



DBCT DORC Valuation

GHD's Response to Connell Hatch's Comments on User Group Submission

8 March 2004

Executive Summary

The following document provides specific responses to comments made by Connell Hatch on the independent report prepared by GHD for the DBCT User Group regarding the valuation of the Dalrymple Bay Coal Terminal.

The key points that can be drawn out of this response are:

- ▶ A lack of detailed information available to GHD has not resulted in a DORC valuation of questionable accuracy. Specific details of existing built infrastructure were not needed to form an accurate and optimised design that meets all site constraints.
- ▶ GHD has demonstrated the credentials of the key staff involved in this valuation. They are considered exemplary and more than appropriate for this project.
- ▶ GHD's Replacement Valuations are robust and strongly defended. They include all allowances generally accepted as fair and reasonable in a valuation of this nature. They have been compared and confirmed with both external parties and published stage 6 estimates and found to be highly accurate.
- ▶ The configuration of the existing terminal is highly inefficient. GHD has been the only party to confirm this through robust modelling of an optimised configuration. The major variation in the optimised configuration from the current configuration is the stockyard and berthing arrangements. Rail receivals and outloading are similar to the existing terminal.
- ▶ GHD's DORC valuation is not a Greenfields valuation. It is in fact a Brownfields valuation, which is in line with QCA expectations. Optimisation has been conducted at the system level (receivals, stockyard, outloading) rather than the asset level, because to optimise at the asset level would still leave gross inefficiencies.



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The following document provides specific responses to comments made by Connell Hatch¹ on the report prepared by GHD² for the DBCT User Group regarding the valuation of the Dalrymple Bay Coal Terminal.

It should be noted that CH have commonly repeated the same assertion throughout their report. GHD has endeavoured to provide a response that addresses an assertion once. Reference is made in italics to the pages of the Connell Hatch (CH) report where CH has made comments that are being addressed by the responses.

1. Background Information

Ref. CH report Pages 16,33,45,57

As stated in GHD's valuation report, the availability of detailed background information on the existing infrastructure was limited, mainly because DBCT User Group had little success obtaining details from the terminal lessor. The DBCT User Group made many requests to Prime Infrastructure (PI) for the provision of drawings and other information to assist with GHD's valuation. But no information was provided. After several requests, Prime did facilitate a site inspection by GHD, which provided valuable background.

Despite the lack of detailed information, an appropriate cost estimation methodology was able to be applied by:

- ▶ Developing a tabulated code of work scope arising from the flow sheet and handling rates definition,
- ▶ Using prevailing unit rates against broad quantities; and
- ▶ Using lump sum allowances, based on the facility requirements and equivalent costs expended on similar projects.

GHD, as a professional and reputable engineering company, has confidence in both the methodology it has applied and the resulting valuation.

¹ Refer 'Comments on the Asset Valuation Component of the DBCT User Group's Submission to QCA including the GHD report for Prime Infrastructure' report of 2 February 2004 by Connell Hatch (Reference H18615co/OCW.lsb)

² 'Dalrymple Bay Coal Terminal Infrastructure Valuations' report dated August 2003 by GHD (Reference No. 41/12163/00/65465)



2. GHD's Experience

Ref. CH report Page 51

GHD does not accept CH's assertion about GHD's experience. As stated in GHD's valuation report, GHD has considerable experience with bulk material handling terminals. Furthermore, it and its staff have significant experience with offshore terminals, including DBCT. And as discussed as follows, some of those staff directly assisted with GHD's valuation of DBCT.

Brian Mahony: Brian was Project Director for the Stage 2 of the expansion of Kooragang Coal Terminal in Newcastle NSW, and undertook various roles in the development of Kaltim Prima Coal's Pinjang Coal Terminal in East Kalimantan, Indonesia, and Manjung Coal Terminal in Malaysia. The latter two terminals are offshore coal terminals such as DBCT. For GHD's valuation of DBCT, Brian prepared the optimised design, supervised the modelling, and prepared the cost estimates.

