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**Connell Hatch's Response to the  
Queensland Competition Authority's Draft  
Decision - October 2004**

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## 1. Introduction

We refer to the Queensland Competition Authority's (The Authority's) Draft Decision on the Dalrymple Bay Coal Terminal (DBCT) Draft Access Undertaking (DAU) submitted by DBCT Management on behalf of DBCT Holdings.

We have reviewed the Authority's Draft Decision and the related Maunsell valuation reports. We have concerns about a number of matters, which we believe result in an underestimation of the DBCT DORC. We have concentrated in this report on those matters which we believe are significant and that we propose the Authority should reconsider. In the case of the shiploaders we have provided further information in support of the Authority's considered position.

We have concentrated on the following matters:-

- Rail Loop and Reveal – Dust Extraction System;
- Alleged Sub - Optimal Design Decisions. i.e., Stockyard Optimisation;
- Valuation of the Rail Inloader Systems;
- On - Costs – Contract Variations and Project Risks;
- Shiploaders; and
- Staging Costs/Growth Allowance

Each of these areas is considered in turn below and the potential impact on the final ORC figure calculated.

Based on the information provided below, we believe that the Authority has underestimated the DBCT ORC by at least \$38.0 million (before any adjustment for any staging costs that may be allowed) as follows:-

| Description                            | \$m         |
|--|-------------|
| Dust Extraction System                 | 1.9         |
| Stockyard layout                       | 27.4        |
| Rail Inloader Systems – Undervaluation | <u>8.7</u>  |
| Total Underestimation of ORC           | <u>38.0</u> |

Applying Maunsell's average depreciation discount (from ORC to DORC) of 26% results in an underestimation of the DORC amounting to \$28 million.

We have provided an additional summary at Appendix 1, based on (and comparing to) the summary provided in table 8.13 in the Authority's Draft Decision.

## 2. Item 1: Rail Loop and Receival – Dust Extraction System in RRP1

Maunsell has argued that, as the RRP1 dust extraction system is currently unused, it should be optimised out as redundant. The Authority accepted Maunsell's recommendation. We have previously argued that, although currently unused, the system is not in fact redundant. The Authority stated in its draft decision that:-

“DBCT Management...argue that it should not be optimised out, as a dust extraction system would be required for any new in-loading facility and because it (DBCT Management) is considering replacing and/or retrofitting the existing unused system”

The Authority may have mis-interpreted the argument raised by DBCT Management. In its letter to the Authority dated 29 September 2004, DBCT Management stated:-

*“It is correct that the RRP1 dust extraction system is currently not used, however a new rail receival pit could not be constructed without one due to EPA requirements for the site. As part of the next inloader upgrade, the current plan is to replace or retrofit an effective system to RRP1.”*

The following points of clarification are important:-

- If the DBCT facility was to be replaced, then under current EPA requirements RRP1 And RRP2 would require a dust extraction system to be fitted;
- This is a legitimate cost that would have to be incurred if DBCT was replaced and is a cost that the DBCT owners have in fact actually incurred;
- In the actual case of DBCT, the environmental requirements placed on the Owner to operate this facility dictate that a dust extraction system must be in place on RRP1 and on RRP2. This requirement **was** met by installing the appropriate equipment of the day;
- This equipment was installed in good faith as per the supplier's instructions but never worked in a satisfactory manner. When the system failed it was decided not to repair it immediately (as dust levels were within tolerable limits) but rather to make it operational at a later stage when the inloading system was being upgraded.

At the time of this report the system has not yet been made operational, as the most appropriate time to do so would be as part of an expansion of the Inloader facilities. We believe DBCT Management's decision to consider whether the option to make the existing system operational (rather than replacing it) is the appropriate and least cost option, as part of the Inloader 3 studies is a prudent approach. In our view, the Authority is, at the very least, being premature in its assumption that the dust extraction system will not be made operational and is therefore redundant.

Whilst Maunsell may argue that the dust extraction system on RRP1 is currently not operating, it is not redundant. There is an obligation for dust extraction equipment as has been installed. Notwithstanding whether or not the system is operated, the fact is that the investment was made, the system was installed and it is a statutory requirement for the operability of the coal facility at DBCT for which this ORC is being carried out. Any replacement cost valuation should include the value of all equipment required for the operation of the facility.

### **Conclusion:**

*The dust extraction system was installed at DBCT to meet the EPA requirements and the cost actually incurred. \$1.9 million would have to be spent if a replacement terminal with the same functionality was to be built. Further, no decision has been made to replace the actual equipment at DBCT and, in fact, it is likely to be retained, made operational and used. Any decision to declare the equipment as redundant at this stage is premature. Hence, using any practical definition of an ORC, the \$1.9m is a true and real cost which was incurred and should be included.*

### **3. Item 2: Sub-Optimal Design Decisions. i.e., Stockyard Optimisation**

In its draft decision, the Authority notes that Maunsell believes that, in the early years of the terminal's development, a less than optimum yard machine selection was made and that in particular the yard machine selection of Reclaimer RL1 in Stage 1 placed a number of constraints on the DBCT operation. The Authority notes in its draft decision that it has been reluctant in the past to optimise assets where hindsight judgement is made. However, the Authority has decided to optimise in this case as it accepts Maunsell's advice that the problems that eventuated should have been anticipated when the stockyard was originally designed (and therefore the decision to optimise is not based on hindsight). Importantly, Maunsell offer no detailed analysis as to why their opinion is any better informed than that of Connell Hatch and more importantly offer no compelling reason why their opinion in this regard, which has not been substantiated by thorough analysis, should be relied on by the Authority.

