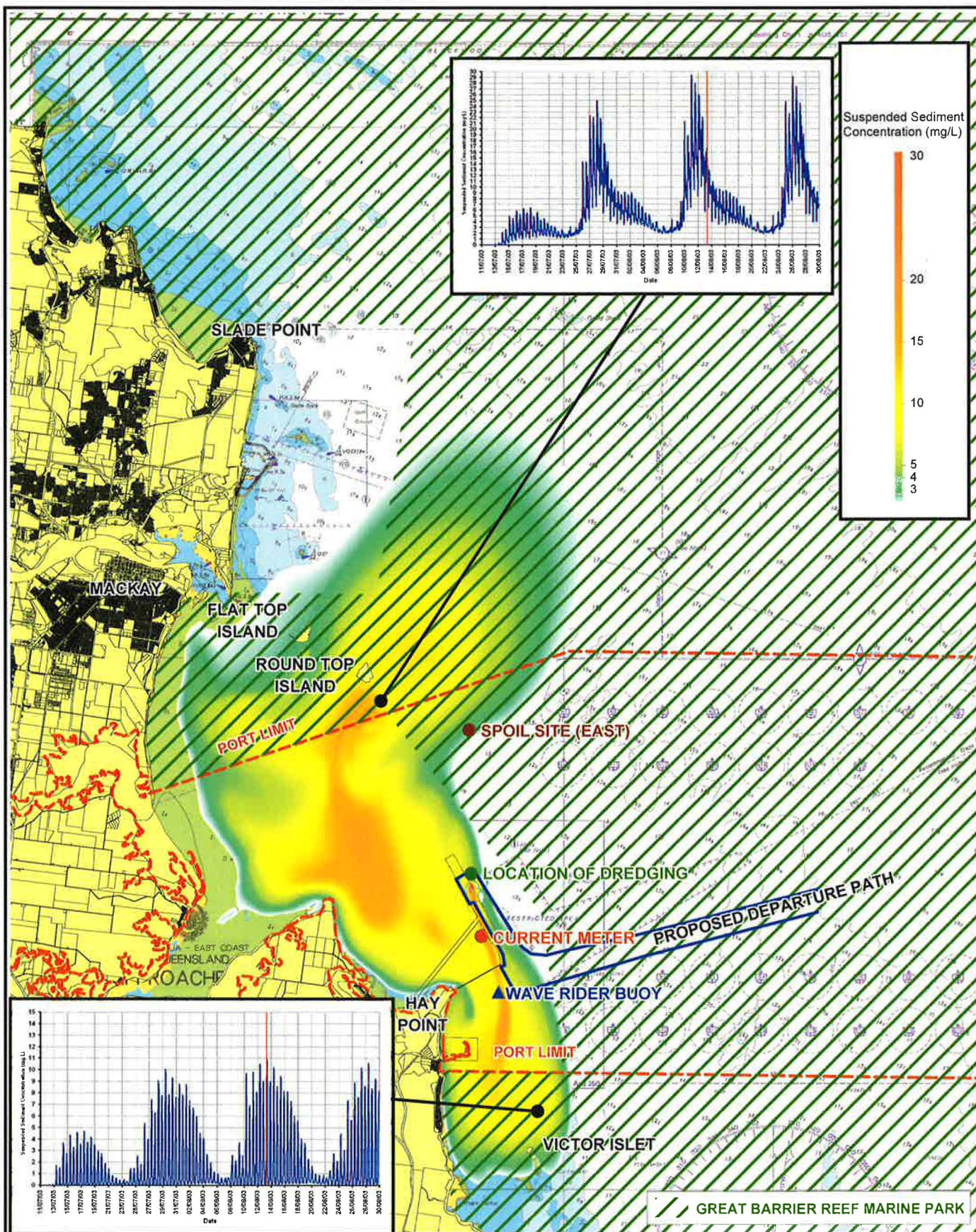
Port of Hay Point Capital Dredging

Sediment Plume After 31 Days of Dredging
Worst Condition for Round Top Island
Dredging at Apron & Dumping at
Spoil Site (East) During Spring Tide Cycle

Figure 2-6



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Source Information: PCQ and Chart AUS 249, Australia East-Coast Approaches to Hay Point to Mackay.

Port of Hay Point Capital Dredging

Sediment Plume After 33 Days of Dredging
Worst Condition for Victor Islet
Dredging at Apron & Dumping at
Spoil Site (East) During Spring Tide Cycle

Figure 2-7



Ports Corporation of Queensland

2.2.4 Plume Decay (Scenario S3)

The model was run for a period of 50 days with the dredge operating in the apron area and disposing of material in the west spoil ground to reach a nominal concentration of 50 mg/L. Once this value was achieved, the model continued to run with no further inputs to simulate the effect of stopping dredging.

As shown in Figure 2–8 following the simulated cessation of dredging the time taken to reach an expected background level of 5 mg/L was six days. A reduction to 25 mg/L is achieved after three days and 15 mg/L after four days.

The same plot suggests a four day period to drop from 30 – 35 mg/L to the nominal background level (5 mg/L). It is noted that essentially, the pattern of decay is similar to that demonstrated during the transition from spring to neap, though the rate appears somewhat faster.

It is concluded that stopping dredging will not result in any quick improvement in water turbidity.

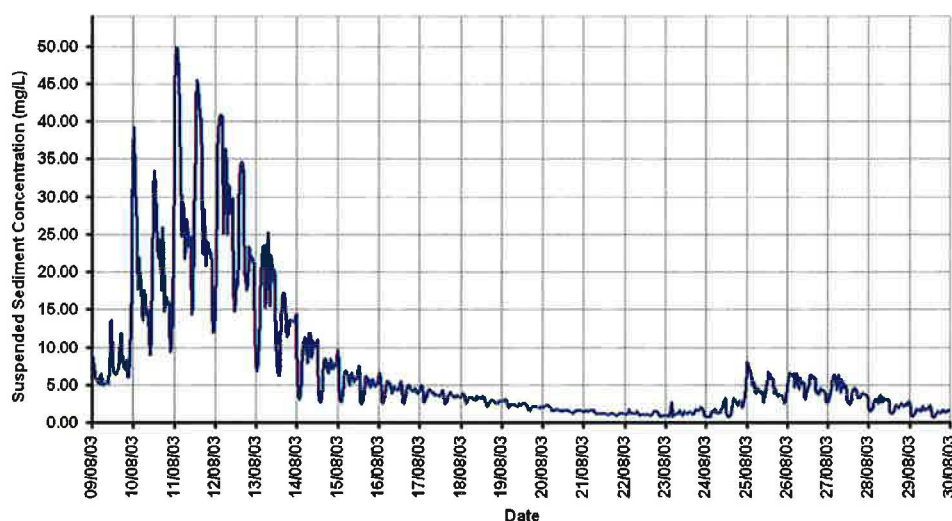


Figure 2-8 Sediment concentrations following cessation of dredging



2.2.5 Recommendation

The results of the modelling, as presented in the Draft EIS and this report, suggest that one management tool to address excessive turbidity levels in the vicinity of Round Top Island is to manage the location of works between the apron area and departure path and utilise the east spoil ground during the spring tidal phase.

2.2.6 Model Validation

PCQ propose to conduct a preliminary validation of the hydrodynamic modelling utilising water quality data, which will be gathered during the dredging of DBCT Berth 4. The dredging of Berth 4 is programmed for the week commencing 12 September 2005. Nephelometers units deployed by PCQ in August 2005 will gather data at points near Round Top Island and provide an indication of turbidity levels for these areas. Water quality sampling is also being undertaken by DBCT in accordance with their approval requirements.

Available data will be utilised to conduct a preliminary validation of the model and the outcomes of the validation will be provided to approval agencies.

2.3 Impacts on Seagrass from Light Attenuation and Sedimentation

Discussion of the impacts associated with turbidity plumes over seagrass meadows is presented in the Section 4.3 of the Draft EIS. The following provides some additional information in relation to impacts associated with light attenuation and sedimentation.

Episodic reductions in the quality and duration (photoperiod) of light experienced on the seabed causes a reduction in seagrass productivity, while a sustained reduction in light quality through suspended sediment induced light attenuation results in seagrass mortality. The minimum light requirements of seagrass species is estimated to be between 10–20% of surface light, (Duarte 1991¹). The *Halophila* species, dominant at Hay Point, generally are restricted to low light environments such as deep waters where <15% of surface light penetrates to the bottom or to shallow turbid waters.

Larger species of seagrass are more likely to resist burial due to sedimentation than smaller species, as they have a comparably greater emergent photosynthetic area (Westphalen *et al.* 2004²). Assessment of seagrass recovery from burial simulations reported that in a mixed community of tropical seagrasses, larger species of seagrasses are better placed to cope with the physiological stress associated with sediment deposition, while smaller species will be smothered by relatively less sediment and are unlikely to have large carbohydrate reserves to maintain them over periods of minimal light (Duarte *et al.* 1997³) resulting in higher rates of mortality.

The medium density *Halophila decipiens* seagrass community located adjacent to the proposed spoil ground will be subject to a deterioration in light quality for the duration of dredge operations. This effect will vary depending upon prevailing tidal phase, sea-state and intensity of dredge operations, but is likely to result in temporary loss of much of this particular meadow. The recovery period for the seagrass will be dependant on return of favourable environmental conditions. The seed bank expected in the area may speed recovery.

Seagrass species located in shallower waters toward the coast will also experience a reduction in light during much of the dredging campaign. However, this area experiences greater variation in light attenuation, compared to areas closer to the spoil ground, depending upon prevailing tidal phase and sea-state conditions. As such, the proposed dredge campaign is likely to result in episodic reductions in photoperiod in this area. It is likely that these medium density seagrass meadows will be subject to a combination of reduced primary productivity and some mortality.

¹ Duarte, C.M., 1991 Seagrass Depth Limits, *Aquat. Bot.* 40:131-137 In Short F. T., & Coles R. G., (Eds) *Global Seagrass Research Methods*, Elsevier Science B.V, Amsterdam

² Westphalen, G., Collings, G., Wear, R., Fernandes, M., Bryars, S. and Cheshire, A. (2004) "A review of seagrass loss on the Adelaide metropolitan coastline". ACWS Technical Report No. 2 prepared for the Adelaide Coastal Waters Study Steering Committee. South Australian Research and Development Institute (Aquatic Sciences) Publication No. RD04/0073, Adelaide.

³ Duarte, C.M., Terrados, J., Agawin, N.S.W., Fortes, M.D., Bach, S. & Kenworthy, W.J. (1997) Response of a mixed Philippine seagrass meadow to experimental burial. *Marine Ecology Progress Series* 147: 285–294.



2.4 Environmental Management Plan

2.4.1 Dredge Management Options

The Draft EIS identified that the key measure to minimise potential impacts associated with the project was to minimise the time frame in which the works were undertaken and therefore minimise the period of time habitat would be subject to impacts associated with elevated turbidity levels. This approach remains the key management measure for the project and is supported by the DPIF (refer submission Appendix B, General Comment 2) and GBRMPA, as identified through consultation meetings.

Modelling results presented in the Draft EIS show that the prevailing currents and tidal cycles result in a distinct oscillation of the sediment plume associated with the tidal cycle. Highest peaks in sediment concentrations at Round Top Island occur on the spring ebb phase of the tide and reduce significantly during the neap tide phase. Programming of dredging works to take advantage of these tidal variations can be implemented to minimise the concentration of sediment within the water column during the spring ebb tide.

As a primary management measure, as far as practicable, disposal of dredge material during the spring ebb tide will be undertaken at the east spoil ground.

As a secondary management measure, the dredge may be moved to work within the departure path area during the spring ebb tide and dispose of material in the east spoil ground where work remains in this area. The implementation of this measure will only occur during exceedences to maintain this option as an emergency measure given the limited amount of dredging required in this area. This option will also not be possible to implement should two dredges being operating.

The dredge contractor will effectively cease dredging for a period of 24 to 48 hours on a 2-3 weekly cycle during which time the dredge will steam to either the Port of Mackay or Port of Gladstone for re-fuelling and taking on other supplies. As far as practicable, it is proposed that these events be scheduled to occur during the spring tidal phase, so that no dredging occurs during this time and some 'relief' provided to marine communities from the peak sediment plumes.

2.4.2 Recommendation

The following measures are proposed, in addition to the measures outlined in the Draft EMP (section 5 of the Draft EIS), to minimise the potential impacts of high turbidity levels on sensitive habitats, particularly those proximate to Round Top Island. The measures have been developed based on the modelled outcomes reported in the Draft EIS and the additional scenarios presented in Section 2.2 of this report.

1. The dredge contractor will be requested to schedule refuelling and supplying outside the Port to coincide with the spring tide whenever practicable.
2. Where this is not possible, the dredge contractor will be requested to schedule works to include the use of the east spoil ground during the spring tidal phase as far as practicable.



These measures complement the management measures already identified in the Draft EIS. Should impacts on coral above the threshold values identified within the Draft EIS be detected during routine monitoring, the following corrective action will be implemented:

- ▶ The larger dredge (if there are two) to be moved to work within the departure path area during the spring ebb tide and dispose of material in the east spoil ground. Relocation of the dredge to the departure path area, however, will be subject to dredging work remaining in the area.

The implementation of this measure will only occur during exceedences to maintain this option as an emergency measure given the limited amount of dredging required in this area.

It should be noted that operational limitations may influence the extent to which the above management measures can be implemented. Weather conditions, shipping movement restrictions associated with works in the apron area, and the proportion of total works to be undertaken in the apron and departure path may result in the implementation of the proposed program being varied.

2.5 Consultation Strategy

During the third TACC meeting, it was agreed that a strategy be developed for the management of consultation with the general community and stakeholders during the period of capital works.

A draft strategy has been developed and is included as Appendix A.

2.6 Monitoring of Mangroves at Louisa Creek and Sandringham Bay

Potential impacts on mangrove communities at Louisa Creek and Sandringham Bay were identified during the third TACC meeting. It was agreed at this meeting that PCQ would undertake monitoring of these areas during works. A detailed monitoring program will be developed shortly in consultation with DPI&F.



3. Response to Comments

3.1 Introduction

A total of eight submissions were received from government agencies in response to the public notification and invitation to comment. Each of these submissions has been considered in relation to the Project. Copies of each submission are included as Appendix B.

A summary of comments and issues raised during the public information session are also included. However, no submissions were received from the community during the public notification period. Details of the issues and responses from the public information session are included as Appendix C.

3.2 Summary of Submissions

Table 3-1 provides a summary of the submission received from the Department of the Environment and Heritage and the Great Barrier Reef Marine Park Authority.

Table 3-1 Summary of submissions from the Department of the Environment and Heritage and Great Barrier Reef Marine Park Authority

Comment / Issue	Response
DEH and GBRMPA provided detailed comment on the preliminary document. The comments and recommendations have been largely addressed and satisfactorily incorporated into the Draft EIS.	Noted.
The document provides an acceptable description of the proposed actions and its likely impacts.	



Table 3-2 provides a summary of the submissions received from State agencies along with a response to each comments or issue.