Peter Searle: Peter was technical adviser to the Ports Corporation of Queensland for the Stage 2 expansion of DBCT. Peter is manager of GHD's Marine division in Brisbane, which reviewed rates for the marine component of the valuation.

Chris Jones: Chris, when working for the Department of Harbours and Marine, was the Offshore Construction Engineer for Stage 1 of the DBCT development, undertook the original design of the Hay Point Tug Harbour, and managed trial blasting and development of trial quarry at Mt Griffith. For GHD's valuation, Chris reviewed rates for the marine component.

John O'Connor: John was Site Construction Manager for Stages 1-2 of the development of DBCT. John provided some input into the valuation

3. Replacement Cost Estimation

3.1 Estimation rates

3.1.1 Project risk and construction growth

Ref. CH report Pages 12,22,33,39

Unit rates and lump sum allowances that GHD has utilised are generally 'middle-of-the range' sale prices (i.e. final cost to owner) experienced on similar projects, adjusted to suit the DBCT location and environment. As such they incorporate allowances for construction growth and project risk, some of which is borne by the contractor and as such are included in the sale prices. They produce an overall estimate of average cost that a project is expected to be delivered for. Some total project costs may end up higher, and some lower. It may be appropriate to estimate a higher cost for budget and feasibility purposes, but not for valuations.

CH's comments that GHD did not allow for construction growth or project risks are therefore unfounded.

It should be noted that more and more of the project risks referred to by CH (such as industrial relations, latent conditions, accidents and litigation, environmental spills, supply issues and abnormal weather conditions) are being placed upon the contractor, and being reflected in the tender rates. Therefore CH



should not be adding additional allowances for such project risks to the base contract prices it claims it has been using.

CH's reference of the 'Cost Estimation Handbook for the Mining Industry' as a basis for the added allowances for construction growth and project risk is considered confounding for the following reasons:

- ▶ This does not appear to be originally mentioned in CH's valuation report;
- ▶ It is not clear where in the handbook the 10% allowances are recommended;
- ▶ The handbook is not considered as the industry authority on cost estimation; and
- ▶ It appears the handbook is aimed at preparing preliminary stage costing for future projects, and is not related to valuation of existing infrastructure. Page 5 of the handbook states, "an estimate produced using the book properly generates a preliminary estimate for a prefeasibility study level of accuracy ($\pm 25-30\%$)."

3.1.1 Marine facilities

Ref. CH report Pages 23,33,39

CH incorrectly asserts a number of times that GHD's valuation excludes allowances for conditions relevant to DBCT. GHD states its valuation report that "unit rates and lump sum allowances have mainly been based on the construction costs for the development of Stages 2 and 3 of the Kooragang Island Coal Terminal development, **adjusted upwards** to suit the valuation date and the Central Queensland environment".

GHD's costing of the marine facilities allowed for cyclonic, tidal, and environmental conditions pertinent to DBCT. As mentioned in Section 2, GHD staff who have particular experience with DBCT and similar type marine facilities particularly reviewed the costing for the marine component of the valuation. As part of this review, they referenced experience from earlier stages of the DBCT development, plus costs from recent similar projects (such as the West Angeles wharf extension project at Cape Lambert, WA) in Australia. Initial estimates were revised to suit this review.

GHD's approach can be illustrated and substantiated as follows:

- ▶ For instance, Kooragang Island Coal Terminal berth costs were <\$50,000/metre in 1996. GHD has allowed about \$110,000/metre for DBCT in allowing for site conditions, as well as inflation. In addition to these unit rates, GHD has made substantial allowances for protection of the marine environment, eg the provision of 'return to shore' slurry handling plant to return spillage to the land based water management system.
- ▶ The estimate prepared by GHD for Stage 6 using this approach closely matched the published value of these works. If GHD had not made such allowances for DBCT, this would not have been achieved. This and the fact that Stage 6 comprised a new berth and shiploader provides further support for GHD's costing of marine facilities at DBCT.