The Authority has decided to optimise the stockyard based on Maunsell's alternative layout but notes that Maunsell has not performed any simulation modelling to determine whether the alternative layout would deliver an equivalent service at the terminal.

In its response to the Authority's asset valuation request for comments paper, DBCT Management provided detailed reasons why it was not appropriate to optimise the stockyard layout and sought to convince the Authority that any optimisation could only, in fact, be based on hindsight.

We also note that Ports Corporation Queensland (PCQ), in its response to the Authority's asset valuation request for comments paper, urged that caution should be exercised in optimising out stockyard machines in circumstances where benchmarking studies indicate the terminal is operating in an efficient manner by world standards.

The responses submitted by DBCT Management and PCQ do not appear to have been considered. Maunsell's only comment on the submitted responses appears to be that it has reviewed the costs of its optimised system but did not change its view on its recommended stockyard optimisation. Neither Maunsell's nor the Authority provided any argument against, or critique of, the responses provided by DBCT Management and PCQ to the Authority's asset valuation request for comments paper.

We believe there is an inherent danger in optimising configurations (or indeed machinery on the subjective assertion of "over-design"), where the alternative configuration and/or machinery has not been tested under similar conditions to that on-site and has not been subjected to simulation modelling. Where there is significant doubt or where the effects of optimisation either cannot or have not been proved, we would have expected that optimisation would not occur.

We note, however, that the Authority stated in its draft decision that it would review its position on this matter if it could be demonstrated that the Maunsell alternative would adversely impact terminal capability in a meaningful way. DBCT Management has commissioned Dr Harry King of Sandwell, a world-renowned coal handling modelling specialist from Canada, to run simulation modelling comparing Maunsell's alternative stockyard layout with the current layout. This independent simulation modelling clearly shows that Maunsell's proposed layout would, in fact, reduce DBCT's capacity by 1.0 Mtpa and increase the loading time of ships by as much as 1.5 hours.

Attached is a presentation prepared by Sandwell which highlights the effects of utilising Maunsell's alternative configuration. As noted above, this clearly shows that Maunsell's alternative layout significantly reduces DBCT's capacity and efficiency. We consider this to be a significant impact and would therefore propose that the \$27.4 million value be added back into the Authority's ORC valuation of DBCT.

**Conclusion:**

*Dr Harry King's simulation modelling shows that the Maunsell alternative stockyard arrangement, with RL1 replaced by SR1a and with ST2 eliminated, reduced terminal capacity by 1.0 Mtpa and increased gross loading times per ship by an average of 1.5 hours.*

*We consider this to be a significant impact and would therefore propose that the \$27.4 million value be added back into the Authority's ORC valuation of DBCT.*

#### 4. Item 3: Rail Inloader Systems (Undervaluation)

We have reviewed the data provided by the Authority's adviser for each of the major costs shown for each area of their valuation.

As part of our review of the Maunsell valuation, we noted a significant difference between the base values provided by Connell Hatch, GHD and Maunsell for the two Rail Inloader systems. The figures quoted in each ORC valuation as per the Authority's draft decision are:

|   |             |
|---|-------------|
| Connell Hatch (Rail Receival and Rail Loop) = | \$39.0m *   |
| GHD (Rail Receival and Rail Loop) =           | \$34.1m **  |
| Maunsell (Rail Receival and Rail Loop) =      | \$21.6m *** |

See pages: \* 142, \*\* 143, \*\*\* 145 of the Authority's draft decision.

As can be seen, the Connell Hatch and GHD valuations are reasonably close, \$39.0m and \$34.1m respectively and are within 12% of each other. This is in stark contrast to Maunsell's valuation at only \$21.6m (i.e. 45% less than the Connell Hatch value). In an effort to resolve this issue we reviewed the latest cost estimates for the proposed new Inloader at DBCT (IL3). These estimates show a **base cost** (i.e. at feasibility stage and before the addition of any on-costs) of one rail inloader system of approximately \$25m (and therefore the base cost for two inloader systems, as is currently in place at DBCT, could be argued to be approximately \$50m).

Whilst we can appreciate that two rail inloaders built together will be cheaper than building one at a time (and hence our value of \$39m rather than \$50m) it is incorrect to effectively state that two separate and independent rail Inloaders can be constructed for the price of one.