Table 3-2 Summary of submissions from Queensland Government Agencies

Submitter	Comment / Issue	Response
Environment Protection Agency		
1	Indicate the likely impact of the sediment plume on seagrass as a result of light attenuation.	The likely impacts of light attenuation are further discussed in Section 2.3 of this report. It is accepted that impacts associated with light attenuation will result in some loss of seagrass outside the area directly impacted by dredging or disposal. However, it is difficult to quantify loss resulting from dredging and the natural loss expected due to seasonal variations. For these reasons, the implementation of the proposed monitoring program will include monitoring at two control sites to aid in the determination of natural seasonal variations.
2	Include an objective statement of the aerial extent and density of the sediment plume after a state of equilibrium is reached.	At the point of equilibrium (for the worst case scenario at Round Top Island) the following characteristics of the sediment plume are noted: • The modelled extent of the plume is approximately 660 km² at concentration above 0 mg/L. The visible extent is likely to be 160 km² based on a background concentration of 3 mg/L being present. • ~75% of the plume is at a concentration of 0–3 mg/L • ~93% of the plume is at a concentration of 0–10 mg/L
3	Provide an explanation of the NTU values represented in the Executive Summary section ES6.3.	A typographical error is noted in the Section ES6.3 of the Executive Summary. This section should read as follows: • At Round Top Island the maximum predicted concentration is ~26 mg/L compared with a recorded turbidity reading of ~146 NTU during May 2005. • At Victor Islet the maximum predicted concentration is ~9 mg/L compared with a recorded turbidity reading of ~65 NTU during May 2005.⁴

⁴ Turbidity of measurements of mg/L and NTU are generally taken to have a one to one relationship.



Submitter	Comment / Issue	Response
4	Indicate that corrective actions will be undertaken in accordance with Approval Conditions rather than at the discretion of the Ship Master.	Development permits will be sought for the proposed works prior to dredging commencing. These permits will be subject to conditions of approval, which will specify corrective actions to be undertaken. Necessarily some corrective actions may be the subject of the Ship Master's discretion, for example, where a matter of ship safety must be considered in determining whether to undertake the action.
5	Include an outline of the effect of the SDPWOA on the IDAS under the IPA.	The SDPWOA includes provision which amend the IDAS process under the IPA where a project is a 'significant project' under Part 4 of the Act. The effect is that the Coordinator-General's report for the Draft EIS is taken to be the conditions of approval for the IDAS development permits. Development applications will be lodged for a material change of use and operational works and these will be assessed based on the Coordinator-General's report.
6	Qualify the statement in section 1.7.5 relating to the area of medium density seagrass adjacent to the existing spoil ground by outlining the potential impact of light attenuation on the seagrass.	Episodic reductions in the quality and duration (photoperiod) of light experienced on the seabed causes a reduction in seagrass productivity, while a sustained reduction in light quality through suspended sediment induced light attenuation results in seagrass mortality.
7	Qualify the statement in section 3.2.3 relating to the area of medium density seagrass adjacent existing spoil ground by outlining the potential impact of light attenuation.	Areas of medium density seagrass adjacent to the spoil ground are likely to experience a reduction in light intensity for the duration of the dredging program. This is likely to result in mortality due to the impacts of the turbidity plume.
8	Remove data spikes from the record before calculating the mean NTU at sites unless an adequate explanation for their presence can be provided.	The data reported from the nephelometers installed within the port for the May 2005 period are reported in two sections of the Draft EIS. Table 3-11 reports the data inclusive of all readings. Whilst it is noted that 'spike' in the data occur, there is no clear reason to exclude these readings. Based on the statistical analysis of the data, a mean concentration of 5 NTU is recorded with a standard deviation of 9.2 NTU. The data is also utilised in the analysis of coral tolerances in Section 4.3.5 of the Draft EIS. In this instance the 'spikes' above 50 NTU were not included in the analysis and therefore a marginally lower mean figure is apparent. It should be noted that the nephelometer data only represents a one month period and that further data is currently being collected which will be utilised to refine the coral tolerance curves prior to finalisation of approvals from GBRMPA. The month of monitoring are expected to represent the period of lowest natural turbidity.



Submitter	Comment / Issue	Response
9	Include more detailed information on the likely effect on seagrass due to light attenuation by the sediment plume, including general information on the location, area and significance of affected seagrass communities.	The area of seagrass affected by the modelled sediment plumes varies according to the prevailing spring or neap tidal phases as presented in Figures 4-23 to 4-25 of the Draft EIS. General information on the location and significance of the seagrass communities affected by the dredge operation is described in section 3.2.3 and section 4.3.3 of the Draft EIS and further in this document. The area of seagrass communities directly impacted by the dredging operation is presented in Table 4-1 of the Draft EIS.
10	Outline the proposed coral impact trigger points for corrective action and the nature of the corrective action that would occur when trigger point is reached.	Table 4-5 of the Draft EIS outlines a number of warning and critical thresholds for coral bleaching and mortality, developed in consultation with GBRMPA. It is proposed that these thresholds in combination with the proposed coral monitoring program (included in Section 5.13 of the Draft EIS) provide the trigger points for corrective action. The frequency of coral monitoring, as proposed in the Draft EIS, was developed in consultation with the GBRMPA. Corrective actions to be implemented, should threshold values be exceeded, are outlined in Section 2.4 of this report.



Submitter	Comment / Issue	Response														
11	Explicitly state the assumptions made in the modelling scenarios, including the basis for source concentrations adopted for plume modelling and the cycle times being used.	The source concentrations utilise a philosophy of near dredge plume concentration based on the protocols suggested by HR Wallingford and DRL, in 2003 and adopted by ACCORD (Advice and Consultation Committee on Re-suspension by Dredging). The Committee is organised by the US Army Corps of Engineers and includes representatives from the EPA (US) and academics and researchers from the US and Europe. The philosophy applied adopts the utilisation of near dredge turbidities for definition of dredger sediment release to filter out effects of at dredge turbulence and density currents caused by the release of dredge overflow / spoil dumping. The philosophy also provides a methodology that can be verified or calibrated by in field measurements. The initial concentrations represent a depth averaged value at the near dredge node (a 2 dimensional model was adopted) and some variation of turbidity will be expected with depth. Initial concentrations for the modelling were adopted as 30 mg/L near dredge during overflow dredging (boundary of cell most proximate to the dredge release = approx 150 m) and 15 mg/L near dredge during spoil dumping. The model assumes that the entire water column is saturated at this concentration. The adopted concentrations were based on historical results (literature review) from previous monitoring undertaken at the port during utilising Trailer Suction Hopper Dredging (TSHD) and Grab Dredger with split hopper barges for spoil disposal. The reviewed reports document NTU readings measured at various stages of the tide both near dredge and residual plumes at various levels. The actual plume will occur from overflow at mid depth, whilst the model makes the conservative assumption that the overflow will be released at the water surface, and will remain at the same concentration throughout the water column. • The dredging cycle used for modelling overflow dredging is:<table><tr><td>Sailing and overflow dredging</td><td>1.25 hours</td></tr><tr><td>Overflow dredging</td><td>4.5 hours</td></tr><tr><td>Dumping</td><td>0.25 hours</td></tr><tr><td>Cycle time</td><td>6.00 hours</td></tr></table> • The dredging cycle used for non-overflow dredging is:<table><tr><td>Sailing and non-overflow dredging</td><td>1.25 hours</td></tr><tr><td>Dumping</td><td>0.25 hours</td></tr><tr><td>Cycle time</td><td>1.50 hours</td></tr></table>	Sailing and overflow dredging	1.25 hours	Overflow dredging	4.5 hours	Dumping	0.25 hours	Cycle time	6.00 hours	Sailing and non-overflow dredging	1.25 hours	Dumping	0.25 hours	Cycle time	1.50 hours
Sailing and overflow dredging	1.25 hours															
Overflow dredging	4.5 hours															
Dumping	0.25 hours															
Cycle time	6.00 hours															
Sailing and non-overflow dredging	1.25 hours															
Dumping	0.25 hours															
Cycle time	1.50 hours															



Submitter	Comment / Issue	Response
12	Provide information on the modelled effects of any changes in dredging location ... on sediment concentrations at Round Top Island during the spring ebb tide.	The effects of implementing various alternate dredging scenarios are reported in Section 2.2 of this report.
13	Address the long term fate of spoil ground material, ie: the likelihood of wave events that would resuspend material in the spoil ground and where this material might accrete.	Potential for the remobilisation of spoil ground material is discussed in Section 4.4.4 of the Draft EIS. This section concluded that the likelihood of resuspension of material was limited and that further analysis was unjustified considering the conclusions reached by previous studies and the deep water location of the spoil ground.
14	Obtain and summarise the electronic dredge tracking records for use in validation of the hydrodynamic model.	The dredge contractor will be required to provide tracking records which can be cross-referenced with peaks in turbidity. This information will be reported monthly in conjunction with the proposed reporting of turbidity data as stated in the Draft EMP.
15	Include objective limits / trigger points for turbidity or suspended solids at critical locations to provide more certainty to the initiation of review and corrective action. Alternatively demonstrate that the results of coral monitoring can provide a timely and objective trigger for the initiation of review and corrective action, and define the limits to coral impact.	As discussed in point 10, Table 4–5 of the Draft EIS outlines a number of warning and critical thresholds for coral bleaching and mortality. The frequency of coral monitoring is also outlined in Section 5.13 of the Draft EIS. The frequency of coral monitoring, as proposed in the Draft EIS, was developed in consultation with the GBRMPA. Corrective actions to be implemented should threshold values be exceeded are outline in Section 2.4 of this report. In consultation with GBRMPA, it has been determined that the routine monitoring of sensitive habitats and measurement of thresholds values is a more effective measure to determine the impact of dredging rather than applying an arbitrary turbidity value which triggers monitoring. Different background turbidity levels are experienced during different tidal phases, seasons and weather conditions. Therefore, trigger values would need to be developed for a range of conditions which would be difficult to monitor. The exceedance of a turbidity trigger level would initiate coral monitoring to determine impacts. As agreed with GBRMPA, undertaking coral monitoring exclusively to identify potential stress or impacts is a more efficient method of monitoring for the aforementioned reasons. Tolerance threshold curves have been developed in consultation with the GBRMPA to determine threshold values and these will trigger corrective actions as outline in the Draft EIS and Section 2.3 of this document.



Submitter	Comment / Issue	Response
16	Provide turbidity monitoring adjacent to the dredge and at Round Top Island and or the reporting of results consistent with the requirement to initiate corrective action based on defined limits / trigger points for turbidity at these locations.	Section 5.13.5 of the Draft EIS outlines the proposed telemetry based monitoring to be implemented during the proposed capital works. This includes positioning a fixed monitoring device at Round Top Island, Victor Islet and a control site. It is proposed that data will be downloaded daily and reported fortnightly and then monthly in conjunction with coral reporting.
17	Provide information on the potential for reducing turbidity level and or reducing the period for which corals at Round Top Island are subject to high turbidity, and identified practical corrective action that can be taken if turbidity (or coral impact) exceeds a defined level.	The proposed methods to minimise turbidity and corrective actions are included in Section 2.3 of this report.
18	In consultation with GBRMPA consider the merits of a final survey of the coral community at Round Top Island following a sufficient period to allow for regeneration of affected corals.	Consultations are currently being undertaken to confirm the coral monitoring program. It is likely that an additional post works survey will be undertaken to determine regeneration. The requirements for this monitoring will be included as part of the GBRMPA approval conditions.
Department of Primary Industries and Fisheries		
1	The species of seagrass are known to be ephemeral but in some other locations this is not always the case.	It is noted that the presence of these species within the port area may be attributable to atypical climatic conditions currently being experienced in central Queensland, which may have created the conditions suitable for establishment of these species (Rasheed <i>et al.</i> 2004 ⁵). This re-enforces the assumption that the presence of the seagrass in the port is likely to be ephemeral.

⁵ Rasheed, M A., Thomas, R and McKenna S A. 2004 Port of Hay Point seagrass, algae and benthic macro-invertebrate community survey, DPI&F Information Series Q104084, DPI&F Cairns.



Submitter	Comment / Issue	Response
2	The currency of information regarding introduced marine species is questionable.	Whilst it is acknowledged that the information used to assess the presence of introduced marine fauna is the port baseline survey which is over six years old, it is also acknowledged that no other ports in Queensland, other than those which have had an outbreak, have undertaken more than a baseline survey. The baseline survey showed for Hay Point showed no introduced marine pest species in the port, despite thirty years of shipping activity. The baseline surveys undertaken for Queensland ports were based on national protocols at the time. No such national protocols for follow up surveys have been finalized to date. The risk assessment of all Queensland ports identified the Port of Hay Point as having a low risk of introduced marine pests as the ships that visit the port are generally from cold climates and any pests transferred have a low potential of establishing in the tropical environment at Hay Point⁶. This situation hasn't changed since the risk assessment was carried out. It is acknowledged that due to the number of ship visits to the Port of Hay Point, the Commonwealth will require annual introduced marine pest surveys at this port. This is likely to commence in 2008, however, the national protocols have not yet been finalised. In the meantime, PCQ proactively uses larval monitoring plates to detect encrusting species. These are checked quarterly and no encrusting species have been found. No introduced pest species have been discovered in other Queensland ports, apart from an outbreak in the Port of Cairns caused by a derelict fishing vessel. This outbreak has been largely managed locally to prevent spread to other ports. This outbreak was not caused by ballast water. The Port of Hay Point is an export port. Vessels visiting the port are coal transport vessels and they do not visit Cairns. There are no fishing vessel moorings in the port which could lead to a similar outbreak in the Port. The management of the introduction of marine pests into Australian ports is primarily through the management of ballast water (Decision Support System). This practice has been in place since 2001 and minimises the risk of introduced marine pest species since the baseline pest survey was carried out. The management of ballast water is not undertaken by Port Authorities, but is regulated through AQIS and Commonwealth government policy. As such, it was not considered necessary to address this issue specifically in the EIS.

⁶ Hilliard, R.W. and Raaymakers, S. 1997 Ballast Water Risk Assessment 12 Queensland Ports Stage 5 Report. Ecoports Monographs Series No 14, Ports Corporation of Queensland: Brisbane.



Submitter	Comment / Issue	Response
3	The area of seagrass to be disturbed does not include the area to be lost from chronic turbidity plumes.	Table 4–1 in the draft EIS indicates an expected loss of seagrass resulting from direct impacts associated with physical removal and/or smothering. It is expected that other areas of seagrass will be lost due to the chronic impacts associated with the turbidity plume however it is not possible to quantify the extent of these areas, nor is it appropriate to assume that all seagrass in the greater plume area will be lost
4	Statement that seagrass is “very sparse” implies this is the case for the entire area.	The density of seagrass across the port area is very sparse in its overall coverage. It is noted that areas of medium and higher density seagrass are present but these do not represent the majority or dominant level of cover.
5	Hydrodynamic model should be re-run using the eastern dredge spoil disposal site.	The results of this work are included in Section 2.2 of this report.
6	Would it not be prudent to investigate alternate spoil disposal locations to increase options to minimise the risk of harm to environmentally sensitive areas.	Two studies were conducted to investigate possible options for spoil disposal at both on-shore and off-shore locations (Appendix C of EIS). These studies investigated a number of alternate disposal actions and concluded that little scope existed of on-shore disposal of dredge material due to a lack of available suitable land and engineering limitations associated with transport of material to an on-shore area. The modelling conducted for the Draft EIS also indicated that greatest proportion of turbidity generated during works is from the dredging of material at the apron area rather than the disposal of material at a spoil ground location. The current spoil ground location was selected based on discussions with DPIF, GBRMPA, EPA and the RHM (MSQ). The DPIF investigation of algae, seagrass and macroinvertebrate communities in the Port of Hay Point was also taken into account when identifying spoil ground options. It was agreed by the TACC that the preferable location of the spoil ground was as far east as possible without intruding on too many existing anchorages. The initial selection of the spoil ground was altered to avoid the area of medium density seagrass.
7	It is highly likely that the lack of seagrass found in previous studies of the Port were the result of method rather than seagrass not actually being present.	Noted.
8	Title of figures 3–2, 3–3, 3–4 and 3–5 should reflect Rasheed <i>et. al.</i> 2004 as the principal source and should include a survey limit line.	Noted. The source of information was noted on each of the original figures. It is also noted that the extent of the survey coincides with the mapped extent of algae and seagrass.
9	Section 3.2.4 sentence regarding impact of algae habitat loss on turtles is unsupported.	This conclusion is based on available QPWS reports in relation to marine turtles within the region.