3.1.2 Source costing data

Ref. CH report Pages 23, 51,53,58

As stated in its valuation report, GHD has utilised unit rates and lump sum allowances that have mainly been based on construction costs for the development of Stages 2 and 3 of the Kooragang Coal



Terminal development, adjusted upwards to suit the valuation date and the Central Queensland environment. The word 'mainly' is highlighted. It is not 'solely' as implied by CH. As mentioned in the previous section, GHD reviewed and adjusted rates to suit cyclonic, tidal, and environmental conditions pertinent to DBCT, taking into account knowledge of costs from earlier stages of the DBCT development, plus costs from recent similar projects in Australia.

While there are invariably site specific differences between bulk commodity terminals, there are large elements of commonality in design, equipment and costs. The mere existence of standard costing manuals such as the 'Cost Estimation Handbook for the Mining Industry' referred to by CH supports this fact.

3.1.3 Level of detail

Ref. CH Report Pages 12,51,52,54,55,57

CH frequently made comments concerning the level of detail in GHD's valuation. As mentioned in GHD's valuation report, the absence of detailed design drawings (refer Section 1) required the adoption of an approach that erred on the side of higher rather than lower valuations. This approach involved using prevailing unit rates against broad quantities, together with lump sum allowances based on the facility requirements and equivalent costs expended on similar projects. Previous coal terminal estimates by GHD using such an approach have generally been validated by actual project costs. GHD continually updates its costing database with actual costs, ensuring that this methodology can continually be successfully applied.

The calibration of the broad-based estimates against the published costs in the Information Memorandum provided additional confidence to GHD in their approach, as did the validation of cost estimates as discussed later in Section 3.4.

In conclusion, GHD confirms its confidence in its valuation of DBCT.

3.2 Assets valued

Ref. CH Report Pages 6,12,16,33,38,39,41

CH has made assertions that GHD's valuation has omitted assets. These assertions are not correct. The position is as follows:

- ▶ Conveyor C1 at the rail receival facility has been included in the Rail Works (Dump Hopper) section, under items for either "Conveyor C1" or "Hopper Conveyors".
- ▶ Contrary to CH's claim, an allowance for Computer / Control systems has been included for each item of the Estimate that would require a PLC (under the 'Elec Control' column of the cost estimate spreadsheets). An allowance for a Control Room with the master PLC is provided under 'Buildings'.

There appears to be some confusion over the Industrial Dam. Based on advice provided during GHD's site visit and from GHD staff previously involved with the DBCT development, it is understood that the dam was initially excavated to provide fill for the site. The \$3.8m allowance for the Industrial Dam for the DORC was to cover additional work to convert the excavation into a dam, such as wall construction, pipework and pumping system etc. It is however acknowledged that this amount has inadvertently been omitted from the replacement cost estimate of the existing terminal.



Ref. CH report Pages 41,42

CH has presented some tables which endeavour to compare CH's and GHD's cost estimates for selected items. On review of the tables, GHD has noted that, in many cases, not all related cost taken into account by GHD has been shown. For instance on page 41, with the Fenders, Berthing & Mooring Dolphins item, the sum of relevant costs estimated by GHD is \$51.5m, not \$20.8m as shown by CH. Another example on the same page is for the Surge Bins, in which the sum of relevant costs (for Transfer Houses, Sample Plant, and Surge Bins) estimated by GHD was \$14.2m, not \$3.2m as shown by CH. These discrepancies demonstrate flaws in CH's attempt to compare costs in its tables.

3.3 Mt Griffith Quarry

Ref. CH Report Page 58

CH stated that the rock from the excavation at Mt Griffith was not used for the construction of the Tug Harbour at Hay Point, as it was found to be inappropriate as rock armour. GHD information confirms that the rock was deemed unsuitable for face armour purposes. However it was still used for other parts of the tug harbour construction, and therefore the excavation costs are appropriately excluded from the valuation.

