DALRYMPLE BAY COAL TERMINAL

MASTER PLAN 2009

POST 85 MTPA EXPANSION OF DALRYMPLE BAY COAL TERMINAL

Revision 1 – June 2009

TABLE OF CONTENTS

1.0 Executive Summary

The Bowen Basin has experienced strong growth for metallurgical coals since 2004. In order to accommodate this demand, BBI (DBCT) Management Pty Limited ("DBCTM") has responded by building the DBCT 7X project, expanding terminal capacity to 85 million tonnes per annum (Mtpa) against long term (minimum 10 years) take or pay contracts.

Phase 1 of the 7X project completed and commenced service on 3 March 2008 providing 68 Mtpa capacity, while a further 4 Mtpa terminal capacity was released at the end of December 2008. Phase 2/3 is approximately 94% (as at the end of March 2009) complete and targeted to deliver 85 Mtpa by the end June 2009. However, following a spectacular drop in demand since November 2008, much of the terminal's new capacity lays waiting for use. While an eventual return to stronger demand is agreed by all, the timing of the recovery is hotly debated. Already, the Wiggins Island terminal project and the Goonyella to Abbot Point (GAP) rail project have been delayed with timing for a resumption of negotiations unannounced.

While global demand has abated, Access Applications for post 85 Mtpa capacity at DBCT are still active, with no sign of withdrawal. Accordingly, DBCTM has continued to plan a post 85 Mtpa expansion to accommodate a total 152 Mtpa terminal demand. Whether these plans will be activated in the short to medium term is yet to be tested and will be determined by the DBCT Access Holders and Access Seekers.

Accordingly, this Master Plan (2009) reviews the preferred expansion path to meet the requirements of current Access Applications. As previous Master Plans (2005, 2006 and 2007) dealt with the 7X expansion, and as the majority of that expansion is almost complete, there is no change to the recommended expansion path to 85 Mtpa, as previously detailed. To avoid repetition, this Master Plan should be read as a succession to Master Plans 2004, 2005, 2006 and 2007, all of which dealt with the increasing demand for DBCT capacity and expansion to 85 Mtpa.

DBCT Background (Chapter 2)

Chapter 2 reviews DBCTM's involvement in the terminal and describes the asset relevant to land use and geographical location. The chapter also explains the contractual Master Planning process and our alignment with the System Master Planning function of the Office of the Dalrymple Bay Coal Chain Central Coordinator (DBCC).

Current Status (Chapter 3)

This chapter provides an update on the current capacity and operation of DBCT in relation to the holistic supply chain performance and 7X delivery, in terms of capacity estimations through Sandwell Engineering's modelling work. The full Connell Hatch Dedicated Stockpile report is attached as Appendix A.

Future Supply/Demand (Chapter 4)

Previous forecasts that were based on leading industry analysis have been thrown into chaos due to the global financial crisis which has triggered a stunning reversal in global economic performance. DBCTM is still trying to piece together the outlook in terms of short to mid term demand prospects for Australian metallurgical coals although it would appear that a short term reduction of global demand is a likely outcome.

Long term forecasts are more comforting although miners are understandably cautious, taking a “wait and see approach”. However, with the delivery of the current expansion, DBCT has sufficient capacity to honour current contracted port capacity. While DBCTM hold Access Applications to 152 Mtpa, it is likely that some of this demand is duplicated with other potential developments as producers “hedge their bets” until the demand/supply landscape becomes clearer. As the GAP rail project has been delayed, it will be interesting to see if Producers have an appetite for post 85 Mtpa expansion of DBCT.

Terminal Expansion – Post 85 Mtpa (Chapter 5)

This chapter assesses previously advised expansion options (Master Plan 2008) and recommends a preferred expansion path based on engineering, economic, operational and ecological evaluation. In essence, it concludes that to satisfy the potential demand of 152 Mtpa, 2 projects, referred to as 8X and 9X will be considered. The 8X project delivers a terminal capacity of 90 Mtpa, while 9X involves a series of incremental stages, which would support the actual capacity which Producers are prepared to commit. The 9X proposal requires a new stockyard and the attached report (Appendix B) demonstrates that of 3 feasible options for additional stockyard capacity, a new location, referred to as the Southern Stockyard, which is positioned to the south west of the current DBCT rail loop, is preferred.

Environment (Chapter 6)

This chapter evaluates the environmental impact of each of the options as well as including forecasts of dust and noise associated with the preferred expansion option. It demonstrates that the preferred option outlined in Chapter 5, is not compromised in any way by environmental requirements. The full dust and noise predictive studies are attached as Appendix C and D (respectively).

Stakeholder Consultation (Chapter 7)

This chapter details how DBCTM will interface with stakeholders in terms of current and future expansion of the terminal.

Even if Producers fail to agree to proceed further with post 85 Mtpa DBCT expansion, this plan lays the basic foundation for an efficient and feasible terminal expansion which can be enacted at any time in the future.

2.0 Introduction & Background

Background to DBCT

In 2001, the Government of Queensland, represented by Ports Corporation of Queensland ("PCQ") and DBCT Holdings P/L, awarded long-term leases over DBCT (50-year term with a 49-year renewal option) to a consortium collectively known as Coal Logistics–North Queensland (CL-NQ). After an IPO in June 2002, the group became Prime Infrastructure. Following a further name change in 2005, the group became Babcock & Brown Infrastructure, with DBCTM responsible for the DBCT asset. For the purposes of this document, "DBCT Management" collectively stands for the leaseholder and related entities responsible for fulfilling the duties related to the DBCT lease and Port Services Agreement (PSA).

The Port of Hay Point is approximately 38 kms south of Mackay and consists of two coal terminals - DBCT and Hay Point Services ("HPS"). The port is administered by PCQ as the statutory Port Authority. DBCT was established in 1983 by the Queensland Government as a common user coal export facility. The terminals are linked to the Bowen Basin coalfields by the electrified Goonyella rail system operated by QR Network. Figure 1 shows DBCT's position relative to the area.

Figure 1 – Port of Hay Point - Connell Hatch – 2006

DBCT is an export coal terminal which is owned independently of miners and as such, aims to achieve the optimum balance of meeting terminal Producer's sometimes conflicting needs for receiving, stockpiling and processing coal within the context of its commercial obligations. The daily terminal operations and maintenance functions are provided by Dalrymple Bay Coal Terminal Pty Ltd ("DBCT P/L"), a 3rd party service provider owned by 5 of the DBCT Producers. This service is governed by an Operations & Maintenance Contract ("OMC") for which an optional third term was exercised by DBCT P/L in 2008 and is current for the next 5 years. This is the final extension under the existing OMC although there are provisions to continue the Operator's term beyond the current expiry date (2013).

Additional information can be gained from the websites http://www.bbinfrastructure.com.au and http://www.dbct.com.au

Current Asset Description

DBCT consists of 3 rail receiving stations, a stockyard and 4 off-shore wharves, all connected by a series of conveyor systems (see Figure 2). The site stretches for more than 2.38 kms from the rail inloading stations to the shore side jetty head with the wharves a further 3.8 kms along a jetty trestle. Total terminal capacity in FY2008/09 increased to 72 Mtpa (from 68 Mtpa) with the 7X project delivery of Phase 2/3 Step A, in the latter part of December 2008. After the expected completion of the 7X project in June 2009, DBCT will have a capacity of 85 Mtpa, making it Queensland's largest export coal terminal. With existing capacity of HPS (44 Mtpa), the Port of Hay Point comprises one of the largest coal export ports in the world.

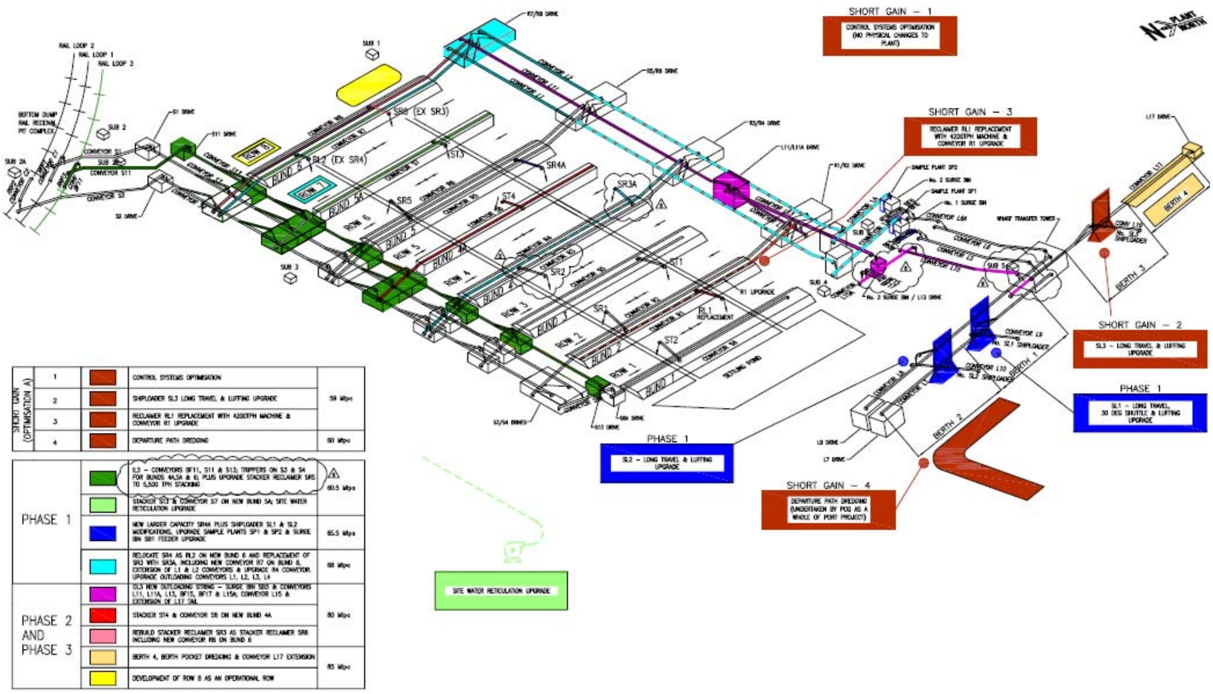


Figure 2 - DBCT Schematic post 7X Project completion – Connell Hatch 2006

DBCT is a common-user facility with a large number of Producers and as such, the operation of the Terminal is unique when compared to most other coal terminals. A distinguishing feature of DBCT is the use of two reclaimers to feed each outloading conveyor/shiploader. This feature enables DBCT to blend cargoes out of the stockpiles which, with other service provision, is acknowledged by terminal Producers as enhancing their commercial position in global markets.

DBCT processes 3 commercial coal categories being: hard coking coal; PCI coal; and thermal coal, which can be blended into a possible 96 registered products (approximately 33 regular blends are processed by the terminal Operator each month). Coal processed through DBCT is defined as a homogeneous product attracting charges as defined by Schedule C of the approved DBCT Access Undertaking. Coal is sold by the terminal Producers according to an FOB ("Free on Board") sales paradigm. As such, the customers of DBCT's Producers are responsible for organising and paying for shipping. Importantly, this means that the DBCT Producers have a limited ability to influence shipping patterns, particularly the vessels' arrival, which drives the cargo assembly operating mode.

DBCT's infrastructure, after completion of 7X will comprise:

- 3 rail receival stations - 2 x 5,500 tph (IL1 & 2); 1 x 7,500 tph (IL3);
- 4 stackers - 2 x 5,500 tph; 2 x 7,500 tph;
- 2 reclaimers - 1 x 4,200 tph, 1 x 4,500 tph;
- 6 stacker-reclaimers - various stack rates from 4,250 - 5,500 tph and various reclaim rates from 3,350 tph – 4,500 tph;
- 8 stockpile rows, each approximately 1,100m in length (plus half row 8). Maximum designed volumetric yard capacity of approximately 2.3 million tonnes of coal;
- 3 outloading systems and 3 shiploaders – 2 x 7,200 tph (SL1 & 2); 1 x 8,650 tph (SL3);
- 4 berths capable of receiving cape size vessels.

DBCT is situated on approximately 200 hectares of strategic port land, primarily described by the following lots (see Figure 3):

- Lot 126 on SP123776
- Lot 130 on SP105841
- Lot 131 on SP136318
- Lot 133 on SP136320
- Lot 134 on SP185573
- Lot 135 on SP185580
- Lot 41/42 on SP136319
- Lot 43 on SP185559

- Lot Part of 132 on SP136318

Figure 3 – DBCT Lease Plan - Connell Hatch, 2006

The stockyard (Figure 4) consists of eight machinery bunds which support 12 yard machines and seven and a half stockpile rows which are each divided into three cells (separated by drainage pits). The 12 yard machines comprise 4 stackers, 2 reclaimers and 6 stacker/reclaimers laid out as per the following:

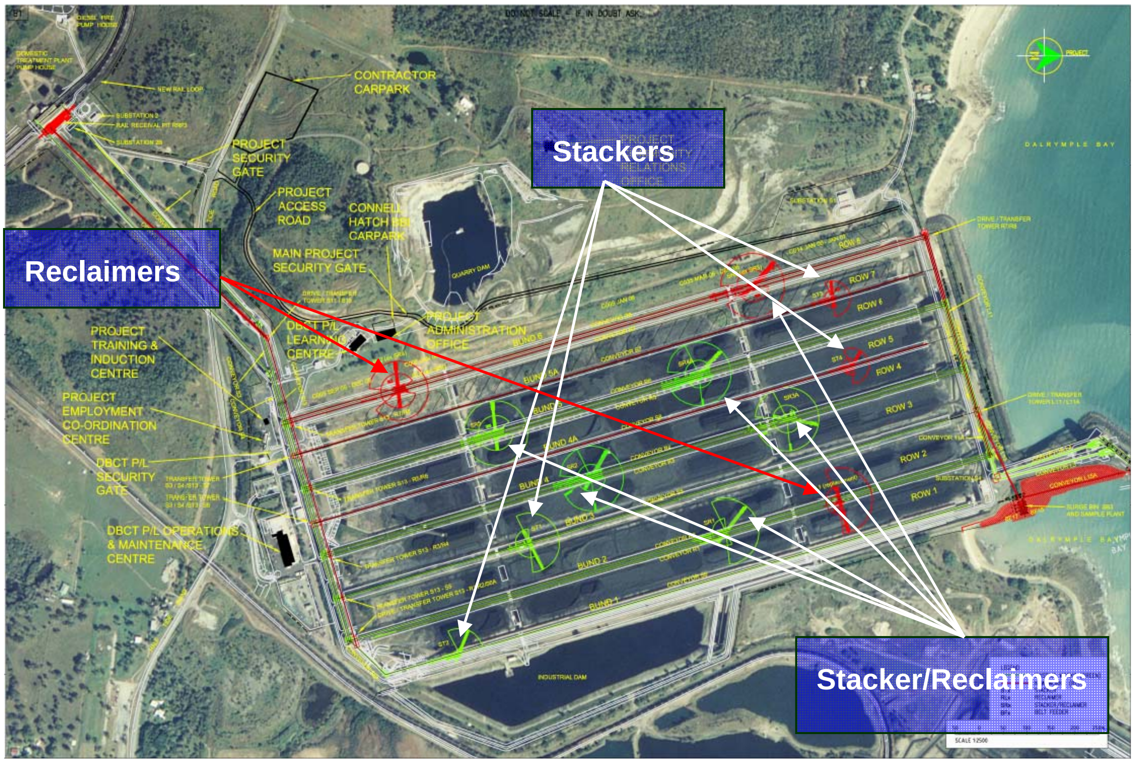


Figure 4 – On-shore layout of DBCT post 7X Project delivering 85 Mtpa - Connell Hatch 2008

As can be seen, the stockyard has a separate inloading and outloading system capability, meaning each inloading train can be independently stacked without compromising outloading. This yard configuration maximises outloading by providing two reclaimers to each outloading system and with the delinked inloading, drastically reduces instances of yard machine conflict.

Individual yard machine rates are as follows:

	ST1	ST2	ST3	ST4	RL1	RL2	SR1	SR2	SR3A	SR4A	SR5	SR6
Nominal stack rate	5,500	5,500	7,500	7,500	-	-	4,250	4,250	5,500	5,500	5,500	5,500
Nominal reclaim rate	-	-	-	-	4,200	4,500	3,350	3,380	4,350	4,500	3,850	3,450

Table 1 – DBCT yard machine rates post 7X stockyard completion – DBCTM 2009

The volumetric capacity of each of the stockyard rows is as follows, although the actual working capacity at any time will be determined by the number of stockpiles in the yard and their size:

	Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Total
Design Volume	236,000	283,000	303,000	304,000	299,000	369,000	306,000	177,000	2,277,000
Working Volume (based 3 benches)	236,500	261,500	285,500	334,400	326,800	391,500	315,800	138,400	2,290,400

Table 2 – DBCT yard row volumes post 7X stockyard completion – DBCTM 2009

In addition to the significant land holdings of PCQ that form a definitive buffer to surrounding communities, the land use surrounding the port (Figure 5) is a mix of agricultural, rural residential and urban (being the communities of Louisa Creek, Half

Tide and Salonika Beach).

Figure 5 - Position of DBCT relative to the local area - Connell Hatch 2008

Requirement for a Master Plan

Pursuant to Clause 13.2 (a) of the Port Services Agreement (PSA), DBCTM is required to submit a Master Plan to DBCT Holdings that addresses any changes in circumstances, demand, technology or other relevant matters no later than 31 March each year. Not withstanding the contractual requirement under the PSA to produce an annual Master Plan for 2009, further prefeasibility work has determined a preferred expansion path to the three expansion alternatives detailed in Master Plan 2008.

As a result, DBCTM has drafted this document to:

i. ensure that DBCT is developed in accordance with customer demand, infrastructure planning best practice, principles of environmental sustainability, applicable laws and the balanced interests of its stakeholders;
ii. ensure that any future expansion satisfies DBCTM's requirements to be both economic and reasonable and that such an expansion can be financed on reasonable financial terms;
iii. ensure a responsible alignment of supply chain partner infrastructure providers, based on agreement to an operating paradigm supporting a supply chain "cargo assembly" methodology;
iv. ensure compliance with contractual commitments and statutory obligations for master planning which meet the requirements of the PSA.

This Master Plan identifies DBCTM's preferred expansion option to accommodate received Access Applications to 152 Mtpa. This plan is at a preliminary level in terms of terminal design, due to the need for further preliminary engineering, detailed engineering and design. As such, this Master Plan seeks to meet, within the boundaries of the current economic and global demand uncertainty:

- contractual obligations and stakeholder expectations;
- provide an accepted DBCT expansion pathway based on access requests;
- provide a basis for the integration of the DBCT environmental strategy; and
- enhance customer value.

Whole of System Master Planning

Apart from DBCTM's contractual obligations to DBCT Holdings, a "whole of system" Master Plan is currently being developed by the Dalrymple Bay Coal Chain Central Coordinator (DBCC). This development is a requirement of the Memorandum of Understanding (MOU) which was signed by all the Goonyella Coal Chain stakeholders and which resulted from a recommendation of the O'Donnell Report. Due to past misalignment of infrastructure development, the System Master Plan will align future supply chain infrastructure expansions. The System Wide Master Plan (SMP) for the Northern Bowen Basin will be an integrated, 10 year plan encompassing:

1. the development of a common set of assumptions for the determination of system capacity;

2. the development and maintenance of a system wide simulation model, which will be used as a tool to assess system capacity and evaluate future capacity requirements; and
3. to align and assess alternative expansion options.

The development and implementation of the SMP needs to be considered as part of a longer term solution which will address the various issues which have led to the current capacity imbalance and operational dysfunction in the Goonyella supply chain. The DBCT Producers and Service Providers are currently developing a Long-Term Solution (LTS) which is intended to complement, rather than supplant, the development of the SMP (and the accompanying model) by the Office of the Central Coordinator. The priority for the LTS is to establish the broader commercial framework within which the SMP resides, including any obligations of supply chain participants in relation to the SMP. It also needs to consider the implications for the QR Network and DBCT Master.

Fundamental to any attempt to provide a systemic approach to Master Planning is the need to agree on just how the system will operate in the daily task of moving coal from mine to ships' holds. To do this, a common set of system capacity assumptions needs to be agreed by all stakeholders which will in turn, set the level of deliverable system capacity (being the lowest capacity of any one part of the system).

Establishment of these capacity assumptions will ensure access entitlements are aligned across track and port. This will ensure capacity is delivered on a supply chain-wide basis, according to the most efficient expansion path for the supply chain as a whole. The key objective is to ensure that the assumptions are refined over time, so as to reflect actual performance and operations as closely as possible. The development of the System Wide Model will encompass these assumptions and be used as the modelling tool to inform the development of the SMP.

To facilitate the development of the SMP, DBCTM mapped the interface between the Terminal Master Plan and the DBCC, which is shown by the following flow chart (Diagram 1).

