

† This document is a working appraisal of the proponent's cost benefit analysis of the proposal. As the project has developed, more information has been provided, which may supersede or respond to questions arising from earlier assessments. This working appraisal was prepared in May 2010 as an input into the Project Assessment Brief prepared by the Office of the Infrastructure Coordinator.

2009-10 INFRASTRUCTURE PIPELINE: ECONOMIC APPRAISAL WORKING ASSESSMENT

Project: East Arm Port Expansion (\$320 million capex May 2010)

Jurisdiction: Northern Territory Government

Date economic review conducted: 27 May 2010 (2 new GHD reports dated March and May 2010)

APPRAISAL TEMPLATE

BCR by Proponent excluding WEBs: 2.28 as per submission

Note: The BCR above is based on the formula: $((\text{Benefits-opex})/\text{capex})$, and would be approx. 1.82 if based on the following formula: $(\text{Benefits}/\text{Costs})$

1. Depth of supporting information

In December 2009, the Northern Territory (NT) provided a consultant's report on the economic appraisal, as well as an independent peer review report of the appraisal. This was supplemented in March 2010 with a consultant's report providing revised economic results and in May 2010 with a consultant's report reviewing the initial capital cost estimates.

2. Demand

Best estimate forecasts for current and potential producers were provided by the NT Government on a bottom-up, mine-specific basis, and subsequently applied in the cost benefit analysis (CBA) by consultants GHD. This is based on supply as opposed to demand for iron ore and other products. Explanation was provided on the costs contributing to the freight choice between alternative ports (in particular Adelaide, Darwin and Townsville).

There is potential that demand assumed to be exported through the Port in the absence of the expansion is understated, as it is assumed that the mine volumes will all be induced and only be exported if the expansion occurs. If this is the case, economic benefits attributed to the expansion could be overstated relative to the base case. The submission suggests, however, that due to the unevenness of exports from different mines of the Port, it is unlikely that new mines can become established without Port capacity of a reasonable level, due to economies of scale of production. The base case was discussed in Deloitte's Oct 09 peer review (p11), which suggests there may be options available to the new project case volumes that would allow them to be exported under the base case (e.g. ration port facilities to allow for partial mine production). As the underlying demand projections indicated some capacity would free up in different years as current mines reach their end of lives, however, Infrastructure Australia requested a sensitivity test where some of this capacity was taken up by the new mines in the base case as well. This has not yet been fully tested by the proponent.

A further significant assumption in the demand was that beyond 2016, the Port export volumes are maintained at a constant level. A sensitivity test was performed in the December 2009 submission to understand the impact if no new mines are identified (as opposed to assuming that volumes will be maintained at 2016 levels as assumed in the core analysis), which reduced the BCR by 16% but maintained a positive result (2.31 → 1.94).

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3. Capital costs/operating costs

In December 2009, only a high level split was provided for capital costs, with no supporting information or detail on the basis or source.

A capital cost review report was provided in May 2010, describing a staging process to increase Port capacity in different stages (i.e. second rail dump station and rail spur proceeding first). WT Partnership's 'high level' capital cost peer review indicates the order of accuracy of the cost estimate is +/- 30% given the 'lack of design input at this submission stage'.¹ (However the current BCR would still be above 1.0 if costs are increased by 30%.)

The GHD report incorporates a Monte Carlo analysis that indicates there is 90% certainty the capital cost will range between \$271-293 million (excluding contingency).² It is not clear if this represents a P90 value³. It is also not clear if GHD has considered a more appropriate contingency than the previous 10%, noting WT Partnership's comment: 'once Monte Carlo Simulation is run, a Design and Construction Contingency can be quantified'.⁴

Infrastructure operating costs (for rail track, road track and port maintenance) were not explained and no source was provided. It is not clear if it is P50/P90 or based on a proxy of current costs.

4. Quality of economic assessment methodology

The analysis is generally robust based on ATC Guidelines in relation to the costs and benefits included and valuation of the benefit of induced freight. The core benefit measures the change in surplus resulting from reduced transport costs due to the East Arm Port expansion. This was measured relative to the transport costs for mines to otherwise export through alternate ports a longer distance away from the mines being considered (e.g. Port Adelaide).

Shipping externalities were not included due to lack of data, however road externalities are included. While it may not be possible to estimate shipping externalities quantitatively, it suggests that the BCR is slightly overstated and may warrant qualitative reference.

5. Comparability and accuracy of the BCR

Port infrastructure projects are not easily applied to conventional transport appraisal methodologies. However, this appraisal broadly aligns with conventional appraisals. There are some departures that may result in an overstated BCR, including:

- Infrastructure capital costs appear to still be preliminary given the 'lack of design input at this submission stage'⁵, and maintenance costs may not be P90 estimates. This may result in costs being understated and the BCR being overstated
- The May 2010 capital cost review suggests that capital investment can be staged, which appears to result in a lower PV of capital costs given some is being delayed. This may increase the BCR.