Submitter	Comment / Issue	Response
10	Section 3.2.6 the currency of information used to assess presence of introduced marine fauna is questionable. Terminology in relation to cryptogenic and introduced species needs clarification. Similarly, the use of exotic and pests should be clarified.	Refer to response for comment 2. Errors in relation to terminology are noted.
11	The density of seagrass is unlikely to be a critical factor for why dugong do not appear to frequent the Hay Point region.	It is noted that there is no clear documentary evidence of the habitat value of the seagrass meadows present within the port. We therefore note that it is not possible to determine either way the link between this habitat and the presence of dugong. However, the lack of visual sightings of dugong would seem to support that the area does not provide habitat for dugong, except as a transitory habitat for individuals migrating between nearby dugong habitat protection areas. It is also noted that seagrass impacted is in deep water, which is less favourable to dugong.
12	Evidence needs to be provided to support claims that seagrass species may be resilient to sediment mobilisation.	Seagrass systems of tropical Australia are influenced by pulses of sediment laden, nutrient rich river flows, resulting from high volume summer rainfall. Cyclones and severe storms or wind waves in conjunction with herbivore pressure from dugong and turtle are natural ecological processes, which influence seagrass communities to varying degrees. This results in a mosaic of dynamic, spatially and temporally variable seagrass meadows (Carruthers <i>et al.</i> 2002⁷). <i>Cymodocea</i> and <i>Zostera</i> are considered to be intermediate genera capable of surviving 'moderate' levels of disturbance, while <i>Halophila</i> and <i>Halodule</i> are considered to be ephemeral species characterised by rapid turnover, high seed set, and well adapted to high disturbance regimes and grazing pressure (Walker <i>et al.</i> 1999⁸). The <i>Halophila</i> species are generally restricted to low light environments such as deep waters where <15% of surface light penetrates to the bottom, or to shallow turbid waters (Fourqurean <i>et al.</i> undated⁹). The above supports a conclusion that the dominant species of <i>Halophila</i> are well adapted to disturbance including sediment mobilisation and are likely to recolonise following such disturbances.

⁷ Carruthers, T. J. B. Dennison, W. C. Longstaff, B. J. Waycott, M. Abal, E. G. McKenzie L. J. & W. J. Lee Long (2002) Seagrass Habitats of Northeast Australia: models of key processes and controls. Bulletin of Marine Science, 71(3): 1153–1169.

⁸ Walker, D. I., W. C. Dennison and G. Edgar. (1999) Status of Australian seagrass research and knowledge. Pp 1–18 in A. Butler and P. Jernakoff, eds. Seagrass in Australia. CSIRO Australia, Collingwood.

⁹ Fourqurean, J W, Durako M J, Hall M O, Hefty L N, A manuscript intended for publication in the book: Linkages between ecosystems in the south Florida hydroscape: the river of grass continues, edited by J.W. Porter and K.G. Porter.



Submitter	Comment / Issue	Response
13	Reference to <i>Halophila decipiens</i> being a large species is incorrect.	Reference to <i>Halophila decipiens</i> as a large seagrass species is a typographical error. This comment should read in reference to <i>Halophila spinulosa</i> as being a large seagrass species.
14	Scale, duration and previous impacts associated with dredging would be very different to the capital works proposed.	It is accepted that this program will represent a significantly longer duration of works compared to previous dredging campaigns in the port. However, the extent of sediment plume experience during previous campaigns is comparable based on modelling results and therefore provides some indication of the potential extent of impact.
15	The statement in paragraph 2 of page 4.14 is misleading.	This statement refers to the broader distribution of seagrass in the study area and is therefore not considered to be not misleading.
16	While some natural seasonal reductions in seagrass could be expected, the effect of dredging could be discerned through monitoring of reference control sites.	The DPIF monitoring program proposed as part of the Draft EMP (see Section 5.14.2 of the Draft EIS) is considered sufficient to determine effects of dredging with the proposed program including monitoring of two control sites over the two year monitoring period.
17	There is little information available on the ability of the seagrass species found at Hay Point to recover from turbidity impacts. Evidence from the 1992 Hervey Bay losses of seagrass may provide a better indication of the likelihood of recovery.	The cyclonic event 1992 in conjunction with two major floods within a three-week period added to pressure on the system and resulted in approximately 1,000 km² of seagrasses in Hervey Bay being lost. The deepwater seagrasses apparently died from lack of light caused by a persistent plume of turbid water from the floods. Heavy seas also uprooted seagrass in shallow waters. The sub-tidal seagrass (below 5 m deep) started to recover within two years. The intertidal seagrasses only started to recover after four to five years and did not fully recover until December 1998¹⁰. It is noted that the loss of seagrasses was the result of a series of severe weather events occurring in quick succession which would have resulted in extreme turbidity events combined with increased bed shear stresses generated through strong wind and wave actions, particularly in shallower environments. It is noted that it was the deeper water species which recovered most rapidly. The 1992 cyclonic event in Hervey Bay event is not considered to represent a comparator to the turbid environment which is predicted to occur during the proposed works.

¹⁰ www.reef.crc.org.au/publications/brochures/CRC_Reef_seagrass_web.pdf



Submitter	Comment / Issue	Response
18	Impact on seagrasses in the spoil ground may be continuous if regular maintenance dredging is required.	It is expected that maintenance dredging of the apron areas and departure path will occur on a 3-2 yearly cycle. In order to minimise continued impacts on the spoil ground a mosaic approach to disposal is proposed and discussed in the Draft EIS. The design of this approach will be further developed with regulatory agencies during the approval process.
19	The only real mitigation measure presented is to shorten the dredging time frame. With large areas of seagrass to be temporarily lost due to the project regardless of dredging methods.	It is acknowledged that seagrass meadows will be lost and that the most effective way to minimise loss is to undertake the works within the shortest period of time possible to allow recovery to commence which will be in the favourable growth period of summer.
20	Many of the comments in relation to seagrass are also relevant to algal communities.	The responses in relation to seagrass impacts, as detailed above, also apply to algae.
21	There are operational measures which can be implemented to minimise the impacts on coral communities.	Operational measures to minimise potential impacts upon coral are discussed in Section 2.3 of this report in relation to management of the dredge program to utilise tidal phases and therefore minimise the extent and concentration of turbidity present at sensitive habitats during the spring ebb tidal phase.
22	The risk of an overseas dredge introducing marine pests needs to be addressed.	Any overseas vessel visiting the Port is required to undertake ballast water exchange in accordance with Commonwealth legislative requirements that prevent high-risk ballast water being discharged. Refer response for comment 2.
23	It is likely that the turbid plume will affect the seagrass meadows outside the area to be dredged. Therefore, the degree of impact is likely to be more than the 28% stated.	As discussed in section 4.3.3 of the Draft EIS it is expected that chronic impacts associated with the turbid plume will occur in addition to direct or acute impacts estimated to represent a loss of approximately 28% of seagrass cover (with 70% of the area to be acutely impacted having a coverage of less than 5%), and that these impacts will result in the loss of some areas of seagrass. However, it is difficult to attribute loss resulting from dredging and the natural loss expected due to seasonal variations. For these reasons the implementation of the proposed monitoring program will include monitoring at two control sites to aid in the determination of natural seasonal variations.
24	Supporting evidence is needed to demonstrate good recovery of the communities at the spoil disposal ground.	Recovery of the existing spoil ground is demonstrated in Rasheed <i>et al.</i> 2004 ¹¹ . Disposal of dredged material occurred at this site in 2002 and the survey undertaken in July 2004 shows low to medium density cover of seagrass across much of the area.

¹¹ Rasheed, M A., Thomas, R and McKenna S A. 2004 Port of Hay Point seagrass, algae and benthic macro-invertebrate community survey, DPI&F Information Series Q104084, DPI&F Cairns.



Submitter	Comment / Issue	Response
25	Information is required in relation to regular surveys conducted at the Port to identify exotic organisms which may have been introduced via ship movements within the Port. Cairns Port Authority undertake monitoring of areas proposed for dredging and ocean disposal sites pre and post dredging to examine risk of translocation	As previously discussed, the management of ballast water, which is a potential vector for the introduction of marine pests into ports, is managed on a Commonwealth level through policy on ballast water. Since July 2001, ships with ballast water that is considered high risk for introduced marine pest species and which have not exchanged ballast mid-ocean are not allowed to discharge into Australian waters within the 12 nautical mile limit. The previous survey undertaken at the Port did not identify marine pests. Regular surveys are undertaken in the form of larval traps, that have been installed at the Port, which are inspected every three months for encrusting species as is undertaken in other ports throughout the State. Whilst it is acknowledged that these surveys only assist in identification of hard substrate introduced marine pests, it is worth noting that outbreaks of introduced marine pests in Queensland have been of such organisms. In discussions with Cairns Port Authority, the requirement of undertaking monitoring pre and post dredging is based on the occurrence of an introduced marine pest outbreak. This pest was identified on a derelict fishing vessel, not on a commercial vessel, which comprises the majority of vessels in the Port of Hay Point. Australian ports were required to carry out a baseline survey for marine pests and the Port of Hay Point was one of the first Australian ports to complete this survey. The Commonwealth Government has not yet identified the need for ports to implement a follow up survey, although it is expected to commence in 2008. PCQ will participate in these follow up surveys when the Commonwealth issues its new requirements. In the meantime, PCQ's proactive program using three monthly checks of larval monitoring plates provides some assurance of lack of encrusting species.
Department of Aboriginal and Torres Strait Islander Policy		
1	Specific mention of Traditional Owners as stakeholders is necessary at Section 1.6.3	Noted. The identification of stakeholders outlined in the Draft EIS took the general community to include Aboriginal and Torres Strait islander people within this group, with specific mention of their role as Traditional Owners being identified in Section 3.9 and have been consulted on the project.
2	After Section 1.5.2 a new heading of Other Legislation and Policies should be inserted. The <i>Aboriginal Cultural Heritage Act</i> and the <i>Native Title Act</i> should be referred to in this section.	It is noted that Section 1.5.2 refers to relevant legislation under which approvals are to be sought and therefore does not include the identified Acts. However, the importance of these Acts is noted and reflected through the document in regard to cultural heritage.



Submitter	Comment / Issue	Response
Department of Natural Resources and Mines		
1	Traditional Owners groups have not been identified as a stakeholder.	Noted. The identification of stakeholders outlined in the Draft EIS took the general community to include Aboriginal and Torres Strait islander people within this group, with specific mention of their role as Traditional Owners being identified in Section 3.9 and have been consulted on the project.
2	Neither native title claim extends over the sea. Accordingly the notification process should have been as per S91(1)(e) of the Act.	Search requests were sent to the National Native Title Tribunal on 28 October 2004, indicating an area including the Port and extent of port limits as the area to be searched. The area to be searched was also indicated on a map and clearly indicated that the areas was off-shore. The response from the National Title Tribunal included two claim summaries – those of the Yuibera and Wiri#2. Searches were also conducted of the Aboriginal Cultural Heritage Database and the Aboriginal Cultural Heritage Register (separate searches) on 3 November 2004. Both requests clearly stated both land and water up to 10 kms off-shore. Searches requested under the Queensland Heritage Act were issued on 2 November 2004 and the Australian Heritage Database on 2 November 2004. Based on the outcomes of the searches, which were conducted in accordance with the Act requirements, notification was undertaken to the identified Native Title Claimants. Further discussions in relation to this matter area being conducted with the DNRM.
Department of Employment and Training		
1	The project does not have a significant impact on the department or its interests.	Noted.
Department of Emergency Services		
1	Requirements have been satisfactorily addressed in the Draft EIS.	Noted.
Department of Main Roads		
1	Section 3.11 should provide a section on community infrastructure and services	As noted in the submission, the proposed works will occur wholly off-shore.
2	Section 4.13.2 does not specify how the provision of supplies, during construction, may be transported in and out of the community.	One or two overseas dredgers will undertake the proposed works. The dredgers will take on supplies at 2-3 weekly intervals from either the Port of Mackay or the Port of Gladstone. The dredger will steam to port, take on supplies and then return to Hay Point. Only small volume supplies such as bread, milk and pharmaceuticals may be sourced locally and delivered by the crew.



2. Structure

2.1 Introduction and Overview

The communication strategy provides a strategic mix of four types of communication activities:

- issues management;
- information dissemination;
- consultation; and
- promotion.
- ensure effective and prompt issues resolution.

2.2 Communication Objective

The communication objective for the project is to design and implement a program of consultation to members of the public and stakeholders who are affected by the project. This will be achieved by:

- building community acceptance for the project;
- building cooperative relationships with stakeholders; and
- ensuring effective and prompt issue resolution.

2.3 Key Messages for the Project

There are five key messages for the project:

- The Commonwealth and State government and the coal industry are working together to improve port efficiencies and maximise the economic benefit to the local, regional and national economies.
- The project is committed to effective environmental management, which ensures potential impacts on nearby sensitive habitats are minimised.
- Local residents and recreational fishers will be kept fully informed of any access restrictions within the port limits that may occur.
- Best practice safety and environmental standards are pursued in the capital dredging works.
- Call 1800 number to call for information and assistance with problem resolution.



3. Target Audience and Stakeholders

3.1 Stakeholder Identification

Key stakeholders (including interest groups) for this EIS will include:

- ▶ Commonwealth approval agencies - DEH and GBRMPA
- ▶ State Government Departments - including EPA, DPI&F, DNRM, MSQ/QT and Premier's Department (Coordinator General)
- ▶ Sarina Shire Council (elected representatives and officers)
- ▶ Local elected representatives of State and Commonwealth Governments
- ▶ Port of Hay Point Community Reference Group
- ▶ Port of Hay Point Technical Advisory Consultative Committee (TACC)
- ▶ Environment / conservation groups
- ▶ Traditional Owners
- ▶ Recreational fishing and commercial groups
- ▶ Tourism industry and professional associations
- ▶ Marine industry and professional associations
- ▶ Industry in the Port of Hay Point
- ▶ Media
- ▶ General Community near Hay Point
- ▶ Port of Hay Point Liaison Group

3.2 Likely Attitudes and Interest Levels

The anticipated attitudes and interest levels of different stakeholder groups are assessed in the table below, to assist with issues management. Table 2 provides a possible stakeholder attitudes and interest level.