Relationship of Proposed AU Requirements to System Master Planning and Role of Central Co-ordinator

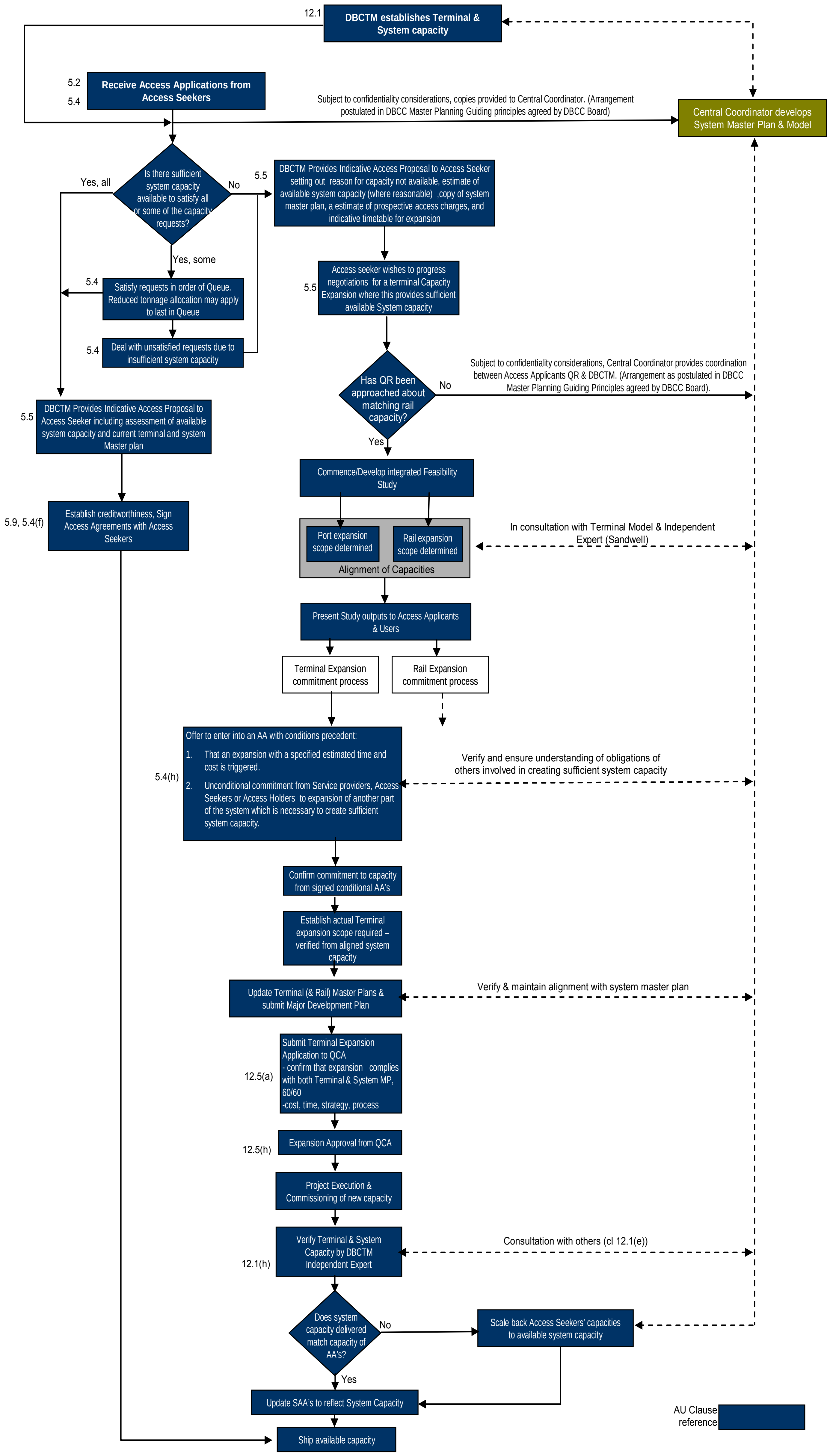


Diagram 1 – DBCT Flow Chart of Regulatory Master Planning cycle

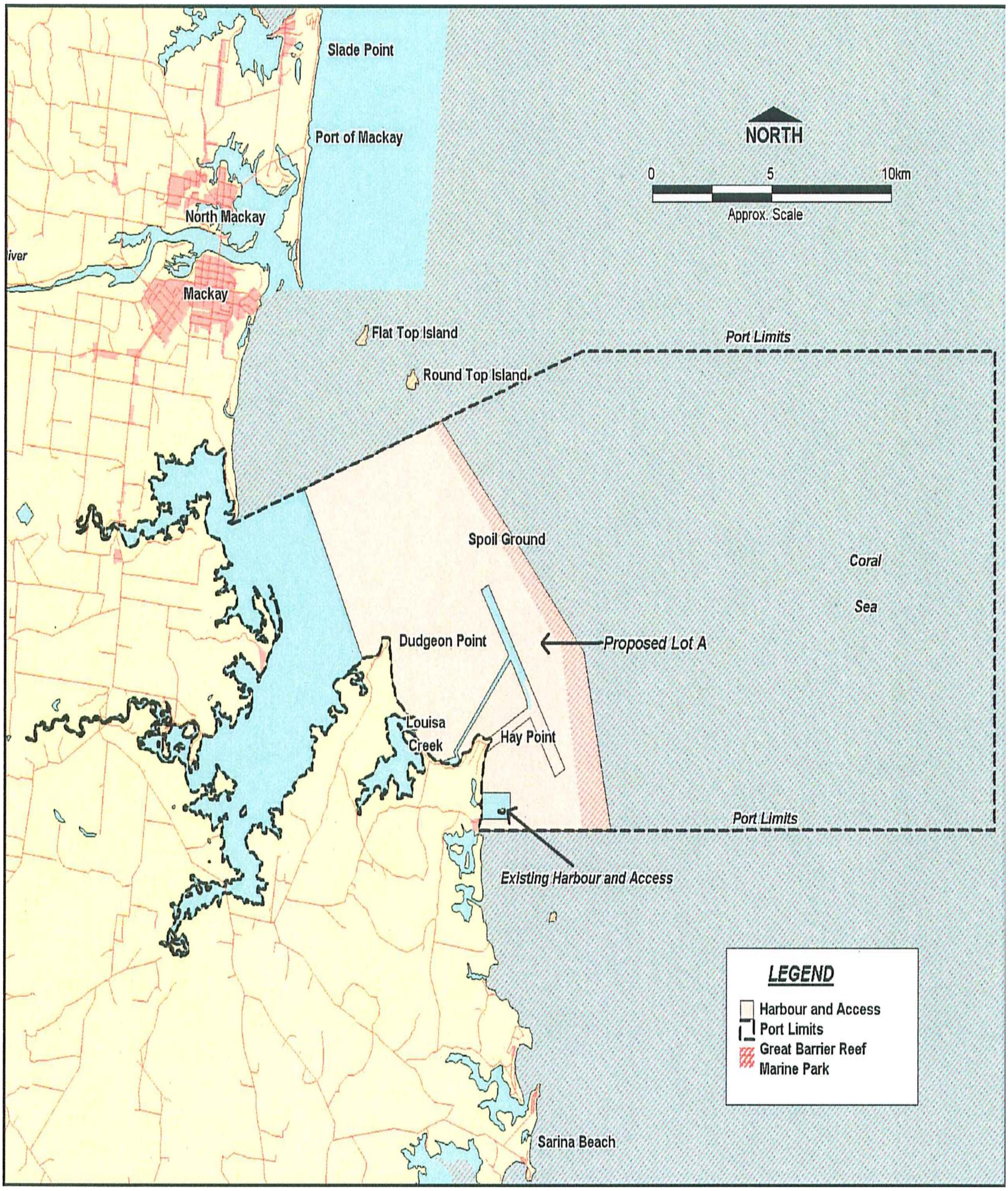
Proposals for Land Use and Site Development

As a requirement of the Transport Infrastructure Act 1994 (TIA), a Port Authority is required to develop and review a Land Use Plan for the appropriate and sustainable development of strategic port land. A Land Use Plan provides an overall framework for the appropriate regulation and management of the development of strategic port land. PCQ is the Hay Point Port Authority and is currently developing a new Land Use Plan as a result of new expansion proposals for both DBCT and HPS, plus Greenfield expansion possibilities for the Dudgeon Point site. This will ensure that any future growth of the Port is "appropriately planned and facilitates excellent development, environmental and community outcomes" (PCQ, Release of the Statement of Proposals for Review of the Land Use Plan for the Port of Hay Point, 30 March 2009).

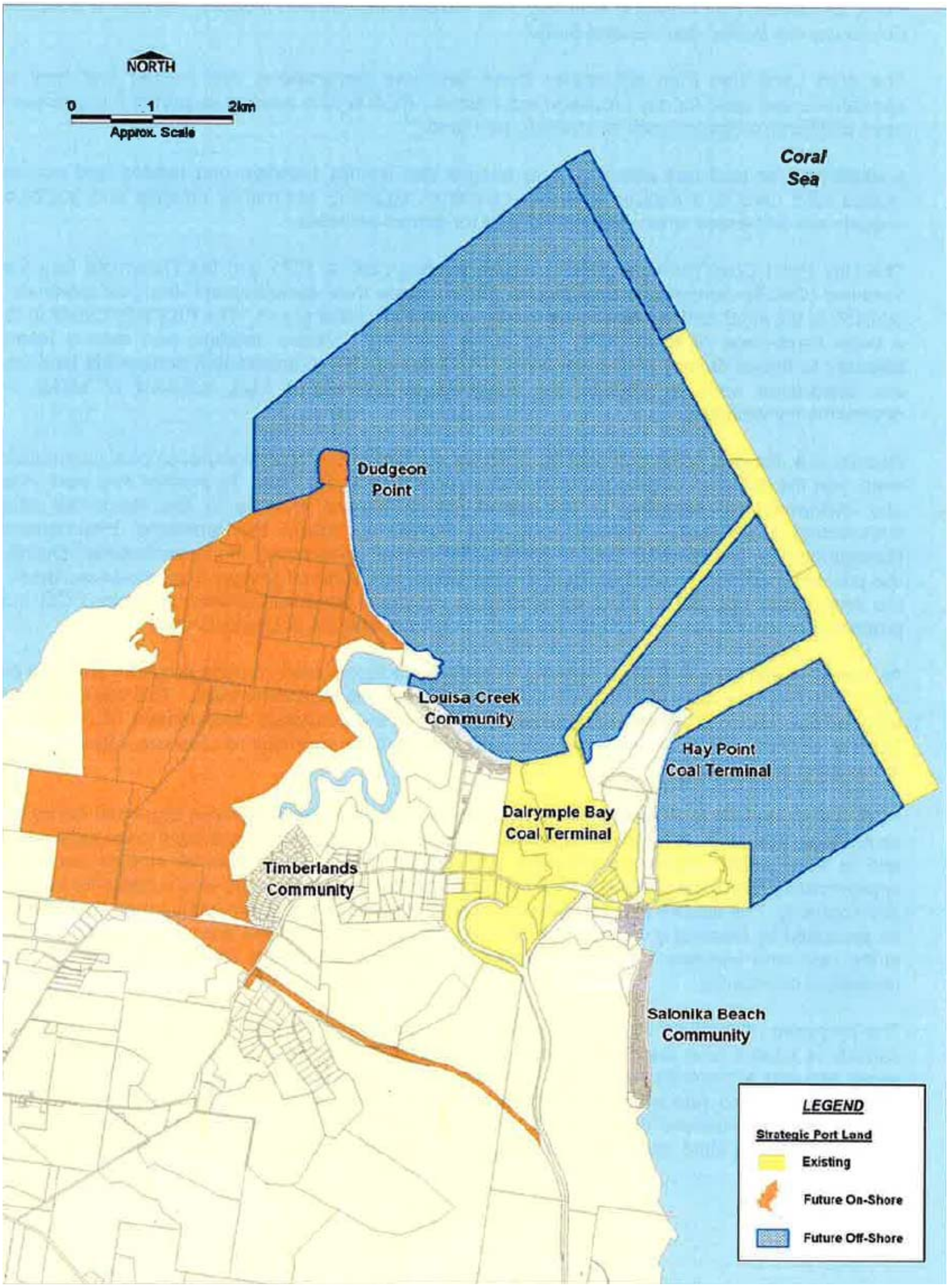
The land contained in the current DBCT lease is zoned strategic port land. As such, it is subject to the PCQ "Hay Point Port Land Use Strategy", rather than the local government planning scheme. However, the future expansion will involve land outside the current terminal boundaries as defined in the attached report (see Appendix B).

As a point of reference, the following maps (Map 1 & 2) show the current off-shore and on-shore areas defined as Port Limits and Strategic Port Land applicable to DBCT.

Looking back along berth 3/4 to berths 1/2



Map 1 – Port s Corporation Queensland – Port of Hay Point Land Use Strategy July 2003 – Port Limits



Map 2 - PCQ Existing Strategic Port Land and Proposed Future Strategic Port Land at Hay Point 2009

All further expansion of DBCT is being developed to meet the land use provisions of the PCQ's Land Use Strategy, as contained in the "Port of Hay Point Land Use

Strategy – Port Handling Activities Area". The land will be used for the purpose of loading, unloading and transport of commodities (coal) to support the Central Queensland Coal Industry. As alluded to earlier in this chapter, future expansion of DBCT will require the acquisition of privately owned land. It is currently DBCTM's intention to request PCQ to purchase identified private land, which would then be rezoned to Strategic Port Land and added to the DBCT Lease. All further expansion of DBCT is being developed to meet the land use provisions of the PCQ's Land Use Strategy as contained in the "Port of Hay Point Land Use Strategy – Port Handling Activities Area".

To meet the intent of the PCQ Land Use Strategy, any DBCT expansion proposal is intended to conform with the Integrated Development Assessment System (IDAS) process which is a requirement of the *Integrated Planning Act 1997*. As a general guide and as the Act relates to any proposed expansion of DBCT on Strategic Port Land, development approval will be required where:

- the development would be a material change of use inconsistent with the PCQ Land Use Plan;
- the development would be a material change of use of the premises for an environmentally relevant activity (other than a mining activity);
- the proposed development will result in a 10% (or greater) increase in the release of a contaminant already the subject of an existing Environmental Relevant Activity (ERA) or Development Approval; and/or
- the proposed development requires clearing of vegetation.

Aspects of the preferred site development are contained in Chapter 5 and 6 of this Master Plan.

Stakeholders

The Dalrymple Bay Coal Terminal is but one component of the Goonyella coal supply chain which relies on the performance and alignment of the upstream and downstream stakeholders to operate at maximum efficiency. As a result, DBCTM continues to place a strong emphasis on maintaining a cooperative relationship with its stakeholders.

Master Plan 2009 has been prepared by DBCTM in preliminary consultation with current stakeholders identified as:

- Ports Corporation Queensland (PCQ);
- Queensland Department of Transport (QDOT);
- DBCT Access Holders and new Access Seekers;
- DBCT Pty Ltd (DBCT P/L);
- DBCT Holdings Pty Ltd (DBCTH P/L);

- Hay Point Services (HPS);
- QR Network;
- QR National;
- Pacific National; and
- local neighbouring communities.

Consultation with the community has been undertaken regularly and will continue to be undertaken as the preferred expansion path develops. This reflects DBCTM's aim of increasing community understanding of the Terminal's position and future development based on increasing demand requirements. As a point of reference, Master Plan 2004 outlined the relationships between the stakeholders in the Goonyella coal chain which has not changed since that time and should be sourced as a reference to this document.

Regulatory Regime

DBCT is an asset regulated by the Queensland Competition Authority ("QCA") under the *QCA Act* and as such, DBCTM can voluntarily submit an Access Undertaking to the QCA for approval. Under the terms of the PSA entered into by DBCTM/DBCT Trust with Queensland Government owned entities at the time of entering into the leases, DBCTM was required to submit an access undertaking to the QCA for approval. The Access Undertaking details the terms and conditions (including the tariff that can be charged) under which third parties can access DBCT's services.

After the approval of the Access Undertaking, the old Terminal User Agreements were replaced with new Standard Access Agreements. The Standard Access Agreements form part of, and are based on, the terms and conditions set out in the approved Access Undertaking. The revenue cap approach adopted by the QCA and the risk profile proposed by its Final Decision have been reflected in the Access Undertaking and Standard Access Agreement.

- The DBCT Access Undertaking (including a new Standard Access Agreement) was approved on 15 June 2006 and backdated to 1 July 2004 and is due for reset in December 2009 (i.e. 5.5 year regulatory term). Negotiations are continuing with the DBCT Producers in order to submit a mutually acceptable Draft Access Undertaking for the Regulator's consideration.

- Differences between the current undertaking and the new draft access undertaking primarily revolve around aligning individual infrastructure development through a System Master Planning process. This will replace individual contracted capacity with a mechanism to contract system capacity and establish an agreed system operating paradigm. Achieving these goals will largely address the current problem of uncoordinated expansion completion times. Further, using system capacity as the single reference point for contracting capacity across the chain should avoid the current imbalance between rail and port contracts which has largely driven the shipping queue problem at DBCT.

Contractual Position

Apart from the existing Producer's Standard Access Agreements and as a result of the 7X project to expand DBCT, a number of DBCT Producers entered into minimum 10 year, 100% take or pay contracts for additional capacity at DBCT (called Expansion Tonnes Agreements). These expansion tonnes contracts, together with current contracted capacity, cover a total contracted volume of 85 Mtpa at their peak.

The expansion tonnes contracts differ to Standard Access Agreements only in so far as they incorporate a number of expansion related clauses. These include providing DBCTM with the ability (at its sole discretion), to reduce contracted tonnes or terminate contracts, under certain circumstances, with the same process/contracts applying to any future expansion capacity.

As mentioned above, recent negotiations with the DBCT Producers have centred on the concept of replacing terminal capacity with system capacity as the mechanism for contracting capacity. System capacity would be based on the maximum capacity that can be achieved through all parts of the coal supply chain, rather than stand alone capacity of any single component (i.e. based on the lesser of rail and port). The intention is to ensure that Access Holder's actual capacity entitlement cannot, in aggregate with other Access Holder's, exceed the capacity of the supply chain.

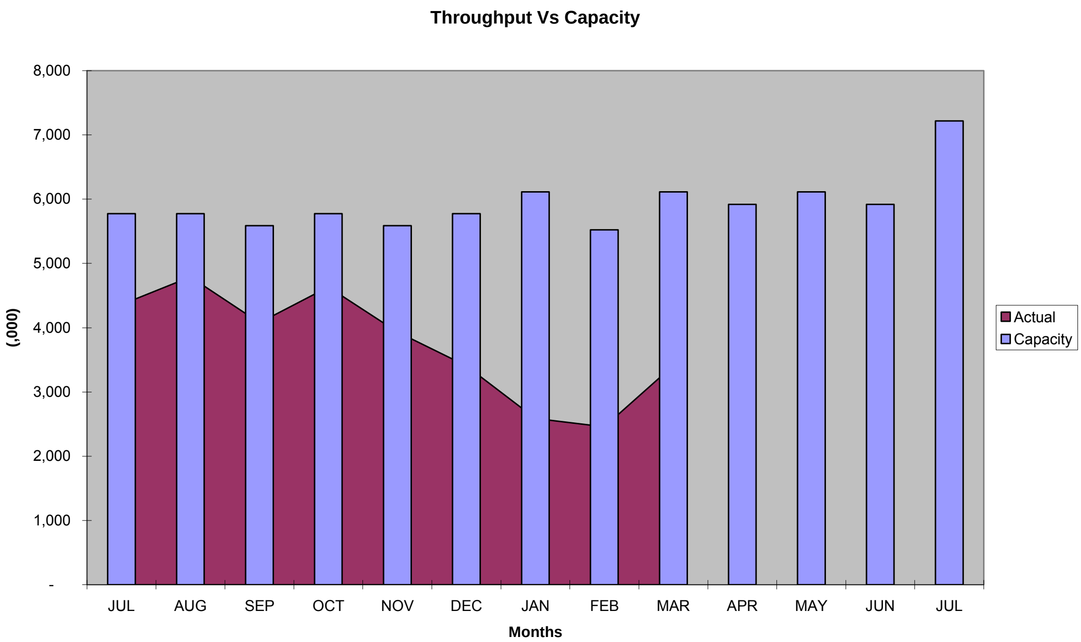
While DBCTM is not in disagreement with this objective, further negotiations are continuing with respect to consequences that may develop in drafting the replacement draft Access Undertaking.

The last pile driven on the jetty triplication, 7X Project – DBCTM 2009

3.0 Current Status

System Throughput

The throughput of DBCT for the nine months till 31 March 2009 was 33,778,451 tonnes, which is considerably below the rated capacity. However, this volume has been strongly influenced by the global financial crisis as can be seen from graph 1, showing the monthly throughput figures in relation to available terminal capacity.

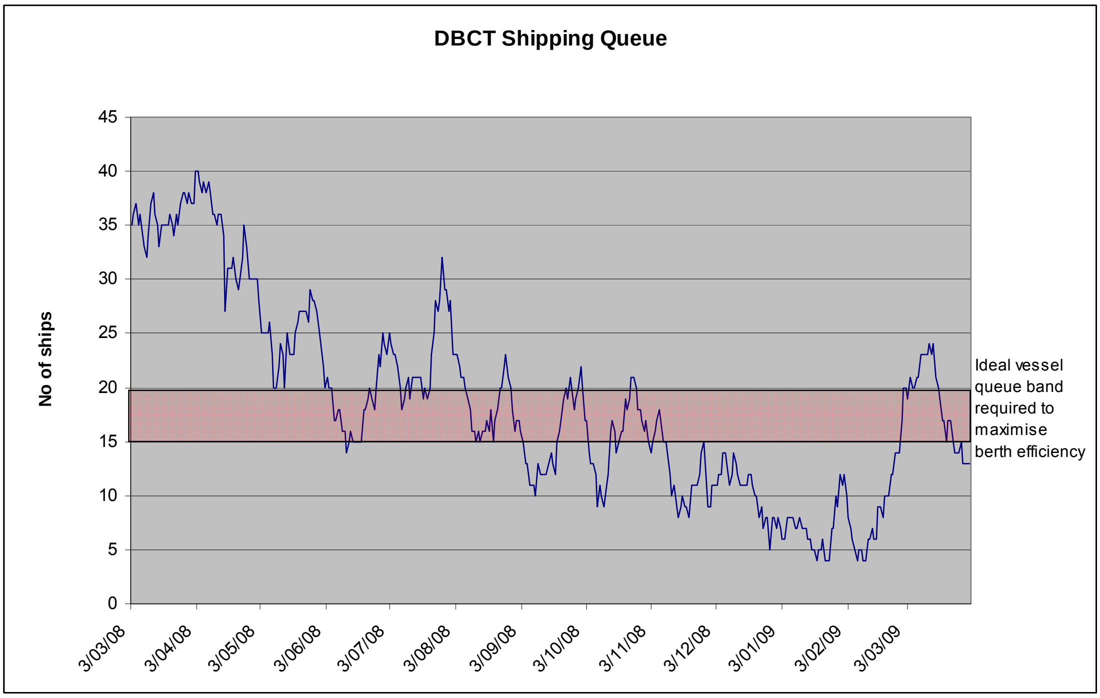


Graph 1 – DBCT throughput versus capacity FY 2008/09 (YTD)

The reduction in demand from October 2008 is very evident. Paradoxically, the capacity of the terminal (blue lines) has continued to increase over the same period with delivery of 7X Phase 2/3 – Step A (Berth 4) at the end of December 2008. The final 7X delivery is now expected in June 2009 when terminal capacity will increase to 85 Mtpa or approximately 7,000,000 tonnes per month.

The impact of this new capacity can be seen in graph 2 which tracks the DBCT shipping queue since the release of Phase 1 capacity on 3rd March 2008. The shaded area represents the ideal band of shipping required to queue (15 to 20 vessels) at DBCT. This number of vessels is required due to the large number of mines that use DBCT and the variability in coal production. As a demand pull system, the terminal Operator needs a variety of vessels at its disposal in order to maximise berth utilisation according to what coal is available. For example, should a mine be unable to produce coal for the next ship in the queue, the operator can select another vessel with coal parcels partially built in the stockyard, rather than lose capacity to an unoccupied berth or an idle outloading system.

While a demand pull system is more complex than dedicated stockpiling system, it is much less capital intensive, requiring lower capital expenditure in the port which, from a coal chain perspective, usually carries the highest capital expansion costs.



Graph 2 – DBCT Vessel queue yoy 2008/09 – DBCTM 2009

Service Provision

Because of Producer product diversification catering for specific steel making blends, DBCT is required to meet varying service requirements. This creates specialised demands within the terminal operation as different coal types present different handling characteristics which require a variety of handling strategies to preserve product identity. Any reduction of normal equipment rates to cater for these requirements will impact terminal capacity. While Producers pay a common tariff per tonne of coal shipped, different handling requirements will impact the terminal's performance (e.g. sticky coal, blending, loading small ships). As a result, some coal types and product blends consume more terminal capacity than others. This applies similarly to the rest of the supply chain.

Terminal capacity is currently calculated considering historical service provision and shipping mix (i.e. the capacity model accounts for the impact on capacity of differing service requirements). However, if future service requirements evolve beyond the current demands, the rated terminal capacity could be adversely impacted. Any detrimental impact of terminal service demands can also impact the upstream coal chain, causing consequential bottlenecks which in turn limit the delivery of coal to DBCT's rail receival pits. The terminal Producers have recognised that service provision does cause capacity erosion and through the LTS working group, are developing a process to allocate accountability for errant capacity consumption.

As noted above, DBCTM incorporates historic service provision in its determination of Terminal capacity. Providing DBCTM complies with the other provisions of Section 12.1 of the approved Access Undertaking, it will not be liable for any delay resulting from the Aggregate Annual Contract Tonnage subsequently exceeding the Terminal Capacity (as determined at the relevant time) for any reason external to the Terminal (e.g. rail or shipping) or because any one or more factors related to utilisation of Terminal capacity subsequently changed (e.g. service levels, the nature of the coal handled, a User's use of the terminal, vessel mix or any other relevant factor). To this extent, DBCTM is protected from terminal Producers' evolving requirements for coal handling and preparation, i.e. service provision.

Cargo Assembly versus Dedicated Stockpiling

Bulk supply chains usually operate in one of two major forms i.e. dedicated stock piling in the export terminal or cargo assembly, although hybrids do exist. The basic philosophy of the operation revolves around the capital investment decisions and the number of products to be accommodated. A dedicated stockpile port allows the terminal Producers to stockpile product at the port which is then drawn down by arriving shipping. The railing system supports the stockyard by railing product evenly (i.e. a scheduled service) from the mine to the export terminal. As such, track infrastructure is tailored to suit the exact number of trains required to match contracted demand.