Accordingly, we believe that the values used by Connell Hatch and GHD (\$39m and \$34.1m) are more accurate and representative of the true value than the Maunsell value of \$21.6m (which appears either to have been heavily discounted, with no apparent reason for such discount given, or has been used in error). If Maunsell and the Authority still consider the value currently ascribed to the Rail Inloader system by them (i.e. \$21.6m) is appropriate, we would recommend that the Authority consult further before any final decision is made. At the very least, we would like to understand why there is such a significant difference. Simply put, we do not think it possible to procure two Rail Inloader systems for use at DBCT for \$21.6m.

**Conclusion:**

*We believe that as Connell Hatch is the only valuer to have had recent experience of market values for this work at the actual site (designed to meet all the safety, EPA and statutory requirements) the Connell Hatch ORC of \$39.0m for the two rail inloaders at DBCT is likely to be the most accurate and should be used instead of the Maunsell figure of \$21.6m, which is less than the cost of one inloader. We believe that Maunsell has, in this case, underestimated the ORC by \$17.4 m. We suspect that the difference between the Connell Hatch and Maunsell valuation is included in the unexplained differences in the ORC as per figure 8.13 on page 156 of the Draft Decision. If this is the case, then the Authority has underestimated the DBCT ORC by \$8.2 m (i.e. half of the \$17.4 m).*

## 5. Item 4: On-Costs – Project Risk and Contract Variations

In prior submissions to the Authority DBCT Management and Connell Hatch has provided comprehensive information to support our position that an average value of 10% for project risk and a minimum of 10% for contract variations/scope creep should be applied to projects of DBCT's nature. We understand that different valuers may arrive at an asset valuation through different means and that it is difficult to accurately compare one valuation with another. This was the reason behind DBCT Management's proposal in its letters to the Authority dated 23 August 2004 and 29 September 2004 and in their e-mail dated 16 September 2004 to meet with the Authority and its valuer to discuss the on-cost issue. We provide further comment on on-costs below.

It should be noted from the outset that the two concepts (i.e. Project Risk and Contract Variations) are totally independent in nature and have different effects upon the project. Previous submissions (23 August 2004 and 16 September 2004) provided comprehensive information to support our position that an average value of 10% for risk and 10% minimum for contract variation/scope-creep should be applied for projects of this nature.

In our view, Maunsell's estimates (see page 141 of the Draft Decision) of an allowance of 2.5% for contract variations and 3% for project risk for mechanical and electrical assets is not based on hard data, or industry averages. Further, the allowance provided for project risk **and** contract variations for the civil and offshore assets of 15.2% underestimates these costs (as is discussed further below).

As noted in prior submissions, the valuation provided by Connell Hatch is based on estimates of base costs at what would be considered the Capital Estimates stage. Hence, sufficient allowances for project risk and variations/scope creep must be provided. None of the valuations (i.e. Connell Hatch, GHD or Maunsell) is based on detailed contractor estimates for each item of the design.

BHP Billiton, Rio Tinto, Xstrata and other major coal companies use values well in excess of 10% for both these on-costs at the Capital Estimates Stage. In DBCT Management's submission dated 23 August 2004, the following table was provided to illustrate the percentages that would be applicable at each stage of a project's development:-

| Contract Extras and Scope Creep |                        |              |
|---------------------------------|------------------------|--------------|
| Phase of the Work               | Extras and Scope Creep | Project Risk |
| Prefeasibility Stage            | 20% - 50%              | 10% - 25%    |
| Bankable Feasibility Stage      | 10% - 15%              | 10% - 15%    |
| Capital Estimate Stage          | 10%                    | 10%          |
| Award of Contract               | 3% - 7%                | 10%          |

In our view, adopting the low project risk and contract variation margins suggested by Maunsell implies that detailed tender documents have been put to the market, this is not the case.

Some clarification is also required with regard to the information previously provided to the Authority in relation to the actual experience at DBCT. In its Request for Comments paper the Authority noted that Maunsell state that if it could be demonstrated that the actual contract variations for civil and offshore works at DBCT were higher than 2.5%. Maunsell would revise upwards its ORC valuation. DBCT Management provided information that showed that the average actual contract variations experienced at DBCT for stages 2 to 6 was in the order of 15.2% (see Appendix 2). **This average covered all categories of work (i.e. not just civil and offshore works but including mechanical and electrical).** Indeed, if only civil and offshore work is included the average for contract variations increases to 18.2%. It should also be noted that this figure does not cover the project risk allowance

but rather only contract variations. In its draft decision the Authority has only allowed 2.5% for mechanical and electrical assets and 15.2% for civil and offshore work. However as noted above, at the very least, the 15.2% should apply to all categories of work.

