



Gladstone Nickel Project Environmental Impact Statement Supplement

Volume 2 • Appendices A — G

Prepared for

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Comments on the Environmental Impact Statement, (EIS) April 2007 for the Gladstone Nickel Project

1 Introduction

Section 1.9 Project Approvals and Legislative Framework

Issue: The EIS does not provide sufficient information to generate anticipated approvals for ore transport from the Marlborough mine to the refinery at Yarwun.

Approvals required for any activity involving beneficiation, stockpiling, loading and unloading of nickel ore will require consideration of potential impacts and include management of fugitive dust emissions. Other than information provided on the slurry pipeline alternative, the EIS provides no information to enable consideration of likely impacts associated with other Marlborough ore transport alternatives, and proposes that additional evaluation be undertaken during the detailed design phase.

Recommendation:

The EIS should provide complete information on ore transport alternatives and their associated environmental impacts and management to allow assessment and generation of the relevant approval conditions.

Section 1.9.2 - Environmental Protection Act

Issue: The list of ERAs under Schedule 1 of the *Environmental Protection Regulation 1998* should include ERA 20(c) Extracting rock or other material, (during construction), and 75(b) Disposing of regulated waste.

Recommendation:

The list of ERAs could be expanded to include 20(c) Extracting rock or other material, (during construction), and possibly 75(b) Disposing of regulated waste.

Section 7.3.2 Environmental Effects of Pipelines – Surface Water

Issue: Potential impacts and mitigation measures for pipeline operating impacts on the Fitzroy River and other water bodies are not adequately addressed.

Recommendation:

The EIS should provide an assessment of potential impacts on flow and quality of surface waters from the operation of the ore slurry pipeline and parallel seawater pipeline as required in the ToR. In addition the assessment should provide management strategies and monitoring programs in sufficient detail to demonstrate best practice management as required in the ToR.

Section 7.3.4.2 Watercourse Crossing Methodology

Issue: The proposed pipelines from Marlborough Beneficiation Plant to the refinery crosses two major sub-tropical watercourses – the Fitzroy and the Calliope River. This section contains Figure 7.3.4 which depicts the HDD method of pipe laying at crossings and shows the pipe at a minimum of 2 m below the bottom of the river bed. The proposed clearance does not appear to be adequate for this type of river and further assessment is required. While section 7.3.4.2 of the EIS describes watercourse crossing methods, site-specific crossing plans are yet to be developed.

Recommendation: Information on the pipeline design should show how the risks associated with the proposed river crossings, particularly the risk of pipe exposure at river crossings and how this will be managed. Detailed crossing plans should be prepared for each of the major stream crossings and for areas of high conservation significance including wetlands.

Section 7.5 Fauna

Issue: The EIS identifies the trapping of fauna in the open trenches of the pipelines as a potential impact of the project. However, the issue of injured or orphaned fauna has not been addressed.

Recommendation: Information on the impacts of the project should include discussion of the potential for fauna to be injured or orphaned. Proposed management measures should also be identified.

Section 7.8.2.1 Hazard Identification

Issue: It is clear from the report that the pipeline design is at a conceptual stage only - as evidenced by the overall content of section 7 – and in particular 7.8.3 Impact Mitigation and 7.8.4 Further Risk Assessment. Also, the risk matrix in Table 7.8.4 is very limited. For example, there is no apparent hydraulic grade line in the report for this pipeline nor a risk assessment of pipeline failure. There are no proposals for addressing potential environmental damage due to failure.

Recommendation: It is recommended that the hazard to the environment associated with the failure of pipelines during operation be revised. Details of the specification and features of the pipeline that would minimise the risk of failure or leakage should be provided.

8 Environmental Effects of Refinery

Section 8.2.1.7 - Flooding of Refinery Stockpile Area

Issue: The proposed stockpile pad level of approximately 5.3m AHD is considered by the EPA to be too low given:

- the project's proposed longevity;
- the flood level for a 1:100 year flood event is approximately 4.64m; and
- the area is subject to storm surges.

To reduce the potential for ore and sulfur stockpile inundation and resulting water quality impacts, a nominal requirement for 0.5 m freeboard should be provided by either a surrounding bund or adjusting the stockpile area level.

Recommendation: The EIS should address means of providing an additional 0.5m freeboard, such as by either a surrounding bund or adjusting the stockpile area level to 5.8m AHD, which would limit the potential for ore and sulfur stockpile inundation during a storm surge accompanying a 1:100 year flood.

Section 8.2.1.8 Water Quality in the Calliope River

Issue: Table 8.2.6 presents water quality in the Calliope River based on combined EPA data from January 1973 to July 2002. However, given the removal of discharges from the Calliope River STP since that date, these data are unlikely to be representative of the water quality currently in the River, especially in the lower reaches. The cessation of STP discharge to the river (except in rare circumstances) would be expected to result in reductions of most indicators with the exception of pH and Conductivity.

Recommendation: The EIS should change the table to reflect current ambient water quality by presenting data collected since STP discharges to the Calliope River ceased.

Section 8.2.3.1 Stormwater Management System

Undisturbed/'Clean' Areas

Issue: No re-use of uncontaminated stormwater run-off from clean areas is proposed. It would be preferable if GPNL could incorporate stormwater storage and beneficial re-use strategies of this 'clean area runoff' to minimise demands on potable water storages.

Recommendation: It is recommended that potential stormwater re-use options be investigated and incorporated into the development of the site. This would follow the mitigation of potential impacts of changes to flow regime as suggested in Section 8.2.3.3 of the EIS.

Section 8.3.2.1 Methodology

Issue: The risk and potential for the seawater intake to entrain marine animals has not been described and no mitigation measures have been proposed.

Recommendation: Measures to minimise the risk of entrainment of marine animals by the seawater intake structure should be fully described.

Table 8.3.3 World Heritage Criteria

Issue: The EIS states that there will be no disturbance to mangroves in the vicinity of the refinery. However, a section of mangroves will be cleared while laying down the discharge water pipeline across the Calliope River to the RG Tanner Coal Terminal. Furthermore, there is no assessment of the potential long-term impacts on mangroves of the increased background level of contaminants from the proposed release of the liquor to Port Curtis.

Recommendation: The EIS should fully address all impacts on marine plants from all potential causes.

Table 8.3.8 Adopted Water Quality Criteria

Issue: Further water quality monitoring has been undertaken since the WBM report referred to in this section, (e.g. PCIMP). The new data may have substantial implications on the Water Quality Objectives (WQO) developed in the EIS, especially if WBM data included monitoring when CQPA dredging was being carried out.

Recommendation: The EIS should consider the new data in this report for all objectives derived in respect of the Port Curtis environment. This and any other data used to develop Water Quality Objectives based on the 80%ile needs to be included in the Appendices. A statement indicating whether the data includes any occasions where dredging was carried out should be made.

Table 8.3.8 Adopted Water Quality Criteria - Temperature

Issue: The water quality objective for temperature is stated in the EIS as being <5° C differential, based on EPA requirement for another Gladstone project. However the other project's 5°C differential is actually measured at the plant prior to leaving the site, which is several kilometres from the discharge point, and the differential at the discharge point, is typically less than 1°C.

Recommendation:

The proponent needs to clarify where the temperature differential Water Quality Objective (WQO) will be monitored for compliance. If the proposal is to have up to a 5°C differential at the point of discharge, the proponent should

provide additional assessment of the potential impacts and the size of the mixing zone.

Issue: For waste water discharge to Port Curtis, Table 8.3.9, (Characteristics) uses a background temperature of 23° C to achieve a discharge temperature of 27 ° C. However, it is not clear if this represents the average or median temperature, nor is it clear what the range of ambient temperatures is, nor how the <5°C differential will be maintained over the range of ambient temperatures. Furthermore, it is important that the EIS assess the impacts of discharging heated effluent that would raise the temperature of the seawater and benthos above the ambient range.

Recommendation:

The EIS should discuss how the temperature differential would be managed within the stated objectives (<5° C differential) throughout the seasonal range of ambient temperatures and fully quantify and assess the impacts of raising the temperature of the seawater and benthos above the ambient range.

Table 8.3.8 Adopted Water Quality Criteria

Issue: The EIS has presented no seawater quality monitoring data for the proposed WIW intake site. Water quality for the site is a vital consideration as it will dictate the discharge quality and water quality objectives, and could have significant consequences for suspended solids concentration and temperature.

Recommendation: The EIS should report results of monitoring undertaken at the WIW intake location to determine the seawater quality and subsequent objectives. The consequences for suspended solids concentration and temperature on discharge characteristics should be determined.

Table 8.3.9 Characteristics of Stage 1 Refinery Discharge

Issue: The EIS contains only one 'typical' ore composition profile, (Appendix O) with no indication of the degree of variability that might be found within the various potential ore deposits (Marlborough and overseas).

Table 8.3.9 of the EIS lists a range of metals that will be found in the discharge waters. However, it is likely there will be other contaminants of concern, (e.g. Cu, Cd, Hg, and Cr). To allow assessment of potential impacts on the discharge water quality (and RSF), the EIS should provide sufficient information on the composition of the full range of potential ore types, and their likely influence on the variability of effluent quality.

Recommendation:

The EIS should assess the influence (and consequent impacts) of the ore from all potential sources including assessment of the likely range of variability of all metals (and other contaminants of concern) in the proposed

discharge liquor. Where different ore types present significant variations from the information provided in the EIS, the potential impacts should be assessed and mitigation measures proposed.

Section 8.3.10.2 Manganese Criteria

Trigger Values for Dissolved Manganese

Issue: The issue of manganese toxicity to seagrasses and mangroves needs to be resolved. It has been presented elsewhere in the EIS that plants exhibit the highest potential to accumulate Mn(II), and may be the most affected by increases in background Mn concentrations.

Recommendation: The EPA requires further data on the potential Mn toxicity issues in relation to important plants in the ecosystem considering that Mn is known to bioaccumulate up to around 100,000 times in plants.

In the absence of other supporting data, the EPA will accept (upon the precautionary principle) the proposed WQO for Mn(II) as proposed by Dr Stauber (i.e., 140µg/L in the habitat of coral, 340µg/L in non-coral habitat).

Section 8.3.10.2 Manganese Criteria

Mn(II) half-life

Issue: Dr Apte suggested that a half-life of 28 days for Mn (II) in the waters of Port Curtis be used with the cautionary note that it "...is a crude estimate based on best professional judgement."

It is understood that a further study is planned or already underway to provide a better estimate of the Mn(II) half-life in the waters of Port Curtis. This should be performed, as was the initial study, both with and without the presence of the synthetic liquor.

Recommendation: The EPA recommends that the proponent re-evaluate the information provided on modelling and fate of the Mn contaminant when this new information on Mn(II) half-life becomes available.

Section 8.3.10.2 Manganese Criteria

Suspended Solids Mobility

Issue : The EIS states that Port Curtis is regarded as well mixed due to strong tidal velocities but this statement contradicts that presented by Dr Stauber in the Executive Summary where she states "...due to poor flushing in Port Curtis."

Recommendation: The EPA recommends that subjective opinions be replaced in the EIS with the actual value for flushing in various areas of the Port. In this instance, the modelled e-folding value should be presented (i.e. 12-16 days).

Section 8.3.12.1 Location of Refinery Discharge to Port Curtis

Issue: Figure 8.3.7 places the discharge pipe diffuser location behind Clinton Wharf. However, CQPA advise that this area is set aside for a new tug wharf.

Recommendation: Given the sensitivity of modelling outcomes to the discharge location, the EIS should provide evidence of agreement for the proposed activity from CQPA that the proposed site behind Clinton Wharf is viable despite tug wharf plans, and if so remodel with the tug wharf configuration. Alternatively, the EIS should propose another discharge site with CQPA agreement, and supported by discharges modelling as for the proposed Clinton Wharf site. The EIS should discuss the effects resulting from any changes to the discharge location, (e.g. proximity of harbour environs or the sea intake) as well as reviewing associated impacts.

Section 8.3.12.2 Discharge Arrangement

Issue: The discharge arrangement is designed to achieve acceptable dilution of pollutants rather than any reduction of contaminant load, the approach relying on eductors and a mixing zone to achieve the stated water quality objectives. The actual water quality of the discharge (return water plus cooling water) would otherwise be unacceptable.

Recommendation: The proponent should detail investigations it will undertake to reduce contaminant loads (and hence discharge volumes) and develop a successful strategy for reducing contaminant loads. This should be provided before any approvals are sought for the expansion to Stage 2.

Section 8.3.12.3 Discharge Characteristics

Issue: In presenting the worst case scenario in Table 8.3.9, the Stage 2 estimates for discharge characteristics (150,000 m³/h) rather than the Stage 1 Refinery Discharge estimates should have been used.

It is also unclear whether the near and far-field modelling presented in Appendix I was performed on the discharge contaminant loads for Stage 1 or Stage 2 discharge volumes.

Recommendation: The EPA recommends that both the Stage 1 and Stage 2 discharge characteristics be presented and their impacts modelled and described. Near and far-field modelling should be shown for Stage 1 and Stage 2 contaminant loads.

Section 8.3.12.3 Discharge Characteristics

Issue: According to the EIS, during shutdowns, the refinery will be operating at reduced throughput, which may reduce the flow rate of the

refinery discharge to Port Curtis. Discharge mixing characteristics are often dependant on the velocity of the discharged wastewater.

A reduced velocity of discharge may affect the near-field (or far-field) mixing characteristics. A reduced velocity of discharge may lead to an unacceptably large near-field mixing zone and/or a zone where the concentrations of contaminants could approach acute toxicity levels.

Recommendation: The EPA recommends that information be provided in regards to reduced velocity discharge of wastewater relating to both near and far-field mixing, and the potential for the formation of acutely toxic conditions during maintenance (or any other) conditions at the refinery.

Section 8.3.12.3 Process Upsets

Issue: The EIS presents no quantification of the capacity of the refinery and the Residue Storage Facility (RSF) to accommodate discharge waters that may not be suitable for discharge to Port Curtis. There appears to be limited potential for the management of these unsuitable discharge waters, other than at the RSF as there appears to be no other treatment ponds.

Recommendation: The EIS should provide sufficient detail, including worst case scenarios, on how the plant will manage wastewaters that do not comply with discharge limits. The EIS should present a quantitative assessment of the potential storage capacity (both in terms of volume and production time) for this 'off spec' wastewater in the RSF. Any effect of this excess liquid on the operation and capacity of the storage facility should be discussed.

Section 8.3.13 Water Quality Impacts of Refinery Discharge

Issue: In Table 8.3.10 Water Quality Objective Compliance Distance Downstream of Diffuser there is no data describing the neap-tide slack water condition, or "Distance (m) $v = 0.0$ m/s".