Alternatively, a cargo assembly port assembles products to suit the shipping program of each arriving vessel. Because the cargo is pulled into the stockyard, the intensity of trains to deliver product is higher, requiring matching track infrastructure so as not to cause excessive train queuing within the system. Regardless of the type of Operating system chosen, it is fundamental that both the rail and port are using and contracting the same operating system.

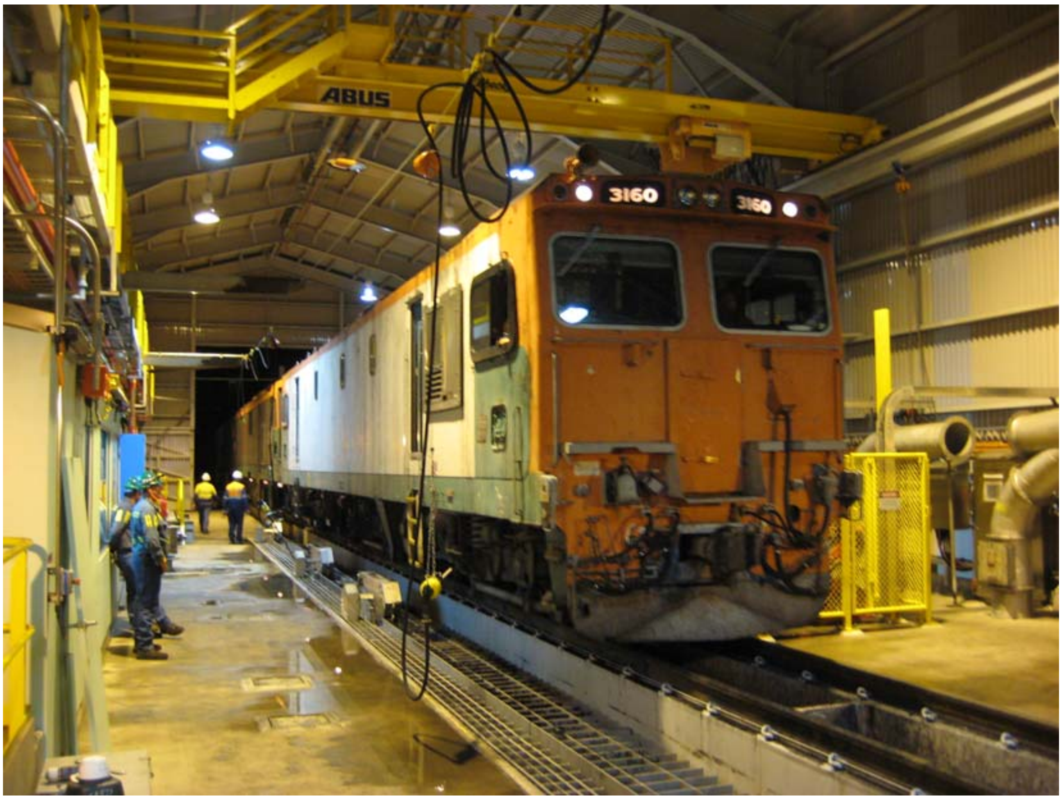
DBCTM designs and calculates terminal capacity on the basis of a "mine to ship" railing regime supporting full terminal cargo assembly. This methodology enables the coal to be pulled to the carrying vessel, once that vessel's berthing program has been developed. This regime requires careful scheduling to slot the right cargo into a pre-planned stockyard area, in order to avoid stockyard congestion. This paradigm has developed at DBCT to limit capital expenditure associated with stockyard expansions.

The size of the DBCT stockyard has a significant influence on throughput as it provides the footprint necessary to receive, store and reclaim coal. Post 85 Mtpa terminal expansions must consider stockyard capacity outside the current footprint (rows 1-8) as the current stockyard has, within a tolerance of 10 Mtpa, reached its expansion limitations.

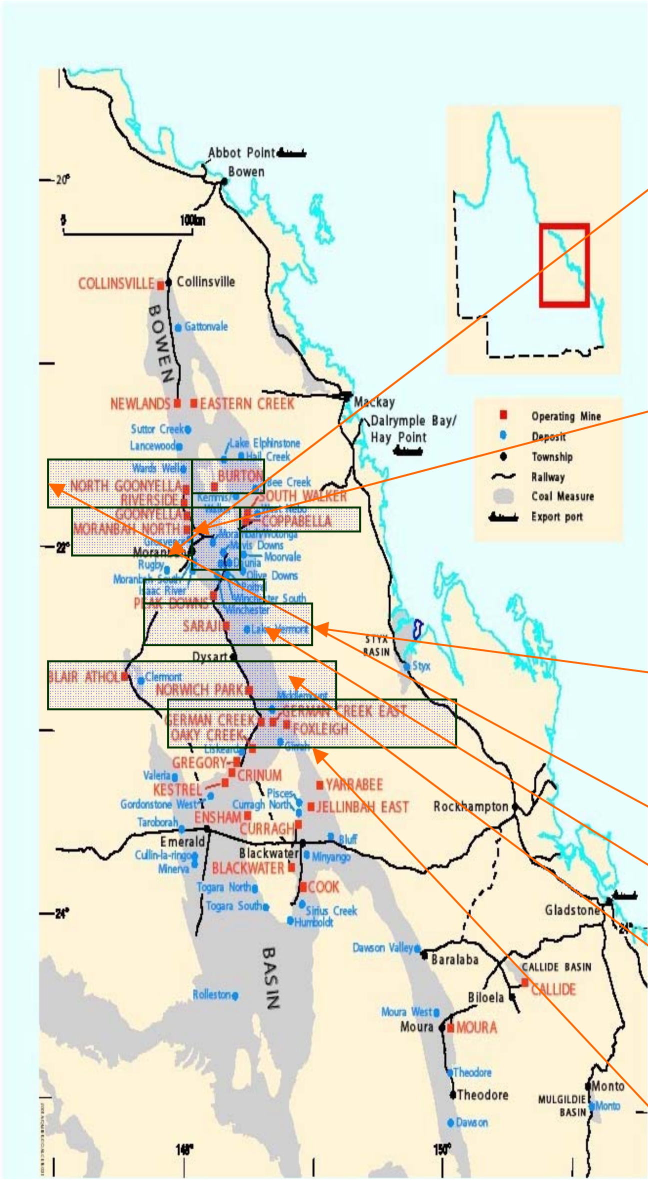
Terminal throughput in a cargo assembly operation is a function of how quickly the coal can be presented to the terminal and how quickly the shipment can be turned over. Terminal Regulations require that a shipment must be available for railing to assemble at the terminal prior to a ship berthing. The 85 Mtpa three outloading systems / 4 berth configuration requires sufficient yard space for a minimum of 3 assembled shipments (on average 240,000 tonnes) and six shipments under construction (similarly 240,000 tonnes). As such, shipment build time is contingent on the ability of the upstream logistics chain to present the coal in the right quantity and right sequence, when required by the terminal Operator.

The current DBCT arm of the Goonyella Supply Chain is an example of the dysfunction created by opposing operating systems. DBCT is a terminal that has evolved to adopt cargo assembly in order to cater for the increasing number of products and terminal clients which sell their cargoes on a Free on Board (FOB) basis. This means that neither the supplier nor the terminal have any control over when a ship will be nominated for loading. Because of this vagueness in the loading pattern of any particular product and the limitations in the size of the stockyard, it is impossible to keep dedicated stockpiles for all products moved through the terminal. In fact, even with only 2 products per terminal user, there would still be insufficient stockyard volume to accommodate all terminal Producers at the current contracted amounts.

The major rail haulage operator in the Goonyella system has a legacy of contracts reflecting a principle of even railings and supplies train sets according to the revenue afforded by these contracts. To restrict the terminal Operator from ordering more trains for a particular mine than the rail resources can accommodate, the rail provider has imposed a clustering system which limits train orders to a maximum number of train services. The following (Map 3 & Table 3) shows the existing cluster arrangement.



QR National train unloading in the new RRP3 – DBCTM 2008



Cluster	Mine	Max train allocation
1	CCP	3
1	HCK	
2	MBN	3
2	GNY	
2	MIL	
2	BCP	
2	PTL	
2	MVC	
2	SWC	
3	CBD	2
3	BDL	
3	PDN	
4	ISP	2
4	NGY	
4	RSD	
4	SAJ	
5	NPK	4
5	BAC	
6	FOX	6
6	GMK	
6	OCJ	

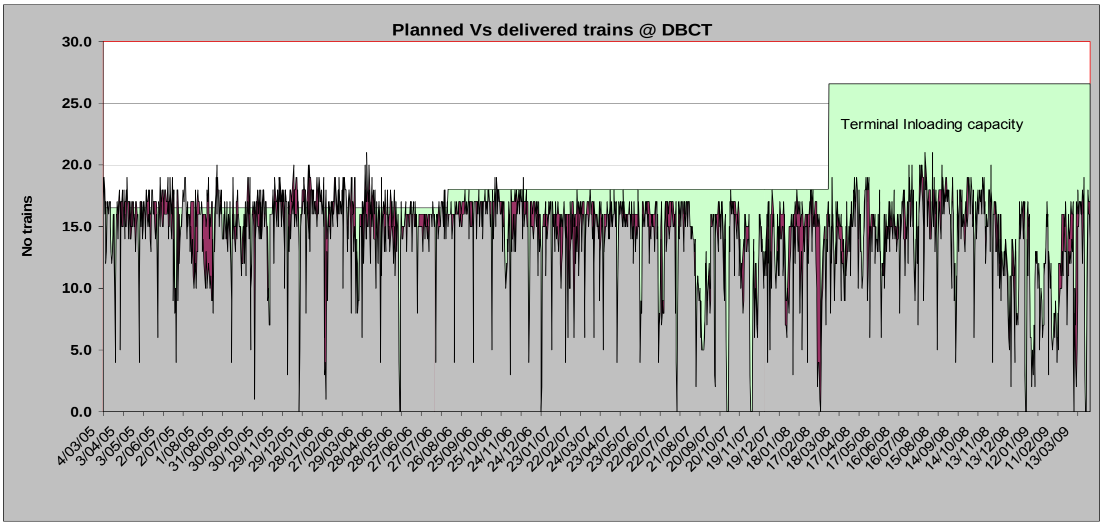
Map 3 – Goonyella rail cluster arrangement 2009

Table 3 – DBCT Mines per cluster

However, as the terminal needs to order trains according to shipping demand, the cluster limitations prolong the build time of parcels in the stockyard which then limits berth efficiency, affecting terminal capacity. Fundamentally, to ensure the system is operating at its maximum advantage, the operating modes of the entire chain needs to be aligned to either support cargo assembly or dedicated stockpiling, as it is impossible to successfully maximise throughput using both operating modes in the same system.

To illustrate the current issue, the 7X project supplied an additional rail receival system and 3rd inloading loop which has de-linked the terminal reclaiming and stacking functions, reducing the likelihood of yard conflict. This increased the inloading capacity to over 90 Mtpa and should have eased the problem of train queuing into the port, often cited by the rail operator as the reason for train operating performance issues.

As shown by graph 3, since delivering this new capacity, there appears to be even greater variation in the number of trains arriving at DBCT, with no improvement in the gap between the planned service and the train's actual arrival. This seems to indicate that inloading capacity is not the issue and that systemic issues are affecting the ability of the trains to arrive at the terminal at the allocated time.



Graph 3 – DBCT trains planned vs actual arrived vs inloading train capacity – DBCTM 2009

Until the operating mode issue is addressed (see Figure 6) DBCTM considers that the contractual dysfunction will continue to restrict any ability to maximise throughput.

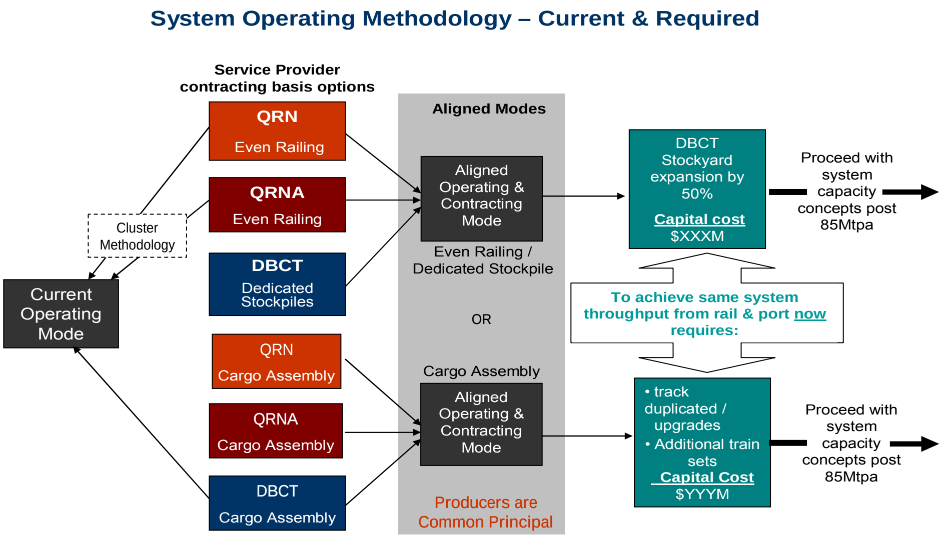


Figure 6 – Goonyella service provider contractual flow chart illustrating operating mode

Dedicated Stockpiling

To explain some of the limitations of dedicated stockpiling in the DBCT environment, it has to be recognised that there are currently 8 Producers using DBCT, soon to be contracting to approximately 85 Mtpa. Using a benchmark of 8.5% (considered by some producers to be the maximum requirement for dedicated stockpiling) of Annual Contract Tonnage, the terminal would need a stockpile able to accommodate approximately 7.2 million tonnes of coal (this number excludes space between each pile). To illustrate the amount of land required to accommodate this much static stockpiled coal, DBCTM commissioned Connell Hatch to review the terminal's operating methodology. From this report (attached as Appendix A), Figure 7 illustrates just how big the stockyard would need to be to meet a total of 8.3% of 85 Mtpa (8.3% takes all land available adjacent to the terminal). Just for illustration purposes, the example has used land adjacent to the existing stockyard as this would be the most convenient location in terms of expanding the existing operation without expanding capacity i.e. this expansion would still require all the inloading/yard enhancements associated with post 85 Mtpa expansion and at that estimated cost, but will only provide dedicated stockpiling to support a terminal capacity of 85 Mtpa. This means 5 inloading stations and associated yard machines, plus some off shore infrastructure, with no capacity increase over 85 Mtpa.

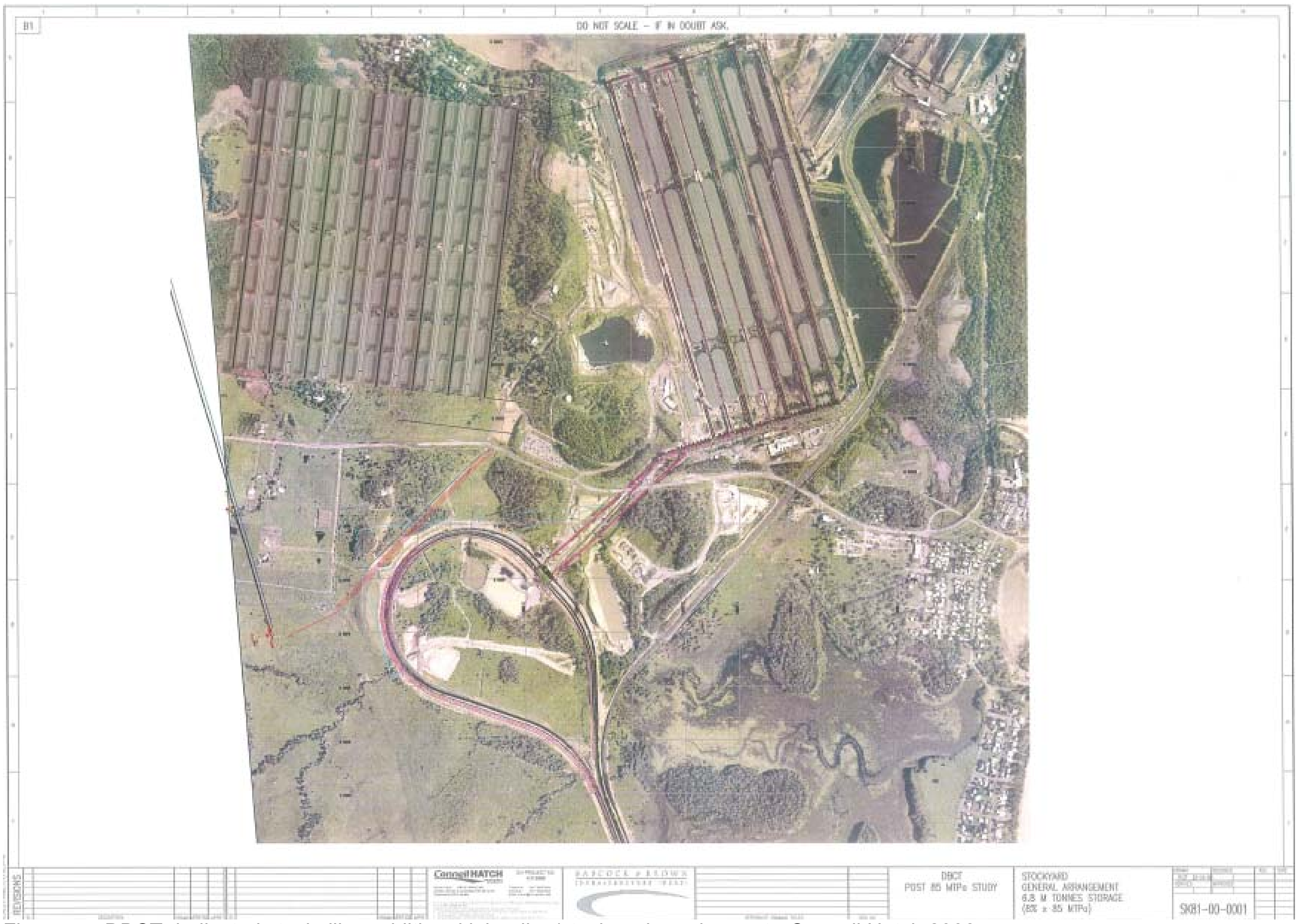


Figure 7 – DBCT dedicated stockpiling additional inloading/stockyard requirement - Connell Hatch 2008

Clearly, this is not a viable option for a number reasons:

1. The land required for stockyard expansion to support dedicated stockpiling would consume all current expansion options for DBCT.
2. If the Louisa Creek option was selected, the addition stockyard area required would encroach on a mangrove environment in Louisa Creek and require resumption of all of the current Louisa Creek Community.
3. If the Southern Stockyard option was selected, there would be no room for future expansion beyond 85 Mtpa.
4. The Dudgeon Point solution is not feasible due to the additional cost of off-shore infrastructure required for this option. This would escalate the cost of this non-capacity producing expansion considerably in comparison to the other two alternatives
5. The capital cost of such additional stockyard will have to include new bunds and additional machines as well as at least two new inloading rail receival pits
6. There is no capacity benefit associated with this addition so the entire costs would be additional to the existing 7X costs just to maintain 85 Mtpa. This means that the Access Holders to 85 Mtpa would have to bear the full cost of the current operation, the 7X expansion and the future inloading/stockyard expansion, causing a multiplication of the post 7X Terminal Infrastructure Charge (TIC) by three to five times

The alternative, which is currently employed at DBCT, uses a cargo assembly zonal stockyard methodology where each zone incorporates two yard rows which are assigned to an outloading system (prior to the delivery of OL3, each zone will be assigned to a shiploader). The fourth zone, which has been initially assigned to rows 7 and 8, will be assigned to dedicated remnant control (Figure 9).

As mentioned earlier in this chapter, to give some independence to the decision to employ cargo assembly as the preferred terminal operating mode, DBCTM commissioned Connell Hatch to prepare a report looking at the requirements and viability for dedicated stockpiling at DBCT which is attached as Appendix A.

Figure 8 shows the stockyard plan post the 7X expansion (post 85 Mtpa) with a total live stackable volume (to bench 3) of 2,290,400m as per the following (Table 4):

	Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Total
Design Volume	236,000	283,000	303,000	304,000	299,000	369,000	306,000	177,000	2,277,000
Working Volume (based 3 benches)	236,500	261,500	285,500	334,400	326,800	391,500	315,800	138,400	2,290,400

Table 4 – DBCT stockyard row volumes - 2009

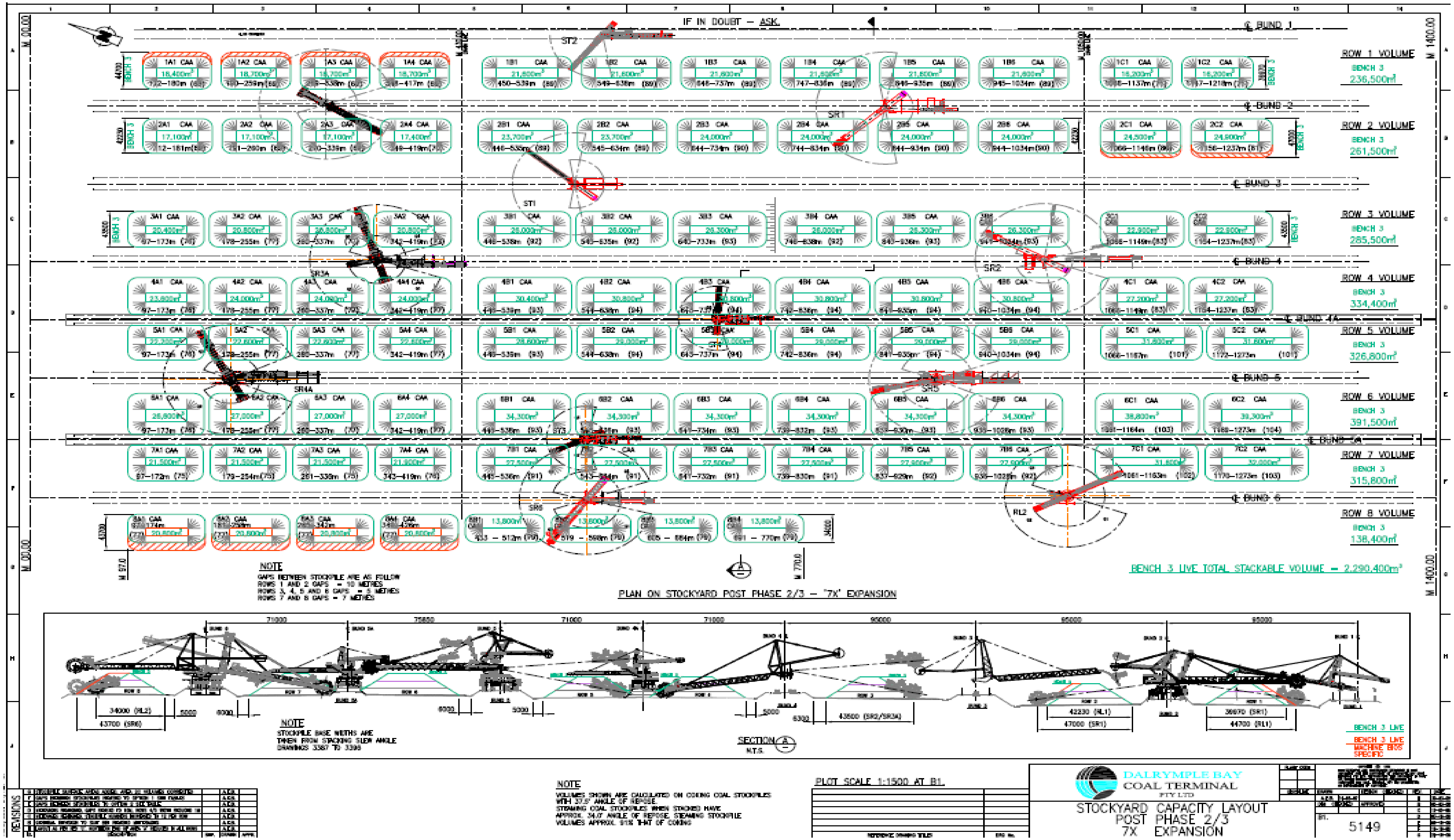


Figure 8 – DBCT Stockyard layout post 7X yard completion – DBCT P/L 2009

Remnant Management

To achieve optimum yard utilization and at the discretion of the Operator, an area of the Terminal stockyard has been dedicated to managing remnant coal while the rest of the stockyard operates in full cargo assembly mode. Each Access Holder will be allocated a portion of the total volume of the assigned stockyard for Remnant Management in accordance with its share of Aggregate Annual Contract Tonnage.