### **Project Risk**

As discussed in prior submissions, Project Risk covers all of the other risks associated with a project not related to contract variations or construction creep. The appropriate amount for Project Risk differs from project to project and is based on:

- The project location;
- Logistics of the operation (i.e. close to a major capital city or very remote);
- Abnormal natural events (i.e. long hot summers creating a lack of water needed for construction or access over the sea due to rough weather);
- The possibility of adverse weather – limited construction months of the year, possible cyclonic damage or delays;
- The project size, complexity, uniqueness and its impact on the construction market;
- The state of the construction market: i.e., slow or volatile which effects:
  - The price of labour
  - The price of equipment
  - The price of material and
  - The extended construction period due to a lack of resources over a normal market;
- Economic and financial risk;
- Political and social risks;
- Environmental risk (very real at DBCT due to the EPA continually reassessing minimum requirements);
- Commercial and market risks;
- Legal and regulatory risks;
- Foreign exchange;
- Contractual risk (in this climate of litigation, legal claims by contractors seeking out of court settlements. This has occurred on several stages of work at DBCT and is a real and known risk which is impossible to specifically quantify); and
- Abnormal construction risk (i.e. abnormal geotechnical conditions being encountered or latent conditions).

We have previously provided information to the Authority indicating that a project risk percentage for DBCT of around 10% is appropriate. We have reviewed a number of projects that Connell Hatch have been involved in over the past 20 years, and note that the project risk margin applied to new projects at the Capital Estimates stage (which equates to the base valuation estimates provided by Connell Hatch) has been a minimum of 10-15%. It is the case that some projects have been considerably higher (i.e. more risky) due to location and political risk.

As well as applying different percentages for contract variations and project risks we note that Maunsell has adopted a different approach to Connell Hatch in applying other “on-costs”. We noted above that different valuers may adopt different valuation approaches and also note that the Authority makes a similar comment at page 155 of its Draft Decision. As a result, the Authority states that it:-

*“...has adopted a conservative approach to its asset valuation and added one half of the unexplained difference of \$65 million to its ORC valuation....”*

Without further discussion with Maunsell we will be unable to reconcile our differences in relation to approach and in particular to the calculation and application of appropriate on-costs. The authority’s approach, in applying half of the unreconciled difference to its ORC calculation could therefore be considered pragmatic under these circumstances.

**Conclusion:**

All items including mechanical and electrical works should, in our view, attract contract variation and project risk percentages of 10% and 10% respectively. At the very least, if these amounts are to be based on actual experience at DBCT, all items, including mechanical and electrical works should attract the average rate of 15.2% (although as noted above that rate does not include the Risk allowance, which is discussed further below).

We note, however, that different valuers may adopt different valuation approaches and that the Authority makes a similar comment at page 155 of its Draft Decision. As a result, the Authority states that it:-

*"...has adopted a conservative approach to its asset valuation and added one half of the unexplained difference of \$65 million to its ORC valuation...."*

Without further discussion with Maunsell, we will be unable to reconcile our differences in relation to approach and in particular to the calculation and application of appropriate on-costs. The Authority's approach, in applying half of the unreconciled difference to its ORC calculation could therefore be considered pragmatic under these circumstances.

**Potential Impact on Expansion of the Authority's Approach to Contract Variation and Project Risks**

It is possible that the differences in approach to the DORC valuation, especially in relation to on-costs, could, without appropriate clarification, have severe detrimental implications upon the timely expansion of DBCT.

In planning for expansion at DBCT, we believe that any prudent engineer would budget for contract variations and project risk percentages of greater than 10% each in the current environment.

Although 10% for each of contract variations and project risks was considered reasonable when the Connell Hatch DORC valuation was originally carried out, the current environment for infrastructure construction projects, backed by recent industry experience, would necessitate an allowance of greater than 10% for each of contract variations and project risks. As you would be aware, there are a large number of major infrastructure projects currently being undertaken throughout Australia. As a result, many of the costs associated with these projects are experiencing significant increases over relatively short time periods. For example, there is currently a shortage of skilled labour and raw materials (such as steel) resulting in upward pressure on labour costs and raw material costs. This upward pressure would need to be reflected in the on-cost allowances. We would estimate that in the current environment contract risk and project risk percentages of 15 - 25% and 10 - 15% respectively would be appropriate.

It is our view that any competent bank's engineer would also advise any lender to a DBCT expansion project to budget for contract variation and project risk on-costs in excess of 10% each.

On the surface, the Authority's valuer has determined on-cost percentages much lower than those which we believe would currently be considered reasonable for expansion at DBCT. As noted above, this may be due to different valuation approaches being followed.

Whether the On-Cost issue is relevant in relation to expansions will, of course, depend on the position that the Authority adopts in relation to including expansion costs (including expansion related on costs) in the regulated asset base. DBCT Management has informed us that it has requested clarification from the Authority of the process for including expansion costs and its treatment of budgeted and actual on-costs in the regulated asset base. We support the need for clarification, especially in view of the different approaches taken by the various valuers in the calculation of the DORC and its possible detrimental effect on the treatment of future expansion costs in the regulated asset base.

## 6. Item 5: Shiploaders

In strong support of the Authority's decision not to optimise the shiploaders, we draw your attention to the following supporting facts:

- i) It is not appropriate to take a "lowest cost", off-the-shelf, shiploader (for example, the Man Takraff machine) and then add features on to it which have the effect of compromising its structural stability, strength and serviceability. All of the operational, maintenance and functionality elements of these machines are designed in and cannot be retrofitted to a base "off-the-shelf" machine.