3.4 Validation of Cost Estimates

Ref. CH Report Pages 33,36,53

The costing data that GHD utilised has been developed over years from actual projects. Therefore there was little need to validate those rates again. Nevertheless, budget pricing from Krupp was obtained to check some of these rates.

What was more important was to validate the combined costing methodology and data, i.e. what is the appropriateness of the resulting valuation. The soundness of GHD's approach was demonstrated by the following:

- ▶ GHD estimated the cost of Stage 6 of DBCT to within five percent of the published actual project cost; and
- ▶ GHD estimated the costs of the first five stages of development of the terminal to within six percent of the indexed historical cost.

3.5 Preproduction Interest

Ref. CH Report Pages 17,37

Although GHD has allowed for a 36-month construction period, shorter periods of construction are achievable. For instance, the Carrington Coal Terminal in NSW was built in 27 months, with coal being loaded at the terminal 18 months after construction commenced.



3.6 Predevelopment Allowances

Ref. CH Report Page 55

Predevelopment costs cover the studies and investigation work required prior to the granting of project approvals, such as EIS preparation and related studies, prefeasibility and feasibility studies, project definition study, geotechnical investigation, land survey and permit applications.

3.7 Spares

Ref. CH Report Page 33

CH's spares inventory cost of \$23m reflects the non-optimised nature of the staged development (eg the existence of 10 large spare drives at \$400,000 each). This suggests that DBCT lacks standardisation in its plant and equipment, and therefore requires a larger number of spares. The resulting extra costs due to such should not be included in a DORC valuation.

It is acknowledged that the extent of depreciation of spares could be lower than allowed for by GHD. However, zero depreciation, as adopted by CH, is inappropriate. Firstly, there is some physical deterioration of spares while not in use. For instance, bearings commonly suffer long-term creep. Secondly, the economic life of spares can be quite limited due to changes in plant and equipment.

3.8 Previous Construction Prices

Ref. CH Report Page 47

GHD's experience is that the productivity improvements in the construction industry have led to a more efficient and competitive industry in recent years compared with the high inflation and industrial cost regime of the 1980s.

4. Depreciation

4.1 Asset Life

Ref. CH Report Pages 14,29,46,56

For asset depreciation, GHD has taken into account the residual economic life of the physical asset. By limiting this to a maximum of 50 years as proposed by CH, there is greater depreciation.

5. Existing Terminal

5.1 Cost of Facility

Ref. CH Report Page 47

GHD is not aware of any information substantiating CH's comments that DBCT is recognised as one of the lowest cost facilities in the world, and not sure if they are referring to operating or capital costs. If the determined DORC value was anywhere near the value CH has determined, then their statement will unlikely apply to the capital cost component, i.e. the access charge.



The question over the cost effectiveness of the existing terminal is particularly valid when it is compared with an optimised terminal as proposed. Should CH's valuation of the DBCT be adopted, the users could be faced with higher usage costs.

5.2 Configuration

Ref. CH Report Page 49

It is understandable that DBCT has its current configuration, as it was developed over 6 stages to suit expansion decisions based on the market during that time. But CH's defence of the existing configuration efficiency is flawed, considering that an optimised design has been shown to require less machine bunds, conveyors and stacker and reclaimer machines, and one less shiploader (refer Section 5.3). Because of this, the existing terminal has significantly higher capital and operating costs assigned to it.

In addition, the configuration is sub optimal in matters such as:

- ▶ The berth configuration, with the first two berths heading south and the third berth heading north, requiring the construction of a third shiploader that may not have been necessary if all three berths had headed north in the first place. (Refer Section 5.3 for further discussion)
- ▶ The continued use of a custom built shiploader with its accompanying berth. There may be a more cost effective shiploader / berth configuration utilizing a design / construct approach from recognized heavy equipment suppliers.

There is no question that the existing configuration is sub-optimal. CH may have been constrained in their consideration of this and the above issues because of their previous involvement in the design.