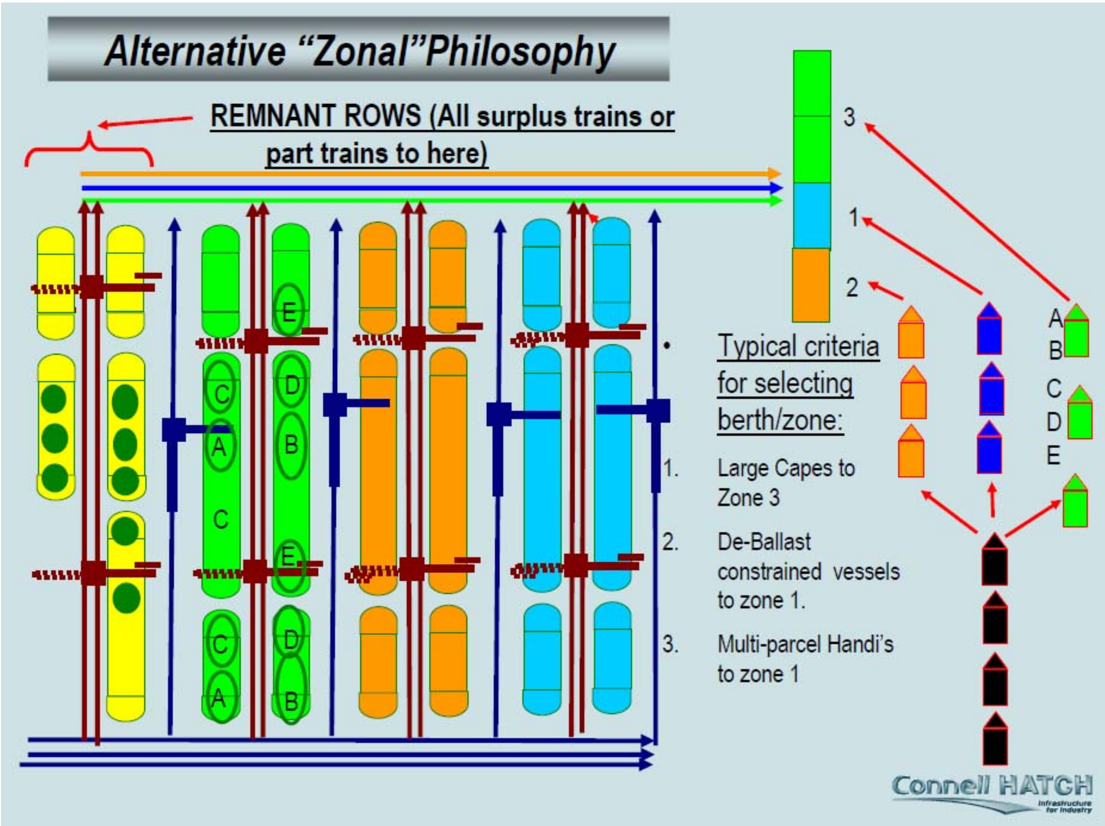


Figure 9 - DBCT 7X zonal yard layout incorporating Remnant Management in rows 7 & 8 – Connell Hatch 2008

This concept will see two cargo assembly stockpiles (Figure 9) allocated to each Parcel in the dynamic stockyard zones (coloured blue, orange and green) comprising ideally of 90-95% of the maximum cargo requested by the Vessel. The balance, plus any surplus remaining in the last train consignment relevant to the Parcel, will be loaded in the Access Holder's remnant management area.

For example, if the Access Holder has suitable coal in their remnant area, the amount of coal railed should ideally be less than the anticipated parcel, with the balance of the Parcel being topped up from the existing Access Holder's remnant area. If there is insufficient coal in the remnant area, the remainder of the coal in the last Train Consignment relevant to the Parcel, after completing the Cargo Assembly stockpiles, will be stacked into the Access Holder's remnant area.

Each Access Holder will be responsible for managing the quantity and quality of remnant coal in its dedicated area, including separation requirements pertaining to different Products. With the objective of maximising cargo velocity through the Cargo Assembly stockyard and in the event of there being any residual stockpile in the Cargo Assembly area after loading of a vessel, the Operator has total discretion in determining the next cargo to be allocated to that area, subject to contamination with unsuitable coals and endeavouring, as practicable, to maintain the same grades/products of coal. However, if, in the opinion of the Operator, it is impractical to maintain the grade of coal between cargo assembly stockpile builds and immediately upon identification of a residual cargo assembly stockpile, the Operator must consult with the Access Holder to whom the residual belongs as to the next cargo to overlay that residual, in order to facilitate trading.

Dalrymple Bay Coal Chain Central Coordinator

It is acknowledged by all stakeholders that a host of issues currently impact the ability of the Goonyella Coal chain to maximise throughput. These include:

- Erosion of capacity due to increasing service levels. The greater the level of service demand, the higher the velocity of throughput that is required to maintain capacity. To illustrate, conducive service levels (i.e. less products, larger parcels, less multi-parceling, minimal blending above 60/40 ratios and an effective remnants management system), reduce yard segregation and cargo build times so the volume of coal to footprint ratio increases (i.e. because there is less land lost to separation between stockpiles and lower residence time before the cargo is loaded). This has a significant beneficial impact on terminal capacity although the converse also applies.

- Stacking and reclaiming efficiency can be compromised by machine conflict once in-situ volumes exceed 1,200,000/1,400,000 tonnes (85 Mtpa configuration) because of the reduced flexibility imposed on the stockyard planning. Similarly, any delays to inloading means that the stocks in the yard will be quickly depleted. Accordingly, the need for reliable upstream coal chain delivery to DBCT to maintain throughput is essential.

- The rail task is also a complicating factor in that it is currently subject to a contractual split of approximately 60:40 between DBCT and HPS. This presents unique scheduling challenges to the rail operator in terms of day of operation running as HPS operate a dedicated stockpile terminal. As the two terminals share the coal chain and the capacity of the Goonyella below rail system (as part of the Goonyella coal chain), any delay in one terminal has the potential to impact the other.

- Equipment reliability issues impact the delivery of coal to the terminal and the processing of coal at the terminal. Variations in train payload, late running trains and cancelled services impact stockyard management. Associated changes to terminal planning that are required to rebalance the loading operation place more stress on the rail systems due to priority deliveries resulting in consequential losses.

- Operating conditions, risk tolerance levels, the sequencing of development by respective infrastructure providers and planned/unplanned maintenance all impact capacity. At any point in time, the DBCT system capacity is the lesser of all the participating infrastructure capacity and capability. While a particular piece of infrastructure may have capacity rated above other contributing infrastructure, it can be de-rated due to maintenance activity.

When any one, or a combination of the above occur, shipping arrivals will exceed coal chain capacity resulting in ship queuing. This risk obviously increases when the system is operating close to capacity or there is one or more systemic bottlenecks constricting throughput below rated capacity. The queue will continue to build until such time that vessel arrivals fall below the system's ability to process coal. While excessive ship queuing is inefficient and causes demurrage exposure to Producers, insufficient vessels available to load can be equally debilitating in that it restricts the Operators ability to react to coal chain supply issues. Accordingly, the Dalrymple Bay Coal Chain targets a 15-20 ship queue at any given time to optimise berth occupancy and outloading commitment. This design facilitates the lateral scope of cargo combinations that are processed by DBCT.

Realising maximum system capacity for both terminals has historically been challenging as throughput increases and now that the Queue Management System (QMS) has expired (31 December 2008), careful management is required to avoid demurrage exposure. This has led to the Producers and Service Providers drafting a set of guiding procedures and processes to control any excessive vessel queuing. The development of the Long Term Solution (LTS) Governing Principles has been coordinated by the DBCC Board to align the basic drivers of development, operation and coordination of the Goonyella Coal Chain. While the LTS Implementation Memorandum is yet to be formally countersigned by the stakeholders, the 9 guiding principles are:

1) Service providers must only contract for the provision of capacity for their element of the supply chain based on the System Capacity that is available (not standalone capacity). Service providers will not be forced to contract to a higher level of capacity than they believe is able to be delivered by their element of the supply chain.

2) Access Holders and service providers will subscribe to a common set of assumptions for the assessment of System Capacity.

3) It is the responsibility of each Access Holder to secure a contractual entitlement to capacity for each element of the supply chain (train, track and port). The contractual entitlement that is secured for each element of the supply chain will be defined consistent with the common set of assumptions.

4) Access Undertakings for the regulated service providers will include Access Protocols which provide that:

    a) Access Holders have surety of ongoing access to contracted system capacity;

  b) Access Seekers have a defined process/path by which to gain access to system capacity;

  c) No Access Seeker will gain access to system capacity at the expense of an Access Holder. For clarity this only applies to post 85 Mtpa.

5) Contracts for access to capacity will provide a mutual obligation:

  a) To use or pay for capacity on a long-term basis;

  b) To make each participant accountable for delivering capacity for their element of the supply chain consistent with that participant's contracted volumes.

6) The System Master Plan will identify the feasible investment options (from load points to port to system rules) for increasing coal chain capacity and evaluate those options from a cost, risk and timing perspective.

7) Capital investments in new infrastructure must be guided by the agreed System Master Plan for the coal chain.

8) The commercial framework must:

  a) to the extent it is feasible, ensure each Access Holder is held accountable for their consumption of coal chain capacity;

  b) provide for capacity to be traded and swapped between participants within the physical constraints of the system and without affecting any organisation not party to the trade.

9) The Supply Chain is to be planned and operated as a system under a commitment from all participants in the Supply Chain to work cooperatively to give effect to the Principles. An independent coal chain planning and coordinating body will facilitate this process.

Should these principles be accepted, Service Providers, including DBCTM will contract post 85 Mtpa capacity according to an agreed maximum system capacity, determined by the System Master Planning model. As such, DBCTM will work with the DBCC and QR Network to ensure alignment of future capacity expansions represented in the System Master Plan. Each Service Provider will then provide an asset Master Plan pertaining to their detailed expansion plans.

Mine Load Points & Recharge Capability

The performance of individual mine outloading infrastructure also contributes to the overall system capacity. As such, the capability of such infrastructure must be able to support the connecting supply chain infrastructure. If not, the total system capacity will be de-rated as delays in each of the under-performing mine load-outs impacts delivery of coal at the terminal as well as contributing to consequential loss, as the train returns late to perform the next haulage task.

While particular emphasis has been employed to challenge infrastructure development of QR Network and DBCT, little is known as to the capability of individual mine load-outs. The current Dalrymple Bay Coal Chain System modelling will show any discrepancy in infrastructure shortfalls although it is hoped that the owner of the infrastructure will have already upgraded its facilities to match the demand requirements of the system, so as to limit daily fluctuations from this capacity and limit day of operational variations to plan.

Terminal Capacity Modelling

DBCTM has appointed Sandwell Engineering Inc. as the AU Independent Expert and Terminal Capacity modeller. This is primarily due to its past involvement with the terminal design and operation and its global reputation as a leading industry expert in bulk terminal design and operation. Sandwell has also been responsible for past capacity estimations and is well known to the terminal Producers, with Dr Harry King presenting past results of DBCT simulations to the Producers personally.

Sandwell has a comprehensive understanding of the terminal operation and service demand as well as a detailed knowledge of the 7X project. As a result of this history, Sandwell has developed specialised terminal modelling using its “Bulk Terminal Model” software. This methodology uses analysis of historic terminal operational data to determine operational characteristics based on the complex, but predictable relationships between the coal supply chain and key operational factors, as a means of validating the terminal Net Operating Capacity (NOC).

For the purposes of master planning, there are constraints that are considered unlikely to change in the foreseeable future and so, these have been accommodated in the terminal capacity modelling. They comprise:

1. stockyard footprint geography (i.e. no increase of the stockyard footprint up to 85 Mtpa);
2. tightening dust and noise emission tolerances; and
3. sub-optimal vessel mix (in terms of outloading capacity) with a continuation of multi-parcelling/blending.

QR-Network’s Coal Infrastructure Master Plan (8/08/2008) sets out committed rail infrastructure capacity enhancements to expand Goonyella rail capacity to 129 Mtpa. However, current operational dysfunction indicates more systemic infrastructure issues will continue, or even increase, if rail infrastructure is designed to accommodate an even railings operation. As the terminal operates to a full cargo assembly operation and orders trains for shipping, modelling is a way of testing the loss as the two systems clash.

To this extent, DBCTM has contracted Sandwell to provide two simulations. The first is focused on only the export terminal operation using only minimal detail for the mine production and rail operation as follows:

- average product rate;
- number of trains;

- average train payload; and
- the average travel time to and from the terminal to the mines.

In this simulation, the model coordinates the movement of trains and ships in the following steps:

1. The main driver for the model's logistics is mine production. Annual production for each mine and grade are entered as inputs into the model.
2. Ships are selected with scheduled arrival dates which match the availability of coal for each parcel. The size and the number of parcels for each ship are selected appropriately from historical distributions for each of the grades.
3. The actual arrival time for each ship is selected randomly in a window around its scheduled time based on historical ship arrival data.
4. Coal is moved by rail from the mines to the terminal on a just-in-time basis, to match the ship arrival times over the following 10 days. Only the amounts of coal needed for the ships' cargo (plus any amount extra needed to make a full train load) are railed to the terminal. If sufficient trains and stockyard space are available, the model accumulates the full amount for each of the ships' parcels 2 days ahead of its berthing.

Calibration provides the link between the model results and the terminal's actual operation. It validates that the model accurately reflects reality and that the subsequent modelling runs (each consisting of 12 months of simulated operation at a specified throughput), will provide useful and accurate information on future options. Both the inloading and outloading systems were calibrated using a simulation run at 50.3 Mtpa corresponding to the 1 July 2005 – 30 June 2006 data set provided by DBCT P/L. The throughput capacity is considered to have been reached when any one of the KPI's reached a pre-determined threshold (rail receival limit of 90% and 85% of outloading commitment) correlated to acceptable demurrage.

There are a number of model inputs which do not directly correlate with historical data and must be determined by observing the simulation results (known as calibration). Key parameters to determine when the model accurately reflects existing conditions include:

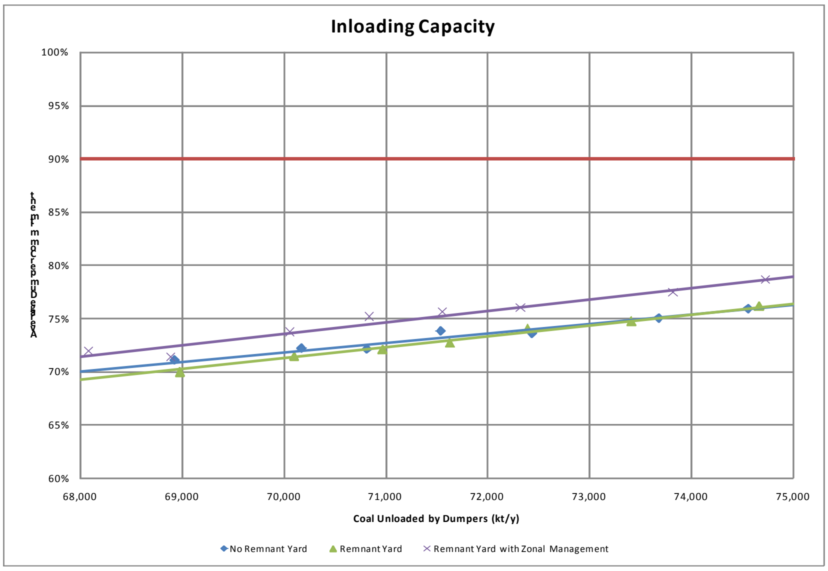
- the outloading string commitment per ship, dependent on the net loading time per ship. Ship delay (a model input), the duration of any yard conflicts and the number and duration of shiploader, stacker/reclaimer and rail receival breakdowns (determined by the simulation model);
- the gross unloading rate of the rail receival stations which is directly related to the net unloading rate but is also affected by events such as direct loading, stacker/reclaimer breakdowns and rail receival maintenance.

Rather than generating ships randomly using the desired proportion of each ship type and number of parcels used as an input to the model, the calibration runs were performed for the exact sequence of ships during the study period. In this way, Sandwell can duplicate exactly the ship sizes, parcel numbers, product types and ship berthing times. The simulation run also included an initialisation period well before the simulated arrival of the first ship so that the modelled terminal could accumulate the necessary amount of each product in the stockyard. Otherwise, the average reclaiming rate for the stacker/reclaimers, ship delays by ship type and the average net unloading rate of rail receival were all adjusted until the key calibration parameters were sufficiently close to the historical data.

Although most of the historical data supplied by the terminal Operator was entered directly as inputs to the model, there are a number of distortions in the data caused by upstream supply chain inefficiencies during the period which have reduced the amount of coal delivered to the terminal below the assumed terminal constraints (i.e. the inloading system). These delays are collected in the terminal data which does not differentiate upstream restrictions in throughput with the terminal operation. Analysis of this data therefore implies that the terminal is responsible for any restricted throughput, even though the cause is a supply chain delivery issue. As such, the terminal operation, responding only to the amount of coal delivered, does not represent the most efficient operation (as by doing so will only increase unproductive delays) in either the inloading or outloading of product. Because the terminal's systems are unable to differentiate the root cause of external delays, the operational result is recorded as the most efficient terminal operating process and, as the terminal is at the end of the supply chain, the terminal is therefore assumed by the model to become the restriction.

To overcome this shortfall, where the data does not directly correlate with previous historical data and the throughput of the system corresponds to reduced delivery, the model input was adjusted to reflect previous historic terminal performance. As the results of the Phase 1 capacity determination were contained in Master Plan 2008, the following graphs (Graph 10 & 11) are for the Phase 2/3 – Step A increment that was delivered at the end of December, 2008. Phase 2/3 completion is currently targeted for end June 2009 when Sandwell will again analyse the achieved construction additions and assess rated terminal capacity.

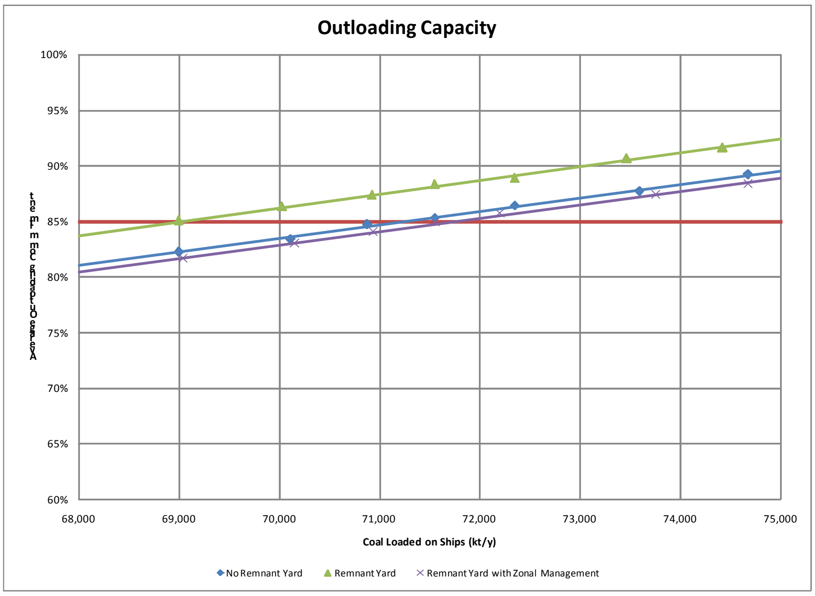
Computer output 1 & 2 shows the Sandwell modelling simulation incorporating the working rail system, based on track infrastructure published by QR Network in its Master Plan. This modelling simulation is still being finalised although, initial results shows the system constrained at approximately 105 Mtpa but to power constraints. While power upgrades are part of the current rail infrastructure expansion, DBCTM's fears that track capacity and yard restrictions plus operational issues caused by the interaction of the two operational modes, may cause a reduction of future delivered coal to DBCT. This in turn may cause yard management issues which will reverberate back in to the rail system, amplifying operational loss. While the dysfunction of an undeclared operating system continues, it is doubtful that the terminal will be able to assemble coal parcels at the velocity required to maintain 85 Mtpa.



- "No Remnant Yard" = Phase 2/3, Step A (no remnant management or zones)
- "Remnant Yard" = Phase 2/3, Step A with Rows 7 and 8 used for remnants, but no zones
- "Remnant Yard with Zonal Management" = Phase 2/3, Step A with Rows 7 and 8 used for remnants and zones 1, 2, and 3 dedicated to shiploaders 1, 2, and 3 respectively

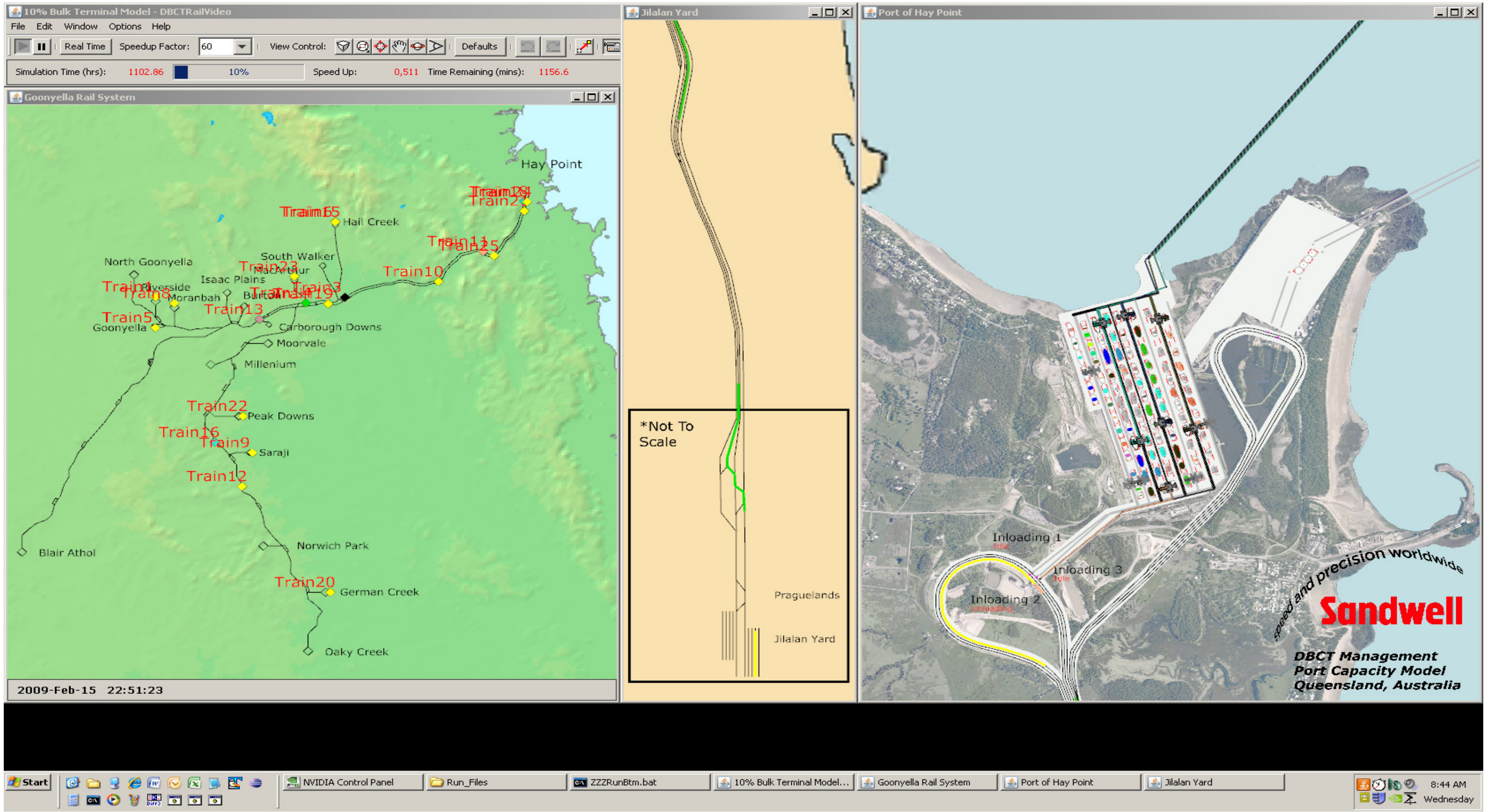
.