Maunsell's view that:-

*"...an allowance of 10% should be added to account for any site specific requirements omitted from the functional design specification"*

is akin to paying 10% more for extra accessories for your Hilux ute and calling it a Mack truck. It overlooks and diminishes the argument of "fit for purpose" and minimises the fact that these machines are designed to fulfil a specific purpose and built to do a very specific job in a very specific environment. These are not generic shiploader machines standing on the shelf, as such machines would **not be** fit for purpose at DBCT. All machines have to be purpose designed and built from the ground up or any true functionality would be lost.

- ii) Maunsell's reasoning to allow only one shiploader to have the ability to load ships to a beam width of 55 metres immediately restricts the mix of shipping, and the ability to load large ships at each wharf and hence reduces the overall capacity of the outloading system.

The operational flexibility / reliability and efficiency provided by the purpose built and designed shiploaders translates directly to terminal throughput tonnage. In the past when the capacity of the terminal has been under pressure, these factors have all translated into maximising the terminal throughput.

- iii) The current SL2 and SL3 shiploaders are designed to be upgraded to 8650 tph which is required for the next upgrade. Without this inherent (albeit at a relatively modest cost) additional capacity the shiploaders would severely constrain the capacity of the terminal in the next planned upgrade.

In its Draft Decision the Authority noted that it:-

*"understands there are serious reservations about terminal expansions relying on upgrade to these outloading systems and, therefore, there is a reasonable prospect that the potential of the Shiploaders will not be fully realised"*

Work has recently been completed for a comprehensive and detailed report on the matter titled "DBCT – MP03 Concept Study – Upgrade of Outloading Systems 1 and 2, Prime Infrastructure, 26 October 2004" as part of the next stage expansion planning. This work concludes (after much research and consideration of other options) that the upgrade of the outloading systems 1 and 2, which includes the shiploaders is highly desirable and cost efficient and produces an increase in capacity of 5 Mtpa when coupled with the strategic yard machine upgrades.

**Conclusion:**

*We believe that we have demonstrated that the shiploaders at DBCT have not been over designed and in fact are appropriate for the service they provide and the environment in which they operate. Further, the shiploaders will be upgraded to utilise their in-built capacity. Finally, in our view, Maunsell's opinion on the optimisation of the shiploaders has not been, and cannot be, substantiated.*

*In our view, therefore, the Authority has acted appropriately and fairly by not applying any optimisation with regard to the shiploaders.*

## 7. Item 6: Staging Costs/Growth Allowance

DBCT Management's DORC valuations did not include an amount relating to staging costs but assumed a single stage construction with what was termed an allowance for growth. This was in view of the fact that if a terminal was to be built at DBCT today, it would be built to a higher capacity than the current terminal (i.e. excess capacity would be built in to allow for growth). The Authority disallowed this allowance as:-

*"...the Authority accepts Maunsell's view that there should be no provision in a DORC valuation to assign values to assets that do not exist in order to accommodate expected capacity requirements in the future" (page 170 of the Draft Decision).*

DBCT Management had also submitted that an alternative valuation method would be to recognise that the DBCT asset had been built over a number of stages following an efficient investment path, therefore staging costs could be applied as an alternative to the "allowance for growth".

In response the Authority stated in its Draft decision (page 168) that:-

*"The Authority accepts that DORC is a forward looking assessment of an asset's value based on the replacement of an existing asset in the most efficient way possible. However, the Authority is also of the view that facility owners should be recompensed for costs that are reasonably and efficiently incurred. In this instance, however, the Authority agrees with the DBCT User Group that it is relevant to take account of past Government pricing practices and the fact that the facility was purchased in its fully developed state. Accordingly, the Authority supports valuation on a single stage basis."*

In short, the Authority appears to be disinclined towards a growth allowance as the cost related to the additional "growth" capacity has not been incurred but does not support allowing staging costs despite this being a cost that has in fact been incurred. The issue appears to be one of regulatory judgement rather than engineering, however, we offer the following comments:-

- No terminal of DBCT's capacity has ever been built in one stage, and it is unlikely that one would be. In other words, staging costs will always be incurred when building a terminal of DBCT's size. Thus any competitive facility would include costs associated with staging;
- We do not understand why the fact that the terminal was purchased in a fully developed state is relevant to a DORC valuation. A DORC valuation is attempting to measure the replacement cost and any sale/purchase should be irrelevant.

Further as we noted at page 24 in our report to the Authority dated 2 February 2004:-

*"As it is usual (and capital efficient) practice for a terminal like DBCT to be built in stages then if a market for the sale and purchase of such terminals was to exist, any sale/purchase would include the efficient cost of staging"*

In our view, it is reasonable to include the efficient cost of staging in the DORC valuation.

## 8. Conclusion

Based on the information provided above, we believe that the Authority has underestimated the DBCT ORC by at least \$38.0 million (before any adjustment for any staging costs that may be allowed) as follows:-

| Description                            | \$m         |
|--|-------------|
| Dust Extraction System                 | 1.9         |
| Stockyard layout                       | 27.4        |
| Rail Inloader Systems – Undervaluation | <u>8.7</u>  |
| Total Underestimation of ORC           | <u>38.0</u> |

Applying Maunsell's average depreciation discount (from ORC to DORC) of 26% results in an underestimation of the DORC amounting to \$28 million.