Table 2 Desktop Assessment of Stakeholder Attitudes and Interest Levels

Stakeholder / Group	Likely Attitude	Likely Level Of Interest
<i>Elected Representatives:</i>		
▶ Local	C	M
▶ State	C	M
▶ Commonwealth	C	M
<i>Government Departments and Agencies:</i>		
▶ Maritime Safety Queensland / Queensland Transport	S	M-L



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Stakeholder / Group	Likely Attitude	Likely Level Of Interest
▶ Commonwealth Department of Environment & Heritage	VC	H
▶ Great Barrier Reef Marine Park Authority	VC	H
▶ Premier's Department	S	M
▶ Queensland Environmental Protection Agency	VC	H
▶ Queensland Department of Primary Industries & Fisheries	VC	H
▶ Queensland Department of Natural Resources & Mines	NC	M
▶ Sarina Shire Council	C	M
Business, Industry and Tourism Interest Groups:		
▶ BM Alliance Coal Operations Pty Ltd (BMA), Babcock & Brown Infrastructure (DBCT) Management Pty Ltd, DBCT Pty Ltd	S	M
▶ Local Chamber of Commerce	S	L
Environmental Interest Groups:		
▶ Mackay Turtle Watch	VC	H
▶ Mackay Conservation Group	VC	H
Social / Community Interest / Fishing Groups:		
▶ Port of Hay Point Community Reference Group	C	M
▶ Local Progress Associations (Louisa Creek, Half Tide, Salonika)	VC	M
▶ Central Queensland Land Council Aboriginal Corporation	C	M
▶ Sunfish Recreational Fishing	C	M
▶ Queensland Commercial Fishermans Organisation	C	M
Marine Industry and Professional Associations:		
▶ Mackay Marine Advisory Group (LMAC)	C	H
▶ Mackay-Whitsunday Regional Consultative Committee	C	M
Media:		
▶ Local	C	M
▶ State / Regional	NC	M
▶ National	NC	L-M
Other Stakeholders:		
▶ The General Community	C	L-M

Table Legend:

Likely Attitude

VC	Very Concerned
C	Concerned
I	Indifferent / Undecided

Level of Concern

H	High
M	Medium
L	Low



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NC Not Concerned
S Supportive



4. Management of Issues through Community Consultation

4.1 Management of Issues

Table 3 sets out the management plans and contingency which are in place to deal with various aspects of expected impacts.

Table 3 Management of Issues through Community Consultation

Expected Impact	Potential Management Plan/Contingency
Visible sediment plume	Community briefing prior to commencement of works Provision for key stakeholders to observe aerial monitoring Reporting to TACC, CRG and Port Liaison Group meetings Addressed in newsletters Updates provided to Local Councils (staff and Councillors) Updates and briefings for local EPA & DPI&F officers Updates provided to Local MPs and provision for observation of aerial monitoring Provision for key stakeholders and Local and Federal MPs to undertake visits to the dredge and observe works in action Web-site updates Media release in the Mackay Daily Mercury and the Pioneer News
Perceived environmental harm caused by dredging	Community briefing prior to commencement of works Reporting to TACC, CRG and Port Liaison Group meetings Addressed in newsletters Updates provided to Local Councils (staff and Councillors) Updates and briefings for local EPA and DPI&F officers Updates provided to Local MPs and provision for observation of aerial monitoring Provision for key stakeholders and Local and Federal MPs to undertake visits to the dredge and observe works in action Web-site updates Media release in the Mackay Daily Mercury and the Pioneer News



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Expected Impact	Potential Management Plan/Contingency
Changes to access arrangements for recreational boaters	Communications with MSQ Regional Harbour Master Regional Harbour Master to issue notice to mariners Signage at Tug Harbour and Mackay marina Addressed in newsletters

Table 4 provides a summary of community engagement methods to be implemented including the level of engagement, purpose and proposed timing.

Table 4 Summary of Community Engagement Methods

Method	Level of Engagement¹	Purpose of Engagement	Timing
Briefing to Community Reference Group and TACC	I	To inform the local community of the work to be undertaken and the expected issues.	One month prior to commencement of works.
Aerial surveillance flights to CRG, TACC, local elected representatives, GBRMPA and key stakeholders	A	To provide visual information to stakeholders on extent of sediment plume.	As required
Visits to dredge for key stakeholders (CRG, local elected representatives, TACC, GBRMPA, Traditional Owners)	A	To provide improved understanding by key stakeholders of dredging processes.	As required
1800 Number	I and C	Provide initial information on the project purpose, milestones and timeframes. Provide weekly updates on project progress.	Daily
Website with e-mail link	I and C	Provide weekly updates on project progress. e-mail feedback option.	Fortnightly
e-mail response	I and C	Provide feedback on questions and comments.	As required

¹ I = Information

C = Consultation

A = Active Participation



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Method	Level of Engagement ¹	Purpose of Engagement	Timing
Key Milestone Newsletters / letter box drop	I and C	Provide an update of progress of works and feedback on issues raised during the month.	Newsletter 1 One month prior to works Newsletter 2 One month after works commence, reporting on preliminary monitoring results. Newsletter 3 Project completion
Media releases	I and C	Promote the Project and respond to any media enquiries. Offer visit to dredge and monitoring.	Coinciding with release of newsletters
Local and State Government briefings	I and C	Provide an update of the project and seek their involvement where required. Offer visit to dredge.	As required
MPs briefings	I and C	Provide an update of the project and seek their involvement where required. Offer visit to dredge and monitoring. Offer photo opportunity.	As required
Stakeholder and Community Database and complaints register	Internal		Updated as required

4.2 Media

An important element of establishing and maintaining a positive project reputation is careful management of media relations and consistent use of the following protocols in all media based communication activities and dealings with the media.

4.2.1 Media Protocols

All media inquiries, requests and opportunities are to be referred to PCQ for review and approval.



4.2.2 Key spokesperson

The only person authorised to comment on the project to the media is the designated key spokesperson – PCQ Manager Corporate Relations and Northern Staff, .

4.3 Complaints Database

A complaints register will be maintained and linked with the stakeholder database. The complaints register should include the following information (but not limited too):

- ▶ Complainant information (name, address, phone number, date and time);
- ▶ Nature of problem;
- ▶ Date and time of problem;
- ▶ Name of person who discussed the enquiry with complainant; and
- ▶ Outcome.

The data shall be collated for analysis at the end of each month to identify the most common sources of complaint or practices that should be reviewed.

4.4 Approvals and Protocols

PCQ has a clear approval process for the majority of public materials about the project, these include:

- ▶ Media releases;
- ▶ Letters;
- ▶ Newsletters;
- ▶ Website material;
- ▶ Advertising;
- ▶ Letterbox drops;
- ▶ Fact sheets;
- ▶ Mail outs;
- ▶ Project signage;
- ▶ Company publications; and
- ▶ Material for inclusion in trade and specialist industry publications.

4.4.1 After Hours Contacts

The contractor shall provide an after-hours emergency contact number for use by the MSQ Regional Harbour Master Centre and emergency services.

PCQ shall provide a 24 hour contact number for use by the community.



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4.5 Responsibilities

The Project Superintendent is responsible for implementing the communication strategy.

The Project Superintendent is responsible for liaising with regulatory agencies to address any complaints or issues which may have been raised and notified to each agency.

This task may be subcontracted to a specialist sub-consultant to undertake or manage the proposed activities.

4.6 Reporting

The Project Superintendent will provide a report, following release of each newsletter outlining any feedback received from stakeholders. The outcomes of the communications strategy will be reported to the TACC and regulatory agencies.



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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	R Gibson	J Keane		J Keane		09/09/05



Appendix B

Submissions on Draft EIS



Australian Government

Department of the Environment and Heritage

Julie Keane
Project Manager
GHD Pty Ltd
GPO Box 668
BRISBANE QLD 4001

Dear Julie

**Port of Hay Point Apron Area and Departure Path Capital Dredging
Draft Environmental Impact Statement (August 2005)**

Thank you for providing a copy of the draft Environmental Impact Statement (EIS) (August 2005) for the Port of Hay Point Apron Area and Departure Path Capital Dredging proposal. Department of the Environment and Heritage (DEH) comments, prepared in consultation with the Great Barrier Reef Marine Park Authority (GBRMPA), are provided below.

As you know, this proposal was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Further, the decisions to issue the relevant permits under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act) and the *Environment Protection (Sea Dumping) Act 1981* (Sea Dumping Act) were also referred under section 161 of the EPBC Act for the Minister's advice. It was subsequently determined that the referred actions should be assessed by an accredited EIS process, namely under Part 4 of the *Queensland State Development and Public Works Organisation Act 1971*.

DEH and GBRMPA provided detailed comments and recommendations on the preliminary draft EIS during discussions with Ports Corporation of Queensland and GHD Pty Ltd on 25 July 2005 and also subsequently in our written advice of 28 July 2005. These comments and recommendations have been largely addressed and appear to be satisfactorily incorporated into the draft EIS. Accordingly, in our view, the document provides an acceptable description of the proposed action and its likely impacts.

We also anticipate that the supplementary EIS, including information describing how any public submissions made are to be addressed, should provide sufficient information to enable an appropriate environmental assessment of the proposal to be undertaken.

Yours sincerely

Nick Gascoigne
Director
Tourism and Natural Resources Section

9 September 2005

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this potential impact should be provided. Subject to the information received, Main Roads will then determine if a Road Impact Assessment, in accordance with its Guidelines for Assessment of Road Impacts of Development Proposals, needs to be undertaken by the proponent.

In the event that any material is to be disposed of onshore, the proponent will be required to prepare and submit to Main Roads for approval a Road Impact Assessment, which determines the impact of construction and operational movements on the state controlled road network. The impacts on the network shall address safety, efficiency, accelerated reductions in pavement life and potential increased road network maintenance. The guidelines for the assessment of the above are detailed the Main Roads publication "Guidelines for the Assessment of Road Impacts of Development Proposals. All costs of these measures will be the responsibility of the proponent.

We look forward to further consultation with your office and the project proponents in the course of preparing the transport aspects (infrastructure and services) of the EIS.

Yours sincerely



Mal Hellmuth
Executive Director (Central Queensland)

0749362212

**Queensland
Government**

Enquires - Steve Elson
Telephone 07 4936 0589
Your reference ID35690/MAN-67292
Our reference ROK3259

Environmental Protection Agency

Incorporating the
Queensland Parks and Wildlife Service

30 August 2005

The Coordinator-General
Port of Hay Point Capital Dredging
Project Delivery
The Office of the Coordinator-General
PO Box 15168
CITY EAST QLD 4002

Attention: EIS Project Manager

Dear Sir/Madam

Re: Port of Hay Point Capital Dredging Environmental Impact Statement

The Environmental Protection Agency (EPA) has reviewed the impact assessment documents, released by your Department for comment on 4 August 2005, for the proposed capital dredging of the apron areas and the departure path for the Port of Hay Point.

The EPA considers that further information should be provided on:

1. The relationship between the extent, concentration and duration of sediment plume impacts on seagrass and coral communities through light attenuation and sedimentation, and the likely short-term and long-term effect on these communities; and
2. Practicable measures to reduce the sediment concentration, or duration of high sediment concentration, in the suspended sediment plume resulting from dredging and dredge spoil disposal at the coral community at Round Top Island, in the event that estimated turbidity levels are exceeded, or the impact on coral communities exceeds defined acceptable levels.

On the basis of its review of these documents the EPA has prepared detailed comments (Attachment 1), and draft conditions of approval relevant to a subsequent application for development approval (material change of use and operational works) designed to control and limit potential impacts on the surrounding environment from direct and indirect impacts that may result from the project (Attachment 2). Please note that draft conditions, particularly conditions relating to limits to turbidity, are subject to further discussion with the Great Barrier Reef Marine Park Authority and Ports Corporation Queensland (PCQ), following the provision of further information as recommended in Attachment 1.

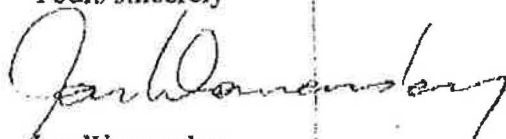
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The EPA has discussed matters raised in this response with PCQ and its consultants. The EPA would be pleased to meet further with PCQ during the review of submissions phase, to discuss the additional information requirements and draft conditions.

Should you have any queries regarding this response, please contact Steve Elson on 4936 0589 or email steve.elson@epa.qld.gov.au.

Yours sincerely



Jon Womersley

Director

Environment (Central Region)

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DETAILED EPA COMMENTS ON THE DRAFT EIS FOR THE PORT OF HAY POINT CAPITAL
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Specific Comments

Executive Summary – ES6.1 Marine Flora and Fauna, Seagrass and Algae

The summary does not indicate the likely impact of the sediment plume on seagrass as a result of light attenuation and sedimentation. Discussion with officers of the Department of Primary Industries and Fisheries indicates that areas of seagrass subject to the effect of the main dense sediment plume will probably die while areas further inshore are likely to survive. However, it is expected that the seagrass will recolonise over time.

Recommendation 1

Include a statement in the Executive Summary of the likely effect on seagrass due to light attenuation by the sediment plume and sedimentation, including general information on the location, area, and significance of the seagrass affected. Addition of similar statements in Table ES-1 in relation to impacts on seagrass would be appropriate.

Executive Summary – ES6.3 Water Environment

The statement that the majority of the plume is at a concentration of less than 5 mg/L is not supported by Maps 4-23 to 4-31, although it is recognised that the maps mostly relate to modelled "worst case" scenarios. These maps show a very large area subject to sediment plume with a suspended solids content of 10 mg/L to 30 mg/L. At times, a sediment plume with a density of 20 mg/L to 30 mg/L appears to cover up to 10 square kilometres in the modelled scenarios.

Recommendation 2

Include a more objective statement of the aerial extent and density of the sediment plume after a state of equilibrium is reached in the dredging operation impacts.

It is stated that the maximum suspended sediment concentration predicted from the model simulations after 50 days during a spring tide at Round Top Island is ~26 mg/L with a maximum of ~146 NTU (Nephelometer Turbidity Unit); and at Victor Islet is ~9 mg/L with a maximum of ~65 NTU. It is not clear what the turbidity levels relate to but presumably it is the maximum actual value obtained from monitoring during previous dredging campaigns.

Recommendation 3

Provide an explanation of what the NTU values represent.

Section 1.2.4 Disposal of Dredged Material

Modelling indicates that increased suspended sediment concentration in marine waters will occur as a result of the dredging operation. The elevated suspended sediment concentration is likely to result in major short term impact on seagrass to the north of the apron, and may cause loss (up to 20%) of corals in the reef community at Round Top Island.

These anticipated levels of impact are under the "worst case" modelled scenarios. However, in the event that measured impacts on the coral reef community exceed, or are likely to exceed, the maximum levels indicated, the EIS has not identified the practical measures that will be taken to reduce the extent and/or concentration of the sediment plume. Statements in this section suggesting that corrective action will be at the discretion of the Master of the

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dredge do not provide an adequate frame of reference within which the Master will exercise that discretion.

Recommendation 4

Amend statements to indicate that disposal of dredged material, including any action required to reduce the impact of the sediment plume on sensitive ecosystems, will be in accordance with conditions of approval and the dredge management plan to address maintenance dredging (included within the Environmental Management Plan).

Section 1.5.2 Queensland State Government Approvals – *Integrated Planning Act 1997*

The *State Development and Public Works Organisation Act 1971* (SD&PWO Act) contains provisions which alter the IDAS process for applications for a material change of use and provide for the Coordinator-General Report to be a concurrence agency response for an application under the *Integrated Planning Act 1997* (IP Act).

The EPA considers that the works constitute a material change in the intensity or scale of Environmentally Relevant Activity (ERA) 71 "Port - operating a port (other than an airport) under the *Transport Infrastructure Act 1994*".

Recommendation 5

Include an outline of the effect of the SD&PWO Act on the Integrated Development Assessment System of the IP Act.