5.3 Excess Asset Base

Ref. CH Report Page 48

CH attempts to defend the need for 3 shiploaders. DBCT now has three shiploaders only because the first two berths were originally developed towards Hay Point with 2 shiploaders (SL1 and SL2). As there was no further room for an additional berth length in this direction, the third berth and a shiploader (SL3) had to be developed to the north. If they had developed all three berths to the north as per GHD's optimised terminal, then only 2 shiploaders would be required. The need for only two shiploaders is recognised by those involved with DBCT, as there has been substantial consideration of moving SL1 over to the third berth prior to purchasing the third shiploader / berth. It is understood that the risks to operations of moving shiploader dictated the decision to leave it on the southern side and to purchase the third shiploader. Though such a decision may have been considered necessary at the time, such inefficiency should not be carried through into the DORC valuation.

Other examples of excess, though less significant, include:

- ▶ Training centres that are rarely used;
- ▶ Office accommodation and workshop far larger than required;
- ▶ The first rail receipt hopper has additional length built into it to allow for an upgrade that did not eventuate; and
- ▶ A large number of substations resulting from the staged development.



6. Optimisation

6.1 Methodology

Ref. CH Report Page 15,45

GHD has discussed in its valuation report the basis for the optimisation methodology. CH has implied that based on previous regulatory decisions QCA's comments in its Statement of Regulatory Principles, this approach would not be acceptable to the QCA.

In the Statement of Regulatory Principles, QCA have stated, "In regulatory decisions to date, the Authority's optimisation processes have focussed on whether or not the infrastructure subject to regulation exhibits excess capacity". To GHD's knowledge, decisions to date have been in relation to network type infrastructure, such as rail, electricity and gas, and DBCT is the first case of a coal terminal. With network infrastructure, there is limited opportunity to alter layouts if they were reconstructed today, as usually there is little benefit in changing service alignments which have been originally established to suit the location of the customers. With coal terminals, the arrival and departure point of coal should stay fixed to suit producers and customers, but in between these two points the layout does not need to be considered fixed, particularly if it is considered inefficient. GHD therefore advocates that the precedents set to optimise capacity only do not necessarily apply to a DORC valuation of the existing DBCT, where other potential and much-needed forms of optimisation exist.

We propose that reconfiguring the DBCT terminal as part of a DORC valuation is consistent with the principle of a DORC valuation, i.e. as defined by the Office of the Regulator-General Victoria to measure:

- ▶ The asset value that is consistent with the prices that would prevail in a competitive market (i.e. prices which reflect the cost structures of an efficient new entrant); and
- ▶ The price that a firm with certain service requirements would pay for access to existing assets in preference to replicating the assets.

The users of DBCT need to be able to compete with other coal suppliers around the world. Therefore DBCT prices need to be competitive with prices of other coal terminals around the world. When CH claim GHD's level of optimisation is too aggressive, they need to realise that that terminals exist, such as Kaltim Prima Coal's Pinjang Coal Terminal in East Kalimantan Indonesia, that are optimised much further, and the users of DBCT need to compete with the users of such terminals.

The large difference between the estimated replacement cost of the existing terminal compared with the proposed optimised terminal in itself demonstrates the need for optimisation. If someone was going to develop DBCT today, it is unlikely they would pay an extra AUD\$273m to rebuild the terminal as it currently exists.

In optimising the terminal, the following standard principles and constraints were applied to be fair and maintain the principles and objectives of a DORC:

- ▶ Satisfy the current levels of service supplied (i.e. throughput, the number of various coal grades, stockpile space, shipping demurrage rates etc);
- ▶ Provision for growth shall be supported, however optimisation cannot increase the value of the infrastructure, and in no case should the capacity exceed the current system capacity;
- ▶ Consider minimum safety and technical standards as well as design philosophies; and



- ▶ Maintain fixed existing supply points / interfaces (in this case the existing railway line and berth fender line).

What GHD may have described in its valuation as a 'greenfields' approach is in reality a 'brownfields' approach, because the location of the rail receipt facility and conveyors, and the outloading conveyors and berths remain fixed. GHD's optimisation primarily focuses on the infrastructure and machines between the inloading and outloading transfer conveyors (i.e. in the stockyard), and the berths and shiploaders.