Recommendation: Data is required on the slack water mixing distances during neap tides to represent the worst case scenario.

Section 8.3.13.2 Far-field Effects

Issue: It is appreciated that the far-field modelling was conducted by WBM employing the best Mn(II) half-life estimate available at the time. However, this modelling may require re-evaluation when the additional experiments on Mn(II) half life have been done.

Recommendation: Modelling be run again if the results of the further work into the oxidation rate of Mn(II) find the rate to be substantially different from that assumed in the EIS.

Section 8.3.14 Discharge Pipeline Crossing of Calliope River

Issue: No measurement is provided to describe what is meant by "relatively thin" fringe, in relation to the distance that mangroves will need to be cleared to allow for the laying of the cross-Calliope River pipeline.

Recommendation: Provide the estimated measurements describing the area and quality of habitat that will need to be cleared.

Section 8.3.15.2 Nickel Ore

Issue: If the ores transported to Port Cutis then later used in the refinery contain significant amounts of Cr (VI), then Cr species should have been included in the Water Quality Objectives. ANZECC 2000 provides a WQO value for Cr (III) and Cr(VI) for marine waters and if chromium species are likely to be present in the ore (in relation to spillages during loading operations at the port) or as a constituent of the discharge wastewater, then the monitoring, modelling and evaluation of this contaminant needs to be included in the EIS.

Recommendation: Assess the potential for contamination of the environment by Cr (III) and Cr(VI) and propose any necessary mitigation measures.

Section 8.3.15 Potential Marine Impacts from Materials Handling

Sulfur

Issue: The use of grab buckets to handle the bulk sulfur is of concern given the amounts being unloaded. A small proportion of this material entering the waterway would result in substantial quantities of sulfur in the harbour. While the EIS states these products are relatively benign, no consideration is made of the various derivatives and secondary contamination potential. Experience with the proposed handling of products in this form by grabs shows that significant dust emissions are likely to be generated at the wharf area, especially as unloading nears completion.

Recommendation: The EIS should provide further assessment of measures to prevent dust generation. Additional information is required on the proposed 'purpose built' grab, and its effectiveness in minimising spillages and dust problems. In addition, information on alternative sulfur handling methods which limit spillage and dust emissions should be presented.

Nickel Ore

Issue: The use of grab buckets to handle nickel ore is of concern given the large tonnages to be unloaded (1.2 mt/a). Spillage of a small proportion of this material into the waterway would result in a substantial build-up of these materials around the wharf structure. The potential for nickel and chromium to be leached from the ore is acknowledged in the EIS. However, the potential impacts of nickel are addressed only briefly with no information provided on chromium relating to toxicity in the aquatic environment.

Recommendation: The EIS should provide additional information on the 'purpose built' grab and other methods investigated that would prevent spillage from unloading of Nickel ores. The EIS should discuss the potential for ore spillage and resultant concentrations and impacts of nickel and chromium, both Cr(III) and Cr(VI), leached from the ore. These impacts should be assessed in combination with the sulfur deposits, including potential acidification in the localised area.

Section 8.6 – Terrestrial Fauna

Issue: Reports for previous, similar projects (Calliope Metals proposed nickel plant) identified the importation of invasive species (such as the Giant African Snail (GAS) from New Caledonia) in mineral ores as a potential issue. The EIS does not identify this issue as a potential refinery/shipping impact.

Recommendation: It is recommended that the EIS include information on the potential impact of accidental importation of invasive species (such as snails) with ore or other materials shipped from overseas. The likelihood of such an event, and potential mitigation measures, should be discussed.

Air

Section 8.7.3.2 Legislative Framework National

Issue: In the EIS, as well as in Appendix M section 1.3 Legislative Framework, it infers that the EPP(Air) goals in Parts 1 and 3 are taken to be only applicable to residential locations. This is not the case, the EPP (Air) Goals are applicable to Queensland's air environment (Part 2 section 4) except places defined in Part 2, section 9 (4), which exclude indoor air quality and work places.

Recommendation: That the EIS and Appendix M be corrected to indicate that the EPP(Air) applies to Queensland's air environment, not just residential or 'sensitive' locations.

Issue: There is variation in the stated performance characteristics of the sulfuric acid plant in various parts of the document. Appendix M Section 1.6 Best Practice Control designs states that for the acid plant, conversion efficiencies of over 99.7% are achieved in this type of plant, compared to 97%

Emissions from the sulfuric acid plant during normal operating conditions are provided in the EIS, however, no estimate of emissions from pre-heating, start up or upset conditions are given.

That the EIS identify the type of fuel to be used during pre- heating and likely emissions during pre-heating.

That the EIS quantify emissions from the sulfuric acid plant during pre-heating, start up and upset conditions as well as the expected duration and frequency that the plant will operate in each of these conditions. Where these are significantly different to the emissions identified in the steady state conditions used in the modelling, identify the potential impact of this on ambient air quality.

Issue: The EIS states that the nickel dryer will emit H₂S but there is no release point for the nickel dryer in Table 8.7.6

Issue: This section of the EIS provides little information on some possibly significant items of plant required by the refinery and listed elsewhere in the EIS.

- anticipated production rate and material throughput;
- frequency and duration of operation;
- potential for any emissions to air during normal or atypical operating conditions; and

- approaches to pollution control.

Where design of the GPN plant does not have sufficient detail to provide the required information, reference should be made to existing plant with similar characteristics.

Issue: Odour emissions from the project have not been quantified. H₂S emissions from the neutralisation and cobalt dryer vents during normal operation have been used as a surrogate for odour in modelling. The potential for fugitive emissions, the cumulative effects of other sources of odour and odour release during commissioning and upset conditions have not been addressed.

Recommendation: That all sources of odour and potential for odour release during commissioning and upset conditions be assessed.

Issue: The estimated emissions of mercury, cadmium and other metals from the refinery are based on maximum concentration guidelines required by the NSW Department of Environment and Conservation rather than the emissions likely from the proposed plant.

Recommendation: That estimates of potential emissions of mercury, cadmium, cobalt, nickel and metal particulates from the proposed refinery be used to identify potential off site impacts. Where design of the GPN plant does not have sufficient detail to provide the required information, reference should be made to existing plant with similar characteristics. Also, a mass balance approach could be used to demonstrate the fate of these contaminants.

Issue: The guideline for cadmium in Schedule 1 of the EPP (Air) specifies that there shall be no increase above existing levels. Appendix M, Table 1.2.0 indicates that an increase in cadmium concentrations will occur.

Recommendation: That the EIS identify means to eliminate any potential increase in cadmium concentrations.

Issue; The results from modelling of dispersion of pollutants other than NO₂ and SO₂ are presented as tables identifying the impact at selected locations. The air quality goals in the EPP (Air) apply to areas throughout the region and therefore the results should be presented as maps showing concentration contours.

Recommendation: That the modelling results for pollutants presented in the EIS Table 8.7.11 and Appendix M, table 1.20 be presented as contour maps to aid interpretation.

Noise

Section 8.8.2.2 Long-term Noise Monitoring Results

Issue: Long-term noise monitoring was carried out in summer (Feb 06), when background noise levels are higher due to insect activity. This could lead to significantly higher background levels, from which noise limits are derived.

Recommendation: Additional long-term noise monitoring should be carried out in winter months, when background noise levels are lower and inversion conditions are likely.

Section 8.8.4.3 Predicted Noise Levels from Stage 2 Operations

Issue: As noise levels are likely to be increased during inversion events, the noise modelling should be able to accurately predict noise levels at Locations S3 and S8 for the inversion situation.

Recommendation: The plant noise data be inputted to another model which could provide accurate results during inversion conditions at locations S3 and S8.

Section 8.8.5.6 Haulage Truck Noise

Issue: The EIS agrees with the recommendation of the traffic report that heavy vehicles not be allowed to use the Calliope River Road between dusk and dawn in order to restrict traffic noise. However, this recommendation is not incorporated in the environmental management plan.

Recommendation. It is recommended that the EMP be amended to state that heavy vehicles would not use Calliope River Road between dusk and dawn. |

Section 9 Environmental Effects of the Residue Storage Facility (RSF).

General comments: The most significant issue for the Residue Storage Facility appears to be the potential for impact to occur on surrounding areas due to saline seepage which also contains elevated concentrations of dissolved nickel and manganese.

The EIS repeats a number of times the statement that "seepage that is not directly intercepted by the trench collection system would move no more than 65 m down gradient of the RSF over a fifty year period." This is based on the assumption that the basement rock on the site of the RSF is a uniform material, with a constant hydraulic conductivity throughout.

Only indirectly does Section 9 suggest the more likely situation, which is that fissures, fractures, and faults can cause large increases in bulk transmissivity through the bedrock material.

If this project is to succeed on the basis that has been put forward in this EIS then it must be accepted that a large groundwater mound of contaminated water will remain permanently under the RSF after closure. If the project is accepted on this basis, then failsafe methods of seepage control and long term groundwater containment are required.

Section 9.1.1.2 Site Geology

Issue: There has been no field investigation of the sub-surface geology of the RSF site. Appendix E of the EIS indicates that geological units in the area were identified from the GSQ 1:100 000 map of the area, and other sources. This has a direct bearing on the reliability assumptions about the likelihood of leakages occurring from the RSF.

It appears that there could be a fault line running through the middle of the site and under the proposed main embankment of the RSF. This contact surface or fault zone could provide a pathway for accelerated movement of seepage flows under the RSF. No investigation of this possible fault line, or of other possible fault lines on the site has apparently been undertaken.

Recommendation: Investigations should be undertaken so that geological sections can be presented showing the stratigraphic units present under the RSF site. Maps and plans should be presented showing the locations of any fissure lines, fault zones, or permeable layers. The potential of these features to carry flow from under the proposed RSF to down gradient areas should be investigated. Sub-surface conditions upstream and downstream of the main southern embankment of the proposed RSF should be included in the investigation.

The regional groundwater table should be mapped and the groundwater contours for the area under and around the site should be shown on a suitable plan.

Investigation holes should be located both inside and outside the proposed footprint to allow ongoing monitoring of areas potentially causing, and areas potentially affected by groundwater fluctuations. The groundwater contours and directions of flow both inside and outside the RSF should be established. This data should be collected from all sides of the RSF site. Enough geological and hydrogeological information should be collected to establish current groundwater gradients and likely future gradients inside and outside the RSF. Bore logs should be presented, and hydraulic conductivity testing should be undertaken for all permeable strata which is intersected by drilling.

The locations of bore holes or investigation trenches used in this investigation and the reasons for their locations should be recorded. All of the drill holes should be deep enough to reach an aquifer connected to the water table. The bore holes should be cased and capped in such a way that future access is possible, and that fluctuations of water levels in the bores can be measured as required in the future.

Section 9.1.2 Topsoil Resources

Issue: There has been an error in the calculation of Topsoil and Subsoil Resources in Table 9.1.2. An arithmetical error appears to have resulted in a factor of 10 overestimation of the Topsoil Resources in column 4, and the Subsoil Resources in column 6. The figures quoted in the two paragraphs following Table 9.1.2. are also overestimated by a factor of 10.

Of particular interest are the figures quoted for resources under the footprint of the RSF. After adjusting for the systematic arithmetical error it appears that the resources to be covered by the proposed RSF are: Topsoil Resources 1.59 million m³ and Subsoil Resources 2.95 million m³ giving a total quantity available under the RSF Footprint of 4.54 million m³.

The term "RSF Study Area" is used in section 9.1.2, and also elsewhere in section 9.1, but it is not defined or described, nor does it appear in the Legend on Figures 9.1.2, 9.1.3a, or 9.1.4 .

Recommendation: Details of the topsoil resources should be revised including:

- 1) the figures for topsoil resources in section 9.1.2 be checked and amended as required.
- 2) A formal definition of the term 'RSF Study Area' should be included in this part of the EIS.

Section 9.3.1 RSF Design Criteria

Issue: If the proposed RSF were to overtop in an extreme rainfall event or collapse and discharge its contents into the Calliope River catchment the environmental damage would be serious. The Hazard Classification of the Dam for design purposes would be "High"

As the critical duration for spillway design, resulting in the maximum spillway discharge for a particular AEP storm, would be less than 96 hours, the 96 hour specification in Table 9.3.1 needs to be replaced with a "critical duration" specification.

Recommendation: In Table 9.3.1 :-

- 1) The Design Storm Event (full containment) for the spillway design should be the 1 in 1000 year, 3 month wet season.
- 2) The Hazard Category of the Dam should be "High"
- 3) The RSF Operational Spillway Capacity should be the 1 in 10 000 AEP storm of critical duration for the contributing catchment above the spillway, plus the wave runup.

Figure 9.3.2 RSF Spillway Location

Issue: Figure 9.3.2 shows a constructed spillway passing over a section of the constructed embankment of the proposed RSF. This is not acceptable because any defect in the spillway structure, or possible settlement of the embankment may cause discharging flows to break through the floor of the spillway and cause a washout, leading to total collapse of the embankment in that section. The spillway should be cut through rock at a suitable point on the periphery of the RSF surface.

Recommendation: Figure 9.3.2 should be withdrawn and replaced with another General Layout of the RSF showing feasible spillway locations. It is not acceptable to pass the spillway over a constructed embankment. It may be that different spillway locations are required for each raising of the main embankment.

Figure 9.3.3 Embankment Design

Issue: The engineering design of the embankment does not follow best practice.

Recommendations: Notes on Figures 9.3.3 and 9.3.4 should be altered as follows:

For Zone 1:

- delete the option of using a 10t vibratory smooth drum roller, and specify 98% proctor MDD; and
- specify a maximum lift thickness of 150 mm.

For Zone 2A: specify a required filter criteria for the Filter Sand.

For Zone 3A: specify a Maximum Lift Thickness of 500 mm.

Sections 9.3.4 Seepage Collection System,

9.4.5 Risk Management and 9.5.1 Seepage after RSF Closure

Issue: The proposals for acceptance criteria at closure in section 9.5.1 appear to be inconsistent with the statements made in Sections 9.3.4 and 9.4.5 that intend to prevent downstream effects due to seepage. The acceptance criteria in section 9.5.1 include the hydraulic head (and seepage trench collection) reaching a "design level", and ongoing groundwater seepage (into recovery bores) meets "design expectations". No values are presented for what is considered acceptable as a level of hydraulic head or the design rate of seepage after closure.

The seepage collection systems and water recovery bores should be operated and maintained until seepage has effectively ceased. If seepage did cease soon after closure of the RSF it should be understood that under this scenario the contaminated groundwater would be retained indefinitely in the groundwater mound under the RSF.

