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Ms Laura Todd  
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Dear Laura

### **PEER REVIEW OF DALSE REPORT**

Further to your request for me to peer review marine and coastal impact assessment reports prepared for the Pilbara Iron Ore and Infrastructure Project proposed by Fortescue Metals Group for Port Hedland, I confirm that I have reviewed the following reports:

- (1) the DAL Science & Engineering Report (No. 389/1) on Marine Environmental Impacts and their Management; and
- (2) the Worley Report (No. 302/07100/a02) on Hydrodynamic modeling of FMG Conceptual layouts for Port Hedland Harbour.

I have based my review of both reports on the following experience:

- (a) over 30 years of consulting in marine and coastal impact assessment in WA, much of this in the Pilbara;
- (b) personal experience in Port Hedland having managed the Impact Assessment and Management and Monitoring Programme for the large (~12.5 M m<sup>3</sup>) harbour deepening and reclamation works undertaken by Mt Newman Mining in the mid 1980s, including the first Sea Dumping Application to the Commonwealth Government;
- (c) personal experience of having managed a couple of smaller maintenance dredging projects subsequently for the Port Hedland Port Authority (PHPA) during the late 1980s and early 1990s;
- (d) personal experience of having managed the Cargill Salt PER and EMP for Salt Pond Expansion (New Pond Zero) east of Port Hedland during the early to mid 1990s;
- (e) personal experience of having managed the recently completed Geraldton Port Enhancement Project PER and EMP and Dampier Port Authority Bulk Liquids Project EMP;
- (f) personal experience of having been a member of the EPA (2000-2002) and having been a major contributor to the EPA Guidance Statement on Protection of Benthic Primary Producer Habitats (BPPH) during my appointment;
- (g) knowledge of current URS projects in area which include:
  - annual monitoring of harbour sediment contamination levels for BHP Iron Ore since 1996;
  - annual monitoring of Cargill Salt ponds since 1992;
  - current assistance to PHPA with Sea Dumping Permit Application and EMP for maintenance dredging programme proposed for August 2004.

My comments on each of the reports are presented separately.

## Worley Report

Please note that I am not a mathematical modeler, but am very familiar with their application. I am also aware that all models should be validated and based on reasonable and justifiable assumptions.

The model used is a 2D model presenting one layer depth averaged in the vertical axis. Given that water exchange in the Port is primarily governed by macro-tidal forcing and that the creeks (which are the area of main interest for the impact assessment) are shallow, the use of a 2D model seems appropriate.

The model has been validated but using only published data from the navigation chart. The authors of the report note that a more precise (and hence reliable) calibration would require measured current data from near Anderson Point.

However, given that the key conclusions are reasonable (in my experience of previous capital dredging projects in Port Hedland), it is debatable if further calibration is required. The key conclusions are:

- (1) the proposed harbour deepening will have minor impact on maximum tidal currents and these impacts will be located to the vicinity of the dredging area;
- (2) the proposed rail loop culverts have been designed to not impede tidal and runoff flow from extreme rainfall events in the mangrove creeks which they span; and
- (3) inundation of the mangrove and tidal flats should not change significantly.

Given that there will be no restrictions to flow within the mangrove creeks either side of the proposed development, and given that tidal flat inundation is governed by tidal height and bathymetry/topography, there is no reason to suspect that hydrodynamics within the mangrove creeks will change as a result of the project.

Note, however, that I have not verified (nor am I qualified to do so) the calculations of the culvert size required to maintain tidal and runoff water flow.

In summary, the report reads well, competently addresses the issues of concern, and presents conclusions which appear logical and reasonable.

## The DALSE Report

I note that the DALSE Report does not address the issue of cumulative loss of mangrove habitat nor does it address the cumulative loss of benthic primary producer habitat, both of which are key issues. I understand that these issues are being addressed by Biota in a separate report. I therefore have not addressed these issues here.

Given the above, I have reviewed the DALSE Report and consider it to be professionally competent. It addresses the relevant issues adequately, and its conclusions are accurate, and recommendations are reasonable and justifiable.

The conclusion that water turbidity inside the harbour is not an issue and as such should not require monitoring accords with my and URS experience. The conclusion that sediments from Anderson Point are unlikely to be contaminated to levels considered unsuitable for offshore disposal also accords with URS experience.