6.2 Optimised Terminal

6.2.1 Footprint

Ref. CH Report Pages 27,50,66

The footprint GHD applied was approximately 1600 m x 400 m and was rotated to a NNE direction to fit within the bounds of the rail line to Hay Point on the south, Mt Griffith to the west, the ocean to the north and Hay point water storages to the east. GHD allowed funds in their estimate to relocate the access road plus excavation at the southern end. Rock protection works to the north similar to that currently provided will be needed.

GHD's cost estimates under General site and Stockyards cover this work. No geotechnical information was provided to GHD and hence cost estimates have been factored up to allow for adverse conditions. Should the QCA consider this approach not acceptable, a fallback position would be to maintain the same alignment and length of 1200 m but have four wider rows of approximately 66 m. Stacker reclaimers would then need to be larger to cater for this, which would require an additional allowance of \$5m per machine.

6.2.2 Operating Parameters

Ref. CH Report Page 27,46

The User Group has confirmed the Optimised terminal complies with their current requirements for services such as blending, storage, and asset integrity.

6.2.3 Modelling

Ref. CH Report Page 27

CH makes a number of assertions about the modeling undertaken by GHD using its model. These assertions seem to be intended to cast doubt on GHD's work. GHD completely rejects these assertions.

The GHD model was first developed in 1978 and has undergone continuous refinement from that time. The model takes into account many parameters that would normally be experienced in real time operations such as efficiency factors for process elements, breakdown allowances, weather delays, industrial strikes, etc. In 1995 the GHD model won an Institution of Engineers Australia award, which demonstrates its acceptance and robustness across the Industry. The model has also undergone a thorough review by Professor Elbrond from the University of Montreal, Canada for Port Waratah Coal Services. The review was to determine the suitability of the model for use in modeling coal terminal operations.



The model is considered to be accurate to plus / minus 2 Mtpa in this tonnage range, and depending on the number of ships stems generated for each tonnage.

The GHD model contains a number of subroutines, which emulate terminal operation in practice. One of these is a train-scheduling algorithm, which generates train arrivals to meet the shipping program. The scheduling algorithm incorporates a train delay distribution, which produces a variability of delays, which is perhaps even more variable than the QR arrival pattern, which is conditioned by the upstream Marshalling yard.

The GHD model was used to validate the optimised design prepared for the terminal. Modelling is an appropriate tool used by competent engineers for terminal design work. The model used by GHD for DBCT has provided important legitimate support for GHD's DORC valuation.

6.2.4 Blending

Ref. CH Report Pages 27,50

CH has referred to blending upon outloading. GHD's configuration provided for blending upon inloading. Blending upon outloading is not considered as efficient as controlled blending during the stacking-out process, due to difficulties in adjusting the blend should it fall out of specification during the building of the blended stockpile. Blending on inloading has met the approval of the User's Group.

6.2.5 Dump Station Hoppers

Ref. CH Report Page 27

GHD considers that sufficient capital has been allowed in its estimate to construct 'fit for purpose' dump hoppers sufficiently robust to achieve the desired throughput. This is based on recent hoppers designed by GHD for PWCS and Macquarie Generation

6.2.6 Stockyard Machines

Ref. CH Report Page 27

CH has commented that the proposed optimised stockyard machinery "results in higher utilisation, and will attract higher wear rates and reduced availability, resulting in reduced capacity". They also claim that the proposed terminal does not have the same inbuilt capacity in the reclaim and outloading systems.

There is an inherent linkage in optimizing the return on investment with through-life costs such as operations and maintenance costs. It is doubtful if PI were faced with a choice, that they would invest significant capital into additional stockyard machinery which will give a lower utilization than an option with increased utilization and lower capital costs.