Management of seepage should be designed to ensure that after closure and after pumping stops that the contaminated groundwater does not push its way along preferential flow paths (fault or fracture zones) and up into the bed of Farmer Creek.

If geological investigations show that strata cause preferential flow directions to be either in an easterly or westerly direction, or in some other direction other than downstream (i.e. south) as assumed in the EIS, then the prescriptive conditions below about stable groundwater levels downstream of the dam embankment may have to be applied to groundwater levels elsewhere than around the periphery of the dam.

Recommendations: In the absence of any geological information which may indicate preferential flow paths and flow directions for sub-surface flows under the RSF, and until better field data suggests differently, the following recommendations should be applied.

That the wording of the last two dot points in section 9.5.1 be changed and expanded as follows:-

- Maintain and operate the seepage collection system at the downstream toe of the main embankment until seepage into the collection system has stopped.
- Monitoring bores and water recovery wells downstream of the RSF must be operated and maintained until the groundwater level along a line 100 metres downstream of the toe of the dam embankment is stable at a nominated depth below the surface. Stability is defined as a situation where groundwater levels remain steady for one year without pumping. Stability must be achieved at all points along the line, and the stable level achieved must be 30 metres or more below ground level at all points. This must include a point under the bed of Farmer's Creek.

- Monitor groundwater levels around the perimeter of the RSF to ensure that surface expression of seepage discharge does not occur, and that stock watering facilities and water supply bores are not contaminated.

Section 9.5.1 Cover Design

Issue: Section 9.5.1 states in its last paragraph that the RSF Cover will not be designed in detail until prior to site closure. As this is a very large dam containing saline material which will not sustain any vegetative growth at all without a substantial cover, planning and provision for the final cover should be undertaken from the start of the project. This will ensure that the large quantities of material required will be available when the time for closure arrives.

Recommendation: The last paragraph in Section 9.5.1 should be deleted.

Section 9.5.2 Cover Design

Issue: The RSF Cover should be designed and the sources of materials identified as part of the initial design. Based on the thicknesses of material proposed in Table 9.5.1, and an RSF footprint area at closure of 1185 hectares (from section 9.1.2) the quantities of material required can be calculated.

Topsoil:	1185 ha x 0.3m depth	= 3.55 million m ³
Drainage Sand :	1185 ha x 0.3m depth	= 3.55 million m ³
Low permeability Soil:	1185 ha x 0.6m depth	= 7.1 million m ³
Capillary break	1185ha x 0.3m depth	= 3.55 million m ³
Total Quantity Required for RSF Cover		= 17.75 million m ³

In terms of the quantity of material available, in the "Study Area" mentioned in section 9.1.2, 3.055 million m³ of topsoil and 6.202 million m³ of subsoil is available. Hence, the total quantity available in the study area is 9.25 million m³, a little over half what is required.

Also, for the material under the proposed RSF footprint, which contains a Total Quantity Available of 4.54 million m³, there is no commitment to remove and stockpile all the suitable material. In section 9.1.2 of the EIS and in section 9.5.2.5 there is a commitment to stockpiling topsoil from under the RSF footprint but there is no commitment to stockpiling the subsoil.

Based on the information given in the EIS there will be a shortage of material for establishing a cover on the RSF at closure.

Recommendation: Further investigations should be undertaken to identify sufficient material to enable construction of a suitable cover on the RSF at closure. Steps should then be taken to secure that material in place where it is now so that it will be available for use at closure.

Section 9.5.4 Stormwater Management

Issue: Design of the embankment and other structures to control runoff after closure is inadequate.

Recommendation: Amend the design of the runoff management facilities the following specifications:

- 1) Contour drains on the surface of the RSF after closure should be designed for a 1 in 200 AEP rainfall event.
- 2) Contour drains across the crest of the RSF embankment should be designed for a 1 in 2000 AEP rainfall intensity. This is because of the danger of cascade failure in the berm drains between embankment raises, which would lead to exposure and cutting out of the residue material.
- 3) Rock lined channels and chutes carrying water from the contour drains across the crest should be designed for a 1 in 500 AEP intensity of runoff because the consequences of overtopping and possible failure of the channels and chutes should not threaten the RSF structure itself.
- 4) Other contour drains should also be designed for a 1 in 200 AEP event.

Section 9.6.5 Surface Water Quality

Issue: The effect on the quality of surface and groundwater around the proposed RSF is a key issue for this project. Samples from pools in Farmer Creek after flow has ceased would be indicative of the water quality regime that would be affected if seepage from groundwater began entering the Creek.

Recommendation: Water quality samples should be taken and analysed from pools which apparently exist in Farmer Creek south of the Bruce Highway.

Section 9.7 Groundwater

Issue: Section 9.7.1 says that the Department of Natural Resources and Water Registered Bores within 3 km of the proposed RSF are shown on Figure 9.7.1. But the locations of these bores are not shown on the figure.

Section 9.7.3 presents in summary form bore log information from nine groundwater bores that were drilled for this investigation. The information obtained is inconclusive about the groundwater regime under the proposed RSF site because only two of the bores, the deepest two, intersected groundwater.

According to Section 9.7.3, the direction of groundwater flow within the bedrock units is dependent upon the subsurface orientation and inclination of the aquifer bedding units. However, no information is provided that indicates

the orientation and inclination of the bedding units. Similarly, no information is provided on possible permeable layers in the bedrock units. The strata below the proposed RSF should have been described as should the likely directions of subsurface flows.

Recommendation: The following changes to the EIS should be made:

- 1) Show the locations of the DNRW Registered bores on Figure 9.7.1. Also show on the same figure the locations of the unregistered windmill bores mentioned in section 9.7.6 of the EIS.
- 2) Using the information gathered from the drilling program already requested, groundwater level contours should be established as should the likely directions of groundwater flow underneath, and adjacent to, the RSF site.

Section 9.2.2 Residue Characteristics

Issue: The EIS discusses the geochemistry of the process residues. It states that refinery residues will be neutralised with limestone and lime slurry and combined with other process inputs. In Section 4.7 the EIS lists and discusses operational solid wastes. Table 4.7.1 lists solid wastes that will be sent to the engineered Residue Storage Facility (RSF) in addition to the process residue.

One sample of residue was tested in order to characterise the material to be disposed of in the RSF (results provided in Appendix O). The sample was neutralised in a laboratory and it is not clear whether the sample contained the wastes listed in Table 4.7.1. The EIS states that a more representative sample will be available for test work in 2007.

Recommendation: The EIS should provide a geochemical characterisation of individual and combined process residues generated from the combined Marlborough and overseas ores. It is necessary that the material tested mimics the residues to be generated as closely as possible including appropriate proportions of the wastes listed in Table 4.7.1 as being disposed of in the RSF.

Issue: Section 9.2.2 does not contain information on the leaching characteristics of the solids. Given the depth and aerial extent of deposition of process residues and that the RSF is not proposed to be covered until the dam is de-commissioned, leaching can be assumed to be a possibility.

Recommendation: The EIS should contain a report on leaching tests run on the solids that will allow estimation of the type and quantity of metals and salts potentially leached out of the material. In addition, geochemical modelling of metal behaviour in the residues under anoxic conditions and under wetting and drying regimes needs to be included to assist in the assessment of impacts from residue storage.

Issue: In Section 9.2.2.3 the EIS describes the liquor in terms of its multi-element composition. The liquor may contain other properties and constituents that have the potential to cause impacts on the receiving environment. Also, the liquor is to be combined with cooling water prior to release to Port Curtis

Recommendation: The EIS should contain an analysis of the process liquor that includes total suspended solids, ammonia and nitrate nitrogen, phosphate, total organic carbon, and chemical oxygen demand. An analysis of the cooling water after treatment must also be included that indicates the biochemical oxygen demand, chemical oxygen demand and total suspended solids concentration of the treated water.

Section 9.3.4 Seepage Collection System

Issue: The depth to groundwater is given as 40m below the ground surface based on the field investigation conducted in 2006. However, this investigation was limited in extent and conducted during a period of extended dry weather.

Recommendation: Data should be collected on the likely changes in ground water levels with wetter seasons. If ground water levels are likely to change significantly, modelling of seepage through the containment dams must be based on higher water levels and more extensive aquifers, and this information should be provided in the EIS.

Section 9.4 RSF Operations

Issue: The factors related to the operation of the thickeners, including capacity, location, bunding, etc.; are not discussed. Also, Section 4.6.1 mentions return liquor tanks at the RSF, but do not give any further details.

Recommendation: The EIS should include information on the operational aspects of the thickeners and return liquor tanks. Specifically the EIS must include information on: the 'footprint' of the thickener complex; infrastructure requirements; thickener number and capacity; size and location of return liquor tanks; bunding of thickeners and tanks; and water/effluent management plans. In addition, contingency plans for spills must be documented. The EIS must include plans for how the residues will be managed in the event of thickeners going offline. It must include details of how the effluent from the thickeners will be managed.

Issue: No mention is made of the possibility of dust from the dried surface of the RSF or of the potential health or environmental impacts of the dust.

Recommendation: The EIS should address potential dust issues at the RSF and the potential for impacts on the environment and dust sensitive locations. If dust is likely to be a problem, the EIS should discuss and present dust reduction and mitigation measures.

Section 9.4.3 Water Balance

Issue: Contingency plans for management of the residue liquor should discharge to Port Curtis be interrupted are not described.

Recommendation: As the RSF will be used to manage residue liquor quality prior to discharge, the EIS should take into consideration the impacts on liquor volumes and required pond capacities in the event that discharge to Port Curtis is prevented. For example, this situation could arise if process problems lead to changes in effluent quality and discharge is disallowed by licence conditions.

Section 9.4.5 Risk Management

Issue: EIS states that seepage through the RSF foundation is not considered significant enough to the overall water balance for it to be modelled. However, in Section 9.4.5 the EIS states that seepage will occur at a rate of 310 L/y/m² during operation. Over the 1185 ha area of the RSF seepage will total 3,674 ML/yr, which is a volume of some significance in the overall water balance.

Recommendation: The EIS should include seepage in the water balance and discuss any potential impacts of this volume of seepage on the groundwater system, given the characteristics and composition of the supernatant liquor and potential leaching from residue solids (see note above).

Section 9.4.4 RSF Monitoring

Issue: The EIS uses the terms 'downstream' and 'down gradient' for the siting of monitoring bores. Because the EIS does not adequately define groundwater dynamics (see note below) around and below the RSF these terms cannot be used with confidence. The monitoring plans given in section 9.4.4 and the EM Plan do not explain the reasons for the siting of the monitoring bores.

Recommendation: The EIS should include detailed monitoring plans for the operation of the RSF. Timelines and analytes in particular need to be detailed and monitoring locations should be based on fundamental information about groundwater dynamics under and around the RSF.

Section 9.7.3 Groundwater Levels and Flow Characteristics

Issue: Nine groundwater monitoring bores were installed but only two intersected the water table. The other 7 bores did not intersect the water table. The discussion of groundwater flow characteristics is inadequate to assess potential impacts from residue storage.

Recommendation: The EIS should provide additional supporting information as to groundwater occurrence and aquifer type and locations. A groundwater contour map is required that defines the aquifer(s) under and around the RSF including the subsurface orientation and inclination of the aquifer bedding units so as to facilitate the assessment of potential impacts of the RSF on groundwater resources.

Section 9.7.8 Potential Groundwater Impacts – Operations Phase

Issue: Assumptions are made as to the length of time it will take for any seepage from the RSF to reach the Calliope River, 5 km away, based on flow through 'deeper bedrock aquifers.' No consideration is given to the possibility of seepage encountering local creeks (Farmer Creek, Police Creek and Larcom Creek) or that shallow aquifers may be present but currently dry due to climatic conditions.

Recommendation: The EIS should consider travel times for seepage to surface waters or shallow aquifers after more effectively identifying and describing groundwater dynamics under the RSF (see comment above).

Section 9.7.8.1 Seepage from the RSF

Issue: The EIS states that there is potential for seepage water to enter deeper bedrock aquifers. However, mitigation measures are only proposed for seepage through the dam walls with no provisions for mitigation of seepage through the dam floor. The EIS proposes to reduce potential risks to the environment through monitoring.

Recommendation: The EIS should provide estimations of the quantity and movement of seepage of neutralised residue liquor across the full extent of the dam floor and its impacts on the groundwater system. Although monitoring of the groundwater system potentially impacted by the RSF will indicate when the groundwater system has been impacted, measures must be developed in the EIS that will prevent or reduce seepage from the groundwater system before impacts can occur.

Section 9.8.3 RSF Rehabilitation

Issue: The EIS discusses the covering and revegetation of the RSF at closure, and notes that the establishment of trees is not recommended due to the negative effects of tree roots on cover integrity. However, no post-closure management strategy is put forward to prevent tree establishment or control weeds during and following rehabilitation of the RSF.

Recommendation: The EIS must include vegetation management strategies to ensure the integrity of the capping system over time and the establishment of sustainable vegetation cover post-closure.

Section 9 Pipelines servicing RSF

Issue: Although the EIS discusses the impacts of the construction of the pipelines in Section 7, the document does not address the operation of the pipelines carrying residues to the RSF and return liquor from the RSF back to the refinery. The document does not discuss the location or operation of pumps or any contingency plans for events such as pump failure, pipeline leaks or ruptures, or for routine maintenance.

Recommendation; The EIS should contain details on the operation and management of the residue and return liquor pipelines. Details must be included on the size and location of pumps. The EIS should include operational monitoring and contingency plans to address pump failure, pipeline leaks or ruptures, and for routine maintenance.

Issue: Above-ground pipelines have some advantages in that they are easier to monitor for leaks, easier to access for maintenance and better able to house monitoring equipment.

Recommendation: The EIS should consider the alternative of installing above-ground pipelines (compared to burial of the pipes) and present the reason for supporting the preferred option.

11 Cultural Heritage

Section 11.3 Potential Impacts and Mitigation Measures - Non-Indigenous Cultural Heritage

Issue: EIS states that cultural heritage surveys may be undertaken. Surveys with the intent of identifying Non-Indigenous cultural heritage require an approval from the Chief Executive [EPA] under Part 7, section 55, of the *Queensland Heritage Act 1992*.

Recommendation: The EIS should acknowledge this requirement. Information relevant to the *Queensland Heritage Act 1992* should be included into EIS Section 1.9 Project Approvals and Legislative Framework.

Section 11.3 page 11-5 - Non-Indigenous Cultural Heritage

Issue: The *Queensland Heritage Act 1992*, section 56, requires that a person who discovers an object that may be of cultural heritage significance must report the object to the responsible Minister as soon as practicable after the discovery is made.