We have provided an additional summary at Appendix 1, based on (and comparing to) the summary provided in table 8.13 in the Authority's Draft Decision.

# ***Appendix A***

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*ORC Summary*

**Appendix A – ORC Summary**

For ease of review, the following summary is based on table 8.13 in the Authority's Draft Decision.

|  | ORC Value per Draft Decision | Proposed Revision as Per this Report |
|--|------------------------------|--------------------------------------|
|  | <i>Differences</i>           |                                      |
| <b>Connell Hatch ORC</b>   | <b>1,090.0</b>               | <b>1,090.0</b>                       |
| <b>Optimisation of Over-Designed Items</b>   |                              |                                      |
| Outloading – Surge Bin 2   | 0.0                          | 0.0                                  |
| Outloading – Shiploaders   | 0.0                          | 0.0                                  |
| <b>Total Over-Designed Items</b>   | <b>0.0</b>                   | <b>0.0</b>                           |
| <b>Optimisation of Redundant Items</b>   |                              |                                      |
| Rail Loop & Receival – Dust extraction system in RRP1  | -1.9                         | 0.0                                  |
| <b>Total Redundant Items</b>   | <b>-1.9</b>                  | <b>0.0</b>                           |
| <b>Optimisation of Sub-Optimal Design Decisions</b>  |                              |                                      |
| Stockyard – Conveyor S6A   | -1.3                         | 0.0                                  |
| Stockyard – S6/S6A Transfer Station  | -0.9                         | 0.0                                  |
| Stockyard – Conveyor S6  | -5.3                         | 0.0                                  |
| Stockyard – Stacker/Reclaimer SR1A replacing Stacker ST2 and Reclaimer RL1                   | -15.0                        | 0.0                                  |
| Stockyard – Electrical   | -1.1                         | 0.0                                  |
| Stockyard – Bulk Earthworks – Stage 5  | -1.4                         | 0.0                                  |
| Stockyard – Stage 5 Drainage   | -2.4                         | 0.0                                  |
| <b>Total Design Decision</b>   | <b>-27.4</b>                 | <b>0.0</b>                           |
| <b>Items Valued in Excess of Their Current Capability</b>                                    |                              |                                      |
| Outloading – Surge Bin 1   | -5.5                         | -5.5                                 |
| Inloading – S1 Conveyor  | -0.9                         | -0.9                                 |
| Inloading – S2 Conveyor  | -0.9                         | -0.9                                 |
| Inloading – S3 Conveyor  | -0.9                         | -0.9                                 |
| Inloading – S4 Conveyor  | -0.9                         | -0.9                                 |
| Stockyard – Bund Fitout  | -8.4                         | -8.4                                 |
| Stockyard – Conveyor R1  | -0.5                         | -0.5                                 |
| Stockyard – Conveyor R2  | -0.5                         | -0.5                                 |
| Stockyard – Conveyor R3  | -0.5                         | -0.5                                 |
| Stockyard – Conveyor R4  | -0.5                         | -0.5                                 |
| <b>Total Items Valued in Excess of Their Current Capability</b>                              | <b>-19.5</b>                 | <b>-19.5</b>                         |
| <b>Other Adjustments</b>   |                              |                                      |
| Electrical – Computer Systems  | -16.1                        | -16.1                                |
| Rail Loop & Receival – Water services in RRP1 and RRP2                                       | -0.8                         | -0.8                                 |
| Rail Loop & Receival – Preliminaries, conveyor footings and substation buildings in RRP1 and | -3.2                         | -3.2                                 |
| Outloading – Supply and installation of sample plant in Surge Bins 1 and 2                   | -3.6                         | -3.6                                 |
| Outloading – Berth 3 dredging preliminary expenses   | -8.4                         | -8.4                                 |
| <b>Total Other Adjustments</b>   | <b>-32.1</b>                 | <b>-32.1</b>                         |
| <b>Total Other Adjustments</b>   | <b>-1.6</b>                  | <b>-1.6</b>                          |
| <b>Differences</b>   | <b>-82.5</b>                 | <b>-53.2</b>                         |
| <b>Total Unexplained Differences before correction for Inloader System</b>                   | <b>-64.7</b>                 | <b>-64.7</b>                         |
| <b>Correction for Undervaluation of Inloader System</b>                                      | <b>0.0</b>                   | <b>17.4</b>                          |
| <b>Total Unexplained Differences after correction for Inloader System</b>                    | <b>-64.7</b>                 | <b>-47.3</b>                         |
| <b>Authority's Base ORC Valuation</b>  | <b>942.8</b>                 | <b>989.5</b>                         |
| <b>Authority's ORC Valuation plus half the Unexplained Difference</b>                        | <b>975.2</b>                 | <b>1,013.2</b>                       |

# ***Appendix B***

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***Sandwell Stockyard Configuration Presentation***

**Sandwell**

A faint, light blue world map is visible in the background of the slide, centered behind the text.