The estimated utilization rates for the existing stockyard machines is discussed in Section 6.2.8

6.2.7 Number of Shiploaders

Ref. CH Report Page 27

CH claims that the existing terminal is able to continue operation with minimal loss of throughput capacity while one shiploader is shut down for maintenance, and that this benefit is lost under the GHD proposal.



The cost of providing a third shiploader while only two trestle conveyors are in service is a very expensive method of providing redundant capacity.

For the Optimised terminal, the output is reduced to some 28-30 Mtpa with one shiploader down. GHD consider this an acceptable risk exposure if appropriate maintenance practices are put in place to monitor performance and minimize outage risks. The additional costs of another \$20m shiploader plus the ongoing operations and maintenance costs are not considered to deliver sufficient cost benefits in increased reliability of supply.

6.2.8 Machine Utilisation

Ref. CH report Page 27

In Table 1 below, estimates of the utilisation rate of machines for the proposed Optimised terminal are provided.

Table 1 Estimated Machine Utilisation Rates

Machine	Optimised Terminal	
	No. of Equiv. Machines	Utilisation Rate (%)
Rail Receival	2	77.8
Stackers	2.5	62.3
Reclaimers	2.5	69
Shiploaders	2	86

The rail receival system utilisation is fairly high although train queuing is minimized by the use of the upstream marshalling yards.

The high level of utilisation of the shiploaders for the optimised terminal is considered achievable and provides an acceptable blend between business risk exposure from outages and the efficient use of capital while providing adequate time for planned maintenance activities. Unplanned outages of the ship-loading equipment are typically short term. Catastrophic damage to machinery is covered by appropriate insurance. The level of utilisation is only possible in a 3 berth 2 shiploader configuration, where pre and post loading delays are decoupled from the shiploader functions by the use of a 3rd berth. A reduced utilisation of 82% can be achieved by increasing the handling rate to 6,600 tonnes/hour.

6.2.9 Use of Demurrage Costs

Ref. CH Report Page 27

GHD firmly believes that the three main considerations in designing bulk port terminals are:

- ▶ Rail demurrage i.e. the cost of excessive rail queuing (generally included in the rail freight);
- ▶ Stockyard buffer; and
- ▶ Shipping demurrage, which can be up to \$50,000/Cape vessel / day after all allowable delays.



The industry places a particular emphasis on shipping demurrage, with DBCT's terminal capacity rated at that tonnage that results in an average of 25c/tonne shipping demurrage over the yearly shipping stem.

CH's comments indicate a lack of understanding of the importance of demurrage costs in coal terminal design.

6.2.10 Taking into Account Various Conditions and Constraints

Ref. CH Report Page 46 and 60

GHD believes that the optimised terminal has sufficient flexibility to meet the operating conditions and constraints associated with terminal operations.

The modelling incorporates typical terminal operating rules, such as:

- ▶ Randomly generated shipping arrival pattern to emulate DBCT stem;
- ▶ Rules for ship configuration such as size, cargo brands, no of hatches, tonnage / hatch, de-ballast rate;
- ▶ Turn of arrival loading;
- ▶ Tidal Delays on departure;
- ▶ Two S/L passes / hatch, working from end to end of each vessel;
- ▶ Anti-collision rules between stockyard machines;
- ▶ Dynamic and / or stockyard allocation rules;
- ▶ Train arrival rules as discussed previously (refer Section 6.2.3);
- ▶ Prepositioning of machines before task commencement;
- ▶ Inloading takes precedence over ship-loading; and
- ▶ Blending is performed during inloading.

6.2.11 Claimed Throughput Capacities

Ref. CH Report Page 50

CH suggests that the claimed throughput capacities of the optimised terminal appear dubious in comparison with proposed ship-loading rates, when the performance of the existing terminal is considered. The basis of this comment is unclear, as the capacity of both the existing terminal and the proposed optimised terminal are limited by the capacity of the two trestle conveyors of roughly equivalent capacity. Additional berths, shiploaders, or rail receipt facilities alone cannot increase the capacity until the trestle conveyor bottleneck is removed.