The conclusion that FMG's proposed marine operations pose a relatively low risk of oil spill is in accord with PHPA experience. URS studies for BHP Iron Ore indicate that the greatest risk of oil spill is from unmanaged spills on the land that then drain to the harbour. As long as all drains from

land-based facilities are appropriately designed with interception traps, and oil handling activities on the reclaimed land are conducted in bunded areas, then the risk of oil spill from land operations should also be low.

The analysis of potential for acid sulfate soils has been conducted in accordance with recommended standards and guidelines, and there is no reason to doubt the findings.

The potential increase in risk of introducing marine pests to Port Hedland harbour is recognised, as is the need to cooperate with AQIS requirements and PHPA management procedures, especially in water hull cleaning at the berth, which is a known source of marine pests. Once markets for FMG's product have been identified, destination ports are known and source of bulk carriers has been identified, FMG could undertake a risk assessment of the potential for pests to be introduced from the ports and vessels that are chartered to load their ore and may be able to influence selection of low risk vessels.

The only weakness in the report (and this is recognised by the authors) is that neither the geotechnical nature of the materials to be dredged, nor the scope, scale and timing of works required to dredge the berths at Anderson Point is as yet defined. Hence no simulation or estimate of the zones of influence of turbid waters resulting from dredging are possible at present. Whilst turbid waters are unlikely to be of concern to the mangrove ecosystem within Port Hedland harbour, my experience suggests that they may potentially be of concern to the clearer water coral and tidal reef habitats which occur in front of Finucane Island and Port Hedland. The potential for impact will depend on whether or not these systems are impacted by turbid waters leaving the port on the ebbing tide and, if they are, on the period of exposure to turbid water.

The experience of Mt Newman Mining during the major capital works in the mid 1980s was that the calcarenite (in the harbour and channel) was very hard and contained red clay lenses which required dredging by large powerful cutter suction dredge. Given this experience and the suggestion in the report that dredging may occur over a 12 month period, I endorse the recommendation for further assessment of the potential turbidity impacts outside the harbour once the geotechnical works have been completed and the scale of dredging works confirmed.

I also endorse the recommendation of the need for careful management of the return water from the stilling ponds as release of additional water volumes at creek headwaters has the potential to cause creek bed and bank erosion if not managed appropriately. Such an impact was observed in the headwaters of Stingray Creek during the mid 1970s when reclamation of East Creek was underway.

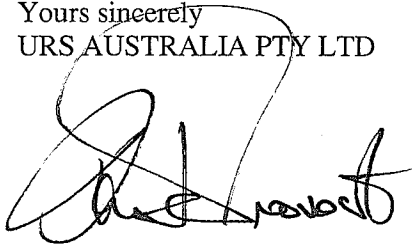
One potential impact that is not addressed in the report (and it may be addressed in the Biota report) is the potential for waterlogging of tidal flat soils adjacent to reclamation levees. URS experience from monitoring the effects of new salt ponds constructed on tidal flats at Port Hedland is that the hydrostatic pressure caused by the weight of water and soil overlying saturated tidal flats causes the waterlogging and salinisation of soils up to 150 m away from the levee. Any landward mangal exposed to this fringe effect is likely to die as a result of both waterlogging and increased salinity.

Therefore, the recommendation that a Dredging and Reclamation Management Plan (DRMP) be prepared once the geotechnical nature of the dredged material has been confirmed and the scope and scale of dredging activities and reclamation activities are better defined, is appropriate and justifiable. Given the industrial nature of the port, its long history of dredging and reclamation, its lack of conservation status, and the record of impacts from previous capital dredging works, I am comfortable that the lack of this Plan at present does not present a fatal flaw in the assessment and that the reclamation issues can be managed.

In summary, I repeat that the DALSE report is professionally competent and that its conclusions are accurate and its recommendations are justifiable. In particular, I commend the recommendation regarding the need to prepare a Dredging and Reclamation Management Plan.

I trust that the above comments are adequate for your requirements and will be pleased to provide clarification if necessary.

Yours sincerely  
URS AUSTRALIA PTY LTD

A handwritten signature in black ink, appearing to read 'Ian LeProvost', written over a faint circular stamp or watermark.

Ian LeProvost  
Senior Principal Environment