# DBCT Stockyard Optimisation: Stacker ST2 versus Stacker/Reclaimer SR1a

Dr. Harry King, P.Eng.  
Sandwell Engineering Inc.

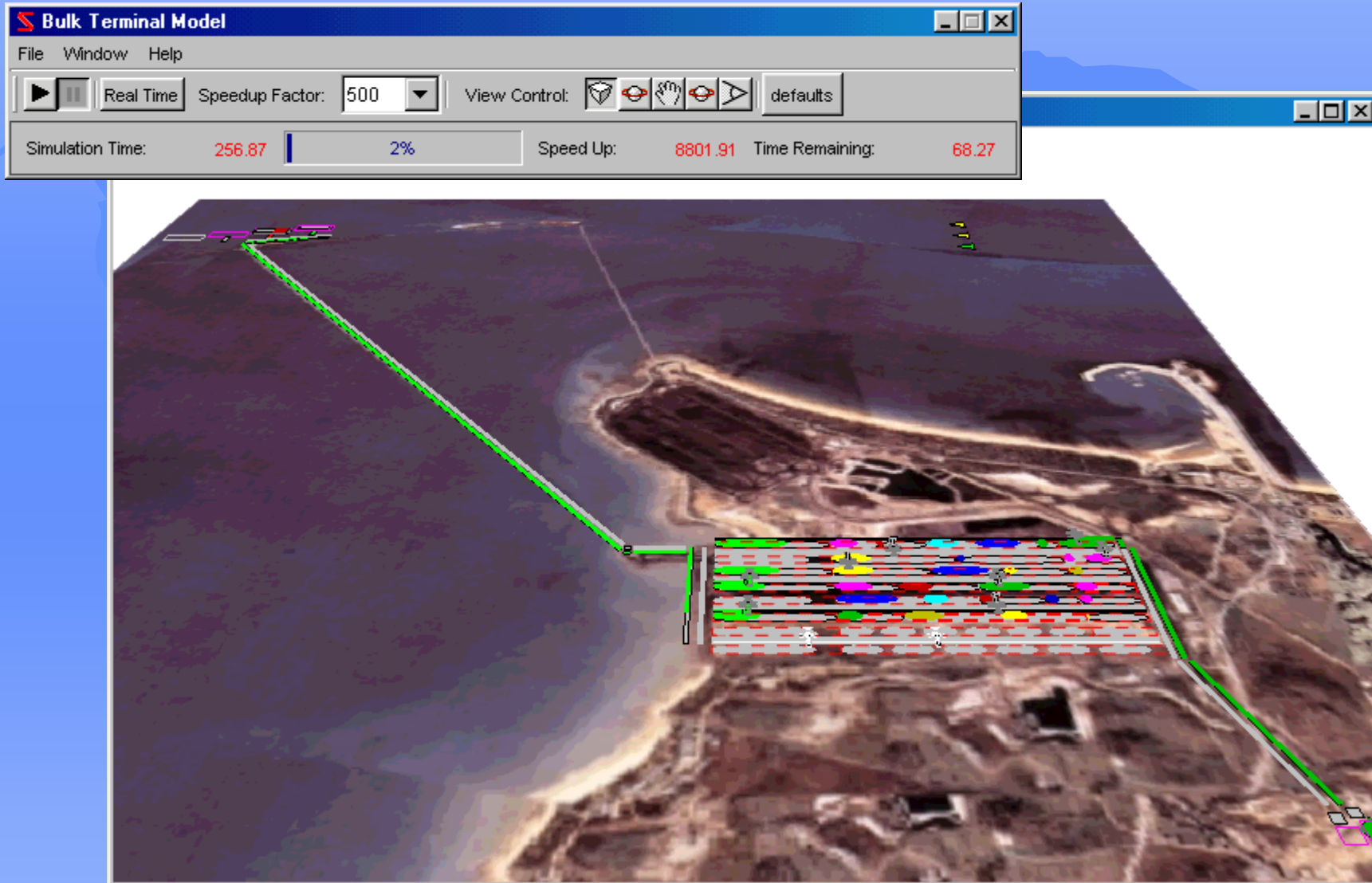
## The Issue

- ◆ A study by Mansell Australia has suggested that the DBCT stockyard could have been optimised by replacing reclaimer RL1 by a new stacker/reclaimer (named SR1a), which would have made the addition of stacker ST2 in Phase 5 unnecessary.
- ◆ This observation ignores the fact that ST2 provides an *independent* route for coal to Row 1 of the stockyard. In other words, with ST2 it is possible to stack to Row 1 while both SR1 and RL1 are reclaiming. Without ST2, it would be necessary to interrupt one of these reclaiming operations in order to stack.