Recommendation: This section should be re-written to acknowledge the above legislation and the need to advise the Environmental Protection Agency of any such discoveries.

13 Risk and Safety

Slurry and sea water pipeline to Marlborough

Issue: The pipeline qualitative hazard and risk assessment (EIS section 7.8) and the Preliminary Risk Assessment Report (Appendix D) define a number of medium and high risks with potential for long or short term environmental consequences. Mitigation for identified potential impacts are inadequately described and while further risk assessment is proposed as part of the detailed design stage for the project a number of issues (including seismic events recorded as "relatively active in the area") should have been addressed in the EIS.

Recommendation: The hazards and risks associated with the pipeline should be reassessed and mitigation measures proposed for those risks identified.

Table 13.5.1 Risk Assessment Results

Issue: The assessment that Area 9 (RSF at Aldoga) is not a major hazard facility is questionable. Similarly, the assessment of Area 8 (Pipelines to/from the RSF at Aldoga), while identified as a major hazard (Table 13.5.2), does not appear to take into account that these pipelines will be at high pressure and that leakages or failures of seals or pipe wall could result in a large loss of material.

Recommendation: The hazard and risk assessment for the RSF and pipelines from the RSF to the Refinery should be reviewed and reassessed taking into account the nature of the material involved and the long term consequences of failure.

14 Environmental Management Plan

Section 14.9 Pipeline Operations EM Plan

Issue: The EIS does not provide sufficient information on the monitoring program for the ore slurry and parallel seawater pipelines during the operational stage. Risks associated with pipeline failure should be identified and contingency plans and emergency procedures outlined.

Strategies to prevent, minimise and contain impacts are required in accordance with ToR Section 3.3.2.

The Pipeline Operations Environmental Management Plan for Development and Operations (EIS Section 14.9.2) presents a brief listing of potential impacts and control measures with a commitment to an EM Plan update prior to commencement of operations. The above approach to addressing potential impacts and mitigation measures is not acceptable for a project with this level of potential impacts.

Recommendation: The EIS should provide an ore pipeline and parallel sea water pipeline monitoring program in sufficient detail to demonstrate best practice management as required by the ToR. The monitoring program should include consideration of appropriate environmental indicators, monitoring technology, location, and timing sufficient to detect and respond to operational upsets and material failures.

Section 14.11.7 Water Discharge Management Plan

Issue: The plan in the EIS states that "detrimental effects" rather than exceedences of the water quality limits will be reported to the EPA as soon as practicable.

Recommendation: The plan should state that any exceedence of the water quality limits will be reported to the EPA as soon as practicable whether or not there are any apparent detrimental effects.

Section 14.11.7 Water Discharge Management Plan

Issue: Corrective Action: The plan does not detail what corrective actions might be in relation to the potential discharge of wastewaters that are likely to result in an exceedence of the water quality objectives for the project.

Recommendation: This plan should state what actions will be taken in response to any exceedence of the water quality limits, (e.g. temperature exceedence, metal exceedence, suspended solids or other variations).

Section 14.11.7 Water Discharge Management Plan

Issue: The possibility of mixing nickel refinery residues with bauxite refinery residues is mentioned as a management strategy. While it is understood that tests have been conducted involving the mixing of these residue streams no

indication of the outcomes of this testing and whether potential exists for implementation of the strategy, has been given.

Recommendation: The project needs to further develop this strategy and preliminary scoping of the following components should be provided including:

- geochemistry of the combined residues;
- how the strategy would deal with much higher volume of nickel related residues compared to the volume of bauxite residues; and
- infrastructure required to transport, mix and store the combined residues.

Section 14 Environmental Management Plan

Issue: Application has been made to amend the existing Environmental Authority for the mining operation at the Marlborough Mine to include a mining lease for the easement for the proposed ore slurry and parallel sea water pipelines. The EIS for the project includes the pipeline and has not met the requirement of providing an environmental management plan (EM plan) for the mining lease application for the proposed ore slurry and parallel sea water. The EM plan is a requirement under the *Environmental Protection Act 1994* necessary to assist in preparing conditions to apply to the Draft environmental authority for the mining lease, and should address pipeline construction and operation.

The statement in Section 14.3 - Legislation that the EM plan would be amended to incorporate conditions following the issue of the environmental authority for the pipeline mining lease is not correct. Rather it is the draft EM plan that should propose environmental protection commitments that may be incorporated as conditions in the EA. The draft EM plan must meet the content requirements of s203 of the EP Act. The EM plan is used by the EPA to develop the draft EA, and an amended EM plan is therefore a necessary precursor to the draft EA.

Recommendation: An amended EM plan for the relevant mining activities associated with the proposed ore slurry pipeline should be provided in accordance with the requirements of s203 of the *Environmental Protection Act 1994* and the appropriate EPA guideline.

Appendices

Appendix A – Terms of Reference

Issue: The final Terms of Reference in Appendix A of the EIS, as recommended in ToR section 6.1, incorporates reference to the relevant sections of the EIS as required in ToR Section 6.6. However, the section numbering in the ToR has been changed. The changes are not applied clearly or consistently and cause confusion with possible misinterpretation of the information provided. Ongoing discussions between the proponent and stakeholders referencing ToR sections run a similar risk.

Recommendation:

The EIS should contain an accurate copy of the terms of reference as issued by the Coordinator-General March 2006 to fulfil requirements of ToR section 6.1. The EIS should provide a separate table to reconcile ToR section numbers and EIS sections to fulfil requirements of ToR section 6.6.

Appendix H - Marine Environments

Issue: The peer review undertaken by Professors Barry Chiswell and Michael Moore of the manganese oxidation studies in this EIS Appendix highlighted concerns regarding some assumptions made in respect of these studies that could have significant impact on the conclusions reached. However, those concerns have not been included in the EIS. As further work on manganese will be guided by the CSIRO studies and the expert reviews access to the expert reviews is needed.

Recommendation: The peer review of the studies into manganese oxidation (by Professors Barry Chiswell and Michael Moore) should be included in this Appendix for completeness.

Appendix M Section 1.4.1 Modelled concentrations of SO₂ and NO₂

Issue: Modelling of ground level concentrations shows that EPP(Air) guidelines will be exceeded in areas around the refinery but the impacts of this on the potential for further development in the State Development Area is not addressed

While the principal conclusion drawn from the assessment of air quality impacts is that "no adverse impacts on human health are anticipated at residential locations as a result of operation of stage 2 of the refinery" (Appendix M 1.10 Conclusions), Appendix M, Table 1.19 and Figure 1.9.4 show significant incremental effects in ground level concentrations even for the normal operating conditions used in other areas. No consideration is given to the possibility of other locations for the refinery to reduce air impacts.

Recommendation: That the EIS includes an assessment of the ground level concentrations at the receptor sites identified in Appendix M, Table 1.19 and

within the area that the model shows would be subject to exceedences of air quality goals that would result from locating the refinery in the alternative sites identified in section 5.3.1 of the EIS. Impacts of the preferred location of the refinery on the State Development Area and non-residential areas should be discussed.

Appendix M Section 1.5.2 Materials Handling emissions

Issue: For emission rates quoted in Table 1.13, a control factor of 90% is used to represent the result of water sprays and chemical suppressant. The NPI handbook for nickel concentrating, smelting and refining quotes 50% as an appropriate control factor for use of water sprays on wet ores and does not provide a control factor for chemical suppressant.

Recommendation: That the EIS identify what type of chemical suppressant will be used and use a 50% control factor to re-evaluate the use of water sprays and chemical dust suppressant unless the use of a larger factor can be justified.

That the EIS provide details of the number and type of water sprays to be installed and details of type of water (salt, treated or fresh) and estimated consumption.

Issue: There is no justification provided for the emission rates or control factors used as model inputs to determine the dust generated from sulfur handling and stockpiles shown in Table 1.13.

Recommendation: The EIS should provide estimates of dust generation and the efficacy of any dust mitigation measures for sulfur stockpiles based on experience with stockpiles of similar material at comparable sites.

Issue Dust from the handling of ammonium sulfate material has been estimated from the site using the methodologies in the NPI Handbook for Nickel Smelting and Refining. However, the handbook does not provide a means of estimating dust generation from ammonium sulfate, and neither does the corresponding handbook for ammonium sulfate production.

Recommendation: That the EIS provide estimates of dust generation and the efficacy of any dust mitigation measures ammonium sulfate handling based on experience with a similar material at comparable sites.

Issue During Agency briefings on the project it was suggested that if trains were used to transport the ore from Marlborough to the refinery, then beneficiation and crushing may occur at the refinery site. However, the EIS does not address any facility for ore crushing or milling.

Recommendation: The EIS should identify where any crushing or milling of local or imported ore is likely to be undertaken. If it is likely that such activities will be undertaken on the refinery site, this should be included in the estimation of dust emissions.

Issue No information is provided on how the modelled estimates of dust deposition based on dust emissions from the refinery were derived.

Recommendation: The EIS should include details of the calculations and assumptions that have been made to estimate dust deposition rates.

Issue It is unclear how the TSP and PM10 emission rates provided in Appendix M Table 1.14 have been calculated from the default emission factors provided in the NPI handbook for mining.

Recommendation; The EIS should detail how the calculations were made to estimate dust emissions from the RSF.

Issue Modelling of the impact of particulate (PM10 and TSP) emissions from the refinery and RSF using constant emission rates does not take into account that most of the dust is likely to come from stockpiles and the surface of the RSF and so will be greater during stronger winds.

Recommendation: The EIS should include an assessment of the likely maximum particulate emissions over a range of potential climatic events and the impact of such events on ground level particulate concentrations in surrounding areas.

Appendix M Section 1.9.4 Air quality from upset conditions

Issue: The only upset situation evaluated is for increased SO₂ emissions when the H₂S scrubber is not operational and the vent gas is bypassed to the incinerator. As acid plants, in particular, are known to be somewhat difficult to operate at optional conditions upset conditions evaluated in the EIS should have included the acid plant and other plants at the refinery site.

Recommendation: The EIS should assess the emissions from the full range of possible upset conditions, particularly those situations where pollution control equipment is out of operation. This assessment should also consider other potential pollutants in addition to SO₂. Where the design of the GPN plant does not have sufficient detail to provide the required information, reference should be made to an existing plant with similar characteristics.

Appendix M Section 1.9.5 Occupational Health and Safety

Issue: The assessment of air quality against of occupational health and safety guidelines uses output from the Gladstone Airshed Model (GAMS) to predict ground level concentrations (EIS Table 8.7.10 and Table 8.7.11 and Appendix M, Table 1.27 and 1.28). GAMS is not an appropriate model for assessing near field concentrations, particularly where building wakes may be involved.

The assessment is made using emissions from the proposed refinery in isolation except for sulfur dioxide, nitrogen dioxide and nitric oxide. However,

emissions of other chemical species from other facilities are available through the National Pollution Inventory.

Recommendation: The EIS should review the suitability of GAMS for assessing impacts at near-by sites and reassess the predictions using a suitable model where necessary. The EIS should include a discussion of the cumulative impacts of the proposed refinery with existing emission sources.

Appendix N Noise Impact Assessment Table 4.3

Issue: Table 4.3 shows monitoring periods not consistent with the requirements of AS1055 – 1997 which recommends a minimum of 10 minutes to a maximum of one hour for assessing background noise. In one case (at L4) the monitoring period is as short as 91 seconds. Also, the monitoring period should be at the time when noise levels are expected to be at their lowest.

Recommendation: Further attended monitoring should be undertaken at these (Table 4.3) sites in accordance with AS1055 – 1997.

- End of comments -



**Queensland
Government**

Enquiries Philip Rowland
Telephone (07) 3227 6446
Your reference TN112197/MD40/D1
Our reference BNE26979

Environmental Protection Agency

Incorporating the
Queensland Parks and Wildlife Service

28 May 2007

Mike Davison
EIS Project Manager
Gladstone Nickel Project
Department of Infrastructure
PO Box 15009
CITY EAST QLD 4002

Dear Mr Davison

Gladstone Nickel Project - comments on EIS

I refer to the letter Geoff Dickie A/Deputy Coordinator General of 5 April 2007 regarding release of the Environmental Impact Statement (EIS) for the proposed Gladstone Nickel Project.

The EPA has reviewed the EIS documents and has identified a number of areas where clarification of the project and its impacts are required and also for some issues, where additional information is needed to fully assess the project. Detailed comments are provided in the attachment.

While a considerable quantity of information has been provided on the project and its potential impacts, the EPA remains concerned with the potential long term impacts of the proposed discharge of waste to Port Curtis and the stability and possible contamination problems associated with the very large Residue Storage Facility at Aldoga. Further information and clarification is requested regarding the proposed pipelines, refinery impacts on the Gladstone air shed and several risk and safety aspects of the project.

Should you have any queries regarding these comments please contact the project manager, Philip Rowland, on 07 3227 6446.

Yours sincerely

Stuart Cameron
A/Director Integrated Assessment

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Fax



Queensland Government
Department of Infrastructure

To	Stewart Peters	Fax	3211 8688
Subject	EIS Submissions		
Reference			
From	Mike Davison		
Telephone	3405 6205	Fax	
E-mail	mike.davison@infrastructure.qld.gov.au		
Date	31 May 2007	Pages	6 (including this page)

Dear Stewart

Please find attached a submission from Primary Industries and Fisheries.

Kind regards

Mike

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Queensland
Government

Reference:

Department of
Primary Industries and Fisheries

22 May 2007

The EIS Project Manager
Gladstone Nickel Project
Major Projects
Department of Infrastructure
PO Box 15009
Brisbane City East QLD 4002

Attention: Mike Davison

Dear Mr Davison

Comments on the Gladstone Nickel Project (GNP) Environmental Impact Statement

DPI&F has reviewed the submitted information and offers the following comments. Please be advised that the basis of DPI&F's comments lies within the jurisdiction of the *Fisheries Act 1994*, and that a site inspection was not undertaken for the purpose of these comments.

DPI&F's interest with this proposal is the management and protection of the fisheries value of any *aquatic features* within or adjacent to the development site and the capacity of the proposal to impact upon fisheries productivity, *fish* habitat and *fish* migration paths.

The GNP is a major project that includes a number of components that will interact with the Departments fisheries management interests. Specifically these project components are:

- 1. The reclamation of tidal lands, including the upper sections of a tributary creek, and the disturbance of protected marine plants for the development of the refinery and bulk material storage site.**

DPI&F would usually strongly oppose the reclamation of tidal land and the disturbance of marine plants for this type of industrial development. However, DPI&F is aware that a 1991 order in Council under the provisions of the then *Harbours Act 1995* authorises the Gladstone Port Authority to reclaim 508 hectares of land lying below high water mark to

the west of the Calliope River. This reclamation approval appears to include the area of the tidal lands proposed to be filled for the bulk material storage site.