Figure 10 – Sandwell inloading capacity estimation inclusive of Remnant Management Strategy

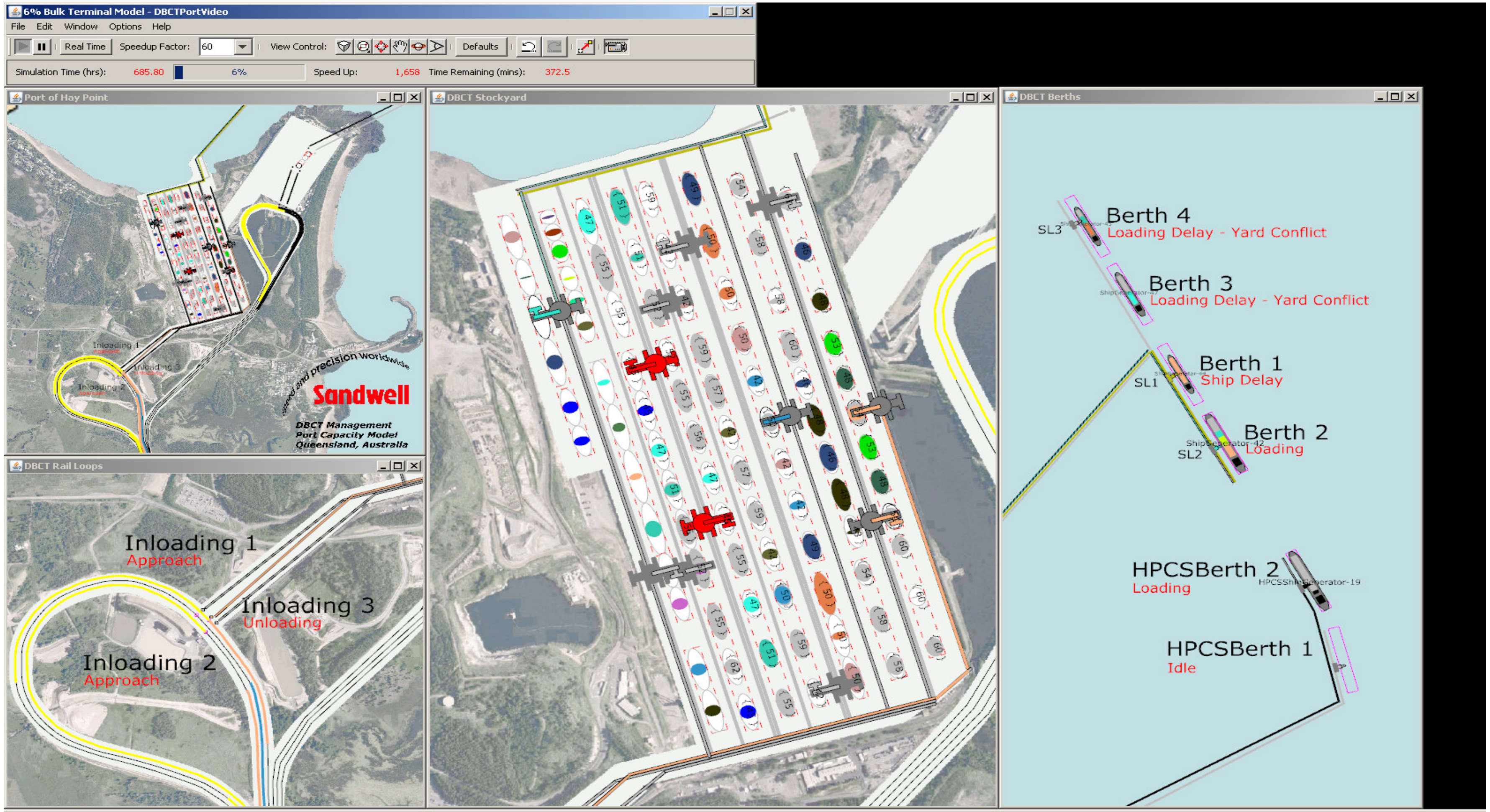


- "No Remnant Yard" = Phase 2/3, Step A (no remnant management or zones)
- "Remnant Yard" = Phase 2/3, Step A with Rows 7 and 8 used for remnants, but no zones
- "Remnant Yard with Zonal Management" = Phase 2/3, Step A with Rows 7 and 8 used for remnants and zones 1, 2, and 3 dedicated to shiploaders 1, 2, and 3 respectively

Figure 11 – Sandwell outloading capacity estimation inclusive of Remnant Management Strategy



Computer output 1 – Sandwell DBCT capacity model with Goonyella rail system module incorporated – system visual – Sandwell 2009



Computer output 2 – Sandwell DBCT capacity model with Goonyella rail system module incorporated – Terminal visual display - Sandwell 2009

Determination of Terminal Capacity

The full procedure for determining DBCT Terminal Capacity is set out in Clause 12.1 of the approved Access Undertaking. Primarily, DBCTM will determine the maximum reasonably achievable capacity, from time to time and after:

- taking advice from an Independent Expert (currently Sandwell Engineering); and
- due consultation with the terminal Operator, Producers and any Access Seekers.

DBCTM has appointed Sandwell Engineering, Vancouver as the Independent Expert due to their long association with this terminal and their expertise in bulk terminal capacity modelling. Determinations are made at the completion of each capacity expansion, or in any event, at least once per financial year and have regard for:

- historic User Agreements (including taking into account historical and reasonably estimated rates of utilisation of the Terminal's capacity but also having regard to reasonably foreseeable future changes);
- Standard Access Agreements;
- Good operating and maintenance practice;
- Terminal Regulations;
- an objective of maximum reasonably achievable capacity for the terminal without unduly escalating demurrage costs;
- rail and vessel interfaces with the Terminal;
- additional capacity anticipated to become available in a relevant year as a result of any proposed capacity expansion; and
- any other matter that DBCTM reasonably considers appropriate.

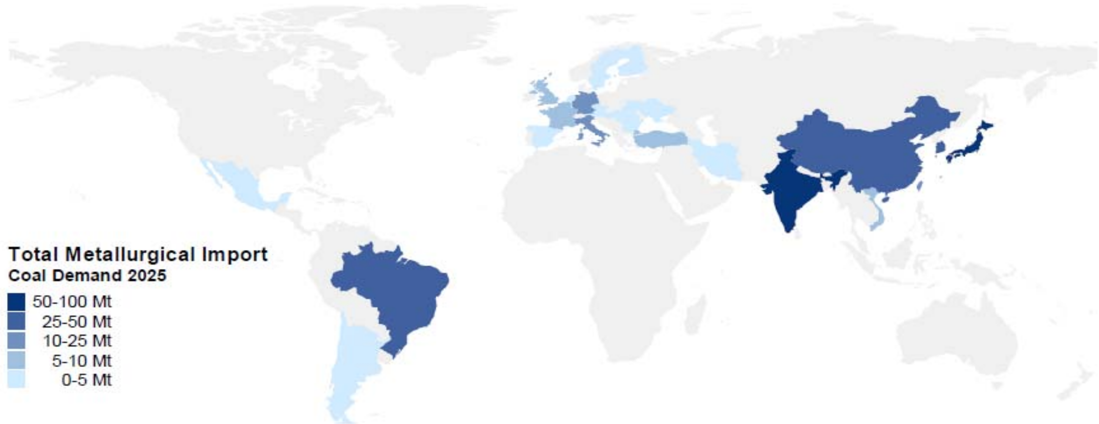
This process was followed on completion of Phase 1 (capacity determination of 3 September 2008) and Phase 2/3 – Step A.

Terminal Producers can challenge DBCTM's determination of terminal capacity where the challenge is made by a group of Producers whose combined Annual Contract Tonnage for that financial year is greater than 40% of the aggregated Annual Contract Tonnage for that financial year. Those Producers can refer the matter for expert determination under the provisions of the approved Access Undertaking (Clause 5.10(c)). However, should DBCTM's determination be shown to have been made in good faith, then those Producers disputing the determination must pay the costs of the expert as well as all of DBCTM's reasonable costs of participating in the expert determination process.

4.0 Supply/Demand Based Projections

Global Metallurgical Coal Demand

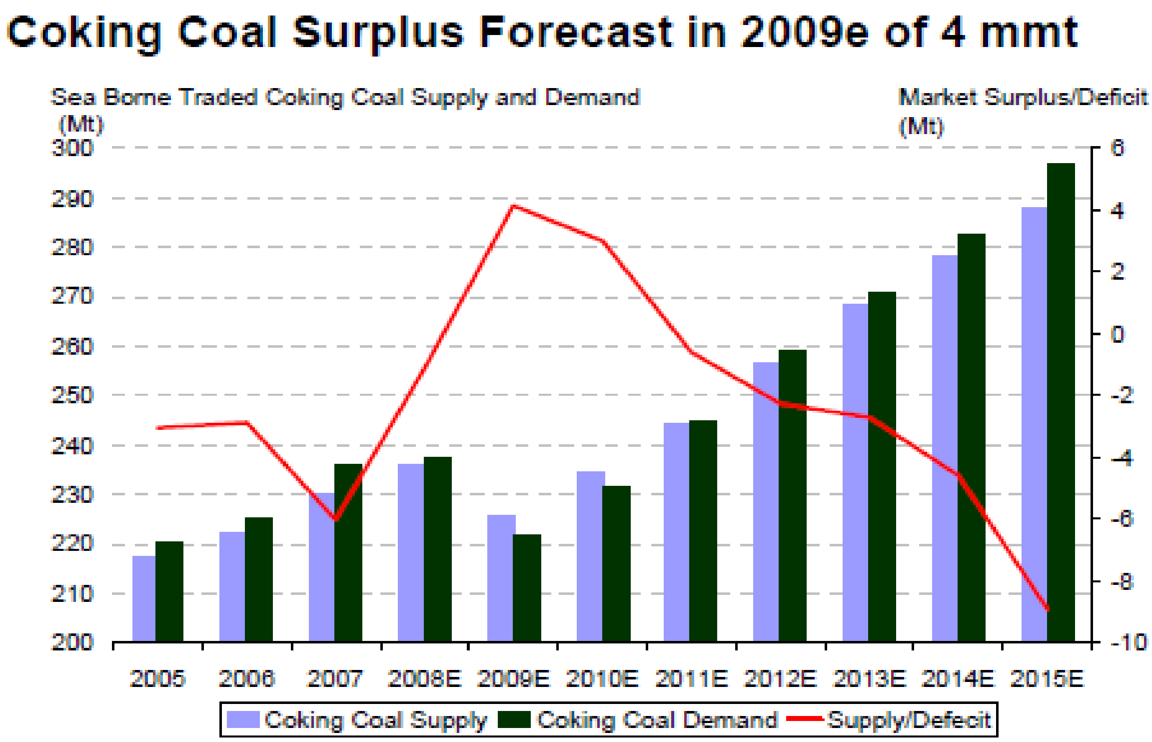
Global demand for metallurgical coal continues to be extremely volatile due to a combination of the global credit crisis, slowing national economies and future economic uncertainly. As such, DBCTM has continued to monitor the business media and contracted both Wood Mackenzie (see Appendix F) and AME Mineral Economics in order to try to decipher emerging trends. According to the analysis we have received, India and Brazil are still predicted to be the major growth areas for metallurgical coal exports with total demand expected to increase to approximately 390 Mtpa by 2025 as represented by the following graph (Map 4).



Map 4 – Metallurgical coal export distribution - Wood Mackenzie 2009

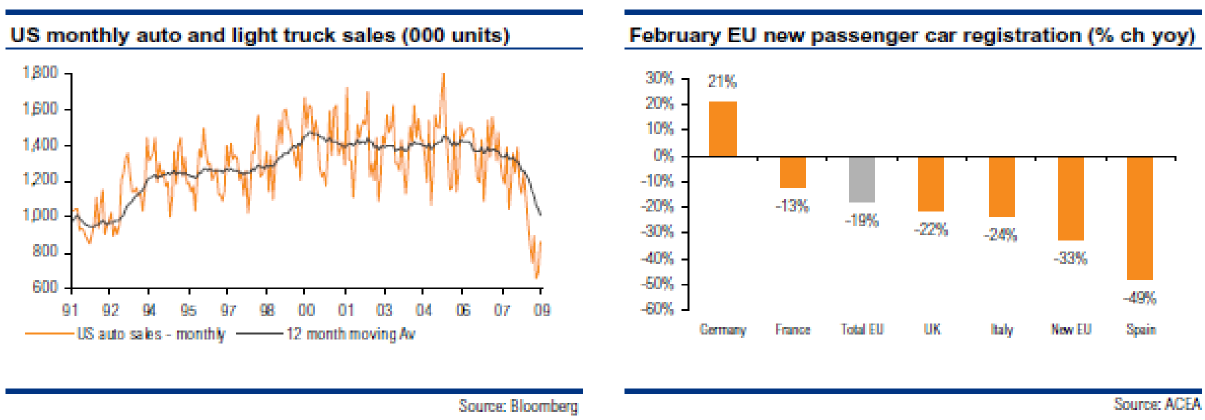
While Japan is expected to increase the proportion of semi soft coking coal in steel production, Europe is forecast to remain relatively static with limited minor growth. This gives a reasonable projection of total demand in the long term, however, the volatility of the past 8 months is making short term forecasting much more difficult. There are various predictions of when demand may bottom and start to increase with general comments from mining companies indicating their belief of strengthening demand from the end of calendar year 2009.

CommSec (March 2009) however, feels there will be a 2-4 year period of static growth before any sustained recovery, a view shared by Westpac, who predict a recovery in 2010/2011 (April 2009). This forecast was made prior to recent price negotiations which were ongoing at the time. However, prices have since been settled (Table 5) at large discounts to last year. Further, negotiations of carry-over tonnages at last year's rate have also been discounted to try to stimulate demand. Morgan Stanley (Graph 4) do not have much faith in these measures predicting global seaborne coking coal demand to fall by 7% year on year (yoy) to 222 million tonnes in 2009 on the back of a 5% reduction in global steel output. If this view becomes a reality, there will be a surplus of coking coal of approximately 4 million tonnes. Supporting this prediction has been the announced production cuts of MacArthur Coal, RTCA, Xstrata and Peabody (Platts 2009).



Graph 4 - Morgan Stanley Global Commodities Playbook, 1Q99 (January 2009)

The central Bowen Basin coal producers reacted swiftly to the demand collapse first witnessed in mid-November 2008 (BHP reported a 25% drop in third quarter met coal production - Platts). Significant production cuts and contractor reductions were announced by most of the Producers that use DBCT due to fears of a prolonged downturn, mainly driven by the collapse in vehicle sales and industrial steel use (Graph 5/6).



Graph 5/6 – CommSec

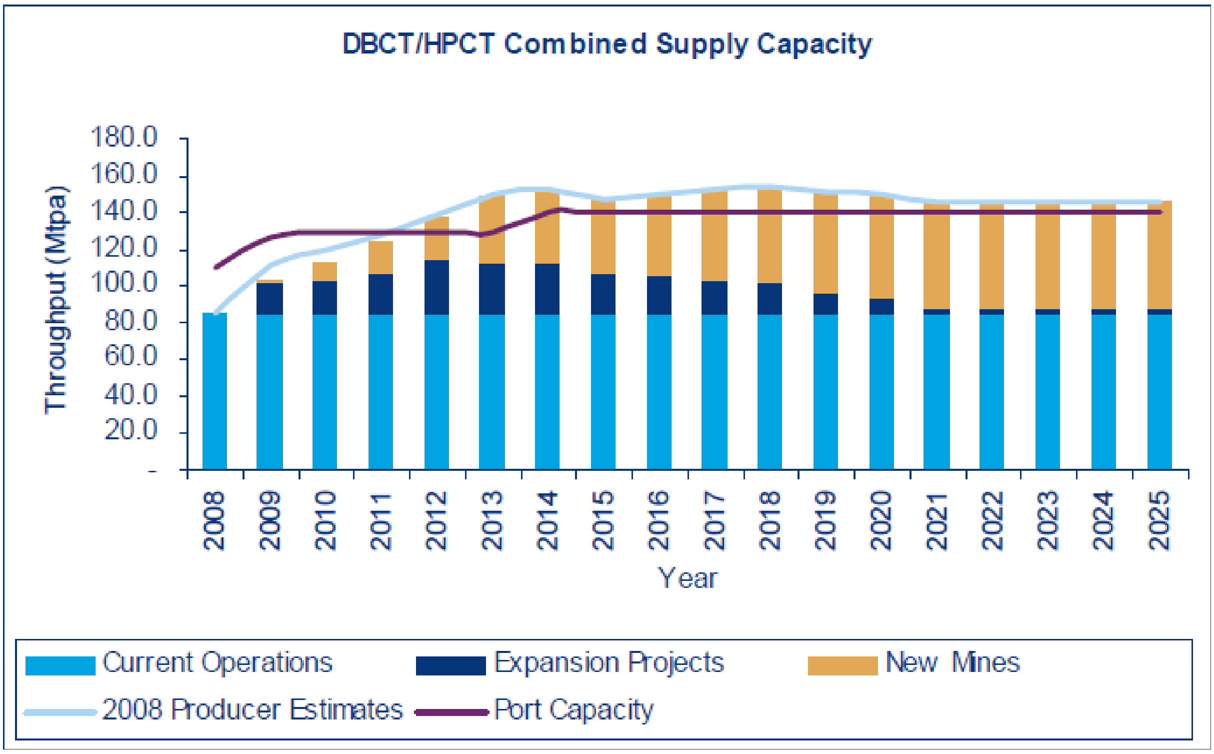
However, since coal prices settled in March, demand has steadily increased which is contrary to the stocking/destocking pattern that appeared to be emerging. March, while impacted by Tropical cyclone “Hamish” and a major train derailment at Coppabella, was quite strong compared to December/January and forward vessel nominations are strong for

April/May.

	Thermal	Semi-soft	HCC
2008/09	125	240	300
2009/10	70-72	80-85	128

Table 5 - Platts April 2009

In terms of supply, new projects in Mozambique, Indonesia and Columbia are all in development and expected to start contributing coking coal into the demand market by 2010. Mongolia coking coal is expected to be used entirely by China with little impact on Australian suppliers. Wood Mackenzie anticipate that supply capacity from the central Bowen Basin will be sufficient to utilise the combined terminal capacity of DBCT/HPS although mine production development may lag port capacity until 2012 (Graph 7). However, post 2012, there should be sufficient excess supply that, if met by seaborne market demand, could justify further terminal expansion although only to a combined 160 Mtpa.



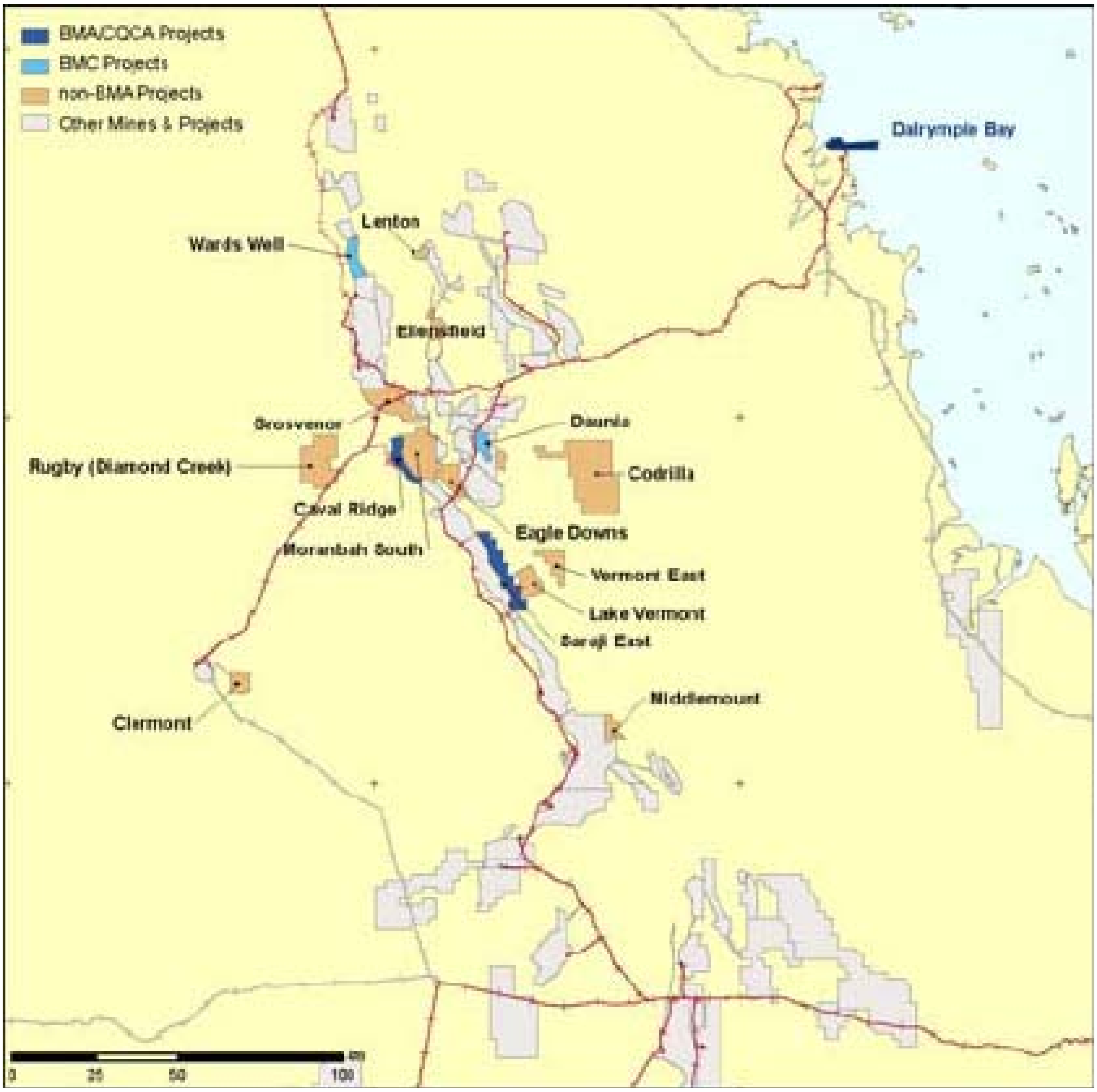
Graph 7 - Wood Mackenzie 2009

Where doubt begins to confuse the issue is with the current situation regarding development of the Goonyella to Abbot Point (GAP) northern missing rail link project. While DBCTM understands that PCQ is pushing ahead with Abbot Point Coal Terminal expansion to 50 Mtpa, this capacity will now only be serviced by the Newlands rail system at this stage. However, it is clear that the central Bowen Basin has an extensive resource and enormous marketable reserves shown by Table 6 (note, this does not include “inferred resources”).