## Evaluating the Proposed Stockyard

- ◆ The proposed stockyard with SR1a instead of ST2 places a restriction on terminal operations. The effect of this restriction depends on how often it is necessary to stack to Row 1 at the same time as both SR1 and SR1a are engaged in reclaiming (and there are no alternative reclaiming routes that could be started). If this situation was infrequent, it would have no effect on throughput capacity and Maunsell's conclusion would have been valid.
- ◆ It was possible to decide this question by the use of Sandwell's simulation model for DBCT.

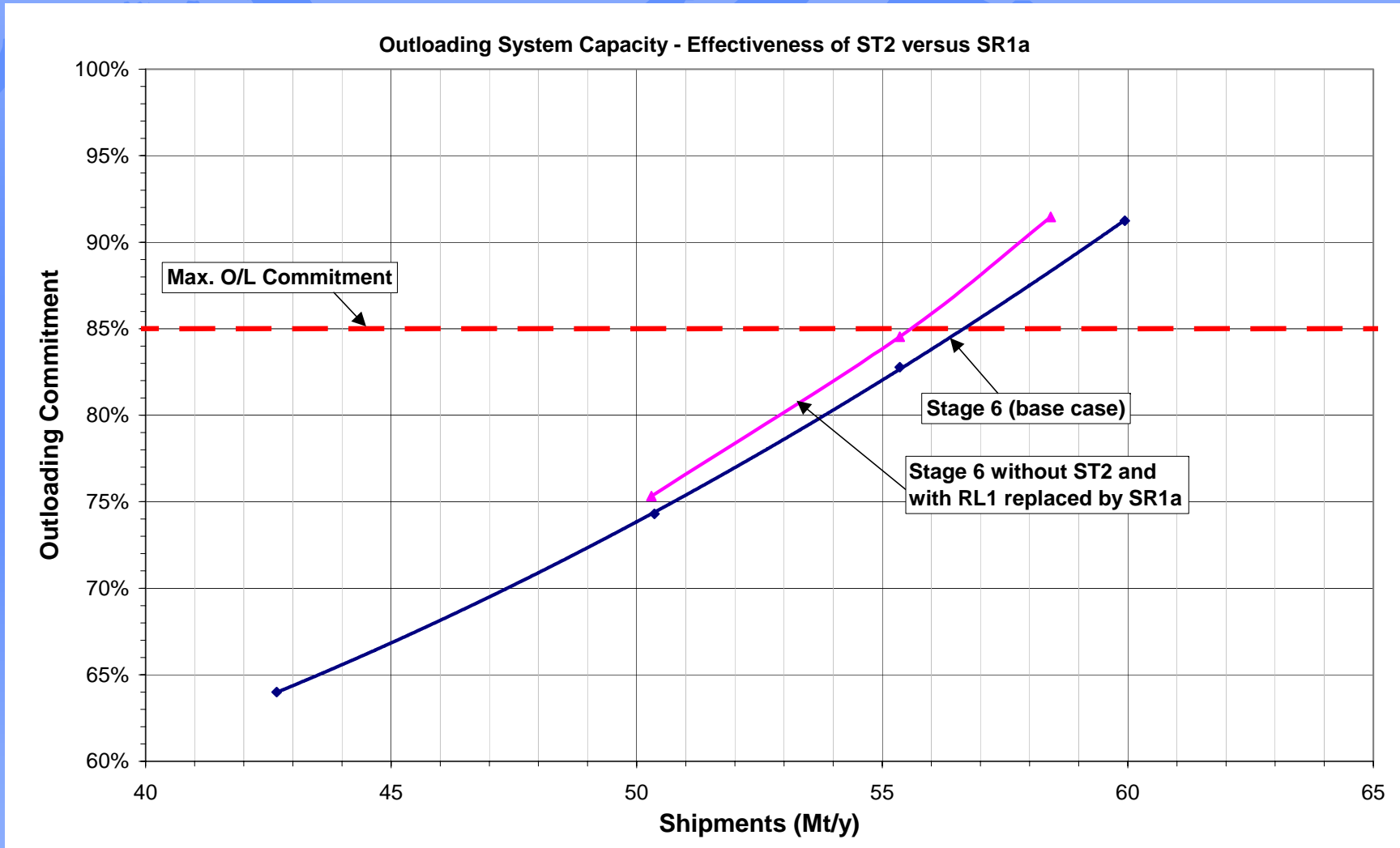
# DBCT Simulation Model



## Evaluating the Proposed Stockyard (continued)

- ◆ Simulation runs were made for the two alternatives:
  - Stage 6, the base case, with ST2
  - Stage 6 with RL1 replaced by SR1a and with ST2 eliminated
- ◆ Simulation runs were made at 50, 55, and 60 Mt/y to determine the throughput at which the terminal outloading system became a bottleneck (taken to be 85% commitment).

# Outloading System Capacity



## Conclusions

- ◆ Terminal outloading capacity for Stage 6 is 56.5 Mt/y
- ◆ The alternative stockyard arrangement with RL1 replaced by SR1a and with ST2 eliminated was found to reduce terminal outloading capacity by 1.0 Mt/y to 55.5 Mt/y.
- ◆ Gross loading times were increased by the alternative stockyard by an average of 1.5 hours per ship.