On the basis of the existence of the reclamation approval DPI&F would not object to the refinery and bulk material storage site storage being sited at this location. A development approval for the disturbance of the marine plants within the proposed areas of reclamation will be required. Through this approval process DPI&F will require minimisation of the effect of reclamation on tidal fish habitats and will require offsets for any impacts that are approved.

It is recommended that the Coordinator General ensure that adjacent projects within this Wiggins Island are well integrated to minimise any unnecessary impacts to fish habitats.

- 2. The construction of a seawater inlet / outlet pipeline from the refinery to the Clinton Wharf which will require a 400 metre long open trench crossing of the Calliope River and the disturbance of marine plants on the western bank of the Calliope River. The quality of the discharge water from this pipe during operation is also of major interest.**

A development approval for the disturbance of the marine plants will be required for this project component. Detailed assessment of such an application will require supporting information which describes alternative construction methods for the Calliope River Crossing and justification for the preferred open trenching construction method.

DPI&F normally recommend and prefer that underground horizontal directional drilling be adopted as an alternative to open trenching across major tidal waterways.

As identified in the EIS, Port Curtis contains extensive areas of high quality fish habitats that support productive commercial and recreational fisheries. The potential impacts of Refinery discharge into this productive fisheries environment is of concern to DPI&F and requires careful assessment. The Environmental Protection Agency is the state agency which has appropriate expertise to assess the water quality implications of this project. DPI&F would be supportive of the EPA requesting any additional information that they consider necessary to enable a thorough assessment of the water quality impacts of the refinery discharge and any other discharges from the project.

- 3. The alignment of the water / slurry pipeline corridor between the Refinery and the Coorumburra beneficiation plant and the pipeline corridor between the Refinery and the Residue Storage Facility in relation to their proximity to tidal land, the boundaries of the proposed Fitzroy River Fish Habitat Area and their requirement for waterway crossings, waterway barrier works and disturbance of marine plants.**

The southern component of the proposed water / slurry pipeline corridor between the Refinery and the Coorumburra beneficiation plant generally follows the alignment of the State Government's proposed multi-user pipeline corridor. DPI&F is unclear as to why

the Midgee to Stanwell section of the GNP pipeline deviates from the multipurpose corridor, given the proposed multi-user pipeline corridor is understood to be the optimal pipeline route. Given that the processes to develop the multi-user pipeline corridor appears to be well advanced, and one of its key purposes is to confine pipeline impacts into a defined corridor, DPI&F would recommend that the section of the GNP pipeline corridor between the Gladstone State Development Area and Stanwell should be installed within this corridor.

It is noted that a number of pipeline route refinements have been undertaken around KP 102 -137 to minimise impacts to tidal lands and marine plants. DPI&F supports these initiatives.

DPI&F has a current proposal to declare a Fish Habitat Area within the tidal reaches of the Fitzroy River. The Fish Habitat Area is proposed to extend into the upper tidal reaches of Raglan Creek. It appears unlikely the proposed pipeline corridor will intercept with the proposed FHA, however a copy of the plan of the proposed Fish Habitat Area plan has been provided to consultants for the GNP (Ms Kym Davie from RLMS Pty Ltd) for confirmation.

Apart from the deviation of the water / slurry pipeline corridor from the proposed multi-user pipeline corridor, DPI&F offers no other major objections to both the alignment of remainder of the water / slurry pipeline corridor and the pipeline corridor between the Refinery and the Residue Storage Facility.

Development approvals will be required for any marine plant disturbance and temporary waterway barriers required for the construction of these pipelines. DPI&F will undertake detailed assessment of these applications to ensure that waterway crossing techniques are appropriate to individual sites and all impacts are justified and minimised.

4. **The impoundment of the upper catchment of Farmers Creek for the development of the Residue Storage Facility and the loss of any fish habitat values within this upper catchment area. The management of this facility to ensure that contamination of downstream habitats will not occur.**

The Residue Storage Facility (RSF) will remove the entire upper catchment of Farmers Creek. The EIS indicates that the area of the RSF has limited fisheries value with the only freshwater features being a number of small farm dams. It is understood that flow within the RSF is ephemeral and only occurs during rainfall events. Given this advice it would appear that the development of the RSF will not result in a significant loss of freshwater fish habitat.

The habitats of Farmers Creek downstream of the RSF do have higher freshwater fisheries values and link to the Calliope River. It is vital that the RSF is appropriately designed and managed to ensure that these downstream fish habitats are not impacted by contaminants from the RSF. It should be noted that any escape of polluting matter from the RSF into downstream fish habitats may be subject to the restoration provisions under the Fisheries Act 1994. Again, DPI&F would be supportive of the EPA requesting any additional information that they consider necessary to enable a thorough assessment of the RSF to ensure that inappropriate release of contaminants to downstream habitats does not occur.

It is possible that the construction of the containment walls for the RSF may be considered to be waterway barrier works. This should be confirmed via a site inspection by DPI&F staff. If these structures are determined to be waterway barrier works a development approval for the construction or raising of waterway barrier works will be required. Irrespective of the status of the containment walls as waterway barrier works, DPI&F would request an opportunity to provide comments on the detailed design plans of the RSF when they are developed.

5. Environmental Management Plans

With the exception of the Hydrotesting Management Plan the environmental management plans (EMPs) appear generally satisfactory from a DPI&F perspective, however DPI&F would be supportive of any improvements to water quality and acid sulfate soil management recommended by the relevant local authorities, EPA or Department of Natural Resources and Water. It is noted that the EMPs identify the need to obtain appropriate permits.

The Hydrotesting Management Plan should be reviewed to detail the management that will ensure translocation of fauna (including fish larvae) and flora between water bodies will not occur as a result of the hydrotesting.

Recommended Conditions for any Coordinator General Approval of this Project.

DPI&F would request that the following conditions should be applied to any approval for this project by the Coordinator General:

1. Prior to undertaking any disturbance to protected marine plants, an approval for operational works to remove, disturb or damage marine plants must be held.
2. Prior to undertaking any works within a waterway which limits fish stock access and movement along the waterway, approval for operational works to construct or raise waterway barriers must be held.
3. All disturbances to tidal lands and marine plants, freshwater wetlands and waterways, must be fully justified.
4. Appropriate mitigation of any impacts to marine plants, tidal lands or other fisheries resources must be provided to offset any loss and/or disturbance to fish habitat.

Thank you for the opportunity to provide comment on the Environmental Impact Statement. Should you require any further information please contact the DPI&Fs Southern Fisheries Centre on telephone 07 3817 9527.

Yours sincerely



for

Paul Walmsley

Regional Director, Central

Regional Delivery

Cc Dan Mayer, DPI&F Southern Fisheries Centre
Shaun Pobar, DPI&F Rockhampton

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Fax



Queensland Government
Department of Infrastructure

To	Stewart Peters	Fax	3211 8688
Subject	EIS Submissions		
Reference			
From	Mike Davison		
Telephone	3405 6205	Fax	
E-mail	mike.davison@infrastructure.qld.gov.au		
Date	30 May 2007	Pages	13 (including this page)

Dear Stewart

I have attached submissions received from Qld Police, DLGPS&R, Mines and Energy, Fitzroy Shire Council, and L.J. Coward.

Kind regards

Mike

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QUEENSLAND POLICE SERVICE

Office of the Chief Superintendent
Central Police Region Headquarters
Rockhampton Police Complex
PO Box 221 Rockhampton, Qld 4700

TELEPHONE (07) 49321400 FACSIMILE (07) 49321465



Our Ref: 07/4397 kjh:djs

Your Ref:

18 May 2007

*Forwarded
GPR*

EIS Project Manager
Gladstone Nickel Project
Major Projects
Department of Infrastructure
PO Box 15009
CITY EAST QLD 4002

Dear Mr Dickie

Re Environmental Impact Statement – Gladstone Nickel Project

Thank you for your correspondence of the 5th of April 2007 concerning requested submissions from stakeholder agencies regarding the Gladstone Nickel Project.

I can inform you that the District Officer, Gladstone raised the issue of increased industrial and commercial traffic on the Dawson Highway, Hanson Road, Reid Road, Blain Drive in the Gladstone area. In particular, that there will be a need for upgrading the traffic control and conditions of the following intersections:

- Hanson Road / Reid Road
- Dawson Highway / Blain Drive / Herbertson Street
- Hanson Road / Blain Drive / Alf O'Rourke Drive

This conclusion is based on an assessment of the commercial, industrial and general traffic that will use these thoroughfares as a direct impact of the development of the Refinery.

Should you require any further advice regarding this matter please contact the District Officer, Gladstone on 49713250.

Yours sincerely

K J HEDGES
Chief Superintendent
OPERATIONS CO-ORDINATOR
CENTRAL POLICE REGION

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61 07 49384057

10 0012230202

P.01/03

Fax**Queensland Government**Department of Local Government, Planning,
Sport and Recreation*Forwarded to
GPR**TN 115405*

To:	Geoff Dickie		
Company:	Department of Infrastructure	Fax:	07 3225 8282
Subject:	Gladstone Nickel Project		
From:	Jessica Labbett	Division:	Regional Planning
Telephone:	(07) 4938 4078	Fax:	(07) 4938 4057
Email:	Jessica.Labbett@dlgpsr.qld.gov.au		
Date:	23 May 2007	Pages (incl. this):	3

Dear Geoff

Please find attached letter from Ms Katrina Clarke regarding the Gladstone Mickel Project comments from DLGPSR.

If you have any questions please call Katrina Clarke on 4938 4077.

Many Thanks

Jessica Labbett
A/Executive Secretary
Department of Local Government, Planning, Sport and Recreation

Enc: Gladstone Mickel Project comments from DLGPSR 250507

*Mike,
For draft
response by
6 June or to
fk & note
please.*

*Sandy
25/5.*

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**Queensland
Government**

Your Ref: TN112197/MD40/DI
Our Ref: ADM895/03
Contact: Katrina Clarke
Telephone (07) 4938 4077
Facsimile: (07) 4938 4057
Email: Katrina.Clarke@dlgpsr.qld.gov.au

Department of
**Local Government, Planning
Sport and Recreation**

25 May 2007

Mr G Dickie
A/Deputy Coordinator - General
Department of Infrastructure
PO Box 15009
CITY EAST QLD 4002

Dear Mr Dickie

Re: Gladstone Nickel Project

I refer to your letter of 5 April 2007 seeking this agency's comments on the Environmental Impact Statement (EIS) for this project.

The principal interests of the Department of Local Government, Planning, Sport and Recreation relate to the future land use approvals and social impacts of the project.

Land Use

This section of the EIS is quite comprehensive, although it would benefit from minor updating in line with the more recent development of the Calliope Shire planning scheme.

The new Integrated Planning Act (IPA) compliant planning scheme for Calliope Shire commenced on 27 April 2007. Comparisons made in the EIS with an earlier draft of the planning scheme should be revised, particularly in relation to land zoning and development made assessable by the scheme for the project area. This will have implications for determining the assessment manager for some project approvals.

The assessment of the project's compliance with earlier versions of this scheme indicated in section 10.12.2 of the EIS has been limited to these previous versions. While this assessment is unlikely to change with more advanced versions of the scheme, consideration of the assessment category for various types of development that will be undertaken by the project and made assessable by the scheme would be useful to include in the EIS.

Social Impacts

The Department considers that the social impacts of the project, in particular, the impacts on accommodation demand and availability, have been addressed adequately in accordance with the EIS terms of reference.

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ABN 61 331 950 314

The social impact mitigation actions as briefly outlined appear appropriate, however the EIS should provide more details on how these measures will be implemented to achieve such actions.

The Department supports and encourages early and continuous engagement by the proponents with the building and development sectors, as indicated in the EIS, together with non-government community support bodies such as Anglicare and Centacare to ensure that social impacts on the overall community as well as the needs of the future workforce are considered from the outset.

If you wish to discuss these comments further please do not hesitate to contact me on telephone number 4938 4077.

Yours sincerely



Katrina Clarke
Principal Planner
Central Queensland Statutory Planning
Sustainable Planning

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FAXed
GPN



**Queensland
Government**

Department of
Mines and Energy

Your Reference: TN112197/MD40/DI
Our Reference: MI07/03743

25 May 2007

EIS Project Manager
Gladstone Nickel Project
Major Projects
Department of Infrastructure
PO Box 15009
CITY EAST QLD 4002

Dear Sir

I refer to a letter dated 5 April 2007 from Mr Geoff Dickie, A/Deputy Coordinator-General, requesting comments from this agency to the Environmental Impact Statement (EIS) for the Gladstone Nickel Project.

I am also replying on behalf of Mr Noel Barker, A/Regional Manager Mines, Central Region, of this Department, who also received a letter from Mr Dickie requesting comments to the above EIS. I wish to advise you there are no comments to the EIS.

Thank you for the opportunity to review and comment to the EIS for the Gladstone Nickel Project. Should you require further information, please contact me, on telephone 07 3237 1603 or via email david.carmichael@dme.qld.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read "David Carmichael".

**DAVID CARMICHAEL
Principal Project Officer
Industry Development**

Department of Mines and Energy
PO Box 15216
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Queensland 4002 Australia
Telephone +61 7 3237 1603
Facsimile +61 7 3237 1534
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ABN 98 628 485 885
ABN 83 705 537 586



**Queensland
Government**

Please quote: MN85856
Contact officer: Kate Liston
Contact telephone: 07 3224 2483

Department of
State Development

31 MAY 2007

EIS Project Manager
Gladstone Nickel Project
Major Projects
Department of Infrastructure
PO Box 15009
CITY EAST QLD 4002

Dear Sir/Madam

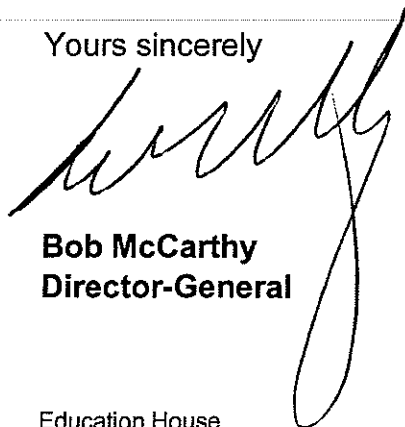
Thank you for your invitation to provide comments on the Environmental Impact Statement for the Gladstone Nickel Project.