	Marketable Reserve			Resource (Measured & Indicated)			
	Metallurgical	Thermal	Total	Metallurgical	Thermal	Undefined	Total
Surface - Operating	1,658.4	86.0	1,744.4	2,839.0	186.0	882.0	3,907.0
Underground - Operating	531.1	-	531.1	2,450.0	-	320.0	2,770.0
Surface - Project	285.9	241.2	527.1	485.0	526.0	645.0	1,656.0
Underground - Project	570.4	34.5	604.9	1,290.0	-	-	1,290.0
Closed/Suspended	-	-	-	930.0	-	-	930.0
TOTAL	**3,045.8**	**361.7**	**3,407.5**	**7,994.0**	**712.0**	**1,847.0**	**10,553.0**

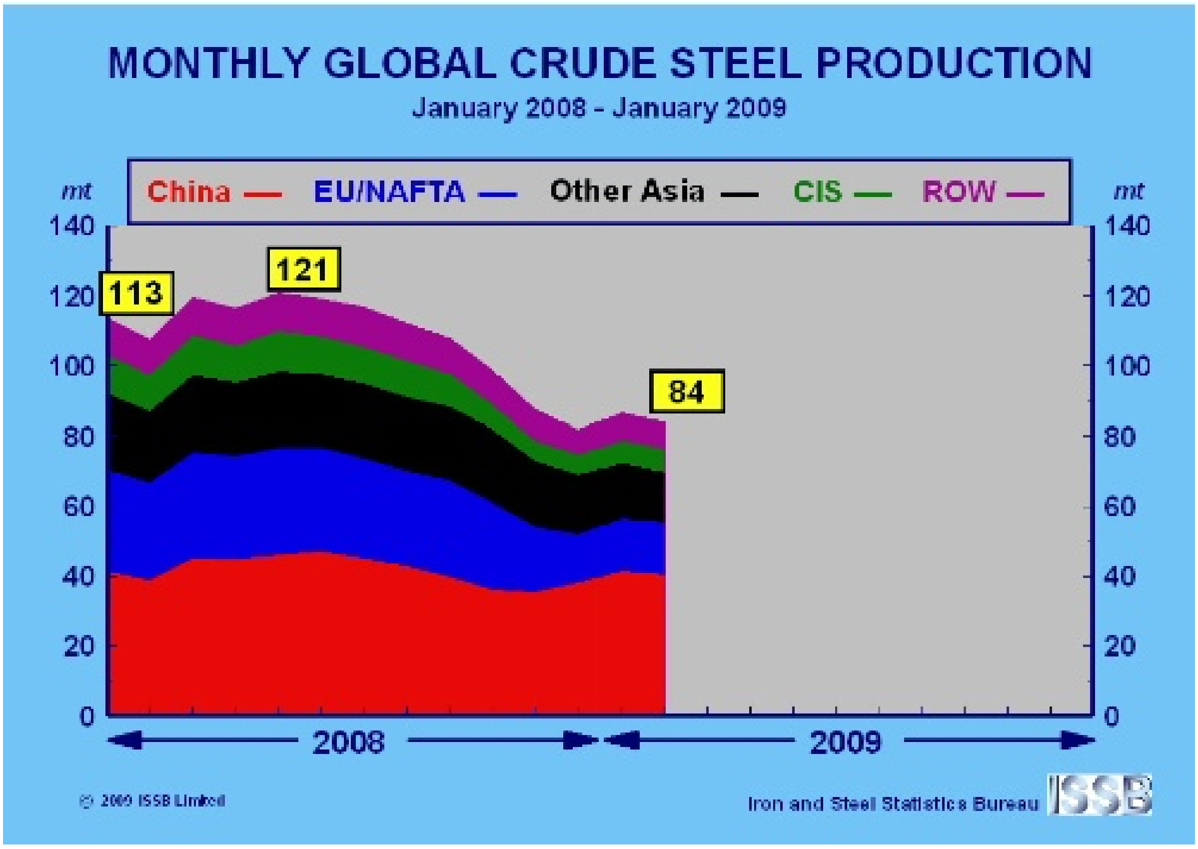
Table 6 - Wood Mackenzie 2009

The following map (Map 5) shows potential new projects that could be developed over the next 5 years to realise the current Access Applications.



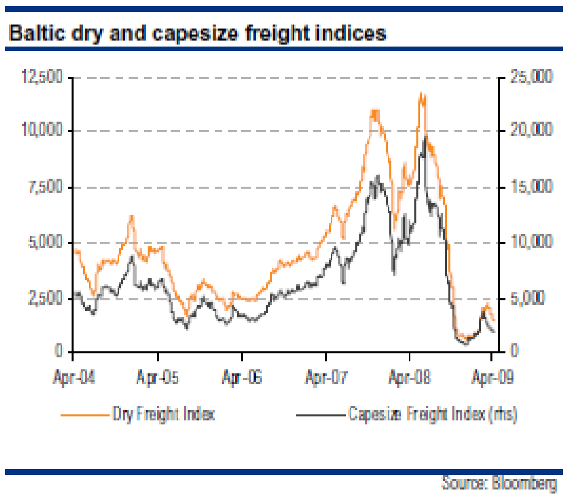
Map 5 - Wood Mackenzie 2009

While global steel production stalled in 2008 (see Graph 8) and global crude steel production for January-March 2009 fell 23% compared to the same period in 2008, the cost of shipping coal became cheaper as the global shipping market collapsed (Graph 9 & 10).

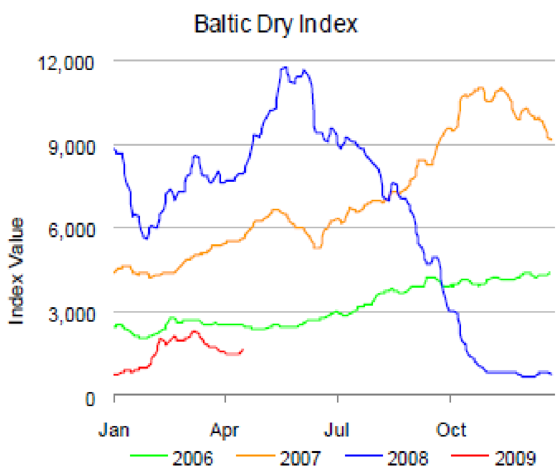


Graph 8 - ISSB 2009

Combined with the price reductions for the 2009 financial year, the FOB cost of metallurgical, coupled with the reduced price of coal, the FOB price is very attractive to that



Graph 9 - CommSec March 2009



Graph 10 – Howe Robinson & Co April 2009 of last year although obviously, steel consumption needs to increase to take advantage of the lower FOB value.

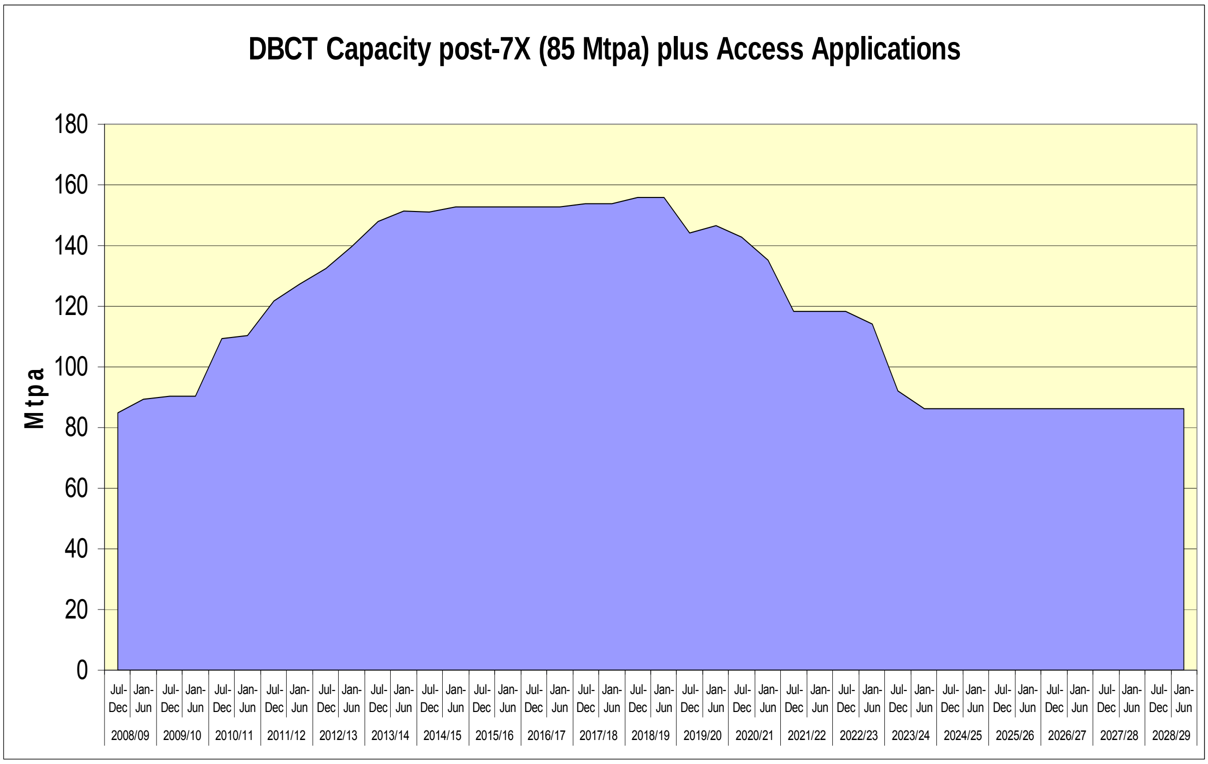
Due to the extreme market conditions, Master Plan 2008 was unable to define trends in the current market that would give a clear direction as to future global demand for coal, despite the strength observed until July/August 2008. Since that time, shipping arrivals continued to decline until March 2009 and while a shipping queue still exists off the port, this is fundamentally due to an inability to receive coal at the terminal at the same rate that can be handled/shipped. As such, DBCTM will continue to adopt a "wait & see" approach, especially as the final terminal capacity is targeted for release by the end of June, 2009.

Supply Based Demand

The Port Services Agreement requires DBCTM to:

- assess the current and future needs of Producers for services and facilities; and
- provide projections for the demand for services at DBCT.

Access Applications for DBCT capacity increased dramatically prior to the recent economic unrest as illustrated by graph 5 and have continued, albeit at a much reduced rate. The following graph (Graph 11) shows the current DBCT demand profile including existing enquiries and access applications in addition to contracts. It includes the "evergreen" options to extend the expiry date term.



Graph 11 – DBCT contractual profile with current Access Applications 2008/2023

The existing mines with contract commitments to export coal through DBCT are (Table 7):

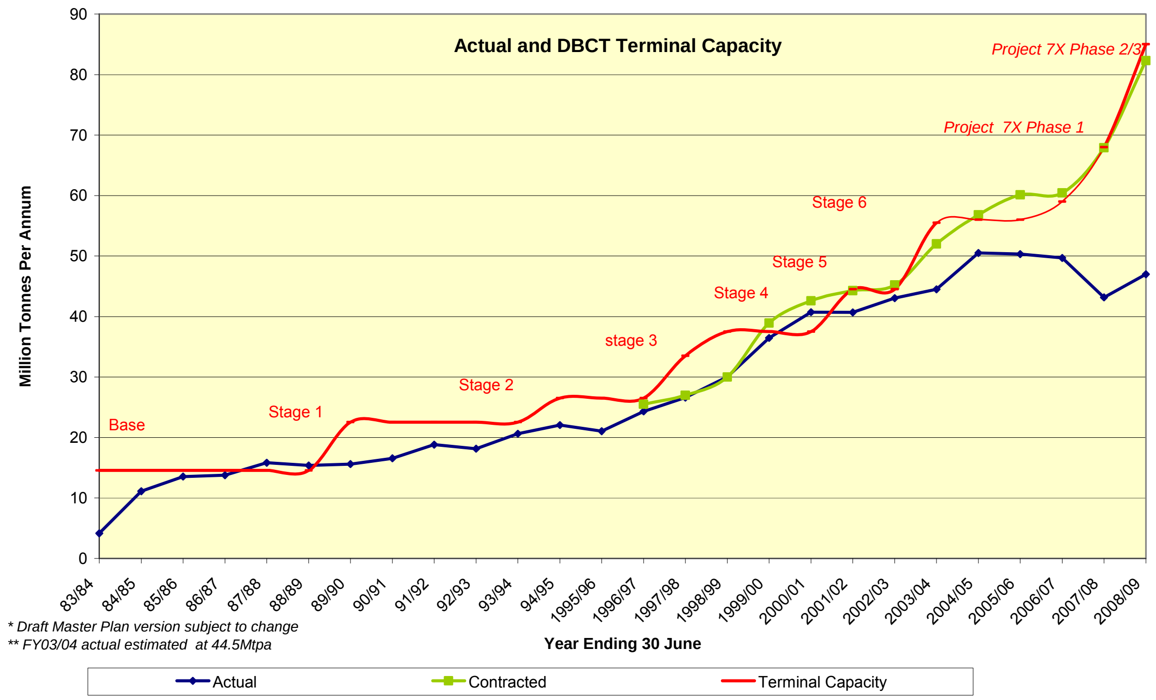
Mine	Owner	Coal type
Blair Athol/Clermont	Rio Tinto Coal Australia	thermal
Hail Creek	Rio Tinto Coal Australia	hard coking
Moranbah North	Anglo Coal	hard coking
Oaky Creek	Xstrata Coal	hard coking
German Creek/Foxleigh	Anglo Coal	hard coking/PCI
Riverside	BMA	hard coking
North Goonyella	Peabody	hard coking
Burton	Peabody	thermal, PCI, hard coking
Millennium	Peabody	thermal, PCI, coking
Coppabella	Macarthur Coal	thermal, PCI, coking
Moorvale	Macarthur Coal	PCI, thermal
Isaac Plains	CVRD Australia Holdings / Aquilla	thermal, PCI, coking
Carborough Downs/Broadlea	Vale Australia Holdings	thermal, PCI, coking

Table 7 – Mines Exporting through DBCT

CommSec (March 2009) has suggested that industry consultation with QR on the GAP project has stalled for a variety of reasons. It is beyond the scope of this Master Plan to probe the reasons for this failure to conclude the GAP project. Rather, and of more concern now, is where that capacity will go and is it already duplicated in existing DBCT Access Applications for post 85 Mtpa capacity? This seems plausible as, despite the delay to the GAP project, no DBCT Access Seeker has withdrawn its Access Application with current applications requiring an extra 67 million tonnes of DBCT capacity (i.e. above 85 Mtpa).

Commissioning of 7X Berth 4 Ship Access Ladder (SAL) – DBCTM

Whether the historic gap between capacity and throughput continues (Graph 12) will be a test of time, although as terminal capacity has been developed to meet contracted capacity, throughput equalisation becomes a Producer risk. The blue line in graph 12 depicts the actual throughput of the Terminal.



Graph 12 – DBCT Capacity Vs Contracts Vs throughput – DBCTM 2009

5.0 DBCT Post 85 Mtpa Expansion Options

Development Objectives for DBCT

DBCTM's development objectives for DBCT are to:

- develop Master Plans that define strategies to ensure efficient and secure long-term operation of the DBCT facility to meet the needs of the existing terminal Producers and new Access Seekers;
- continue to build an alliance with all the coal chain stakeholders in order to achieve mutually beneficial enhancements for the operation of the coal chain, including an equitable sharing of the costs and benefits of system improvements;
- provide the core business functions (treasury, financing, customer relations, regulatory relations, contracts management, etc), while outsourcing technical and operating functions, to ensure that the DBCT facility continues to be managed, operated and maintained at a high standard;
- realise additional terminal capacity through improved process efficiency at the terminal and within the Goonyella coal chain;
- operate and expand DBCT's capacity to meet the needs of existing Producers and new Access Seekers on an efficient and profitable basis and in compliance with the approved Access Undertaking and SAA over the long term;
- support community involvement by DBCT P/L and engage in ongoing meaningful stakeholder consultation; and
- take actions that demonstrate a commitment to environmental best practice.

Additionally, this Master Plan seeks to outline the principles of the preferred future capacity expansion at DBCT and as such, presents the engineering content at a high, overview level. The more detailed plan of the proposed expansion project will be developed following the consultation with Access Holders and Seekers to confirm expansion is required and future feasibility studies are appropriately funded. If the proposed expansion is accepted by the Access Seekers and they enter into Future Expansion Tonnage Agreements for a minimum 10 year period with DBCTM, a Major Development Plan will be prepared detailing the preferred proposal and submitted for approval.

DBCTM intends to base its expansion key development objectives on:

1. capacity yield;
2. cost effectiveness (compared against known development costs per tonne);
3. lowest whole of life costs (maintainability, operational flexibility etc);
4. realisation of terminal capacity against User contracted requirements;
5. integration with existing infrastructure;
6. minimisation of environmental impacts;
7. future upgrade/optimisation potential; and
8. minimising operational loss of capacity during construction.

As mentioned in early chapters, any terminal expansion is integrally linked to other supply chain infrastructure which has been illustrated in previous DBCTM Master Plans. As the DBCC now has the obligation to prepare a system wide Master Plan, DBCTM will work with the DBCC to match infrastructure expansions with rail to ensure capacity expectations are met and delivered across the system. The DBCC involvement in this alignment is vital as DBCTM has no contractual relationship with QR (a point made in Master Plan 2008). As such the DBCC will become the independent coordinating body responsible for aligning capacity expansions.

However, notwithstanding the above, DBCTM also has a Port Services Agreement (PSA) obligation to accommodate the actual and reasonably anticipated future growth of demand for the use of DBCT by Access Holders and Access Seekers, as well as a regulatory obligation to address and accommodate Access Applications, subject to a reasonableness and economic test. In terms of post 85 Mtpa expansion, DBCTM has been working to conceive an expansion that will comply with these obligations. Preliminary conceptual feasibility has identified a preferred expansion path which is the subject of this Master Plan. Prior to any further commitment however, DBCTM requires confirmation from Access Holders and Seekers that they wish to proceed. The following flow chart (Figure 12) describes the consultation/commitment process and time frames to satisfy DBCTM's obligations.

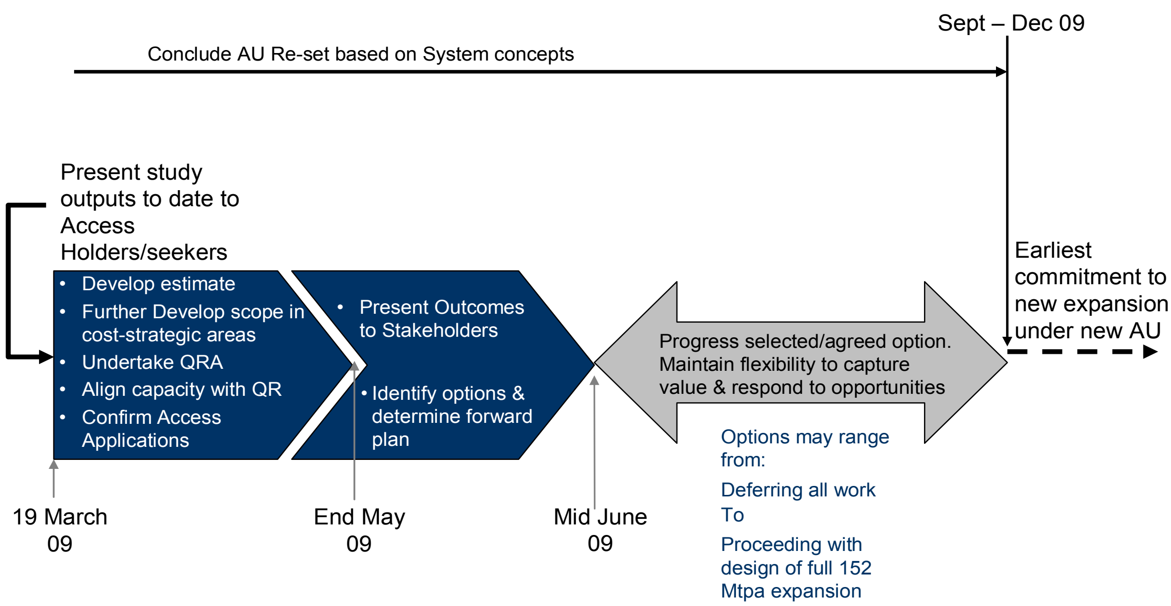


Figure 12 – Post 85 Mtpa expansion planning – DBCT 2009

Post 85 – 152 Mtpa Expansion Options

Study Scope & Assumptions

DBCTM holds Access Applications exceeding the post 7X delivered capacity of 85 Mtpa up to a total terminal capacity of 152 Mtpa. Acknowledging that any access demand that exceeds 89.5 Mtpa will require a 2nd stockyard, DBCTM commissioned Connell Hatch to undertake a follow-up concept study to Master Plan 2008, to identify the preferred stockyard option. The study team were also asked to present expansion scenarios that provided a capacity exceeding the demand requirement. The following chapter summarises those basic expansion options, with the full report attached to this Master Plan as Appendix B.

Because this is a concept study, it is limited in its scope and depth of investigation*.* Capital cost estimates have been developed based on initial plan layouts only and by extrapolating costs from the DBCT 7X expansion for similar works (where practical). Capacity estimates in this report are based on simple spreadsheet models for inloading, stockyard and outloading capabilities calibrated to DBCT operational data and need to be tested by the DBCC System capacity model to verify and align other infrastructure development.

It is vital to note that this plan has been developed on the basis of a supply chain operating to full cargo assembly. The plan does not make any allowance for dedicated stockpiling apart from the remnant area. Capacity increments have been determined for each of the major component parts (the inloading system, the stockyard and the outloading/shiploading system) as described in section 3 of the attached report. The stockyard storage capacity has been calculated adopting a “zonal” approach and adopting a “static” separate area in the stockyard for a remnant management system. This zonal approach means that the stockyard is divided into 3 zones that are each associated with a particular set of reclaimers and a particular outloading system.

The separate remnant management system means that the stockpiles assembled in the “dynamic zonal stockyard” will be built to achieve the maximum possible velocity of coal through the yard. Again, it is vital to ensure that the rail system is capable and contracted to deliver coal to the terminal at the rate required to satisfy the intensity of shipping demand. On this basis, the zonal stockpiles will always be built reliably short of the parcel size that has been ordered by the vessel’s Master. The remainder of the coal brought to the terminal for that parcel would be stacked within the appropriate remnant area that is always to be located in the “static” remnant yard, rather than in the dynamic stockyard space. This ensures that the dynamic stockyard is not congested by left-over coal.

The following factors affect the storage requirements and machine requirements for the stockyard using this approach and have been incorporated into the design after discussion with the Producers:

- stacking whole trains or part trains to remnants - whole train stacking is recommended for the terminal up to 85Mtpa, but this has been assumed to convert to part train stacking for the 8X/9X expansions to accommodate an increased number of remnant coal types; and

- the number of remnant cells to be provisioned. DBCTM, the terminal Operator and the Producers are considering dedicating a volume of yard row 7 & 8 to each Producer according to their share of aggregated contracted capacity. The responsibility for managing the number of products in the remnant area is assigned to the Producer.

DBCTM has deliberately designed the terminal to full cargo assembly in order to reduce the capital expenditure. This is the most efficient use of capital at the terminal in order to cater for the increasing multi-user base and product diversity. Should the Producers wish to change operating mode to dedicated cargoes, it has to be recognised that the expansion described in this Master Plan will be required just to support a capacity of 85 Mtpa. Until such time that Producers direct DBCTM to support an alternative operating mode, expansion plans will be a continuation of the existing terminal operation i.e. full cargo assembly.