¹ WT Partnership 2010, *Capital Cost Review*, 26 March 2010, p 1 (Appendix A to GHD's 2010 report)

² GHD 2010, *Capital Costs Review*, May 2010, p 9

³ WT Partnership 2010, *Capital Cost Review*, 26 March 2010, p 5 (Appendix A to GHD's 2010 report)

⁴ WT Partnership 2010, *Capital Cost Review*, 26 March 2010, p 4 (Appendix A to GHD's 2010 report)

⁵ WT Partnership 2010, *Capital Cost Review*, 26 March 2010, p 1 (Appendix A to GHD's 2010 report)

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- Export volumes in the Base Case may be understated if there is potential to ration port facilities to allow for partial mine production. The Base Case was discussed in Deloitte's Oct 09 peer review (p11), which suggests there may be options available to the new Project Case volumes that would allow them to be exported under the Base Case
- Port charges were not included in the transport cost, which may result in a slightly overstated BCR if Port of Darwin charges are higher than Adelaide charges (Note that GHD responded in December 2009 indicating its assumption is that there is no difference, though not providing evidence the costs are aligned across ports)
- Shipping externalities were not included and may be significant relative to rail/road externality costs, resulting in slight underestimation of the BCR
- The BCR ratio is calculated based on ATC Guidelines $PV(B-OC)/PV(IC)$, and is lower if calculated as $PV(B)/PB(OC+IC)$...See Table 1 below.

LIST OF POSSIBLE QUESTIONS

27 May 2010

The BCR is currently 1.82 or 2.28 (dependent on the BCR formula). This suggests that there is some room to adjust the appraisal in response to the queries below, and still maintain viable results:

- **CBA impacts from staging and GFC:** What is the impact on the CBA from the capital cost staging? It appears to reduce capex in a PV sense, however it would also appear that mine timing has been delayed due to the Global Financial Crisis and viability for export may have reduced altogether with lower prices.
- **Dredging costs:** Please confirm whether dredging costs required to export the volumes forecast in the Project Case are incorporated in the \$320 million capital cost? (Page 5 of the GHD Capital Costs Review report indicates it is a major cost consideration however it is not itemised in the costs on page 3)
- **Capex reliability and contingency allowance:** The GHD report incorporates a Monte Carlo analysis that indicates there is 90% certainty the capital cost will range between \$271-293 million (excluding contingency).⁶ It is not clear if this represents a P90 value.⁷ It is also not clear if GHD has considered a more appropriate contingency than the previous 10%, noting WT Partnership's comment: 'once Monte Carlo Simulation is run, a Design and Construction Contingency can be quantified'.⁸
- **Rationing of port facilities as alternative:** It would still be useful to understand whether there is potential to ration the Darwin port facilities to allow for partial mine production or delayed mine production (as an alternative to port expansion, or to delay the expansion).
 - To understand this it could assist to understand whether a mine looking to export been refused access to Port of Darwin due to capacity issues
 - It would also assist if there is possibility to model the Base Case under this assumption (i.e. when existing mines reduce/stop production, new mines are assumed to fill that capacity). Deloitte's peer review similarly recommend allocating port capacity on an 'economic efficiency' basis in line with this alternate approach.

⁶ GHD 2010, *Capital Costs Review*, May 2010, p 9

⁷ WT Partnership 2010, *Capital Cost Review*, 26 March 2010, p 5 (Appendix A to GHD's 2010 report)

⁸ WT Partnership 2010, *Capital Cost Review*, 26 March 2010, p 4 (Appendix A to GHD's 2010 report)

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WORKING NOTES

Further write-up on demand in the base case

Deloitte raised concerns in their October 2009 peer review that there may be options available to the new Project Case volumes that would allow them to be exported under the Base Case (e.g. ration port facilities to allow for partial mine production). Deloitte recommend allocating port capacity on an 'economic efficiency' basis in line with the alternate approach above. Also, a number of statements in the December 2009 submission support that this could be possible in the Base Case:

- p ii: possible impacts of port capacity constraints include 'delaying infrastructure investment in new mining projects'
- p.vi: reason given for keeping benefits/export levels constant beyond 2016 in the Project Case: 'some mines will close, and new mines realised over time, with a profile similar to that of recent history'
- p. 55: suggest port capacity is not that important in export decisions: 'assumptions made regarding timing of production are typically independent of immediate capacity at port – rather they are a reflection of time to raise equity and debt to fund development, confirmation of resources, construction time of the mine, and approval processes to produce. The overall time for this process is significant and can take a number of years'.

Further write-up on the implication of the BCR formula

Table 1 – indicative impact on results with alternate BCR equation

	(B-opex)/capex	B/C
Costs		
Capital outlay	351,125	351,125
Residual value	- 17,053	- 17,053
Rail track maintenance		90,193
Road track maintenance		68,830
Port maintenance		29,500
Externalities		
Road operating costs		
Rail operating costs		
Ship operating costs		
Total	334,072	522,595
Benefits		
Capital outlay		
Residual value		
Rail track maintenance	- 90,193	
Road track maintenance	- 68,830	
Port maintenance	- 29,500	
Externalities	- 65,871	- 65,871
Road operating costs	- 462,423	- 462,423
Rail operating costs	- 447,958	- 447,958
Ship operating costs	- 523,971	- 523,971
Consumer surplus	2,450,593	2,450,593
Total	761,847	950,370
NPV	427,775	427,775
BCR	2.28	1.82

Note: opex= infrastructure opex (e.g. Rail, road and port opex)