The Department of State Development supports the Environmental Impact Statement for the project and encourages further consideration into the construction of a permanent village providing short-term accommodation for industry and construction employees (Appendix Q- Housing Study, Section 7.3.5).

The construction of a permanent, strategically located work camp may provide valuable infrastructure to support future construction projects, such as the Wiggins Island Coal Terminal or a possible future expansion to the Rio Tinto Refinery.

If you require further information on this matter please contact Ms Kate Liston, A/Senior Industry Development Officer, Project Development and Facilitation Unit on telephone 3224 2483 or Mr John Beeson, Principal State Development Officer, Gladstone State Development Centre on telephone 4971 2308.

Yours sincerely



Bob McCarthy
Director-General

Education House
30 Mary Street
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Facsimile +61 7 3224 2454
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**Queensland
Government**

Ref: H01541/07

Department of
Housing

28 MAY 2007

Mr G Dickie
Acting Deputy Coordinator-General
Major Projects Facilitation and Development
Department of Infrastructure
PO Box 15009
CITY EAST QLD 4002

Dear Mr Dickie

I refer to your letter of 5 April 2007 seeking the Department of Housing's review and comments on the Environmental Impact Statement prepared by the proponent for the Gladstone Nickel Project.

The department is impressed by the comprehensive evaluation of the housing issues undertaken by URS Australia Pty Ltd and, in particular, the potential impacts on the Gladstone City and Calliope Local Government areas. The methodology and analysis of the existing housing market and the capacity of the local building sector to meet expected demand placed on accommodation for a largely imported workforce associated with the project do raise some concerns. However, the multi-faceted strategy and mitigation measures that have been suggested appear to be based on sound modelling developed by the Department of Infrastructure.

The Department of Housing would appreciate the opportunity to meet with the proponent to discuss the department's interests and, in particular, to discuss and assist in the development of an accommodation management strategy.

For further assistance, you may contact Mr Alan Dick, Director, Private Housing Support, on 3227 6223.

Yours sincerely

Natalie MacDonald
Director-General
Department of Housing

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Network Access
Rail Access Services

COPY FAXED
28/5/07

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Brisbane Qld 4001
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127 Creek Street
Brisbane Qld 4000
Telephone
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parthasarathy.rangaswamy@qr.com.au

Our Ref.: A.1552.WICT/GPN EIS

Mr Mike Davison
EIS Project Manager
Gladstone Nickel Project
Major Projects
Department of Infrastructure
PO Box 15009
City East QLD 4002



Dear Mr Davison

GLADSTONE NICKEL PROJECT – ENVIRONMENTAL IMPACT STATEMENT

Queensland Rail has reviewed the Environmental Impact Statement for the Gladstone Pacific Nickel and is pleased to furnish the following initial set of comments for your consideration:

1. General

- There are several instances in the EIS where reference is made to the use or potential use of rail to transport materials in and out of the GPN refinery. However, neither the scope (loading / unloading stations, rail tracks, sidings, etc) nor the impacts of use of rail (both on existing rail corridor and at QR/GPN interface sections) for these purposes have been dealt with in the EIS. These will need to be addressed in this EIS by the proponent after consultation with QR.
- The proponent's proposal relies to a certain extent on part or whole of the Wiggins Island Coal Terminal being completed for its functioning. The proponent needs to provide details of adequate and appropriate contingency plans for operating the refinery should the WICT project get delayed or even suspended. General statements (i.e., Section 5.4.1 penultimate paragraph) would not suffice.
- The pipeline interfaces / crosses the QR network in several locations details on how the proponent intends to address this impact are minimal (e.g. it is noted there has been substantial discussion on the impact with roads and water courses, etc). One of the key areas is within the GSDA from Aldoga to the plant. Their route is parallel to the QR corridor where there are expansion plans under consideration. The proponent's construction methods may impact QR operations (e.g. crossings, blasting, etc). These need to be discussed with QR and mitigation measures agreed prior to completion of Detailed Design.

- GPN's plant will contribute to the Gladstone Air Shed; therefore the EIS should spell out how they will monitor air quality to be able to determine their contribution to the air shed.
- QR notes that the proponent has a residue storage dam within the GSDA near where QR's proposed Moura Link Line will run. Given the scale of the map it is hard to tell how far the dam would be away from QR's potential alignment. QR could not find any link to the Coordinator General's Corridor Studies for the GSDA and whether they will be consistent with that planning. GPN should provide details of the proposed location to QR showing the extent of the proposed works and the likely impacts.
- Safety and operation of workers and plant in the vicinity of rail lines: GPN to determine risks & undertake necessary actions in consultation with QR.
- The EIS states that the construction of Stage 1 of GPN is likely to commence in early 2008. The construction for Wiggins Island Coal Terminal (WICT) rail works is not likely to commence at that time and property acquisition of required land parcels may be still in progress. The proponent will need to take this into consideration in their planning and address all possible impacts on the current residents in the vicinity of GPN refinery.
- The proponent has also stated that adequate space has been provided in the refinery layout for a rail siding and dump stations. Is this still current? Connection points to the existing QR rail network need to be agreed with QR.
- The impact on the rail network during construction has not been adequately addressed.
- Ore Delivery: The proponent has stated that the option of transporting ore from Marlborough to the refinery at Yarwun through rail, though not the preferred option, has not been discounted yet. QR notes that it is the proponent's responsibility to secure all necessary approvals (environmental, safety, etc) for the loading, transporting and unloading of ore through the rail corridor and on rail wagons. The proponent will also need to discuss and secure all necessary agreements with QR if this option is to be adopted.

2. Specific Comments

- **Section 2.1 (4th Paragraph)** – indicates the provision of a rail connection along the eastern boundary of the refinery site as being proposed by QR for the WICT project. QR wishes to state that this option is no longer pursued by Central Queensland Ports Authority and QR. The current option is for the trains to unload coal through a balloon loop on the southern side of the existing North Coast Line and transfer coal to the stockpile yard in Wiggins Island by three conveyors crossing underneath the North Coast Line. Under this scenario the provision of separate conveyors to carry materials from and to the GPN refinery is likely to be the most appropriate arrangement. The provision of non-coal dump stations and unloaders on a new balloon loop for GPN refinery and the conveyor streams to the GPN refinery are not covered in the WICT EIS and will need to be covered by the proponent as part of their EIS. QR is ready to discuss and resolve these issues with the proponent.

- **Section 2.2.1 (3rd paragraph)** – regarding rail access this needs to be covered by the proponent as part of their EIS.
- **Section 2.3.4.1 (1st paragraph)** – the proponent needs to allow for the change in scope of the WICT project with no rail infrastructure on the northern side of the North Coast Line.
- **Section 2.3.6.4 (Table 2.3.9)** – The proponent will need to meet all QR requirements with regard to all pipeline crossings over/under QR rail. QR will need engineering details of the proposed crossings before it can approve the crossing and it will be necessary to execute a crossing agreement with QR.
- **Section 2.3.6.9 (2nd paragraph)** – The proponent to include the scope of works, assessment of impacts and mitigation measures in their EIS.
- **Section 2.5.2.5** – The use of Mt Miller yard for transporting of nickel / cobalt briquettes needs to be agreed with QR and impacts assessed as part of this EIS.
- **Section 2.5.6.2** – The proponent needs to provide detailed plans of all pipelines in proximity to the electrified rail lines, the cathodic protection to be provided on the pipeline and secure QR's consent on the measures prior to completion of detailed design.
- **Section 2.9.4 Pipelines** – The procedure for decommissioning of pipelines near / under / over rail lines will need to be agreed with QR initially as part of this EIS and then prior to the actual decommissioning at which time further stringent conditions on decommissioning may apply.
- **Section 13.3 (Risk Management Approach)** – states '*fatalities*' as being a major risk requiring assessment. Yet the EIS has only focused on the occupational refinery matters and failed to look at such downstream effect of either the construction traffic with the pipeline and refinery and/or increased freight rail services associated with the project having on interface points with the rail network (i.e. level crossings). Particularly with the possible transport of probably very long pipes via rail from Kemble Grange (Section 2.3.6.9) and likely rail transport of 130 containers of refined nickel & cobalt briquettes per week from Gladstone to Port of Brisbane.

To resolve this matter the proponent should discuss during the detailed design phase with QR the safety implication of the above scenarios and agree on the proposed measures to be adopted to mitigate the safety risks. These agreements are to be signed off at least three (3) months prior to commencing construction of the proposed refinery and pipeline.

- Likewise if the ore's transport mode is changed from being pipeline to rail, a similar Liaison with QR about the safety implications of increased rail services associated with the proposed project using any rail/road level crossings and agreements signed off at least three (3) months prior to commencement of any such proposed rail services.

- It was very interesting and, from QR's public reputation perspective, a little disturbing to read the feasibility analysis presented in the EIS why the proposed pipeline was preferred over rail. Second reason very clearly pointed out in numerous parts of the EIS was the issues of noise and air quality issues with freight rail services passing sensitive areas. This could have been easily resolved without placing such a negative blight on rail via explaining it will be adequately assessed against well acceptable (e.g. legislative) targets and processes prior to commencing such rail services. Prior to commencing any rail services associated with this proposed project, GPN shall arrange with QR for assessment of the noise and air quality implications of the proposed addition services in accordance with QR's Access Undertaking 2005, Code of Practice for Railway Noise Management and relevant legislation. This will be done in consultation with QR. Note this has to occur anyway to comply with the EIRMR requirements of the Access Undertaking.
- Where Electricity supply points and transmission/distribution routes could impact on rail operations, GPN to coordinate locations, transmission/distribution routes and railway crossings with QR, the electricity infrastructure owner and other neighbouring stakeholders (e.g. CQPA).
- GPN to determine whether residues & effluents could have deleterious effects on QR overhead systems
- GPN to determine the extent of corrosion effects due to proximity of pipelines to electrified rail and provide mitigation measures in consultation with QR
- GPN to determine impacts of High frequency and low frequency interference between GPN & QR communications, data and power systems in consultation with QR
- GPN to ensure that the type, location and intensity of site lighting do not interfere with visibility of railway signals. Detailed drawings to be provided to QR and approved during design stage.

QR will continue to review the EIS document in detail and will provide additional comments, as more details emerge, during ensuing discussions with the Coordinator General / GPN. QR is prepared to engage in further dialogues with GPN and help resolve the issues raised in this letter.

Yours faithfully



Bob Stuart
Project Director
Wiggins Island Coal Terminal Project

25 May 2007

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sent to GPR



**Queensland
Government**

Queensland Transport

EIS Manager
Gladstone Nickel Project
Major Projects
Department of Infrastructure
PO Box 15009
City East Qld 4002

Attention: Mr Mike Davidson

Dear Sir

Gladstone Nickel Project - Comments on Draft Environmental Impact Statement

I am writing in response to your Department's letter dated 5 April 2007, seeking comments on the Gladstone Nickel Project - Draft Environmental Impact Statement (EIS).

Submissions closed at COB Monday, 28 May 2006.

Queensland Transport is an advisory agency with respect to this EIS project and our comments are enclosed at Attachment 1.

Should you have any queries regarding these comments please contact Mr Greg Hollands, Senior Advisor (Coal and Mineral Transport) on 3306 7376. Mr Hollands will be pleased to assist.

Yours sincerely

Helen Stehbens

Executive Director (Rail, Ports and Freight)

Rail, Ports and Freight
Coal and Mineral Transport Group
Level 8 Capital Hill Building, 85 George Street
Brisbane Qld 4000
GPO Box 1549 Brisbane Qld 4001
ABN 13 200 330 520

Our ref E53476
Your ref TN112197/MD40/DI
Enquiries Greg Hollands
Telephone +61 7 3306 7376
Facsimile +61 7 3306 7455
Website www.transport.qld.gov.au
Email greg.s.hollands@transport.qld.gov.au

EIS Manager
Gladstone Nickel Project
Major Projects
Department of Infrastructure
PO Box 15009
City East Qld 4002

Attention: Mr Mike Davidson

Dear Sir

Gladstone Nickel Project - Comments on Draft Environmental Impact Statement

I am writing in response to your Department's letter dated 5 April 2007, seeking comments on the Gladstone Nickel Project - Draft Environmental Impact Statement (EIS).

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Yours sincerely

Helen Stehbens
Executive Director (Rail, Ports and Freight)

Rail, Ports and Freight
Coal and Mineral Transport Group
Level 8 Capital Hill Building, 85 George Street
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Our ref E53476
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Website www.transport.qld.gov.au
Email greg.s.hollands@transport.qld.gov.au

Attachment 1

Queensland Transport Comments on the Gladstone Nickel Project - Draft Environmental Impact Statement

Background

Gladstone Pacific Nickel Ltd (GPNL) is proposing to built and operate a nickel/cobalt refinery. The project, known as the Gladstone Nickel Project (GNP) consists of a high pressure acid leach (HPAL) plant and metals plant (collectively called the refinery), situated approximately 8km west of the Gladstone central business district in the Yarwun Precinct of the Queensland Government Gladstone State Development Area (GSDA).

The refinery will process ores from a nickel laterite mine near Marlborough, approximately 180km north-west of Gladstone, together with nickel laterite ores imported from the south-west Pacific region. The ores from Marlborough will be beneficiated at a plant adjacent to the mine site at Coorumburra and then pumped as a slurry through a pipeline to the refinery.

Residue from the refinery will be pumped to a residue storage facility (RSF) located in the Aldoga Precinct of the GSDA, approximately 15km south-west of the refinery site, and approximately 19km west of Gladstone CBD. The RSF will cover an area of 975hectares. During the 25 year life of the refinery approximately 250Mt of ore residue will be stored within the RSF.

The refinery will produce nickel and cobalt metal which will be exported to the growing world market, primarily to meet the increasing demand for stainless steel.

The refinery will initially be developed in two stages – 1 and 2. It is anticipated that Stage 1 will produce up to 60,000t/y of nickel metal and 4,800t/y of cobalt metal. Stage 2 will produce up to 126,000t/y of nickel metal and 10,400t/y of cobalt metal. At the completion of Stages 1 and 2, the refinery will have the capacity to produce 8-10% of global nickel demand.

The total capital cost of the project will be assessed in the next phase of the feasibility study and is expected to exceed US\$3 billion.

It is proposed to start construction of Stage 1 in early 2008. Construction is expected to take approximately 2.5 years with the commissioning of Stage 1 operations beginning in mid-2010. Depending on market demand, Stage 2 construction could begin in 2013 with Stage 2 operations starting in 2015. For both stages, full production is expected approximately 12 months after start of commissioning.

