

**Lauderdale Quay Proposal**  
**Response to Proofs Of Evidence**  
**Environment Protection Authority**

**12 June 2009**



## **Response to Proofs of Evidence Environment Protection Authority**

### **Issue**

#### **Disposal of sediment from dewatering ponds**

The respondents for the proponent have not adequately addressed the points raised in the EPA submission. Namely that “the proponent should be required to provide further information (including the contaminant bioavailability associated with these sediments) to demonstrate that this means of disposal will not constitute an environmental risk. If necessary, an alternative means of disposing of this sediment should be considered”

One respondent used the experience from previous projects in Queensland. While these can be relevant to issues such as settlement rates etc, any assessment of remobilisation of contaminants should be site specific. This is because potential metal remobilisation is dependent on a range of site specific factors such as the type and speciation of metal, the nature of the material the metal is bound to, pH, and energy within the environment.

Dr Cuff did advise Dr Rundi Larsen (in a letter submitted to the RPDC) that the sediment from the dewatering ponds should not be placed in the channels but rather be placed on a terrestrial site (eg landfill). While the EPA supports alternative options for the final placement of this potentially contaminated material, no details are available as to expected volumes and contaminant levels of these sediments.

Regardless of the approach the proponent proposes as regard to disposal of these sediments, the EPA considers that a more thorough assessment is required. This assessment should include a more extensive monitoring program to characterise the contaminant levels within the proposed navigation channel. This would enable the proponent to gain a more thorough understanding of the potential volumes and contaminant levels (including potential remobilisation) of sediments that will require disposal.

#### **Management of silt**

A respondent reiterated that a double silt curtain is standard practice, the integrity of the curtains will be monitored, and the conditions within Ralph's Bay are conducive to the use of these curtains.

However, the proponent has not provided any data relating to soluble metals. The EPA considers that the proponent should be required to estimate at what distance plumes and metal levels would return to a “background” level, and worst-case metal levels (based on most contaminated sediment and worst-case weather conditions) in the water column. This type of modelling (based on data gathered from an appropriate sampling survey) would allow a more thorough assessment of potential impacts.

The conclusion regarding the use of silt curtains in open water on the basis that the bay is seldom rough or choppy is questioned. With the fetch and shallow water of the bay the rough and choppy status would be expected more often than seldom. If a worse case of “more than seldom” occurs the proponent should provide an alternate management option (such as suspension of dredging) if the silt curtains do not control turbidity in a suitable manner.

#### **Management of leachate from dewatering ponds**

The respondent applies a 1:500 initial mixing or dilution ratio to the elutriate data. This ratio is defined as mixing which occurs within four hours of dumping, and was derived from modelling, that the modellers thought “would give a good estimate of a site-specific value for the initial mixing factor”.

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This approach of using a initial mixing or dilution ratio is based on the guidance from *The National Ocean Disposal Guidelines for Dredged Material (2002)*. It is reasonable to suggest that the guidelines used this approach because the dumping would be in relatively deep water and the effects within the water column would be transient (a matter of hours as the material passes through the water column). While this approach is considered acceptable for dumping at sea, the EPA does not support that approach for evaluating impact from dumping potentially contaminated sediments in a shallow bay for prolonged periods of time (nine hours per day). The appropriate approach is provided in the *State Policy on Water Quality Management 1997 (SPWQM)*. Within SPWQM, the proponent may propose site specific Water Quality Objectives (although it is only the EPA that can set them) and then demonstrate how any discharge or diffuse source will be managed to meet these Water Quality Objectives (WQO).

### **Particular Respondents notes**

**Respondent: Anthony Howard**

#### **Page 5 Disposal of fines within over-excavated waterways**

The respondent's response has been to rely on previous experience. However, no data are provided for the levels of metal contamination in those previous projects to allow a reasonable assessment of whether the data from those previous projects bear any relevance to the current proposal.

The respondent does not clarify whether the monitoring in the other projects (Lake Kawana and Parrearra Channel) included metal concentrations in the water column (total and soluble). In addition, remobilisation of metals is dependent on a range of factors including the type and speciation of metal, the nature of the material the metal is bound to, pH, energy within the environment

#### **Para 3**

There is uncertainty regarding the management practice to be employed by proponent to contain the fines in the fill to ultimately reduce the amount of fines entering the waterways during construction. Two options are available; either to rely on the compaction achieved with hydraulic placement of fill or to mix fill thoroughly with agricultural lime and then re-compact. The added benefit with the second option is the neutralizing of acidity produced from the oxidation of pyrite/metal sulphides. Clarification of the proposed method should be sought.