Section 1.7.5 Feasible Spoil Ground Alternatives

The statement that the spoil ground was relocated to exclude an area of medium density seagrass adjacent to the existing spoil ground is likely to create an expectation that the area of seagrass will not be significantly affected by the work. It is likely that the seagrass in this area will be affected by light attenuation by the sediment plume from dredging.

Recommendation 6

Qualify the statement in section 1.7.5 relating to the area of medium density seagrass adjacent to the existing spoil ground by outlining the potential impact of light attenuation on the seagrass.

Section 3.2.3 Seagrass Communities

The statement relating to protection of medium density seagrass by relocation of the spoil ground may create an expectation that this area of seagrass will not be impacted by dredging operations.

Recommendation 7

Qualify the statement in section 3.2.3 relating to the area of medium density seagrass adjacent to the existing spoil ground by outlining potential impact of light attenuation on the seagrass.

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Section 3.4, Table 3-11

The EIS indicates background mean turbidity levels of around 5 NTU over a 1 month period during April and May 2005. It is not clear whether the information in this table includes data that could elevate the mean values to levels higher than that naturally occurring due to spikes in the data such as that shown in Figure 3-29. The EPA is concerned that the maximum recording of 294 NTU at the spoil ground is not explained adequately, and that the inclusion of this value has given a substantially higher estimate of background mean turbidity level.

Recommendation 8

Remove the data spikes from the record before calculating the mean NTU at sites unless an adequate explanation for their presence can be provided.

Section 4.3.3 Seagrass Communities

Although the potential impact of elevated turbidity on seagrass in general is discussed, there is no discussion of the potential or likely impact of the modelled sediment plume on the mapped seagrass communities over the period of dredging. The Department of Primary Industry and Fisheries has indicated to the EPA that the main sediment plume is likely to cause significant die-off of seagrass.

The following statement occurs on page 4-12 under "Conclusions": *"The concentration and movement of sediment plumes is likely to be such that any significant reduction in light penetration caused by the increase in turbidity will be of relatively short duration and within the natural range of turbidity experienced by these seagrass communities."* This statement is not supported by modelling of the sediment plume in the area to the north of the apron.

The statement on page 4-14 (under "Chronic Impacts") that "impacts associated with the reduction in light penetration (light attenuation) are expected as a result of increased turbidity within the path of plume migration" is considered to more correctly indicate the likely effect on seagrass communities. However, the EIS provides no estimate of the area of seagrass most at risk.

Recommendation 9

Include more detailed information on the likely effect on seagrass due to light attenuation by the sediment plume, including general information on the location, area, and significance of the affected seagrass communities.

Section 4.3.3 Seagrass Communities -- Mitigation Measures

The EIS contains no mitigation measures based on monitoring of seagrass communities, as suggested on page 4-15. The data obtained from monitoring of the seagrass will be used to better predict the impact of future dredging operations and to determine the rate of recovery of the seagrass communities.

Previous comments in relation to mitigation of impact by relocation of the spoil ground are relevant to this section.

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Section 4.3.5 Coral

The EPA understands that the potential impacts of the sediment plume on coral reef communities around Round Top Island, Flat Top Island and Victor Islet were determined on the basis of advice from the Great Barrier Reef Marine Park Authority (GBRMPA) and therefore expects that any comment in relation to these impacts will be made by the GBRMPA.

Section 4.3.5 Coral – Mitigation Measures

This section sets out "dynamic trigger values" for monitoring of turbidity at the reef communities at Round Top Island and Victor Islet. However, there is no indication of how Table 4-5 relates to turbidity monitoring, no information on any planned limit to impact on corals, and no information on mitigation strategies that may be triggered by the monitoring of impacts on the corals.

Recommendation 10

Outline the proposed coral impact trigger points for corrective action and the nature of the corrective action that would occur when the trigger point is reached.

Section 4.5.4 Sediment Modelling and Potential Impacts

Dredging at the Apron (Scenario F1)

It is stated that, on a spring tide after 31 days of dredging and spoil disposal, "the majority of the plume is at a concentration of less than 5 mg/L (approximately 16% of the adopted average concentration of 30 mg/L at the dredging site)". The EIS should also comment on the large area subject to significantly elevated turbidity of approximately 30 mg/L. The peak concentrations at Round Top Island at spring tide exceed the adopted average concentration of 30 mg/L at the dredging site.

The EIS makes the statement that: "*Irrespective of the build-up of concentration, peak plume concentrations remain below approximately 50% of the concentrations modelled in the immediate vicinity of the dredge.*" This statement does not appear to be supported by other information in the EIS. Peak plume concentrations appear to be approximately 30 mg/L which is the same as the adopted average concentration of 30 mg/L at the dredging site. Presumably the comparison is with the modelled peak plume concentration at a location near to the dredge. This is supported by the statement in s4.5.7 that "The maximum suspended sediment concentrations during the spring cycles in the vicinity of Round Top Island were determined to be of the order of 40 % of the peak plume concentrations near the dredge."

Recommendation 11

The EIS should explicitly state the assumptions made in the modelling scenarios, including the basis for the source concentration adopted for plume modelling and the cycle times being used.

Section 4.5.8 Mitigation Measures

The EPA recognises that the sediment concentrations in the plume may not respond immediately to changes in dredging location, spoil disposal location, or dredge management. However, the EIS presents no information to support the statement that "the

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most practical measure to minimise potential impacts is to minimise the duration of dredging". This information is of particular importance to identifying measures for limiting impacts on the coral reef communities.

Recommendation 12

Provide information on the modelled effects of any changes in dredging location, spoil disposal, and dredge management on the suspended sediment concentration and period of elevated concentration at Round Top Island at spring ebb tide. Discuss the practicality and cost implications of making such changes, if they are shown to give a potentially significant reduction in the biological impact of the plume.

Section 4.15.6 Risk Evaluation, Table 4-12

It is stated that the risk to water quality associated with increased turbidity will be monitored and that corrective practices will be implemented should conditions result in significant turbidity. However, no acceptable limits to the level of turbidity have been specified in the draft EIS or Environmental Management Plan, and no corrective practices have been defined for implementation in the event of turbidity levels exceeding modelled estimates for level or duration.

This matter is referred to in specific recommendations contained in other parts of this advice.

The EIS does not contain adequate information on the long term fate of the dredge material in the spoil ground. The EIS indicates that the spoil ground area is relatively stable based on previous survey data.

Recommendation 13

The EIS should address the long term fate of spoil ground material in the form of a risk analysis based on the wave climate/events likely to occur i.e. the likelihood of wave events that would resuspend material in the spoil ground and where this material might accrete.

Draft Environmental Management Plan

Section 5.6 Monitoring Responsibility

It is stated that PCQ will take responsibility for monitoring the potential impacts of the dredging. The location and activity of the dredge(s) will be critical to interpretation of the sediment plume monitoring data. It is therefore desirable that PCQ also take responsibility for obtaining the electronic tracking information from the dredge, to enable observed impacts to be correlated with the location and activities being undertaken by the dredge.

Recommendation 14

PCQ should also be responsible for obtaining and summarising the electronic dredge tracking records for use in validation of the modelling.

5.12.1 Element 1: Water Quality

The Performance Indicator of "minimal impact on water quality around the dredge and spoil disposal sites" is not objective and not useful in managing impacts and triggering corrective

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action. The Performance Indicator under 5.12.2 (Element 2: Sediment Mobilisation from Dredge Head) of "visible turbid plumes should not exceed the limits predicted in modelling" is more appropriate and is effectively called up for Element 1. However, neither the draft EIS nor the draft EMP defines what these limits might practically be as there is a complex spatial and temporal relationship to modelled turbidity/suspended solids levels.

A more specific water quality objective (performance indicator) should define:

- the maximum turbidity at specified depth(s) within a specified distance of the dredge which reflects the maximum level assumed in the modelling (30 mg/L); and
- a limit to the period of time for which the coral reef community at Round Top Island is subjected to elevated turbidity (greater than 20 mg/L) as a consequence of the dredging and spoil disposal.

Monitoring of the sediment plume should be designed to trigger timely corrective action, where this is practicable, as well as to provide improved data for model validation. The data is also needed to improve understanding of the effect of suspended sediment (light attenuation and sedimentation) on both seagrass and coral communities. The outline of the monitoring program refers to seagrass but not the coral community, although continuous turbidity monitoring is proposed at Victor Islet and Round Top Island.

The options available to reduce the level of sediment suspension by the dredging and disposal operation, and to reduce the impact of the sediment plume on sensitive habitat are very limited. The draft EIS has discounted a range of options including on-shore disposal, operation of the dredge without overflow, and pumping of spoil to the disposal area, based primarily on economic considerations.

Some modelling of the effect of changing the location of dredging and disposal has been carried out but not to the extent needed to identify practical options to reduce impacts. Further modelling of the effect of practical options to reduce sediment suspension or to move a proportion of the suspended sediment away from sensitive habitat (coral community at Round Top Island) would provide a specific basis for triggering decision making in the event that turbidity and/or impacts on corals exceeds the EIS estimates.

There may be some benefit in an initial trial to determine the economic loading (pumping time for maximum loading of the hopper) to assist in establishing operational procedures to minimise sediment in overflow release.

If a dredge similar to the 'Queen of the Netherlands' is used, the draft of the vessel when fully laden is such that, at low tide, there is potential for propeller wash to impact on marine flora and to suspend sediment in the water column.

Recommendation 15

Include objective limits/trigger points for turbidity or suspended solids at critical locations to provide more certainty to the initiation of review and corrective action. Alternatively, demonstrate that the results of coral monitoring can provide a timely and objective trigger for the initiation of review and corrective action, and define the limits to coral impact.

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Recommendation 16

Provide for turbidity monitoring adjacent to the dredge and at Round Top Island, and for the reporting of results, consistent with the requirement to initiate corrective action based on defined limits/trigger points for turbidity at these locations.

Recommendation 17

Provide information on the potential for reducing the turbidity level and/or reducing the period for which corals at Round Top Island are subject to high turbidity levels, and identify practical corrective action that can be taken if turbidity (or impact on corals) exceeds a defined level(s).

5.12.2 Element 2: Sediment Mobilisation from the Dredge Head

The Performance Objective and the Performance Indicator are not entirely consistent in that one relates to the duration of elevated (undefined level) turbidity and the other relates to the level of turbidity in the plume. The impact of the sediment plume on sensitive habitats is related to both the turbidity/suspended solids concentration and the duration.

Comments and recommendations in relation to Element 1 of the draft EMP are relevant.

5.12.3 Element 3: Sediment Mobilisation from Spoil Disposal

The Performance Indicator is appropriate but is not supported by information on what would constitute a significant exceedance of predicted turbidity values. Proposed corrective action is not supported by adequate information on the likely effect of practical options on the density of the sediment plume at sensitive locations.

Comments and recommendations in relation to Element 1 of the draft EMP are relevant. Actions in relation to suspension and resuspension of sediment at the disposal area are closely linked to actions in relation to suspension of sediment at the dredge.

Location of spoil disposal further seaward, subject to constraints imposed by the ship moorings, will reduce the impact of sediment plume from spoil disposal on the coral communities at Round Top Island. Further consideration should be given to disposal in locations within and outside the proposed spoil disposal area, from which the disposal suspended sediment plume will have a reduced effect on turbidity levels at Round Top Island. These sites are likely to be in the eastern areas of the proposed disposal area or outside of that area beyond port limits.

5.12.4 Element 4: Marine Flora and Fauna

The Performance Objective "To ensure marine flora and fauna is not adversely impacted by the dredging operation" is not consistent with the likely impact on seagrass, coral, algal and other benthic communities stated in the EIS and inferred from modelling of the sediment plume. This objective is appropriate for fauna of conservation significance using the area such as turtles and cetaceans.

The Performance Indicator "Impacts on the coral and seagrass communities are minimised" is not objective. It is likely that, in addition to the direct impact on seagrass from dredging and spoil disposal, the seagrass subjected to the highest density of sediment plume will die

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off. This includes the area of medium density seagrass adjacent to the existing spoil disposal area. The only practical indicator may be limitation of the areal extent, and density/time of the plume over seagrass communities to that indicated by modelling.

A similar turbidity indicator could be used for the coral community. However, if the level of coral bleaching and mortality provides a timely trigger for corrective action to reduce the impact of the sediment plume, coral monitoring results could be used as an indicator/trigger for corrective action. The draft EIS and EMP do not provide sufficient information on the likely response time of coral to elevated turbidity to determine if coral monitoring results will allow adequate time for corrective action to prevent unacceptable levels of impact. The draft EIS indicates a potential for a maximum 20 percent loss of coral from the coral community at Round Top Island. No information is provided on how coral monitoring results can be used to initiate corrective action.

Section 5.13.4 (Routine Coral Monitoring) does not indicate that coral monitoring information will be used as a basis for requiring corrective action to reduce impacts of the sediment plume. Section 5.13.5 indicates that data from automatic turbidity, sediment deposition, and photosynthetically active radiation (PAR) monitoring will be compared with trigger values. No such trigger values are specified in the draft EIS or EMP.

The EPA recommendations in relation to Element 1 of the draft EMP are relevant.

Section 5.13

The proposed coral monitoring program appears to conclude on completion of the capital dredging following a final "post-dredging" survey. It is desirable to resurvey the transects following sufficient time to allow regeneration of the coral community in order to confirm projections, similar to that proposed for seagrass. The EPA recognises that a number of factors may impact on this regeneration (climate, wind events, rain events, other dredging) which may affect the usefulness of data from such a survey.

Recommendation 18

In consultation with the Great Barrier Reef Marine Park Authority, consider the merits of a final survey of the coral community at Round Top Island following a sufficient period to allow regeneration of affected corals.

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DRAFT CONDITIONS**PORT OF HAY POINT CAPITAL DREDGING OF DEPARTURE PATH AND APRON AREAS****Attachment 2****Development Permit Requirements**

The project will require a development permit under the *Integrated Planning Act 1997* for the following assessable development for which the Environmental Protection Agency is the administering authority:

- operational work - tidal work and disposal of dredge spoil (Schedule 8, Part 1, Table 4, Item 5(a) and (b)(ii) of the *Integrated Planning Act 1997*); and
- material change of use - environmentally relevant activity (ERA) 71 Port—operating a port (other than an airport) under the *Transport Infrastructure Act 1994*.

Information Required for Assessment for Development Approval

The following information is required for assessment of an application under the Integrated Development Assessment System of the *Integrated Planning Act 1997* against the provisions of the *Coastal Protection and Management Act 1995* for operational work - tidal work and disposal of dredge spoil.

1. Three (3) copies of all plans detailing the boundaries of the areas to be dredged, constructional drawings of the apron area and departure path, and the location of the spoil disposal area. Constructional drawings are required to be signed by a Registered Professional Engineer of Queensland. Details should include but not be limited to the following:
 - the location of the works with respect to adjacent lease boundaries (where applicable);
 - the location of the works defined by either metes and bounds or alternatively, the co-ordinate positions of the corners of the areas of the works, where a co-ordinate position for a defined real property or lease boundary point is also provided;
 - the quantity of material to be dredged and disposed (cubic metres);
 - the full dimensions of the plan view of the proposed works;
 - the existing bed level by way of a hydrographic survey of the area to be dredged and the disposal site;
 - details of dredging methodology and any proposed staging;
 - the design criteria for the proposed works (eg. rate of dredging, solids/water content);
 - typical cross sections of the completed works detailing:
 - the finished levels of the works and tolerance;
 - the levels of lowest astronomical tide (LAT), mean high water springs (MHWS), highest astronomical tide (HAT);
 - the datum for the levels shown (relative to Australian Height Datum); and
 - design batter slopes.