Other scope considerations to acknowledge are:

- The study concentrates on potential options to increase the design throughput of the Terminal but does not consider how the rail network or mines might expand to provide the additional capacity. However, DBCTM has been working closely with QR Network on expansion of rail track capacity to incorporate DBCT expansion to 152 Mtpa and HPS expansion to 75 Mtpa. This work will be aligned by the DBCC as part of the System Master Planning based on the Access Applications already received for additional terminal capacity.
- The study relies on and represents options contained in previous studies undertaken for Ports Corporation of Queensland (prior to the leasing of DBCT) and DBCTM, in addition to identifying new options.
- The study does not consider potential expansion of the Hay Point Services (HPS) Terminal, its effect on the rail network or any potential for sharing new facilities. The exceptions being that:
    - – Potential new export berths to the south of the existing HPS berths (as identified in previous studies) are now reserved for HPS.
    - – In locating future rail loops, arrangements have been developed that would practically accommodate an additional future rail loop that could possibly provide inloading support to future HPS capacity expansion.
- The study has included workshops with DBCTM to discuss required outcomes and potential options. There has been some consultation with the DBCT Producers Group and the DBCT Pty Ltd during the study, although this has been limited, with informal feedback from these groups used to date.
- The study has assumed that the design throughput, after completion of the current expansion 7X, is 85 Mtpa.
- The study assumes that the use of the Terminal in the future with regard to operational parameters such as shipping mix, extent of blending, extent of multi-product ships, number of products being serviced, parcel size, train size, railway performance and cargo assembly times, cargo assembly philosophy etc. will be similar to that used for 7X.

- The study does not consider power upgrade requirements external to the site and this should be considered by the DBCC in a system wide sense.
- No assessment has been made at this stage of potential environmental upgrades to existing infrastructure that may be required to keep total environmental outputs (e.g. dust, noise) at acceptable levels. However, preliminary environmental studies have been done to assess likely dust and noise imposts (refer chapter 6)
- Detailed assessment of operational impacts to the existing operation has not been completed in terms of extent and durations of shutdowns to tie new facilities into existing facilities, although the affect of brownfield development has been considered in the ultimate choice of a preferred option.

It is also important to understand that the existing boundary limitations of the current stockyard mean that any demand profile exceeding total terminal capacity of 89.5 Mtpa must consider alternative stockyard sites, as the current stockyard reaches its operating limitations at approximately 89.5 Mtpa. As DBCTM holds Access Applications to 152 Mtpa, DBCTM requested Connell Hatch to consider alternatives to accommodate an expansion based on a 2nd stockyard option. While this study has selected a preferred alternative, this will now be subject to detailed feasibility studies, environmental impact assessment and general development approvals.

Stockyard Expansion Options

Preliminary investigation detailed in Master Plan 2008, identified 3 suitable areas where a 2nd stockyard could be developed to accommodate capacity above 89.5 Mtpa (Figure 13). These locations are Dudgeon Point, Louisa Creek and an area south of the existing rail loops. Some of these options involve considerable community interface and assessment included consideration of stress to residents living near any of the identified sites. Future detailed studies should also include social impacts and consequences of the location of the preferred site, in combination with accommodating supply chain infrastructure (i.e. rail lines and train operations). As part of DBCTM's community obligations, residents have been made aware of all potential sites and briefed of progress of site selection and aggregated Access Applications.

Also of importance when considering site preference is the possible competition from new exploration and identification of coal deposits in the Galilee Basin (approximately 360 kms south west of Mackay). The Alpha Coal Project, which has been declared a "Project of State Significance", has already indicated that Dudgeon Point is an alternative export terminal site for its future coal production. PCQ has indicated in their Statement of Proposals, Land Use Plan Review (March 2009) that, as land owner and developer of Dudgeon Point, it is working with the coal company proponents to investigate the potential future industrial development of Dudgeon Point. Further, PCQ are undertaking a number of studies to prepare a whole-of-area concept plan for possible port infrastructure and land use in the area, considering environmental, social and planning constraints. While sharing the site does offer capital expenditure savings, the operational interface with other terminal/site occupiers must be considered in determination of the post 85 Mtpa preferred stockyard site.

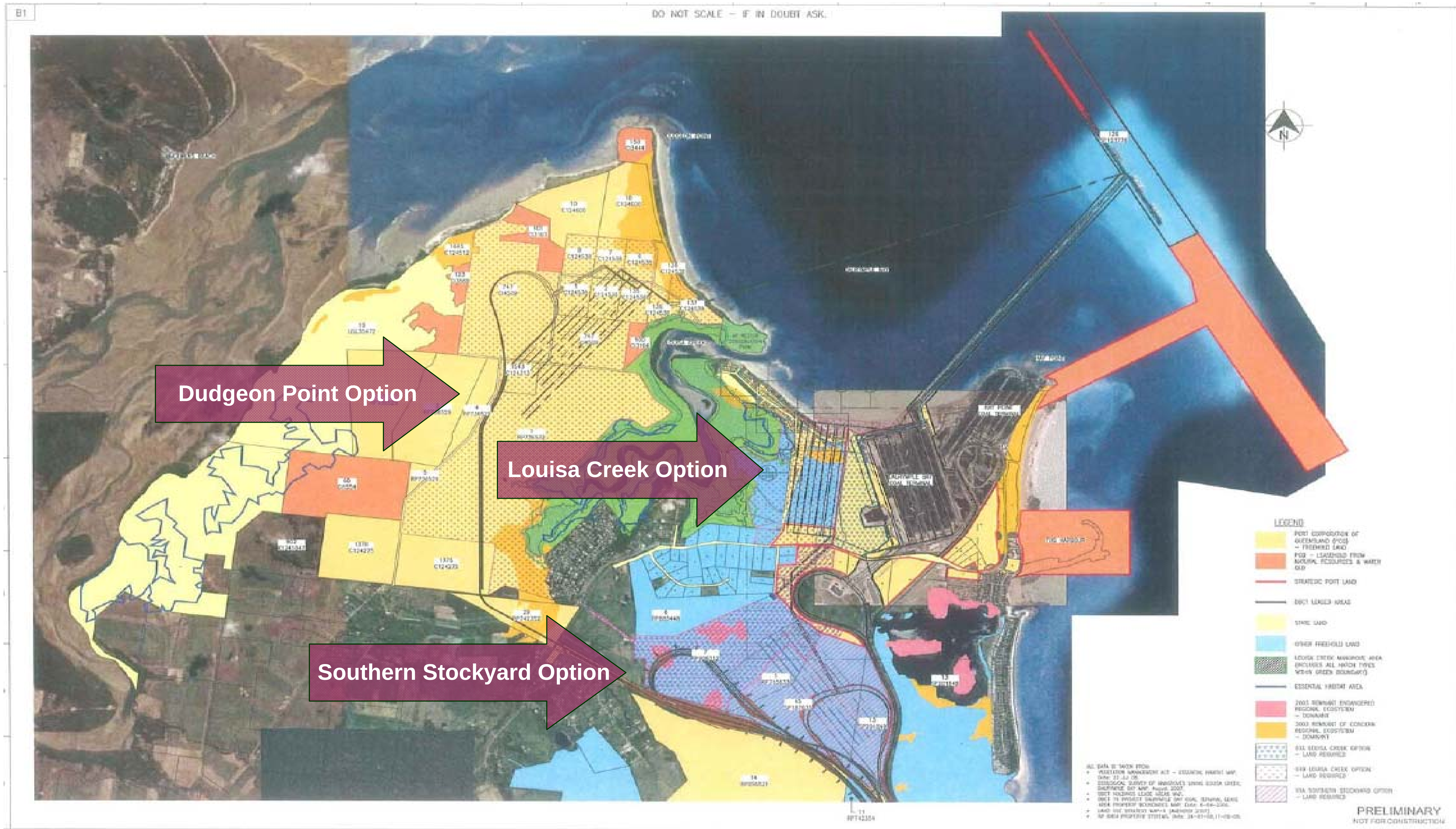


Figure 13 – The 3 DBCT post 85 Mtpa stockyard expansion options – Connell Hatch 2009

Dudgeon Point

Ports Corporation Queensland holds large amounts of freehold land at Dudgeon Point which would be suitable for the expansion of Dalrymple Bay. However, due to its distance from the existing terminal, any development would require independence from the existing operation involving rail, inloading, stockyard, outloading and a jetty structure joining any new terminal to the existing quay line (Figure 14).

While the land is linked to the existing rail network by a rail corridor, its location is very close to the existing community of Timberlands. The land is also adjacent to a National Conservation area and healthy mangrove forests which include a population of the endangered false water rat. This could make development approval difficult. The land is also not zoned “Strategic Port Land” and while rezoning should not prove to be too onerous, it could be time consuming. Apart from the Timberlands community, there is another community to the North West known as McEwans Beach that would likely be impacted by coal dust due to the prevailing south easterly winds.

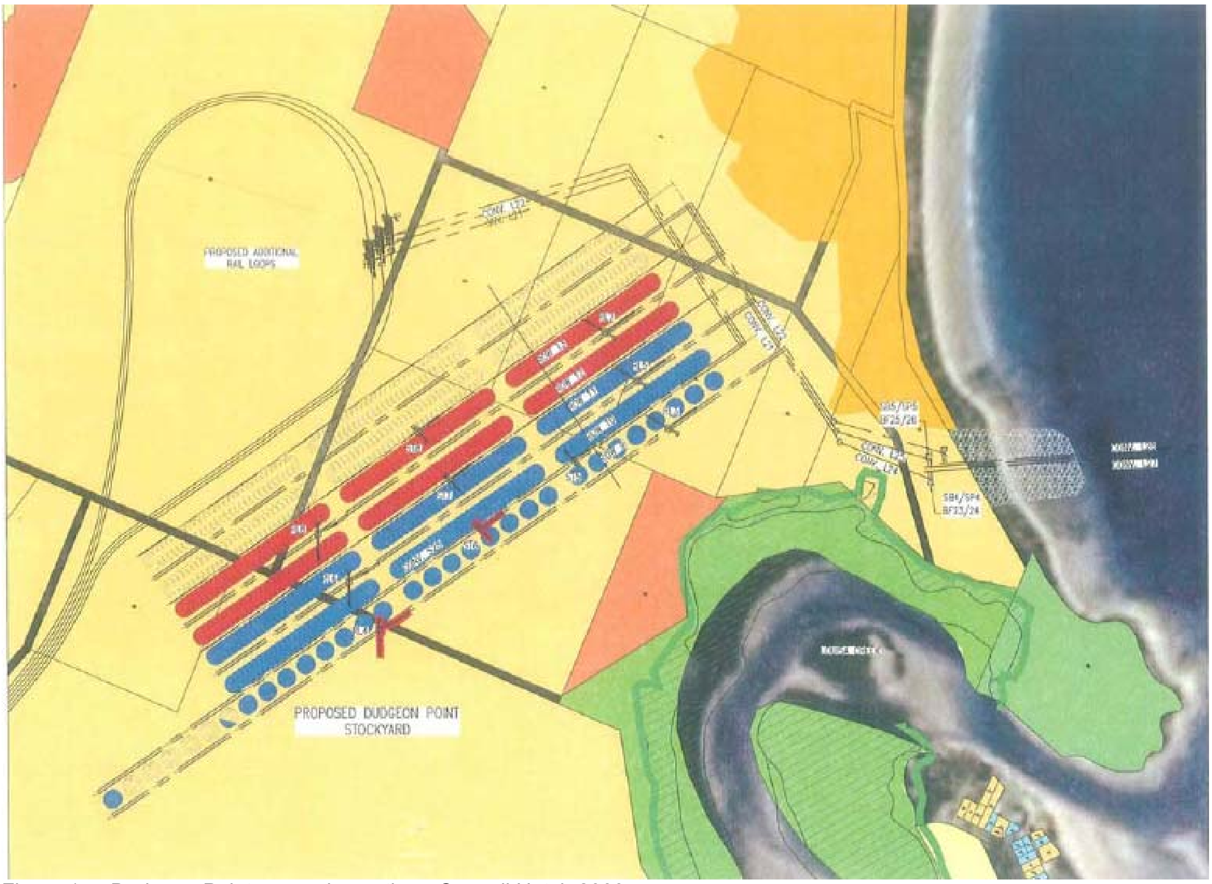


Figure 14 - Dudgeon Point expansion option - Connell Hatch 2009

Louisa Creek

The area to the west of the existing terminal would be suitable for a 2nd stockyard that would provide sufficient capacity to accommodate the current Access Applications (Figure 15). The advantage of this location is that the two stockyards are reasonably close and could share the existing offshore jetty structure.

However, the majority of the required land is currently held in private hands triggering commercial negotiations for purchase. Furthermore, various Louisa Creek lots would be required for the new terminal with future terminal operations adversely affecting the remaining households. As the main access road to the community (Louisa Creek Road) would also be required for the new stockyard, DBCTM would recommend and expect PCQ to complete its acquisition of Louise Creek properties with a view to vacating the area.

After land purchases (or compulsory acquisitions) have been completed, the land would need to be rezoned to “Strategic Port Land”. An additional 4 berths would be required although it should be noted that these extra berths apply to any of the options in order to support 152 Mtpa (note that 4 berths will deliver 153 Mtpa capacity).

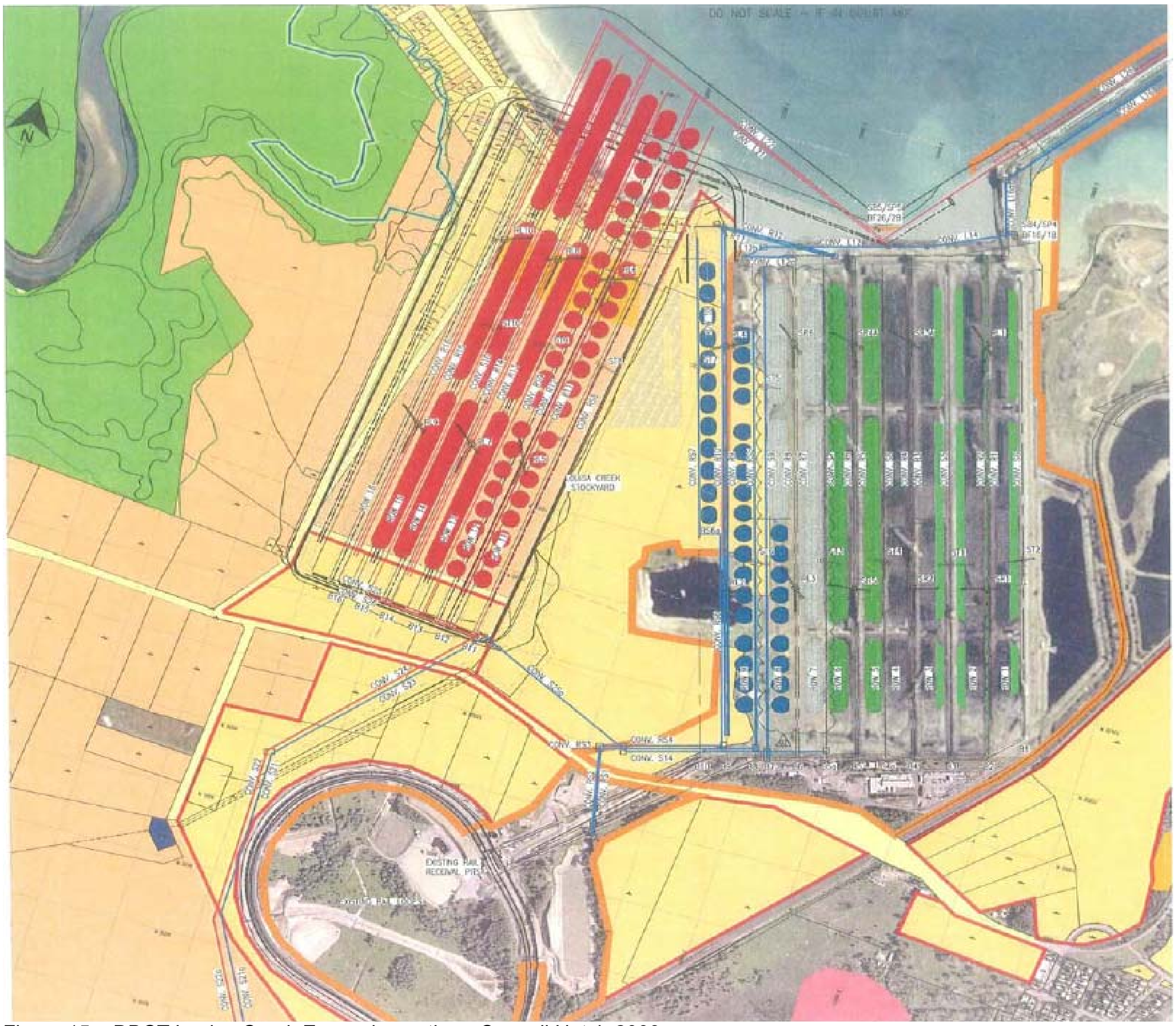


Figure 15 – DBCT Louisa Creek Expansion option - Connell Hatch 2009

Southern Stockyard Option

This is the most recently developed option. The area is to the south of the existing terminal rail loops and would be suitable for a 2nd stockyard that would provide sufficient capacity to accommodate the current Access Applications and still provide space for further expansion (Figure 16). This option shares the advantage of the Louisa Creek option in that the two stockyards are reasonably close to the existing operation and could share the existing off shore jetty structure, but does not trigger the community property issues.

Again, some of the required land is currently held in private hands requiring commercial negotiations for purchase. After land purchases (or compulsory acquisitions) have been completed, the land would also need to be rezoned to "Strategic Port land". This option does create some challenges in conveying coal from the stockyard to the berths via surge bins although this is not expected to detract from the advantages of this option.

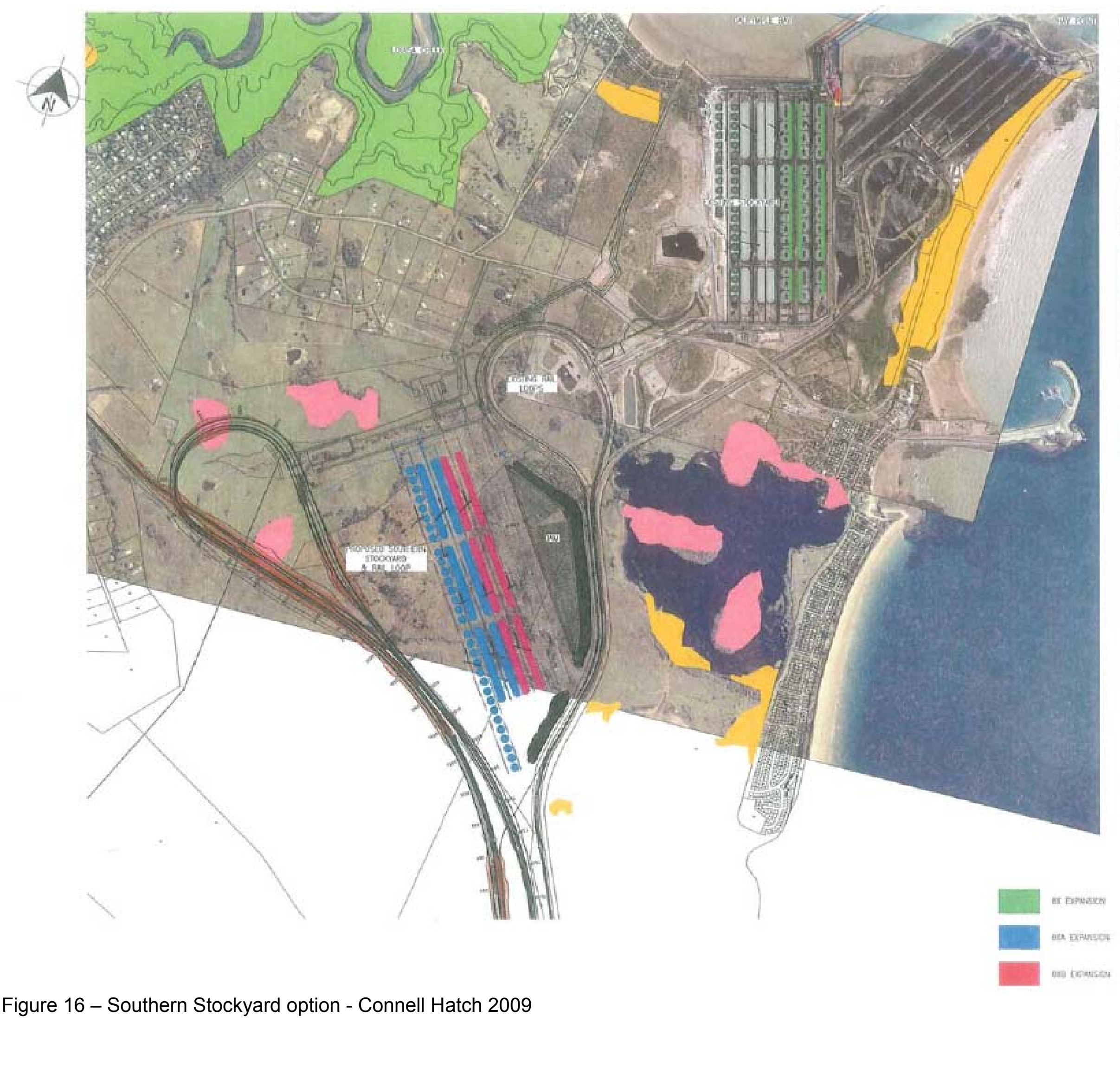


Figure 16 – Southern Stockyard option - Connell Hatch 2009

Basic Expansion Design

The expansion stages required to satisfy the demand broadly consist of the following scope of works, which then require selection of a preferred stockyard option in the 9XA works. The full details of the scope of works applicable to all of the stockyard options can be found in Section 5 of the attached Connell Hatch study report (Appendix B).

8X Expansion - Minor increment expansion that provides an additional yard capacity which is reduced to approximately 3 Mtpa due to inloading constraints (3 rail receival stations). As this expansion is confined to the existing stockyard, the 85 Mtpa Development Approval conditions would apply (max capacity increase of < 10%). This allows for a reasonably fast construction period due to minimal environmental approvals. Expansion works would broadly consist of:

- walls on bunds 1 and 3 to increased stockpile storage capacity of rows 1,2,and 3;
- a new Reclaimer on Bund 2, to suit new stockyard geometry; and
- Stacker ST2 upgrade from 5500tph to 7500tph to enable IL3 to inload at full capacity into Row 1.

However, this expansion will be operationally invasive to the existing terminal operation.

9XA Expansion – Depending on the extent of the new stockyard development, this phase may only require a development application for some of the site (depending on the extent of demand). It is also a logical step to commission progressively, in the event that the entire 9X capacity is not immediately required. The basic scope for this phase comprises:

- Fourth rail loop and inloading system (rail loop to be provided by QRNA)
- A new stockyard
- Fourth outloading system and shiploader servicing existing berths 3 and 4

9XB Expansion - This scope of works delivers the majority of the capacity and triggers a controlled action (under Commonwealth EPBS Legislation) requiring a full EIS process at all sites. Expansion works broadly consist of:

- Fifth rail loop and inloading system inloading into the new stockyard (rail loop to be provided by QRNA)
- Fifth outloading system and shiploader outloading from the new stockyard
- New jetty and jetty roadway (required in 9XA expansion for Dudgeon Point option)
- Two new berths 5 and 6

Comparison of Stockyard Options

The three stockyard alternatives have been evaluated using a qualitative review (see

Section 10 of Appendix B) based on the following criteria:

- Constructability
- Capital Cost
- Extent of off-shore infrastructure
- Impact to existing operations during construction
- Operations of expanded terminal
- Implementation schedule
- Ultimate capacity
- Preliminary Environmental Impact (see Chapter 6 for full evaluation)

Each of the above are described as follows:

Constructability of the Proposed Expansion

The Louisa Creek site is the least preferred site based on this criterion, as the 9XA expansion (Rows 8, 9, 10 of the existing stockyard) has restricted access and is constrained by a lack of laydown area in the immediate vicinity of the construction. This makes construction more difficult. The Dudgeon Point and Southern Stockyard sites onshore both have good access and plenty of room, so are judged to be similar for this criterion onshore. Offshore, the 9XA expansion is assessed to be more difficult to construct for the Dudgeon Point site because a new jetty is required at this stage, which exposes the project to a larger amount of marine works. The associated risk profile relating to weather and marine conditions and geotechnical risk associated with piling also impact this option. While a new jetty is also required for Louisa Creek and the Southern Stockyard, it is not until 9XB expansion.