**Respondent Dr Rundi Larsen**

#### **Section A:**

##### **Point 1**

The respondent should note that the consolidated comments of the EPA mention of the inappropriate use of the NODGDM 2002 for analysis of contaminant metals on the basis that these guidelines are for ocean dumping and utilize the 95% upper confidence limit (UCL) of the mean. The EPA considers the ANZECC/ARMCANZ Sediment Quality Guidelines, contained within the Australian and New Zealand Guideline For Fresh and Marine Water Quality 2000 (or subsequent revisions) to be appropriate.

##### **Point 2**

According to the ANZECC guidelines a maximum of mg/kg (not a mean) triggers a management action (including further assessment) consistent with the decision tree framework.

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Sediment disturbance arising from the trenching of material and creation of the outer bund wall would need to satisfy the ANZECC approach, i.e. preconstruction identification of contaminant levels with maxima exceeding the low ISQG results in triggering further investigation to determine the potential environmental risk (consistent with the decision tree framework and weight of evidence approach) and appropriate management response.

### **Section C:**

It is stated that metal mobilisation from the "reclaimed islands" will be controlled through the alkalinity provided by seawater. While this is correct in general, site specific factors should also be considered. The EPA considers that modelling should be provided that considers the effects of oxidation of sulphides through processes such as wetting and drying cycles, and the moderating influence of seawater alkalinity on any metals released.

### **Section E:**

It is the understanding of the EPA that four subsurface sediment samples from the intertidal zone were collected and porewater analysed. As presented in a previous submission the adequacy of four samples to represent the whole site still requires justification.

### **Respondent: Dr Philip Treloar**

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It is stated that mg/L to NTU is a site specific procedure that may be undertaken as a preliminary monitoring exercise. Relating suspended solid concentration in mg/L to turbidity (NTU) is not always a simple linear relationship and the literature states that very poor correlations can exist. Therefore, monitoring to ascertain this relationship should be undertaken.

### **Respondent: Marcus PL Smith**

Page 4 Denitrification

As this is a contentious issue the methodology to be used should be assessed against contemporary methods such as the use of <sup>15</sup>N Isotope measurement of denitrification in sediments.

### **Respondent: Neil I Collins**

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It is proposed that an on-going monitoring program will continue during the detailed design, construction, establishment and operational phases of the project. The on-going monitoring proposed is supported but it should fulfill the requirement detailed in the ANZECC Water Quality Guidelines to determine site specific water quality targets or water quality objectives (two years of data and possibly more to understand seasonal changes) for key indicators.

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It is stated that the elevated levels are only minor and in isolated areas with all the metals in the sediment falling underneath the ANZECC Water Quality Guidelines for the upper 95% confidence limit.

The use of the NODGDM where the 95% upper confidence limit of the mean is used for comparison to the ANZECC Water Quality Guidelines is not a supported approach. The EPA's position is consistent with the ANZECC guidelines, i.e., management action (including further investigation) is required if a chemical contaminant exceeds the ISQG value after the decision tree framework has been applied.

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### Page 6 Stormwater

The EPA supports the commitment by the proponent to monitor a wide range of parameters during construction. Also it is the correct understanding of 'Gilbert and Sutherland' that the DIIS team should propose water quality targets and water quality objectives for consideration by the EPA.

### Page 7 Water Quality

*"The proponent should propose Water Quality Targets and Water Quality Objectives for Ralphs Bay for consideration by the EPA. These should be derived from site specific data representing both seasonal and spatial distribution."*

This statement, above, was a "catch all" statement in the Executive Summary principally reminding the proponent of the importance of deriving site specific WQT/WQOs including seasonal targets and objectives. Trigger values (TVs), which are synonymous with water quality guidelines (WQGs), should be derived for the bay or from a reference bay and not from B1 and B2 in the Derwent River. To achieve this further monitoring of the bay is required to collect 24 months of data.

More detail is provided in the "Specific comments" section previously provided as consolidated comments.

The commitment of on-going monitoring as it relates to the above issue, made on page 2, is supported.