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DRAFT CONDITIONS**PORT OF HAY POINT CAPITAL DREDGING OF DEPARTURE PATH AND APRON AREAS****Attachment 2****Draft Conditions of Approval - Operational work**

Tidal work and disposal of dredge spoil (Schedule 8, Part 1, Table 4, Item 5(a) and b)(ii) of the *Integrated Planning Act 1997*).

General

- A1. The Environmental Protection Agency Project Manager must be advised in writing (PO Box 3130, Rockhampton Shopping Fair Qld 4701, facsimile (07) 4936 2212) of the date of commencement of capital and maintenance dredging, at least ten days prior to that date.
- A2. All reasonable and practicable measures must be taken to prevent environmental harm being caused, and to minimise environmental harm where impact on the marine environment is unavoidable.

Environmental Management Plan

- A3. Prior to the commencement of works, the Environmental Management Plan (current revision) must be endorsed by the Environmental Protection Agency.
- A4. The Environmental Management Plan (current revision) must be implemented, except where the Environmental Management Plan is inconsistent with this approval.
- A5. The holder of this approval must provide any amendments to the Environmental Management Plan to the Environmental Protection Agency at least 28 days prior to the implementation of the proposed amendments, except where amendments must be implemented to prevent environmental harm or to ensure compliance with this approval.
- A6. If the Environmental Protection Agency gives to the holder of this approval any comment on the proposed amendments (referenced in condition 5) within 21 days of receiving the document, the holder of this approval must have due regard to those comments when implementing the proposed amendments.

Construction of the departure path and apron

- A7. The removal of material from the departure path and apron is to be confined within the boundaries as detailed on Figure ES1 dated 27 April 2005 and Figure 2-1 dated 6 June 2005.
- A8. The maximum depth of the departure path and apron is to be limited to -14.9m LAT, including over-dredging.
- A9. If material has been removed from outside of the boundaries specified, or if the batters are steeper than those designated, those areas may need to be repaired to the satisfaction of the Environmental Protection Agency.
- A10. Capital dredging is to be carried out using a trailer suction hopper dredge only.
- A11. No blasting is to be undertaken.
- A12. No dredging is permitted for the period between September and March inclusive in order to minimise impacts on seagrass and coral communities. The period when no dredging is permitted may be extended with the written agreement of the Environmental Protection Agency.

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DRAFT CONDITIONS**PORT OF HAY POINT CAPITAL DREDGING OF DEPARTURE PATH AND APRON AREAS****Attachment 2***Disposal of dredge spoil*

- A13. Dredge spoil is to be disposed of within the area marked as proposed spoil ground in Figure ES1 dated 27 April 2005.
- A14. The level of dredge spoil within the spoil ground must not exceed a maximum height of -10m LAT.
- A15. Any material that is deposited outside of the boundaries of the proposed spoil ground may be required to be removed to the satisfaction of the Environmental Protection Agency.

Protected species

- A16. An effective turtle deflector device must be fitted to the dredge head. Evidence that this device has been installed and used on the dredge for the entire period of the dredging activity must be provided to the Environmental Protection Agency.
- A17. Operating procedures that minimise the risk of turtle capture by the dredge head, and the risk from all activities of injury to marine species of conservation significance, must be developed and provided prior to the commencement of dredging activities, and implemented to the satisfaction of the Environmental Protection Agency.
- A18. Dredging and spoil disposal activities must cease, or relocate to another site, if dugongs, turtles, or other marine species of conservation significance, are either likely to be struck or captured, or are observed within 150 metres of the activities being undertaken.
- A19. The Environmental Protection Agency is to be immediately notified of any turtle captures by the dredge, or of injury to any marine species of conservation significance.

Turbidity management

- A20. Monitoring must be undertaken at the locations and frequency identified in Table 1, and records kept.

Table 1

<u>Monitoring Point</u>	<u>Turbidity Limit</u>	<u>Minimum Monitoring Frequency</u>
Coral Community - Round Top Island. Fasting, Northing (Zone 55)	Max. 32 NTU or 25% above background*, whichever is the greater, on the ebb tide Not to exceed 15 NTU or 25% above background continuously for a period greater than 4 hours	Continuous

* Background measurement to be taken from a location in the general area not subject to the visible sediment plume within four hours of the measurement against which it is compared.

[Note: Turbidity monitoring, limits and corrective action requirements are subject to further information on practical limits and options for corrective action, and further discussion prior to finalising these conditions.]

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DRAFT CONDITIONS**PORT OF HAY POINT CAPITAL DREDGING OF DEPARTURE PATH AND APRON AREAS****Attachment 2**

- A21. Sediment plume validation monitoring must be undertaken over a range of sea state conditions during the first four (4) weeks of commencement of dredging activities in accordance with methodology defined in consultation with the Environmental Protection Agency.
- A22. Dredge track records that are time stamped and indicate the draught of the dredge are to be retained.
- A23. A report detailing the extent to which modelled data correlates with recorded data, and the implications of any significant variation for biodiversity values within areas affected by the sediment plume, must be submitted to the Environmental Protection Agency within 1 month of completion of the sediment plume validation monitoring.
- A24. If the turbidity limits specified in Table 1 are exceeded measures must be implemented to reduce the sediment plume at the monitoring points in accordance with corrective action specified in the Environmental Management Plan.
- A25. If the turbidity limits specified in Table 1 are exceeded, the Environmental Protection Agency must be advised, within 24 hours of the event, of the corrective action that will or has been implemented. A copy of the daily record of dredge movements and disposal activity (map based) that includes turbidity readings from monitoring stations is to be provided to the Environmental Protection Agency.

Reporting

- A26. A monthly monitoring report must be prepared and submitted to the Environmental Protection Agency throughout the period that the dredging and spoil disposal works are being undertaken. This report shall include but not be limited to:
- results of the monitoring required by this development approval and the Environmental Management Plan;
 - A daily summary of dredge movements and disposal activity (map based);
 - an evaluation or explanation of the data from these monitoring programs;
 - details of any turtle captures by the dredge and the species involved;
 - details of any complaints received including investigations undertaken, conclusions formed and action taken;
 - a summary of significant equipment failures or events that have potential environmental management consequences;
 - an outline of corrective actions that will or have been taken to minimise or reduce environmental harm; and
 - quantity (volume in cubic metres) of dredging material removed and disposed of.
- A27. A report from a Registered Professional Engineer of Queensland must be submitted to the Environmental Protection Agency within three (3) months of the date of completion of the works, certifying that the works (including any other associated

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DRAFT CONDITIONS**PORT OF HAY POINT CAPITAL DREDGING OF DEPARTURE PATH AND APRON AREAS****Attachment 2**

works) have been constructed in accordance with the approved drawings and these conditions.

- A28. Within three (3) months of completion of the capital dredging and associated spoil disposal, hydrographic surveys of the bed levels of the area dredged and spoil disposal site must be completed. The surveys must be carried out in accordance with the requirements of condition A29.

Hydrographic survey requirements

- A29. The hydrographic survey must be carried out in accordance with the following requirements:

- Sounding lines shall be spaced at not more than 20 metre centres along the entire survey area (or over a lesser area or density if supported by the Environmental Protection Agency);
- Soundings shall include all areas that were dredged and shall continue 100m beyond that area;
- Soundings shall be taken at every change in grade so as to accurately define the profile of the bed along the line;
- Soundings shall be plotted on a plan to a suitable scale;
- The datum for levels shall be Australian Height Datum;
- The plans of the surveys shall clearly identify the location of the batters, departure path, apron, adjacent berths, or other features;
- The plans of the surveys and cross sections shall be forwarded in duplicate to the Environmental Protection Agency, within one month of completion of each survey; and
- Representative cross sections from the hydrographic survey must also be provided, detailing the previous and current bed levels, and design depth.

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DRAFT CONDITIONS
PORT OF HAY POINT CAPITAL DREDGING OF DEPARTURE PATH AND APRON AREAS

Attachment 2

Draft Conditions of Approval - Material change of use

Environmentally relevant activity (ERA) 71 Port—operating a port (other than an airport) under the *Transport Infrastructure Act 1994*.

General

- B1. The Environmental Protection Agency Project Manager must be advised in writing (PO Box 3130, Rockhampton Shopping Fair Qld 4701, facsimile (07) 4936 2212) of the date of commencement of maintenance dredging, at least ten days prior to that date.
- B2. All reasonable and practicable measures must be taken to prevent environmental harm being caused, and to minimise environmental harm where impact on the marine environment is unavoidable.

Environmental Management Plan

- B3. Prior to the commencement of maintenance dredging, an Environmental Management Plan (current revision) must be endorsed by the Environmental Protection Agency.
- B4. The Environmental Management Plan (current revision) must be implemented, except where the Environmental Management Plan is inconsistent with this approval.
- B5. The holder of this approval must provide any amendments to the Environmental Management Plan to the Environmental Protection Agency at least 28 days prior to the implementation of the proposed amendments, except where amendments must be implemented to prevent environmental harm or to ensure compliance with this approval.
- B6. If the Environmental Protection Agency gives to the holder of this approval any comment on the proposed amendments (referenced in condition 5) within 21 days of receiving the document, the holder of this approval must have due regard to those comments when implementing the proposed amendments.

Noise

- B7. Noise from activities must not cause an environmental nuisance at any noise affected premises.
- B8. All noise from activities must not exceed the levels specified in Table B1 at any noise affected premises.

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DRAFT CONDITIONS**PORT OF HAY POINT CAPITAL DREDGING OF DEPARTURE PATH AND APRON AREAS****Attachment 2****Table B1 (Noise limits)**

Noise level dB(A) measured as	Monday to Saturday			Sundays and public holidays		
	7am - 6pm	6pm - 10pm	10pm - 7am	9am - 6pm	6pm - 10pm	10pm - 9am
	Noise measured at a 'Noise sensitive place'					
L _{A10} , adj, 10 mins	40	35	28	40	35	28
L _{A1} , adj, 10 mins	45	40	33	45	40	33
	Noise measured at a 'Commercial place'					
L _{A10} , adj, 10 mins	45	40	33	45	40	33
L _{A1} , adj, 10 mins	50	45	38	50	45	38

B9. When requested by the Administering Authority, noise monitoring must be undertaken to investigate any complaint of noise nuisance, and the results notified within 14 days to the administering authority. Monitoring must include:

- L_{A10}, adj, 10 mins
- L_{A1}, adj, 10 mins
- the level and frequency of occurrence of impulsive or tonal noise;
- atmospheric conditions including wind speed and direction;
- effects due to extraneous factors such as traffic noise; and
- location, date and time of recording.

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PORT OF HAY POINT CAPITAL DREDGING OF DEPARTURE PATH AND APRON AREAS

Attachment 2

- B10. The method of measurement and reporting of noise levels must comply with the latest edition of the Environmental Protection Agency's Noise Measurement Manual.

Complaints

- B11. All complaints received must be recorded including investigations undertaken, conclusions formed and action taken. This information must be made available to the administering authority on request.

Records

- B12. Record, compile and keep all monitoring results required by this document and present this information to the administering authority when requested, in a specified format.

General

- B13. A competent person(s) must conduct any monitoring required by this approval.
- B14. All instruments, equipment and measuring devices used for measuring or monitoring in accordance with any condition of this approval must be calibrated, and appropriately operated and maintained.
- B15. Dredge spoil from maintenance dredging is to be disposed of within the boundaries detailed on Figure ES1 dated 27 April 2005, or alternatively used for beach nourishment or beneficial use on land. Spoil is to be disposed in a mosaic pattern within the spoil disposal site to minimise impact on the regeneration of benthic flora and fauna, in accordance with a management plan endorsed by the Environmental Protection Agency.
- B16. Prior to the start of any maintenance dredging and within three (3) months of completion of the maintenance dredging campaign, hydrographic surveys of the bed levels of the spoil disposal site and the area to be dredged must be completed. The surveys must be carried out in accordance with the requirements of condition B19.
- B17. Provide a report to the Environmental Protection Agency based on assessment of the hydrographic surveys undertaken including details on the rate of siltation, quantity of material to be removed, and migration of dredge spoil within and outside of the spoil ground.
- B18. A report from a Registered Professional Engineer of Queensland must be submitted to the Environmental Protection Agency within three (3) months of the date of completion of the maintenance dredging works, certifying that the works (including any other associated works) have been constructed in accordance with the approved drawings and these conditions.

Hydrographic survey requirements

- B19. The hydrographic survey must be carried out in accordance with the following requirements:
- Sounding lines shall be spaced at not more than 20 metre centres along the entire survey area (or over a lesser area or density if supported by the Environmental Protection Agency);

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Attachment 2

- Soundings shall include all areas that were dredged and shall continue 100m beyond that area;
- Soundings shall be taken at every change in grade so as to accurately define the profile of the bed along the line;
- Soundings shall be plotted on a plan to a suitable scale;
- The datum for levels shall be Australian Height Datum;
- The plans of the surveys shall clearly identify the location of the batters, departure path, apron, adjacent berths, or other features;
- The plans of the surveys and cross sections shall be forwarded in duplicate to the Environmental Protection Agency, within one month of completion of each survey; and
- Representative cross sections from the hydrographic survey must also be provided, detailing the previous and current bed levels, and design depth.



Department of
Primary Industries and Fisheries

Enquiries: D McGill
Telephone: 07 49670635

29 August 2005

The Coordinator General
Attention EIS Project Manager
Port of Hay Point Capital Dredging
Project Delivery
The Office of the Coordinator General
PO Box 15168
City East QLD 4002

Dear Sir/Madam

DPI&F Comments – Hay Point Apron Area and Departure Path Capital Dredging Draft EIS

The Department of Primary Industries and Fisheries has reviewed the Draft Environmental Impact Statement prepared for the proposed Port of Hay Point Apron Area and Departure Path Capital Dredging.

Please find the review included as an attachment to this letter.

If you require any further information regarding this matter, please do not hesitate to contact David McGill on Ph: 4967 0724 or email: david.mcgill@dpi.qld.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read "P. Walmsley".

For Paul Walmsley
Regional Director, Central

ATT/ENC:

DPI&F Review of Hay Point Apron Area and Departure Path Capital Dredging Draft EIS

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Comments on Draft Environmental Impact Statement - Port of Hay Point Apron Area & Departure Path Capital Dredging**General Comments**

1. The sections on seagrass and algae in the EIS understate the potential chronic impact of the dredge turbidity plume on these marine plants. Under the presently proposed dredging schedule some areas will be exposed to elevated turbidity for nearly 6 months with little respite, especially adjacent to the apron area.
2. The mitigation sections for seagrass and algae lack detail and are potentially misleading. Most of the measures mentioned such as monitoring light/turbidity and status of the seagrass/algae do not mitigate the effects of dredging. The only true mitigation mentioned is to try and shorten the time taken for dredging. The other measures mentioned in these sections will be useful and desirable information to collect but it should be made clear that they will not result in a reduction of the dredging effects on marine plants.
3. There are incorrect or unsubstantiated statements regarding the resilience of seagrass and algae communities to increased turbidity.
4. This port is the first port of call for a large number of internationally sourced vessels. Particularly those depositing ballast water. This suggests there is a high risk of marine species being introduced to this area, the occurrence of which could negatively impact on the ecology and economy of the area. The proposed port expansion will increase the capacity and number of ships moving through the port which further raises this risk. Despite this, this issue is not given much consideration in this document. The document does not present all available information regarding surveys that may/may not have been conducted in the area. As such, some of the summary statements are not well supported and this needs to be addressed. For example, management of internationally sourced ballast water is not mentioned. This would occur through the Australian Ballast Water Decision Support System (DSS) for internationally sourced, high risk, ballast. The DSS does, however, only screen for a limited number of species and many of these are temperate species. Concerns exist that other, not screened for species, could be introduced via this vector. Regardless, management of this vector and appropriate concerns of such should be addressed in this document, as should management of biofouling vector concerns (not mentioned in document beyond noting that this could be a vector).
5. Information that is presented to support a number of the conclusions regarding introduced marine species is over 6 years old and as such the currency of information is questionable. This is not addressed. More recent surveys that included pest monitoring should be noted and used to support the statements in the document or develop mitigation measures. Although mention is made of other monitoring work that has been conducted, the type of work and information available through it is not presented. As such it cannot be assessed in relevance to the statements it is purportedly supporting. This needs to be addressed.