Some of the key transport related elements of the GNP are:

- A refinery will be developed on a 250ha site at Yarwun. Stages 1 and 2 will occupy approximately 125ha of the western half of the site.
- Nickel and cobalt ore will be mined from lateritic nickel/cobalt deposits owned by Marlborough Nickel Pty Ltd (MNPL), a wholly owned subsidiary of GPNL.
- Nickel and cobalt ore will be beneficiated at the Coorumburra beneficiation plant (at the Marlborough Mine).
- A 500mm diameter pipeline will transport ore slurry from the beneficiation plant to the refinery at Gladstone. The pipeline will be approximately 180km long. The pipeline is expected to be located within a multi-user pipeline corridor. The pipeline will cross railway lines on at least 5 occasions and several main roads.
- Seawater will be used to create the slurry at the beneficiation plant. A 550mm pipeline, located parallel to the ore slurry pipeline, will transport seawater from Port Curtis to Coorumburra.

- Nickel and cobalt will be extracted from the ore slurry at the refinery. Waste material (residue) left after the nickel and cobalt have been extracted from will be transported in a residue pipeline to a residue storage facility (RSF) at Aldoga (approximately 12km south west of the refinery). Stage 1 will require a 27km residue pipeline, approximately 700mm in diameter. Stage 2 will require a duplication of this pipeline.
- Liquor (liquid waste) that is separated from the residue at the RSF will be returned to the refinery in a return liquor pipeline. Stage 1 will require a 27km pipeline, approximately 500-600mm in diameter. Stage 2 will require a duplication of this pipeline. Liquor from the RSF will be combined with some refinery liquor and returned by pipeline for discharge into Port Curtis via a diffuser system to be constructed near the existing Clinton Wharf at the RG Tanna Coal Terminal. Four diffuser discharge pipes with multiple openings (ports) will mix ambient channel seawater with the liquor and discharge the diluted liquor into the Port Curtis channel.
- Nickel ore from the Marlborough Mine (1-4Mtpa) will be supplemented by nickel laterite ores (8-10Mtpa) sourced from the south-west Pacific Region. Imported ores will be unloaded via material handling facilities at the proposed Wiggins Island Wharfs (WIW).
- Sulphur will also be imported through WIW.
- Construction loads to the project sites will generally be delivered by truck. Construction and operational workers will travel to work by either car or bus. In addition there will be a small number of trucks delivering chemicals and consumables each day.
- Various upgrades of the local road network will be required.
- The major products from the refining process will be nickel and cobalt briquettes. These will be containerised and trucked from the refinery to the Mount Miller rail siding which is located immediately west of the refinery, or to the port of Gladstone. These containers will then be railed to the port of Brisbane for export.

Comments on the draft EIS

Queensland Transport comments on the EIS are below, highlighted with a grey background.

2. Proposed Project

2.7. Project Outputs

2.7.1. Nickel and Cobalt Briquettes (Page 2-32)

Stage 2 of the project will produce approximately 126,000t/y of nickel and 10,400t/y of cobalt. Both metals will be produced in the form of briquettes. The briquettes will be packed into steel drums and loaded onto pallets at the refinery. The drums will be strapped and shrink wrapped to the pallet. The palletised drums will then be loaded into containers at the refinery and the containers (130 per week) will be trucked to either the port of Gladstone or to the Mt Miller rail siding, railed to the port of Brisbane and loaded onto ships for export to the required destination.

A laydown and storage area will be designed for the transfer of product to containers at the refinery site. This area will be designed to allow easy access for transport and handling equipment and will provide separation of road transport and forklift truck movements in loading the containers.

GPNL is requested to liaise with the Central Queensland Ports Authority (CQPA) regarding the capacity and suitability of CQPA facilities to lift, store and load containers of the required number, dimensions and weight at the port of Gladstone, for trans-shipment by rail to the port of Brisbane.

GPNL is requested to outline why export of Nickel and Cobalt product through the port of Gladstone is not efficient or practicable, and why Brisbane is the preferred port for the export of product.

5. Alternatives

5.5. Slurry Pipeline Route Alternatives

5.5.3. Multi-User Pipeline Corridor (Page 5-10)

The Queensland Government announced on 22 November 2006 that it is considering the development of a multi-user pipeline corridor between the western or north-western edge of the GSDA and the Stanwell Energy Park west of Rockhampton. The southern section of the proposed route for the corridor is aligned with the GNP pipeline route. To minimise environmental disturbance and impacts to landholders along the pipeline route, it is GPNL's preference to use the multi-user corridor if it proceeds, is technically suitable, and its timing does not constrain the GNP schedule.

It is stated that should the multi-user corridor not eventuate or the timing constrains the GNP schedule, the mining lease covering the project pipeline corridor will apply to the whole route from GPNL's mining lease boundaries/freehold property boundaries in the Marlborough project area to the GSDA boundary. If the multi-user pipeline eventuates in a timely way, the mining lease will extend from (GPNL's mining lease boundaries/freehold property boundaries in the Marlborough project area to the northern end of the multi-user corridor.

Queensland Transport supports the location of the slurry pipeline within the proposed Multi-user Pipeline Corridor.

The development of the ZeroGen Clean Coal Power Project is being planned with a 100MW power plant to be located at Stanwell. The project will deploy carbon capture and storage technologies to capture and transport supercritical (near-liquid) CO₂ by pipeline approximately 200km west of Stanwell for deep geological injection and storage. This CO₂ pipeline will be the first of an emerging network of CO₂ pipelines that are also likely to be located in multi-user pipeline corridors. There is potential for the Gladstone Power Station to be linked by CO₂ pipeline, using the Multi-user pipeline corridor, to Stanwell sometime after 2015. Gladstone Power Station at 1,680MW is Queensland's largest power station. It potentially would be seeking to geo-sequester over 10Mtpa of CO₂ or over 100Mt over a ten year period.

GPNL is requested to liaise with Mr Fergus FitzGerald, EIS Project Manager – ZeroGen Clean Coal Power Demonstration Project, Department of Infrastructure, (3224 2911), to clarify whether there is any need to take account of relative co-location or separation of the slurry and possible CO₂ pipeline within the proposed Multi-user pipeline corridor linking Marlborough, Stanwell and Gladstone.

5. Alternatives

5.4. Ore Delivery

5.4.1. Marlborough Ore (Page 5-3)

GPNL has considered two alternatives for transporting ore from Marlborough to the refinery at Yarwun:

- By pipeline with the beneficiated ore slurried using water.
- By rail transport with the ore beneficiated at either Marlborough or the refinery.

For the pipeline alternative, the ore will be beneficiated at Coorumburra to concentrate the nickel content of the ore. It will then be pumped as a slurry in seawater to the refinery. For the rail transport alternative, beneficiation can take place at either Coorumburra, adjacent to the rail loop at Marlborough, or at the refinery.

Currently, GPNL's preferred method of transporting ore from Coorumburra is by slurry pipeline. The major reasons for this are:

- proven and established technology;
- reduced potential for noise and visual impacts during operations;
- energy requirements for pumping the slurried ore will be substantially lower than for rail;

- the pipeline will be installed underground and does not impact on surrounding visual or productive amenity; and
- the pipeline may be installed over parts of the route in a State Government multi-user pipeline corridor reducing the overall disturbance footprint outside of the multi-user pipeline corridor.

However, a slurry pipeline requires additional water supply infrastructure and additional plant infrastructure to enable the product to be pumped and thickened to higher solids content for processing. Hence, additional evaluation will be undertaken during the detailed design phase of the GNP to confirm the suitability of using a pipeline rather than rail. Adequate space has been provided in the refinery layout for a rail siding (off the WICT project rail network) and dump station to keep the rail option open, should that be the preferred option finally selected for Stage 1. In the eventuality that the part of the WICT project required for the GNP doesn't proceed or is delayed, options for rail include a stand-alone siding or use of the Comalco Alumina Refinery (CAR) rail loop.

The several options for the slurry pipeline route involve crossing of more than five railway lines and more than three crossings of major main roads. GPNL is requested to consult with Queensland Rail and Main Roads on the design parameters for pipeline rail and road and crossing underboring, and methods to ensure safe and effective preservation of the integrity of rail and road infrastructure, and the arrangements to be put in place to effectively manage any potential traffic disruptions.

6. Transportation

6.2. Study Background and Scope

6.2.6. Intersection Analysis

6.2.6.12. Summary of Intersection Effects (Pages 6-18 to 6-20)

The results of a traffic operation impact assessment indicate the project will generate additional road traffic within the project area. Some intersections and pavements will require upgrade and rehabilitation to meet anticipated increases in traffic demand.

GPNL proposes to enter an infrastructure agreement with the Department of Main Roads to allocate responsibilities for works within the road network. This is appropriate.

6.3. Shipping

6.3.1. Wiggins Island (Page 6-23)

CQPA and QR are proposing to develop the WICT. The WICT will have four (4) berths for coal loading with initial capacity of 25Mtpa, with capability of upgrade to 70Mtpa in later stages. In addition to the coal terminal, another 2 berths (to be known as Wiggins Islands Wharfs (WIW) is to be developed at WI, to be used as multi-user berths to support commodities other than coal. It is proposed that GNP will be allocated berth No. 5 of WIW to import nickel laterite ore and sulphur.

The planning for WICT has incorporated the WIW facilities and has notionally earmarked the GNP for use of these wharf facilities. It should however be noted that to-date there has been no decision to proceed with the development of the WICT and associated WIW facilities.

6.4. Rail Transport (Page 6-25)

Nickel and cobalt briquettes produced at the refinery will be containerised and trucked from the refinery along Reid Road to the Mt Miller rail siding which is located immediately west of the refinery. Containers will be railed to the port of Brisbane for overseas shipping, with an estimated 130 containers per week being railed to Brisbane.

This should not pose any problems. However, earlier in Section 2.7.1 (Page 2-32) it was indicated that for Stage 2, nickel and cobalt product could potentially be trucked to port of Gladstone rail-loading facilities. The palletised drums of metal product will be loaded into containers at the refinery and the containers will be trucked to the port of Gladstone or to the Mt Miller rail siding, railed to the port of Brisbane and loaded onto ships for export to the required destination.

It needs to be clarified whether the trucking of containers to the port of Gladstone for rail loading is still being considered. It should be further clarified whether the rail siding at Mt Miller has the capacity to lift, store, lift and load 130 containers per week of the specified dimensions and weight product, for railing to Brisbane for shipment.

8. Environmental Effects of Refinery

8.3. Marine Environment

8.3.15. Potential Marine Impacts from Materials Handling

8.3.15.1. Sulphur (Pages 8-58 & 8-59)

During Stage 2, approximately 1.2Mt/y of sulphur will be unloaded through berth No.5 of the proposed WIW. In its pure form sulphur is a bright yellow powder that is relatively non-toxic and is not listed as a carcinogen. Solid sulphur poses a low hazard to workers/handlers or the environment unless it is allowed to dust or become involved in a fire.

In the prill/pastille form that the GNP plans to use, the sulphur will comprise small, compacted tablets that are designed to minimise dusting and the risk of explosion or fire. When stored and handled by appropriate dry and non-dusting methods, prill/pastille sulphur is not a dangerous good and is considered to be non-toxic. While dry sulphur is listed as a dangerous good under the Australian Dangerous Goods Code, this classification does not apply to the prill/pastille form.

It is stated that sulphur will be unloaded using a purpose-built wharf crane with specialised grabs. Grabs with steel dust curtains will deposit the prill/pastille directly into wharf-mounted hoppers equipped with a choke to prevent dusting from long fall streams and impact. The grabs will be purpose-designed to prevent prill/pastille spillage between the ship's coaming and the wharf. Because of the tidal range at Gladstone, use of folding spill-trays or tarpaulins to cover the gap between the ship and wharf will not provide a practical or safe option.

The wharf hoppers will discharge directly onto a covered conveyor belt for transfer to the sulphur stockpiles at the refinery. There will be two sulphur stockpiles of approximately 120,000t each (approximately 200m long by 20m wide by 15m high). These stockpiles are sized to receive three 70,000t Panamax ships plus several weeks' usage to cover disruptions to sulphur supply or acid plant consumption.

To minimise dust generation, the two sulphur stockpiles will be sprayed with dust suppressant at the various discharge and conveyor transfer points using suppressant sprays with variable rate control.

The stockpiles will have low permeability floor surfaces designed such that all rainfall runoff will be channelled into settlement ponds that are large enough to contain a 12 hour 1 in 100 year storm. Runoff captured from the sulphur stockpile will be re-used in the process.

Wharf facilities and conveyors will be designed such that washdown water can be collected. Each conveyor transfer point will have spillage and belt washing contained in a collection tank. The tank contents will be pumped back to the refinery for use in the process.

The measures to contain sulphur spillage and minimise dust generation during unloading and transport to the refinery stockpiles are appropriate.

In relation to enclosure of conveyors, the EIS states that: "The wharf hoppers will discharge directly onto a covered conveyor belt for transfer to the sulphur stockpiles at the refinery".

It is unclear what comprises a "covered conveyor" and the degree of enclosure. Is it fully enclosed, fully enclosed except for service windows, partly enclosed or merely covered by a roof? The nature of the "covered conveyor" needs to be more fully and accurately described.

8. Environmental Effects of Refinery

8.3. Marine Environment

8.3.15. Potential Marine Impacts from Materials Handling

8.3.15.2. Nickel Ore (Pages 8-59 & 8-60)

Nickel laterite ores sourced from the south-west Pacific will be unloaded through berth No.5 of the proposed WIW facility. Imported ore will be unloaded onto a covered conveyor which will transport the ore to the refinery site where it will be discharged from a stacker onto stockpiles.

Nickel ore will be unloaded using a purpose-built wharf crane with specialised grabs. Grabs with steel dust curtains will deposit the ore directly into wharf-mounted hoppers equipped with a choke to prevent dusting from long fall streams and impact. The grabs will be purpose-designed to prevent spillage between the ship's coaming and the wharf.

It is important that the escape of dust from nickel unloading operations and its dispersion onto nearby coal stockpiles and loading facilities is minimised and kept to very low level. The unloading methods are broadly appropriate.

The section refers to transport of ore by "covered conveyor". Again it is unclear what comprises a "covered conveyor" and the degree of enclosure. Is it fully enclosed, fully enclosed except for service windows, partly enclosed or merely covered by a roof? The nature of the "covered conveyor" needs to be more fully and accurately described.

It is requested that the GPNL outline any need for or proposals to install conveyor belt scrapers or belt washing systems at conveyor transfer points to minimise nickel ore dust travel-back and dust dispersal to nearby coal stockpiles.