6.2.12 Potential to Expand and Increase Throughput

Ref. CH Report Page 50, 65

For any significant capacity increase over say 60 Mtpa, both the existing and proposed optimised terminal will require a third trestle conveyor. The ability of either configuration to meet future demand can only be discussed after the future demand has been quantified.



6.2.13 Bulldozer Reclaiming Coal

Ref. CH Report Page 56

GHD notes CH's comments on bulldozer reclaiming. A bulldozer is currently employed on site to provide dead storage when live storage for any coal type is inadequate. DBCT has presently at least one bulldozer, which is used to stack / reclaim coal. Both the existing and proposed optimised terminals have dead storage. Under normal operating conditions and with the increasing trend to cargo assembly, the optimised terminal does not require this additional capacity. In regards to the capital cost of the bulldozer, GHD has assumed such plant will be procured under lease arrangements, which is common practice.

6.2.14 Sensitivity of Terminal Capacity to Changes in Other Elements of Supply Chain

Ref. CH Report Page 60

The DBCT Coal Chain is a complex logistics system requiring all components to perform at capacity to assure coal chain integrity. Fortunately, the upstream rail marshalling yard provides a buffer between rail system and the dump hoppers. It also provides terminal operators of adequate advance warning to plan the stockyard allocation with minimal delays due to stacker interference / prepositioning. The stockyard provides buffer between rail and ship, allowing for changes in other elements in the supply chain.

6.2.15 Staged Works

Ref. CH Report Page 60

CH queried the proposed staging of the optimised terminal. GHD confirms the staging is as follows:

- ▶ Stage 1 Capacity 22.5 Mtpa - 2 Pads, 2 Stacker / Reclaimers, 1 Berth, 1 Shiploader
- ▶ Stage 2 Capacity 45 Mtpa - 4 Pads 4 Stacker / Reclaimers, 2 Berths, 2 Shiploaders
- ▶ Stage 3 Capacity 54.5 Mtpa - 4 Pads, 4 Stacker / Reclaimers, 3 Berths, 2 Shiploaders, 1 Stacker

The main focus of this report is the final staged capacity, which reflects the present built capacity.

6.2.16 Existing vs Optimised Terminal

Ref. CH Report Pages 61-64

CH has made assertions with respect to the proposed optimised terminal design. The optimised design provides a simpler process flow diagram that provides significant capital and operating cost advantages over the present layout. These include:

- ▶ Fewer Bunds (3 only) with only 5 Stockyard machines;
- ▶ Only 2 stockyard machine types;
- ▶ Simpler transfer layouts at both inloading and outloading areas;
- ▶ Simpler Design, i.e. reduced design costs, as plant expansion mirrors stage 1;
- ▶ Standardized plant allows for rationalized and reduced spares holdings; and
- ▶ Reduced fixed maintenance costs, i.e. painting



GHD's responses to other assertions by CH are as follows:

- ▶ Blending on outloading. As explained earlier (refer Section 6.2.4), the optimised plant blends on inloading, which is considered superior to the existing practice.
- ▶ Handling at 6000 tph. While GHD's modelling shows this to be adequate, a handling rate of 6600 tph could be achieved at little additional capital cost, and would in fact be the design rate for a nominal 6000 tph plant
- ▶ Terminal Staging. While the staging process for the existing plant was understandable for historic reasons, it is unlikely that it provides an optimised layout within the context of a DORC valuation. For example, every stage after Stage 1 requires additional site establishment, and construction under difficult brownfield conditions within an operating plant. It is self evident that 2 subsequent stages are better than 5 stages given these added difficulties and costs.
- ▶ Redundancy. The existing layout provides, at substantial additional capital cost, a high level of redundancy within the stockyard operations. Notwithstanding this, there are many examples of major stockyards with fewer machines. Examples are: Kooragang coal terminal – 60 Mtpa – 4 Stackers, 3 Reclaimers; Kaltim Prima Coal – 25 Mtpa – 1 Stacker, 1 S/R.