6. Introduced marine flora have not been addressed. Seagrasses, macroalgae and phytoplankton (particularly dinoflagellates) may be introduced as readily as faunal taxa, and in other locations had serious impacts on benthic systems, particularly those subject to disturbances such as dredging. Risks associated with the potential introduction and establishment of these taxa and impacts of dredging should be addressed.

Specific Comments

Executive summary

Pg xvii

Paragraph 2

We really don't know if Hay Point seagrasses are ephemeral or not as they have only been surveyed once. The species present are known to be ephemeral in some other locations but this is not always the case.

Paragraph 3

The area of seagrass to be disturbed does not include likely areas to be lost from chronic turbidity plume.

Pg xviii

First Sentence

Statement that seagrass is "very sparse" implies this is the case for the entire area. This was not the case with some substantial areas of seagrass with higher % cover.

Pg xix

Paragraph 2

The old dredge spoil site is not to be utilised for the proposed dredging however, the modelling investigation into the potential impacts of non-overflow dredging used the old spoil disposal ground for the model, not the proposed new spoil disposal ground which lies further from sensitive environments. The model should be re-run using the eastern dredge spoil disposal site to provide more accurate estimates of impacts to sensitive environments.

Chapter 1

Pg 1-13

1.7.5 Feasible Spoil Disposal Alternatives

While the investigations by WBM in 2004 determined that the proposed new spoil disposal location was the best location for this project, would it not be prudent to investigate other disposal locations, at least for small spoil volumes, to increase the options to minimise the risk of harm to environmentally sensitive areas such as Round Top Island, from sediment plumes during spring tide and unfavourable wave conditions.

Chapter 3

Pg 3-4

Section 3.2.3 Seagrass Communities

Paragraph 2

This paragraph is not consistent. It states that no seagrass was found in the port but then identifies that seagrass was found near Dudgeon Point (which is within the port limits).

There is no indication of the extent or intensity of sampling given for the previous studies or the methods employed. It is highly likely that the lack of seagrass found in these studies was a reflection of the methodology rather than seagrass not actually being present (i.e. a limited number of grab samples within a small area of the port).

Paragraph 4

The statement that this was the first time seagrass was found in the port (July 2004) is not correct (see above).

Pp 3-6 & 3-7

Maps (Figures 3.2 & 3.3)

The title of these maps should be changed to reflect the provenance of the information. The authors of the EIS have directly taken the seagrass data layers generated by DPI&F and used them (with no reinterpretation) yet the stand out feature of the maps is the "GHD logo". Titles should be something like: "Seagrass Biomass and community types....from Rasheed et al. 2004"

The maps should have a survey limit line (as originally portrayed in Rasheed et al. 2004) to indicate areas of the maps presented where sampling occurred. This is important as seagrass distribution was likely to continue beyond the bounds of the survey into other areas of the port limits. The maps currently give the false impression that this is the complete extent of seagrasses for the port limits and areas outside the port limits presented on the maps.

Pg 3-8

Section 3.2.4 Algal Communities

Paragraph 1

Should reference Rasheed et al. 2004 rather than "conducted by DPI&F"

Paragraph 2

Last sentence regarding impact of algae habitat loss on turtles is unsupported. Who considers this unimportant? What is the source and evidence for this consideration?

Maps - Figures 3-4 & 3-5

See previous comments for Figures 3-2 & 3-3 - also applies to these figures.

Pg 3-29 Introduced Marine Fauna

Section 3.2.6

A baseline targeted survey was conducted by CRIMP in 1998 for introduced marine pests. None were detected. This work is over 6 years old and since that time large numbers of ships have visited the area depositing ballast water. As the survey is over 6 years old the currency of information is questionable. This is not addressed.

"The survey did identify numerous introduced or cryptogenic species including bryozoan, hydroids...." should this read "...numerous introduced AND cryptogenic..."

"Cryptogenic" and "introduced" are not interchangeable terms. Either something is identifiably introduced or it is cryptogenic (neither identifiably introduced or native). Wording needs to be clarified. Later in the document (Pg 4-89) exotic is used

interchangeably with introduced pest. These terms are not equitable and this should be addressed. Taxa may be exotic but not pests.

Pg 3-35

3.2.10 Dugong

Paragraph 3

The last sentence "The low density of seagrass within the area would be unlikely to support other than dugong transiting the area" should be rewritten or deleted as dugong are known to prefer feeding in low-density seagrass meadows. The density of seagrass is unlikely to be the critical factor for why dugong do not appear to frequent the Hay Point region.

Chapter 4

4.3.3

Pg 4.8 First sentence and dot points

There are 3 key impacts to seagrass communities:

- Physical removal (from dredging footprint)
- Burial (spoil disposal)
- Loss of light from elevated turbidity (dredge and disposal plume)

Pg 4.11 – Recovery of seagrass communities from sedimentation

Paragraph 1

In the first sentence the figure referred to (Fig 4.5) does not present evidence of seagrasses resilience to sediment mobilisation as the text implies, it is merely a collection of seagrass photographs. The statement needs to be supported by actual evidence or a reference to studies that support this.

Further in this paragraph it is stated that *Halophilla decipiens* is a "large species" that can maintain photosynthesis even after "large scale burial". This is not the case. *H. decipiens*, the dominant species adjacent to Hay Point, is one of the smallest seagrass species that occurs in Queensland and would be quite vulnerable to burial and deposition. Even if it were a large species the consultants do not provide a reference to support the statement in this sentence.

Paragraph 3

Scale, duration and severity of previous impacts of dredging would be very different to the major capital program that is proposed, so time for recovery of seagrasses may be substantially different.

Pg 4.12 – Conclusions

The statement "...increase in turbidity will be of relatively short duration and within the natural range of turbidity experienced by these seagrass communities." is misleading. Some areas of seagrass, especially the higher density community adjacent to the apron area, are likely to be subjected to 6 months of constantly elevated turbidity. While it may be within the natural range, it is not natural for turbidity to be chronically elevated for this length of time.

Pg 4.13

Paragraph 2

This paragraph is very misleading.

"Short term increases in turbidity" – while this may be true for a large area of seagrasses some areas of seagrass will be subjected to 6 months of elevated turbidity (see previous comments)

The dot points presented in the paragraph to support the statement that "turbidity associated with dredging and disposal are considered unlikely to impact on seagrasses" are unsupported by evidence in the text or misleading:

- There has been no evidence presented on "documented survivorship of seagrasses" in low light environments. In fact there are many studies that demonstrate the opposite, that low light and increases in turbidity cause a decline in seagrasses.
- Pulsed nature of turbidity may be true for some areas, but modelling indicates some areas of seagrass will be exposed to a chronic increase in turbidity for the life of the dredging program (approx 6 months). This could be expected to have a major effect on survivorship of the affected seagrasses.
- The chronic longer term turbidity increases in some areas would be well outside what would be expected naturally
- Demonstrated colonisation of the existing spoil ground does not demonstrate a lack of impact from turbidity, only that there is a capacity to recover from the impact.

Pg 4.14 Chronic Impacts

Paragraph 2 Last sentence

While some natural seasonal reductions in seagrass could be expected the effect of dredging could easily be discerned through appropriately designed monitoring with reference control sites.

Paragraph 3

There is very little information on the ability of the type of seagrass community found at Hay Point to recover from impacts. A better reference is probably from Campbell & McKenzie 2004 which indicated similar deep water seagrasses took approx 3 years to recover from a week long turbidity event from cyclone related flooding in Harvey Bay.

Impact on seagrasses in the spoil ground may also be continuous if regular maintenance dredging and spoil disposal is required

Pg 4.15

Mitigation Measures

The only real mitigation measure presented is trying to shorten the dredging time frame as much as possible (see general concerns). The consultants should be upfront in this section and spell out that they expect large areas of seagrass to be temporarily lost due to the project regardless of dredging methods. Could also add that a research and monitoring program will be implemented to assess what these potential impacts are and increase the knowledge on the resilience and capacity for recovery of these poorly understood deepwater seagrass communities for future projects.

Pg 4-15

4.3.4 Algal Communities

Many of the previous comments about seagrass also apply to the algae section, including the issues on chronic turbidity and mitigation

Pg 4-33

Mitigation Measures

There are other operational measures that could be undertaken to minimise the impacts on coral communities and these should be identified and incorporated into the Environmental Management Plan. For example, it may be possible, during the spring tides and unfavourable weather, when the turbidity plume is most likely to extend towards Round Top Island, to dredge the departure path rather than the apron area.

Pg 4-34

4.3.6 Introduced Marine Fauna

This section has not been adequately addressed. See General Comments above. Introduced Marine Flora has not been addressed.

The risk of the overseas dredge (to be contracted to undertake the dredging work) of introducing marine pests needs to be addressed in this section. Mitigation measures to reduce this risk should also be addressed here and in Section 5.

Pg 4-36

4.3.9 Dugong

Habitat Loss

It is likely that the turbid plume caused by dredging over an extended period will affect the seagrass meadows outside the area to be dredged. Therefore, the degree of impact is likely to be more than the 28% stated, but not readily quantified. The last sentence of the first paragraph should be rewritten or deleted.

Pg 4-78

4.5.8 Mitigation Measures

See comments for Pg 4-33 above

Pg 4-81

Top of page

Paragraph 1, last sentence

Supporting evidence is needed for this statement. What studies demonstrate good recovery of the communities at the spoil ground post deposition? These may be used to address some of the concerns above, if provided.

Pg 4-89

Introduced Exotic Organisms (see comment re terminology above)

"Regular surveys of the Port are conducted to identify exotic organisms which may have been introduced via ship movements within the port."

What are these surveys? How regularly are they conducted? What species are they focussed on identifying? What is the taxonomic expertise of those undertaking the work? Are these surveys the settlement plate traps checked by port Environmental Officers on a regular basis for taxa such as the black striped mussel or Asian green mussel. If so, these are hard substrate monitoring devices, and the results have limited relevance to soft sediment pest inoculations, which would be the highest concern for dredging operations. Also, the program, if it is the settlement plate program, is targeted on a specific subset of taxa. Relevance to the project would need to be demonstrated. Lack of this information in the document undermines the ability to make the conclusions made in the document.

In addition, last sentence of that paragraph: "...proposed works are not expected to have any influence on the future introduction oforganisms to the Port" is not related to previous work and should not be linked as if it is. This statement has no supporting evidence in the document. Future introductions, and probability of such, will be linked to types and origins of vessels visiting the port, ballast water management regimes, bio-fouling management regimes etc. The likelihood of success of an introduction establishing would be linked to type of receiving environment as well as some translocation/vector issues. Dredging activities go towards manipulation of the receiving environment through disturbance and creation of habitat. Disturbed habitats are the most frequently invaded areas. Statements like the one noted above need to be revisited and reworded appropriately.

Pg 4-103

Introduced Marine Pests

There is switching in terminology from previous sections. Terminology should be consistent throughout the document.

The statement that no pests have been identified in the port, ergo no predicted impacts from translocation, is completely unsupported by evidence presented previously in the document. Therefore mitigation measures should be addressed.

Cairns Port Authority undertakes monitoring of areas proposed for dredging, and ocean disposal sites, prior to dredging activities and post dredging activities to examine risks associated with translocation of marine pests of concern to ocean disposal sites. This could be considered as a mitigation measure to provide current information on risks associated with translocation of marine pests to dredge deposition areas.

The statement that there are no marine pests in the areas to be dredged is not supported by the 1998 study due to the elapsed time since the study was undertaken. Therefore, the statement following that there are no risks of translocation of pests to spoil ground via dredging cannot be true. This needs to be addressed. Further evidence to support statements should be provided and appropriate mitigation measures should be addressed. Further evidence may include other benthic macro-invertebrate work done in the area that may have also looked for marine pests since the 1998 survey.



From: Clayton Ive <clayton.ive@datsip.qld.gov.au> on 26/08/2005 02:14:31 PM
Repository: 4113829 Hay Point Capital Dredging EIS
To: jkeane@ghd.com.au
cc:
Subject: Port of Hay Point Capital Dredging EIS

Dear Ms Keane,

As mentioned today by telephone, DATSIP has the following comments:

Specific Mention of Traditional Owners as stakeholders is necessary at point 1.6.3 (heading **Stakeholder Identification**).

It is important that Traditional Owners are flagged as part of the stakeholder body at this early part of the draft EIS paper, in the same way that other parts of the community, such as Environment / conservation groups, Social / community / recreational fishing groups, Tourism industry and professional associations are.

Indigenous people have to be recognised as a part of the broader community, distinct from their role in cultural heritage management.

After point 1.5.2 (heading **Queensland State Government Approvals**), a new heading of **Other Legislation and Policies** should be inserted.

The *Aboriginal Cultural Heritage Act* and the *Native Title Act* should be referred to in this section.

Clayton Ive

The Department of Aboriginal and Torres Strait Islander Policy

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Your ref: D13690/MN-67282
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Phone: 4967 0816



**Queensland
Government**

Natural Resources and Mines

30 August 2005

The Coordinator-General
Attention: EIS Project Manager
Port of Hay Point Capital Dredging
Project Delivery
The Office of the Coordinator-General
PO Box 15168
CITY EAST QLD 4002

Dear Sir,

**Draft Environmental Impact Statement – Capital Dredging of the apron areas and
departure path for the Port of Hay Point**

I am writing in response to your request for submissions on the draft Environmental Impact Statement (EIS) for this project. Copies of the EIS were received by the Department of Natural Resources and Mines (NR&M) on the 9th August 2005.

NR&M has reviewed the EIS in relation to its portfolio of State Interests and considers that the EIS substantially addresses the Terms of Reference. However, there are some matters relevant to Cultural Heritage that the Department considers should have been explored in more depth in the EIS. Specific comments on these matters have been provided in Attachment A.

The Department would like to thank you for the invitation to review the EIS. If you require any clarification in relation to this response, please contact Marion Lourens on 4967 0816.

Yours sincerely,

J N Kelly
**REGIONAL MANAGER
LANDSCAPES AND COMMUNITY SERVICES
CENTRAL WEST REGION**

Attachment A

**Comments on the Draft Environmental Impact Statement
Port of Hay Point Apron Area and Departure Path Capital Dredging**

The following comments are limited to matters relating to Cultural Heritage considerations only.

1. Introduction

1.6 Stakeholder Consultation

Comment:

Traditional Owner (TO) groups have not been included as a stakeholder. Amend section 1.6 to recognise the traditional owners as 'stakeholders'.