The escape of Nickel ore into marine environments has potential to cause some community concern. However, nickel enters aquatic environments naturally through mineral rock weathering and by several anthropogenic sources. More than 90% of the nickel in the aquatic environment is associated with sediment particulate matter. Nickel has a low background concentration in the marine environment and is an essential trace element for aquatic organisms. It can be toxic at high concentrations.

Florence et al (1994) assessed the environmental impact from potential spillage of nickel ore imported from New Caledonia and Indonesia into Halifax Bay in north Queensland. Because small amounts of ore may be spilt during that project's off-shore unloading operations from the import ships into small open-hold shuttles (estimated to be a maximum 16t/y) long-term leaching tests of the ores with seawater were undertaken. The tests showed that only nickel and chromium (VI) were released from the ores in concentrations that could cause toxicity to a range of marine organisms. The study concluded that the nickel ore was not highly toxic and if spilt in the quantities predicted, would not have a significant impact on the ecological processes of Halifax Bay.

As the ore imported for the GNP will be off-loaded in a more stable wharf-based environment rather than at an off-shore single mooring unloading facility, the potential for spillage is likely to be significantly less. On this basis, no toxic effects are expected from spillage of GNP ore at WIW, should this eventuate.

Mitigation measures to manage ship decks, coamings or wharfside spillage of nickel ores and road transport spillage of amsul outlined in Section 8.3.15.4, are appropriate.

8.3.15.3. Ammonium Sulphate (Page 8-60)

Ammonium Sulphate (amsul) a fertiliser and principal by-product of the nickel refinery will be transported to a storage shed at Fisherman's Landing for loading. To minimise dusting and spillage front-end loaders will operate inside a shed at Fisherman's Landing and will tip the amsul into mobile hoppers mounted over a load-out conveyor running the length of the shed. Any dust generated will be retained inside the shed and the loading operation will be protected from the weather thus minimising the risk of spillage to the marine environment the loaded onto load-out conveyors contained within the shed.

This is appropriate.

Paragraph 3 refers to use of a "covered conveyor" that will connect to the common-user ship loader that CQPA plans to build at Fisherman Islands' Berth No 3.

Again it is unclear what comprises a "covered conveyor" and the degree of enclosure. Is it fully enclosed, fully enclosed except for service windows, partly enclosed or merely covered by a roof? The nature of the "covered conveyor" needs to be more fully and accurately described.

8. Environmental Effects of Refinery

8.7. Air Quality

8.7.7. Emission Rates

8.7.7.2. Materials Handling Emissions (Pages 8-94 to 8-96)

Ammonium sulphate (amsul) is a fertiliser that is highly soluble in water and poses a risk of eutrophication if spilt into marine waters.

Amsul will be produced at a rate of 166,000 and 343,000 t/y respectively for Stage 1 and Stage 2, and will be exported through the Fisherman's Landing port facility. The amsul will be stored at the refinery in silos, and will be loaded directly into covered B-double trucks for transport to the port. The trucks will unload into a covered dump pit using bottom dump trailers to minimise dust, and the amsul will be transported into a storage shed at the port by a covered conveyor. The amsul will be loaded by front-end loaders into mobile hoppers within the storage shed and then via a conveyor to the ship. Ship transfers of amsul will only take place in dry weather due to its soluble nature.

These material handling measures are appropriate. As previously requested, the more detailed description of the degree of enclosure of the "covered conveyers" should be provided.

8.7.7.2. Air Quality Impact from Materials Handling (Pages 8-95 & 8-96)

Emission Rates and Quantity

Table 8.7.9 provides Emission Rates for TSP and PM10 from Materials Handling Operations, Stage 1 and Stage 2. For handling Imported Nickel Ore, the ship unloading and conveyor activities are expected to generate dust lift-off rates (at Stage 2) for Total Suspended Particulates (TSP) of 0.46g/s and PM₁₀ of 0.19g/s.

Applying these lift-off rates as a proportion to the Total Emissions from the site of TSP 1.97g/s and PM10 0.8g/s, it can be calculated that Nickel lift-off represents approximately 23% of total TSP and 22% of total PM10's. This translates into dust dispersal of approximately of 10.7 tonnes per annum of Nickel ore as TSP and 4 tonnes per annum as PM10's.

Table 8.7.9 indicates "Controls factors used of 90% - Covered conveyor, wet ore/water sprays". While it is suggested that the high moisture content of imported ore of 35% will reduce dust by 90% due to high moisture content and the covered conveyor, it is unclear whether the use of water sprays is optional control measure or whether they will actually be installed.

GPNL is requested to specify and make clear if water spray systems will actually be installed and used as an integral part of their dust management system.

8.7.8.3. Air Quality Impact from Materials Handling (Page 8-99)

Emission Exposure Concentrations

Table 8.7.12 provides details of modelled Ground-level Concentrations of TSP and PM10 due to Refinery (Stage 2) with a Constant Background Concentration (ug/m3). The constant background concentration was designated as represented by measurements at Tanginie of 93 ug/m3 for the 24 hour average concentrations and 23 ug/m3 for the annual average concentrations.

Using the modelled results for the Rural Residential sites, this indicates that PM10 24 hour average concentrations would be increased at sensitive receptor sites from 93 to 97 ug/m3 or 4%, and on an annual average basis from 23 to 25.7 ug/m3 or 11.7%. The modelled concentrations remain well within EPA Guideline measures of 150 ug/m3 (24 hour average) and 50 ug/m3 (annual average).

GPNL is requested to clarify if these concentrations include the concentrations from materials handling both at ship-loading/unloading and the conveyors as well as from the Refinery itself, or whether it is from materials handling specifically at the Refinery Site only.

Queries regarding these comments

Should there be any queries regarding these comments please contact Mr Greg Hollands, Senior Advisor (Coal and Mineral Transport) on 3306 7376.

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28th May 2007

The Coordinator-General
Attention: EIS Project Manager
Gladstone Nickel Project
Major Projects
Department of Infrastructure
PO Box 15009
BRISBANE CITY EAST QLD 4002

To the Project Manager,

Re: Environmental Impact Statement – Gladstone Nickel Project

Thank you for the opportunity to comment on the above mentioned Environmental Impact Statement (EIS) as an advisory agency. The Department of Communities is committed to ensuring that all Queenslanders can live in communities where they feel safe, valued and empowered.

The Department therefore has a number of interests in responding to this Environmental Impact Statement:

- our whole-of-government responsibilities in social impact assessment,
- advocating for the needs of disadvantaged groups in the communities of Gladstone, Calliope and surrounding districts,
- ensuring that the Gladstone Nickel Project contributes to overall community well being and
- providing and offering advice to the proponents on community engagement principles and processes.

The proponents are to be commended for the level of investigation and analysis they have undertaken into the nature of the local communities and the possible impacts on those communities, of not only their own project, but the cumulative impact of the several projects with whom they may temporally coincide.

The EIS identifies a number of issues that the Department of Communities would wish to see addressed if the project were to proceed. These include –

- development of a Community Consultation Management Plan that is more proactive than the reactive based 'Incident and Complaints Management Plan' proposed in the 14.11.12 of the EMP,
- a commitment to identify and enact strategies arising from community consultation that mitigate the negative impacts of the project particularly those relating to-
 - skills shortages and employment opportunities and equity,
 - housing stress on disadvantaged families and individuals,
 - childcare, family and individual support services.
- a more thorough and current investigation into the capacity of the infrastructure and services within the communities of Gladstone, Calliope and surrounding region to maintain existing levels of community wellbeing in the face of the impacts of the Project.

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Community Consultation

The Department commends the efforts of the proponents to undertake community consultation throughout the EIS process and their undertaking to continue this throughout the life of the project (12.3.3). The Department would like to see the proponents set down in writing a Community Consultation Management Plan that outlines in more detail the terms of reference of any Community Consultation processes that may be enacted following the approval of the project.

The Department refers the proponents to the guidelines for community consultation set down by the Organisation for Economic Cooperation and Development (OECD) which encourage projects to adopt strategies that promote more active participation by communities in the identification and management of issues.

Recommendations:

That the proponents develop a Community Consultation Management Plan that incorporates:

- the establishment of a social monitoring group that incorporates representation from key community stakeholders who can identify broad issues of concern,
- provision of information that is easily accessible to the community and specific interest groups; and
- the provision for focused and detailed consultation to consider issues, resolve conflicts, and to develop mitigation or monitoring strategies with the relevant parties.

NB. Officers at the Department of Communities, Fitzroy / Central West Queensland Region, are able to provide advice regarding appropriate community consultation strategies that include a more active role for impacted communities. For further advice regarding these strategies the proponents are referred to the Manager of the Planning, Engagement and Coordination Unit on 4938 4218.

Social impacts

The proponents' thorough investigation into the impacts of their project particularly the cumulative nature of theirs and other projects is commended. The proposed mitigation strategies outlined in the EIS however, tend to lack detail and commitment and rely too heavily on perceptions of community capacity that are inaccurate. This Department has particular concern with the impacts on disadvantaged groups in the community such as - youth, Aboriginal and Torres Strait Islanders, seniors and those families and individuals on low incomes. The most prominent impacts of the project on these groups will come from

- the perpetuation and aggravation of existing skills shortages and associated service costs,
- the provision of equitable access to employment opportunities,
- increased pressure on the availability and affordability of current housing and rental properties,
- increased demand on family and individual support services and childcare services

Each has its own dimensions of impact and possible mitigation strategies.

Skill shortages and employment opportunities

Figure 110.5.3 indicates that during the first half of 2009 a cumulative demand for construction workers from the GNP and other projects in the Gladstone region may reach well above 4000 positions. The Department agrees with the proponents that, despite a policy of sourcing as many of their workforce locally as is possible, there will remain the need to bring workers from other areas to the local area. The proponents cite the origin of people moving to Gladstone in 2001 as a precedent for the likely origin for the GNP

construction workforce for 2008 - 2010. This is based on the erroneous assumption that demographic conditions evident in 2001, continue to exist. In 2001 the unemployment rate for Queensland was approximately 8%, while in 2007 it is closer to 4.8% with a downward tendency. The level and spread of skill shortages, across Queensland, currently far exceed that which existed in 2001 and it is unlikely that the proponents will be able to source 75% of their workforce from within either Queensland or perhaps even Australia, as the model suggests. It is more likely that workers from overseas will need to be accessed and the cultural implications of this will need to be planned for, monitored and addressed. The demand for local labour will exacerbate existing skill shortages and increase the upward pressure on labour costs. Those on fixed incomes such as welfare recipients retirees or people with disabilities have little capacity to bear such an increase.

An available source of local and regional labour that is often overlooked is to adopt recruitment strategies that target those sectors of the regional community that have traditionally been disadvantaged in accessing employment - Aboriginal and Torres Strait Islanders, young people especially those from low socio-economic backgrounds, people from non-English speaking backgrounds and people with disabilities. All these groups continue to have unemployment levels well above the regional state and national averages. The Department commends the proponent's intention to consider equal opportunity and training strategies to attract such groups into their workforce.

Recommendations:

That the proponents partner with other major developers in the area, local and regional stakeholders such as the Department of Employment and Training, local Councils, the Gladstone Area Promotion and Development Limited (GAPDL), Get Real About Social Partnership (GRASP) and other community agencies and individuals-

- to develop and enact strategies to mitigate the burden accruing to fixed and/or low income households of increased labour costs arising from their projects and
- to develop a skills/employment working party that advances the availability of training and promotes the adoption of affirmative action policies and procedures for the training and employment of local employees from a variety of disadvantaged and diverse backgrounds from both within and outside the immediate region.

That the proponents ensure that the adoption of such policies and procedures, which might emanate from such collaboration, is a condition of engagement for any of the contractors and sub-contractors to the Gladstone Nickel Project.

Impacts on Housing Demand and Supply

The proponents project that the population increase associated with their own workforce might peak in the first half of 2009 at 3 101. The cumulative upward pressure of this and other projects on the housing and rental markets will impact most severely on those on lower or fixed incomes, such as those on Disability, Aged, Carer or Sole Parent pensions or other welfare benefits. Many individuals and families on low and/or single incomes are likewise vulnerable to such pressures. Section 10.7 of the EIS concludes that the Project will contribute to pressures on the cost and availability of accommodation in Gladstone City and Calliope Shire. In 10.7.2/3 the proponents outline a housing strategy and mitigation initiatives. Of particular interest to the Department is the proponent's consideration of providing financial support to Councils to assist low-

income households seeking accommodation assistance. Service providers are already reporting the eviction of low-income families as a result of increases in rent.

Recommendation:

The Department strongly supports the enactment of the initiative to assist Councils to fund services that support low income households.

The Department also supports the proponent's intention to negotiate with local Councils on the development of a workforce camp and the establishment of a relocatable home park, both with permanent infrastructure that can be handed over to local authorities at the end of the project.

Demand on community service infrastructure

Local community service providers are already reporting increases in service demand as anticipation builds towards the initiation of the various projects of which GNP is one. This service need includes homelessness, childcare and family support services. The proponents have failed to meet the requirements of the Terms of Reference for the EIS in particular section 3.10.2 in which they undertook to describe mitigation and enhancement strategies and practical monitoring regimes for the social environment, a dimension of which is community service infrastructure.

The proponents acknowledge that there will be an impact (10.8.3), but offer no investigation into the extent of that impact, nor strategies to manage or mitigate that impact. In the conclusion to section 7 of Appendix P they only offer that the services are adequate to handle the expected increase in population. This is at odds with local expectations and experience and there is little evidence to support such a claim.

Recommendation:

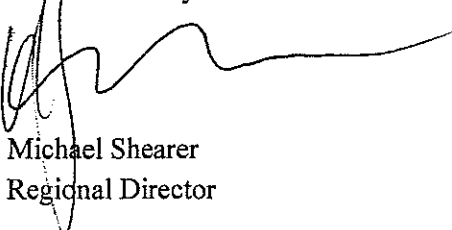
That the proponents commit to collaborating with Government, the community and other project developers in the region to not only investigate but also resource the strategies required to mitigate the increased demand for community services in the region.

Summary

Gladstone and Calliope communities have a history of large projects impacting on their communities. Community services workers have considerable experience in recognising the triggers that indicate changes in community stress and capacity. In preparation for this response the Department of Communities has consulted with a number of such key workers who maintain that such triggers are already becoming evident within their case loads. The Department assert that compliance with the above recommendations is necessary to maintain community well being for those most vulnerable to the project's social impacts.

Should you require any further assistance or advice please do not hesitate to contact Eric Boardman, Regional Planner (4938 4478) or Bill Higham, Manager Planning, Engagement and Coordination (4938 4218).

Yours faithfully


Michael Shearer
Regional Director

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