3. Description of the Existing Environment

3.9.2 Consultation with Traditional Owners

The first paragraph of this section reads:-

"In accordance with the requirements of the ACHA notification, to the registered Native Title Claimants, who are the Aboriginal Parties under the ACHA was undertaken. Two parties, the Yuibera [QC98/37] and the Wiri#2 [QC98/11], responded to the notification and were endorsed as parties to be consulted in the development of the CHMP."

Comment:

Please note that neither native title claim extends over the sea (Refer to Figures 1 & 2 below). The Yuibera claim is not immediately adjacent to the apron starting point (Refer to Fig 1). Accordingly, the notification process should have been as per s91(1)(e) and s96 of the *Aboriginal Cultural Heritage Act 2003*.

Appendix H – CHMP

1.2 Aboriginal Parties

Comment:

The notification process for determining the relevant 'Aboriginal parties' to the CHMP is technically incorrect. Section 1.2 'Aboriginal Parties' of the project Cultural Heritage Management Plan (CHMP) states:

"Two registered Native Title Claims, namely the Yuibera [QC98/37] and Wiri#2 [QC98/11], include the Hay Point area within their external boundaries."

This statement is correct, in that the Wiri#2 claim covers the Hay Point area. However the Yuibera claim does not cover this area, and neither claim extends out to sea, which is the area affected by the proposed project. Therefore as:

- no part of the proposed project area is within the boundaries of an Aboriginal Cultural Heritage Body's area;
- nor is there a native title party for part of the project area,

the representative body for the area should have received written notification (s91(1)(e)). In addition, public notification of the proposal should have been

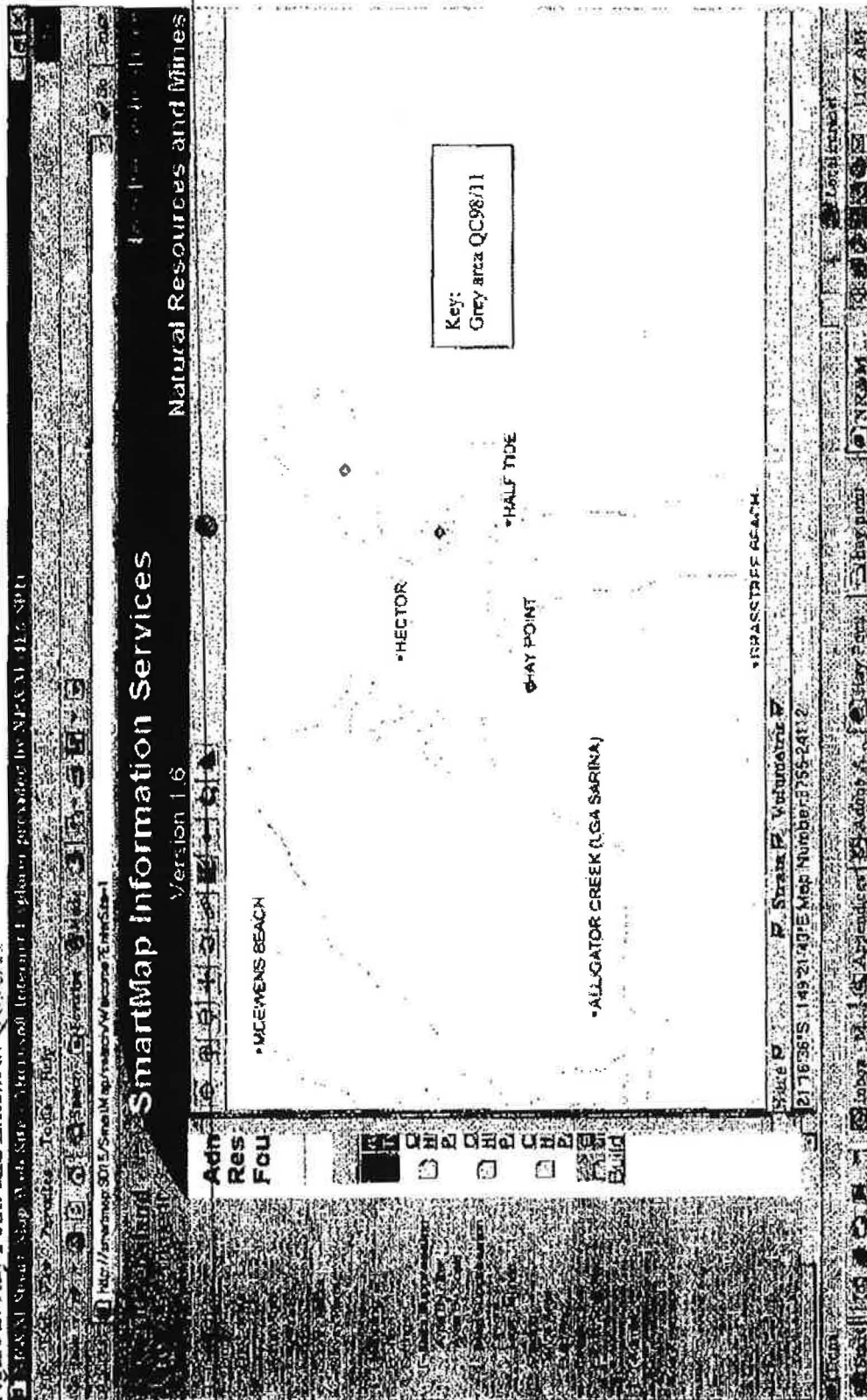
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undertaken as per the requirements of s96 of the *Aboriginal Cultural Heritage Act 2003*. This was not the process outlined in the EIS and/or the attached CHMP. Instead, written notification was sent to the 'service address' for the Yuibera and Wiri#2 native title claimants (s91(4)). As a result, the validity of the consultation and assessment process and resulting CHMP is questionable. To rectify this, the proponent has two options:

1. Submit the existing EIS and attached CHMP along with a written submission stating clearly why they believe the process they have followed is adequate to address the requirements of the *Aboriginal Cultural Heritage Act 2003*.
2. Retrospectively undertake the public notification process and alter the CHMP as required.

Please Note: If option 1 is followed, the officer responsible for assessing and approving the CHMP has discretion to determine whether the process followed and the written submission provided is deemed adequate to address the requirements of the *Aboriginal Cultural Heritage Act 2003*.

Figure 2: Hay Point and Extent of QC98/11





**Queensland
Government**

Contact: Julia Harry
Ph: 07 3109 5076
Your Ref: D13690/MN=67292
Our Ref: U006236

15 August 2005

The Coordinator-General
Port of Hay Point Capital Dredging
Project Delivery
The Office of the Coordinator-General
PO Box 15168
CITY EAST QLD 4002

Attention: EIS Project Manager

Dear Sir/Madam

**Draft Environmental Impact Statement for the Port of Hay Point Apron Area and
Departure Path Capital Dredging project**

I refer to your letter of 4 August 2005 seeking this Agency's submission on the draft
Environmental Impact Statement (EIS) for the Port of Hay Point Apron Area and Departure
Path Capital Dredging project.

The Department of Emergency Services (DES) responsibilities include the Queensland
Ambulance Service (QAS); Queensland Fire and Rescue Service (QFRS) including the
Rural Fire Service (RFS); Counter Disaster and Rescue Services (CDRS) including the
Chemical Hazards and Emergency Management; and Disaster Mitigation and Management.
This is a coordinated whole of Department response.

DES advises that its' requirements have been satisfactorily addressed in the draft EIS.

Thank you for the opportunity to be involved in the EIS process development for the Port of
Hay Point Apron Area and Departure Path Capital Dredging project. We look forward to our
continued involvement. Should you require any further information, please contact Ms Julia
Harry, Project Officer, Disaster Mitigation Unit, on telephone number (07) 3109 5076.

Yours sincerely

Alan White
**Director
Community Safety and Sustainability**



Finalist - 2003 Australian Business Excellence Awards

**Community Safety and
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**Queensland
Government**

Department of
Employment and Training

Action Officer: Mark Whewell
Contact No: 07 3247 5181

Ms Julie Keane
Project Manager
GHD Pty Ltd
GPO Box 668
BRISBANE QLD 4001

Dear Ms Keane

**Port of Hay Point Apron Area and Departure Path Capital Dredging Draft
Environmental Impact Statement – Public Display**

Thank you for your letter dated 2 August 2005 and the information CD comprising the above described draft environmental impact statement and attachments.

Following a review of this information I wish to advise that the draft environmental impact statement does not have a significant impact on the department or its interests.

Should you have any questions in relation to this issue, please do not hesitate to contact me on (07) 3247 5181, email mark.whewell@det.qld.gov.au.

Yours sincerely

MARK WHEWELL
Planning Officer (Property)
Infrastructure Development
Operations Division

15/8/2005

IDO/007

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30. AUG. 2005 14:24

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NO. 4143 P. 3001/002

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**Queensland
Government**

29 August 2005

Department of Main Roads

The Coordinator-General
Attention: EIS Project Manager
Port of Hay Point Capital Dredging
Project Delivery
The Office of the Coordinator-General
PO Box 15168
CITY EAST QLD 4002

Dear Sir

**Draft Environmental Impact Statement for Port of Hay Point Apron Area and Departure Path
- Capital Dredging**

Thank you for your invitation of 4 August 2005 to comment on the above document.

Main Roads officers from our Central Queensland Regional Office and Mackay District Office have reviewed the draft EIS and have the following comments for your consideration:

As the work is predominantly located off-shore it appears that it will have few significant impacts on the State Controlled Road network. The dredging works are to be carried out at sea. The purpose is to provide additional ship manoeuvring area and a deeper channel that will increase the loads ships can carry. All of the dredged material is proposed to be disposed of at sea.

However, the Terms of Reference provide for a "Description of the Existing Environment", including the Socio-economic Environment. This should include a section on "community infrastructure and services". Road infrastructure and road transport should be covered.

Similarly, the Section 4 on "Description of the Potential Impacts and Mitigation Measures" should under Section 4.13.2 discuss potential community infrastructure impacts. It indicates only that there may be some increase in provision of supplies within the local community to accommodate the dredging works. However, nothing is said about how these to be transported in an out for the project and the resultant impacts on the roads, other road users and the community.

The EIS does not appear to provide any information on any proposed increase in staff numbers and vehicle trips associated with staff movements or the transport of equipment and supplies that will occur during the construction and subsequent operational phases of the project. A statement to address

Central Queensland Region
Regional Office
31 Knight Street North Rockhampton Queensland 4701
PO Box 5098 Central Qld Main Centre Queensland 4702
ABN 57 638 727 711

Our ref 830/44 P14992
Your ref D13690/MN-67292
Enquiries Don Seiler
Telephone +61 7 4831 1840
Facsimile +61 7 4822 5461
Website www.mainroads.qld.gov.au

61749225481

this potential impact should be provided. Subject to the information received, Main Roads will then determine if a Road Impact Assessment, in accordance with its Guidelines for Assessment of Road Impacts of Development Proposals, needs to be undertaken by the proponent.

In the event that any material is to be disposed of onshore, the proponent will be required to prepare and submit to Main Roads for approval a Road Impact Assessment, which determines the impact of construction and operational movements on the state controlled road network. The impacts on the network shall address safety, efficiency, accelerated reductions in pavement life and potential increased road network maintenance. The guidelines for the assessment of the above are detailed the Main Roads publication "Guidelines for the Assessment of Road Impacts of Development Proposals". All costs of these measures will be the responsibility of the proponent.

We look forward to further consultation with your office and the project proponents in the course of preparing the transport aspects (infrastructure and services) of the EIS.

Yours sincerely



Mal Hellmuth

Executive Director (Central Queensland)



Appendix C

Summary of comments at Public Information Session



Ports Corporation of Queensland

Port of Hay Point Capital Dredging Departure Path and Apron Areas Environmental Impact Statement

Public Information Session – 13 August 2005

Summary

9 people attended the Port of Hay Point Capital Dredging EIS Public Information Session on Saturday 13 August 2005. In summary the issues and questions they raised is in Table 1.

Table 1 Summary of Issues

Issue	Number of people who raised it
Impact of the plume – decrease in water quality;	8
Impact of the plume – increase of the silt in local creeks;	3
The specifics of the spoil – what will it consist of and how the spoil ground will be created;	9
Impact on the coral around Flat Top and Round Top Island and Victor Islet	5
Impacts of turtle and dugong	4
Impact of tides/current on spoil ground	4
Impact on sea grass	4
Dredging logistics for capital and maintenance works	6
Timeframes of the dredging	2
Legalities of the project	4
Coal floating on to local beaches	2
Impacts of the dredging on the Great Barrier Reef	2
Impact of a cyclone on the dredging and the spoil grounds	2
Monitoring of Environmental Impacts	6
Other parties involved in the EIS	4
Issues and concerns outside of the scope of the EIS	7



Table 2 Key Issues Raised and Questions Asked

Issues
Impact of the Plume - decrease in water quality (inc. sedimentation and turbidity) ▸ Impact on aquaculture – prawn farming. ▸ Impact on coral. ▸ Impacts of fishing. ▸ Question if will see the plume from the shore.
Impact of the Plume – increase of silt in local creeks ▸ Concern that the sediment in the plume would increase the silt build-up in the local creeks.
What is the Spoil made up of and how will the spoil ground be created? ▸ Questions relating to what was in the spoil. ▸ How will the spoil ground be created – all just dumped or build from one end to another. ▸ Concern of what the new spoil ground will be 'covering'.
Impacts of coral around Flat Top and Round Top Island and Victor Islet ▸ Is there and what types of coral are there around the islands? ▸ Will the sediment from the plume cover the coral and what impact will this have?
Impacts on turtles and dugong ▸ Are there any turtles and dugong in the area? ▸ What will the dredging do to minimise the impact on the turtles and dugong?
Impact of tides/currents on spoil ground ▸ Concern that the tides and currents will wash the sediments from the spoil ground into the local creeks and local beaches.
Impacts of the sea grass ▸ What type of sea grass is there? ▸ How much sea grass is there? ▸ Do the dugong eat the sea grass?
Dredging Logistics for Capital and Maintenance Works ▸ Where is the dredge from? ▸ How many dredges will there be? ▸ What will the draft of the dredge be? ▸ How close to the sea bed will the dredges be? ▸ How much draft is required to operate the dredge?



Issues

Timeframes of the Dredging

- ▶ Where the dredging will begin.
 - ▶ How long will the dredging take?
-

Legalities of the Project

- ▶ Who has the 'power' to stop the dredging if there are higher than expected impacts?
 - ▶ EPBC process for the EIS
-

Coal floating onto local beaches

- ▶ Coal currently floating on to local beaches, will this project mean that more coal will float on to them?
-

Impacts of dredging on the Great Barrier Reef

- ▶ Concern that the sediment from the spoil ground will drift on to the Great Barrier Reef and have a major impact.
-

Impact of a cyclone on the dredging and on spoil grounds

- ▶ Has the modelling taken into consideration a cyclone and what will happen to the spoil ground if there is a cyclone?
-

Monitoring of Environmental Impacts

- ▶ What monitoring of sea grass, coral, turtles, dugong etc will take place during the dredging and after?
-

Other parties involved in the EIS

- ▶ What else has had an input into the EIS?
-

Construction of new beacons

- ▶ Will there be any new beacons?
-

Issues and Concerns outside the scope of the project

- ▶ Impacts of dredging on the erosion at McEwans Beach.
 - ▶ Impacts of the dredging on the beaches in Mackay.
 - ▶ Impacts of the dredging on Sandringham Bay.
-



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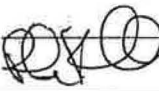
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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	J Keane	R Koskela		J Keane		9/09/05