Capital Cost

Table 8 shows the concept study capital cost estimate for the initial studies, feasibility study, environmental study, project management, engineering, procurement, construction and commissioning for the three alternative sites. The purpose of the estimate is to provide a high level assessment of possible capital cost of expansion and to differentiate between the sites.

Description	Site Option					
	Southern Stockyard		Louisa Creek		Dudgeon Point	
	Cost (M$)		Cost (M$)		Cost (M$)	
8X Feasibility Study and Approvals 8X Total Cost 8X Total Cost/tpa	\$2.3 \$265.6 \$59		\$2.3 \$265.6 \$59		\$2.3 \$265.6 \$59	
9XA/9XB Feasibility Study and Approvals	\$54.3		\$54.3		\$54.9	
9XA Total Cost 9XA Total Cost/tpa	\$1,785.3 \$83		\$1,922.4 \$89		\$1,959.3 \$91	
9XB Total Cost 9XB Total Cost/tpa	\$1,970.4 \$48		\$3,317.9 \$81		\$1,697.2 \$41	
Total DBCT Management Costs **Total DBCT Management Costs/tpa**	**\$4,078** **\$61**		**\$5,562** **\$83**		**\$3,979** **\$59**	
	9XA	9XB	9XA	9XB	9XA	9XB
Rail Infrastructure Sub Total Rail	\$267.2	\$104.8	\$190.9	\$75.2	\$472	\$112
Rail Infrastructure Total	\$372		\$266		\$584	
	9XA	9XB	9XA	9XB	9XA	9XB
Sub Total DBCTM and Rail Sub Total DBCTM and Rail Cost/tpa	\$2,052.5 \$96	\$2,075.2 \$51	\$2,113.2 \$98	\$3,393.1 \$83	\$2,431 \$113	\$1,809 \$44
Total DBCTM and Rail **Total DBCTM and Rail Cost/tpa**	**\$4,450** **\$66**		**\$5,828** **\$87**		**\$4,563** **\$68**	
Percentage Difference compared with Southern Stockyard	Total (inc rail) NA	DBCT Cost NA	Total (inc rail) 24%	DBCT Cost 27%	Total (inc rail) 2%	DBCT Cost -2%

Table 8 – Post 85 Mtpa stockyard expansion approximate costs subject to firming of exact capacity benefits associated with each post 85 Mtpa expansion option e.g. 8X \$/mt is based on a inloading capacity limitation of 88,320,000 million tonne

As can be seen, there is little capital cost difference between the Southern Stockyard and Dudgeon Point option (inclusive of rail costs) with the Southern Stockyard option marginally cheaper. Broadly speaking, the additional conveyors required in the outloading system of the Southern Stockyard option are offset by: the rail line; the more complex civil works; and the longer jetty required for the Dudgeon Point option, resulting in a similar total capital cost for each of these options. As such, the Southern Stockyard and the Dudgeon Point site need to be differentiated by the other entire non-capital cost criterion presenting this comparison

Other points to note regarding the cost estimates are:

- The capital cost estimate has been developed in a manner consistent with achieving an overall accuracy of the estimate, including contingency, in the range of + 50% to - 30% which represents an AACE Class 5 Order Of Magnitude estimate.
- The estimate is based on identifying similar elements for each item of scope from the DBCT 7X expansion project. The contract values, including variations from the DBCT 7X project, have been used. For elements that were not constructed in DBCT 7X (e.g. many of the civil works items), a reasonable estimate based on historical estimating data and engineering experience has been used. No enquiries to the market have been undertaken for this study. A nominal escalation factor has been used to bring the DBCT 7X data up to the estimate base date.
- An allowance for design growth has been included in the estimate. Engineering and project management allowances are based on factors derived from analysis of the DBCT 7X project costs.
- The estimate is in Australian Dollars at a base date of February 2009. Escalation beyond the estimate base date is not included. All foreign currencies have been exchanged in to Australian Dollars using exchange rates from the time of the DBCT 7X tenders.
- A contingency has been included in the estimate to allow for the undefined elements of the project scope resulting in part from a minimal amount of engineering having been carried out. The addition of contingency is required in order to determine the most likely cost of the project and should be expected to be expended. Contingency is not intended to minimise any order of accuracy provisions nor does it cover scope changes or project exclusions. Contingencies are included in this estimate as a percentage of the direct costs and are applied at the summary level.
- Estimate exclusions
    - Schedule delays and associated costs, such as those caused by:
        - Unexpected site conditions
        - Unidentified ground conditions
        - Labour disputes
        - Force majeure
        - Permit applications
    - Development fees and approval costs of Statutory Authorities
    - Changes and additions to scope
    - Off site infrastructure costs

- Operating costs including plant start up costs
- Land acquisitions or licences
- Consequential costs associated with production delays during construction
- GST, import duty, and sales tax
- Escalation beyond the estimate base date
- Working capital
- Marketing
- Foreign exchange
- Sustaining capital/financing costs

Extent of off-site Infrastructure Requirements

As Dudgeon Point is the site furthest away from the existing road network, power supply and water supply, it is the least preferred site based on these criteria. The Louisa Creek site is marginally better than the Southern Stockyard on this criterion, because it is closer to the existing terminal.

Impact to Existing Operations During Construction

The Louisa Creek site is clearly the least preferred site based on this criterion, because of the extent of interlinking of new conveyor systems with existing conveyor systems to achieve the remnant management system in 9XA expansion. The Dudgeon Point site is the most preferred site because it is essentially a greenfield site and has no tie-ins to the existing terminal. The Southern stockyard site also has no tie-ins to the existing terminal, but some of the outloading conveyors are crossing over and under the existing conveyors. However, compared with the extent of brownfield work in the 7X Expansion, these interactions will be considerably less involved and therefore much easier to manage.

Operations of Expanded Terminal

There are two primary factors that affect this criterion. Firstly, the proximity of the terminal to the existing terminal, which impacts the degree of difficulty and cost of operations and maintenance, security and third party access, together with the ability to integrate the operations of the terminal. The second factor is the extent of works (number of conveyors) required for the site, which affect the power demand and extent of maintenance required.

The Louisa Creek site is closest to the terminal, but has the most new conveyors (41). The Southern Stockyard is next closest to the existing terminal and has 29 new conveyors. The Dudgeon Point stockyard is remote to the existing terminal, but has the least new conveyors (22). A more detailed quantitative assessment would be required to determine the relative impact on the overall operations and maintenance cost for the expanded terminal. At this stage, based on a qualitative assessment, it is assumed that the proximity of the two terminals to each other will be a primary issue causing ongoing operations and maintenance challenges for the expanded terminal.

On this basis, the Southern Stockyard is the most preferred site with Dudgeon Point the least preferred site.

Ultimate Capacity of Sites

The Southern Stockyard and the Dudgeon Point sites ranked similarly on this criteria, as they both have the space to expand to 185 Mtpa with two additional stockpile rows in the new stockyard. The Louisa Creek site is the least preferred for this option, as it can only accommodate one additional stockpile row in the new stockyard, which results in an ultimate capacity of 179 Mtpa.

Implementation Schedule

The key differentiator between the sites with respect to schedule is the approvals process. The two full types of implementation schedules (subject to further, more detailed review) are attached in Appendix B, with the key milestone dates summarised by the following (Table 9). However, it must be noted that the timeframes shown are based on a continuation of the current concept work into full post 85 Mtpa expansion planning, concept finalisation and detailed engineering. Any delay to that process will cause a corresponding delay to these timeframes:

Milestone	9X as EIS Process	9XA as Development Application and 9XB as EIS Process	Capacity (Mtpa)
8X - Financing and Project Approval	January 2010	January 2010	
9X - Financing and Project Approval	March 2011	March 2011	
8X - Completion of construction	November 2012	November 2012	89.5
9XA - Planning approvals secured	July 2012	November 2011	
9XA - Completion of construction	February 2014-15*	June 2013-14*	111
9XB - Planning approvals secured	July 2012	November 2012	
9XB - Interim commissioning	December 2014-15*	April 2014-15*	122
9XB - Completion of construction	December 2015-16*	April 2015-16*	152

Table 9 – DBCT Post 85 Mtpa expansion Planning and Approval timeframes (estimates)

* Completion range dependent on ability to proceed with critical fabrication works in parallel with approvals process and prevailing market conditions

There is approximately an 8 month advantage by undertaking the approvals process in 9XA as a development application rather than 9XB, which is likely to be a full EIS process. To this extent, the Louisa Creek site has the advantage with the Dudgeon Point Site having no advantage. There is a possibility that the Southern Stockyard site may share the Louisa Creek advantage although, at this stage it is prudent to assume that it will be preferable to adopt an EIS process for the whole 9X expansion project, which will put the Southern Stockyard option on to the same schedule as the Dudgeon Point option.

Preferred Expansion Option

The following table (Table 10) presents a quantitative comparison of the three alternatives based on: constructability; capital cost; site infrastructure requirements; impact on existing operations; ongoing Opex; ultimate capacity; and community consideration.

Criteria	Southern Stockyard	Louisa Creek	Dudgeon Point
Indicative Cost incl. rail loop	$4,500M + fin. & esc.(Indicative TIC – approx $6.00)	$5,800M + fin. & esc.(+$1,300)	$4,600M + fin. & esc.(+100M)
Project Approval /Risk **Environmental/ ecology**	Likely earlier approval for first part. Minor issues	Likely earlier approval for first part. Mangroves invasion	Will require full EIS prior to commencing. Adj National Park
Operational Disruption	Negligible	Substantial 'brownfield' component	Negligible
Ongoing O&M Costs	Equal to Louisa Ck option	Equal to Southern stockyard option	Substantially higher due to remoteness from existing facility
Ultimate Capacity	185Mtpa total at DBCT	155Mtpa because likely to be limited for environmental reasons	Indeterminate– subject to PCQ land use strategy but could be up to 185Mtpa
Community Issues/Land Acquisition	Single private land owner. Likely impact on some rural properties.	Impacts on many land owners and may be highly emotive	Land owned by PCQ. Impacts on Louisa Ck and McEwans Beach

Table 10 – DBCT 9X Stockyard expansion selection appraisal

Based on cost, the Louisa Creek site is clearly the least preferred site being 27% more expensive than the Southern Stockyard and Dudgeon Point sites. Holistically, the Southern Stockyard is clearly the preferred alternative. The critical disadvantages of the Louisa Creek site are the brownfields complexity with interconnection and the inability to expand to the ultimate capacity of 5 inloading and 5 outloading strings.

The critical disadvantage of the Dudgeon Point site is its separation from the existing terminal adversely impacting ongoing operations and maintenance. Although this alternative does have an advantage during the relatively short duration of the construction phase, it is a significant disadvantage during the operating life of the expanded terminal, affecting whole of life cost. Hence, the Southern Stockyard is the recommended site, based on the assessed criteria.

Description of Preferred Expansion Option

On the preferential basis of the Southern Stockyard option, the complete scope for the full expansion (to 152 Mtpa) would be as follows based on a want to deliver 3

Mtpa (8X) quickly. Layout options and refinement of the optimum layout for the selected site will be undertaken in the next study phase which will include reconsideration of the latest Producer requirements for capacity delivery:

8X Expansion

Overview of Works

- Walls on bunds 1 and 3 to increased stockpile storage capacity of rows 1,2,and 3
- New Reclaimer on Bund 2, to suit new stockyard geometry
- Stacker ST2 upgrade from 5500tph to 7500tph to enable IL3 to inload at full capacity into Row 1

Civil Works

- Bulk Earthworks (Quarry) and Material Preparation
- Construct widened Bunds 1, 2 & 3
- Re-profile stockyard bed in Rows 1, 2 & 3
- Demolish & modify existing drainage as necessary
- Install new concrete toe drains, CCP’s and subsoil drainage
- Stockyard Bed Preparation

Yard Machines

- New Reclaimer on Bund 2 and demolish Stacker Reclaimer SR1
- Modify boom rest, cable/hose pit, hold down, buffer to suit new reclaimer

Upgrade Conveyors

- Upgrade R2
- Upgrade ST2 boom
- Upgrade S6A
- Upgrade S6

Infrastructure and Services

- HV Upgrades
- Stockpile Spray Rework

9XA Expansion

Overview of Works

- Fourth rail loop and inloading system. New rail loop to be sited south west of the existing loop (to be provided by QRNA)
- New stockyard south west of existing rail loop
- Fourth outloading system and shiploader servicing existing berths 3 and 4

Inloading

- IL4 rail receival pit and tunnel (RRP4)
- IL5 rail receival pit and tunnel only (RRP5) (9XB early works)
- RRP4 mechanical fitout including wagon vibrator, BF21 and sound attenuation
- 2 x Inloading conveyors

Stockyard - Civil Works

- Bulk Earthworks (for all of 9X)
- Earthworks and material preparation (for Stage 9XA)
- Construct new stockyard bunds 7,8,9 and 10, including foundations and stockpile sprays
- Install new concrete toe drains, CCP's and subsoil drainage
- Construct Drain Lines SA, SB, SC & SD and provide miscellaneous yard drainage
- Stockyard Bed Preparation

Stockyard - Materials Handling

- 2 x yard stacking conveyors
- 3 x yard reclaiming conveyors
- 2 x Stackers
- 3 x Reclaimers
- Yard machine rail

Outloading

Materials Handling

- 5 x onshore outloading conveyors
- Surge bin including 2 x belt feeders and sample plant
- 4 x offshore outloading conveyors
- 1 x shiploader
- Slurry collection/return system

Offshore Marine

- Extension to jetty headstocks
- Extension to transfer tower platform
- Extension behind berths 3 and 4 to support new wharf conveyor

Infrastructure and Services

Infrastructure

- Construct new RR Water Harvest Dam
- Construct new RR (IL4) CCP's, Secondary Settlement Pond, Dam and associated Industrial WT Facilities
- Construct new 9X Industrial Dam, Coal Collection Filter Pit , Weirs, Spillways and Pump Station
- Construct Environmental Screening bunds as necessary around rail loop and along eastern side of Stockyard
- Provide new 9X Administration Office, Workshop, Warehouse, Spares area and Security Gate buildings and facilities
- Provide new 9X site access road with security entrance, stockyard perimeter road plus access roads, car parks and area paving for; RR, stockyard bunds, stockyards, 9X Administration Office, Workshop, Warehouse and Spares area
- Upgrade intersection at Hay Point Road

- Provide new link road between 9X site and current DBCT site, including a grade separation bridge over Hay Point Road plus links to QR maintenance tracks
- Provide maintenance access roads along new conveyor routes and to miscellaneous facilities
- Reclamation and armour for OL conveyors
- Dismantle and relocate project site office
- Stormwater Drainage and Creek diversions
- Site fencing
- Soil Stabilisation, Vegetation and Landscaping

Services

- HV & Communication underground cables from new substation(s)
- Electrical site power supply upgrades and 3.3kV switchgear
- Provide new Industrial Water and Fire Services Systems from new Industrial Dam, including Pumping Station, Stockyard ring main plus services to RR facility, Administration areas, IL conveyors and OL conveyors
- Provide new Water Reservoir
- Provide a new link main back into current terminal industrial water system
- Water reticulation upgrade offshore

Capital Spares

- Capital Spares

9XB Expansion

Overview of Works

- Fifth rail loop and inloading system inloading into the new stockyard
- Fifth outloading system and shiploader outloading from the new stockyard
- New jetty and jetty roadway
- Two new berths 5 and 6

Inloading

- IL5 rail receival pit and tunnel (RRP5)
- RRP5 mechanical fitout including wagon vibrator, BF22 and sound attenuation
- 2 x Inloading conveyors
- Extension of conveyor S24 for IL5 stockyard width

Stockyard

Civil Works

- Earthworks and material preparation
- Reclamation and armour
- Construct new stockyard bunds 21-26, including foundations and stockpile sprays
- Install new concrete toe drains, CCP’s and subsoil drainage
- Install concrete lining of Drain Lines SA, SB, SC & SD plus miscellaneous yard drainage
- Stockyard Bed Preparation

Materials Handling

- 2 x yard stacking conveyors
- 3 x yard reclaim conveyors
- 1 x Stacker
- 3 X Reclaimers
- Yard machine rail supply

Outloading

Materials Handling

- 5 x onshore outloading conveyors
- Surge bin SB5 including 2 x belt feeders and sample plant SP5
- 3 x offshore outloading conveyors
- Extension of conveyors L219 (from 9XA) and existing conveyor L17
- 1 x Shiploader and rail
- OL5 Slurry return system

Offshore Marine

- New jetty and jetty roadway
- Extension to transfer tower platform
- New berths 5 and 6,including Moormaster systems
- Dredging for new berths 5,6
- Wharf amenities building
- Wharf extension behind berth 3 and 4 to support OL5 wharf conveyor and roadway

Infrastructure and Services

Infrastructure

- Provide new access roads to stockyard bunds and stockyards
- Provide maintenance access roads along new conveyor routes and to miscellaneous facilities
- Modify or reinstate existing roadways
- Stormwater drainage
- Soil Stabilisation

Services

- Extend and Upgrade industrial water system to include new stockyard facilities
- Extend and Upgrade industrial water system to include IL5 Facility
- Water reticulation upgrade offshore

Capital Spares

- Capital Spares

Table 11 shows the approximate capacity associated with each stage:

Stage and scope of works	Capacity (Mtpa) - Southern Stockyard and Dudgeon Point Stockyard Options		
	Inloading Capacity	Net SY/OL Capacity	Terminal Capacity
7X Existing	88.8	85	85
8X -Walls on Bunds 1 & 3, ST 2 upgrade, new reclaimer, rezone	89.5	89.5	89.5
9XA - IL4, OL4, Rows 1,2, & 3 of new stockyard	127	111.2	111
9XB - IL5, OL5, Rows 4, 5 of new stockyard, Berth 5 & 6	162	152.2	152

Table 11 – Post 85 Mtpa expansion path - Connell Hatch 2009

A scope of works has also been developed to provide interim capacities that could be made available. These incremental capacities would deliver usable capability at approximately 122 Mtpa, 139 Mtpa, 157 Mtpa, 158 Mtpa, 179 Mtpa and 185 Mtpa and are described in the expansion scenario tables (Appendix A of the full report), attached as Appendix B. Otherwise, the following table (Table 12) outlines the scope and scalability of expansion to 153 Mtpa using the preferred Southern Stockyard option.

Phase	Capacity (Mtpa)	Additional equipment required above 7X equipment (excludes machinery bunds for yard machines)	Cumulative equipment/major facilities				
			Inload	Yard M/C's	Outload strings	Berths	Ship - loaders
7X	85	7X Configuration	3	12	3	4	3
8X	88	85 plus 1 * Reclaimer (replacing SR1)	3	12	3	4	3
9X Part A	111	88 plus, 1 * Inloading , 1* Outloading, 1 * Shiploader, 2* Stackers, 3 * Reclaimers	4	17	4	4	4
9X Part B	123	111 plus, 1* Berth, 1*Stacker, 2* Reclaimers	4	20	4	5	4
	140	123 plus, 1* Inloading, 1* Outloading, 1* Stacker, 1* Reclaimer, 1 Shiploader	5	22	5	5	5
	153	Berth 6	5	22	5	6	5

Table 12 – Post 85 Mtpa expansion path – DBCTM 2009

Figures 17-26 illustrate the 8X existing stockyard expansion and the 9 X Southern Stockyard expansions.

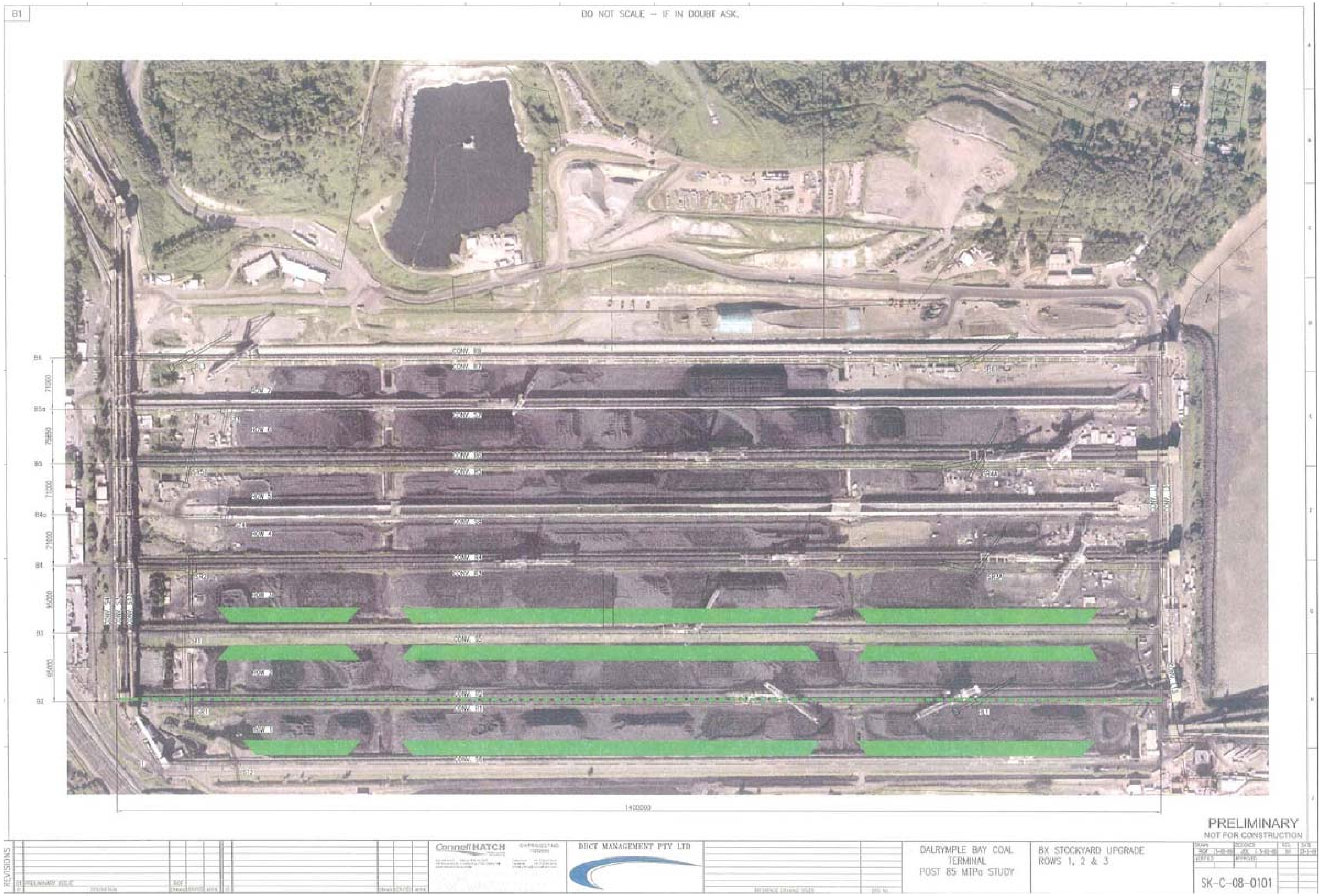


Figure 17 – DBCT 8X expansion

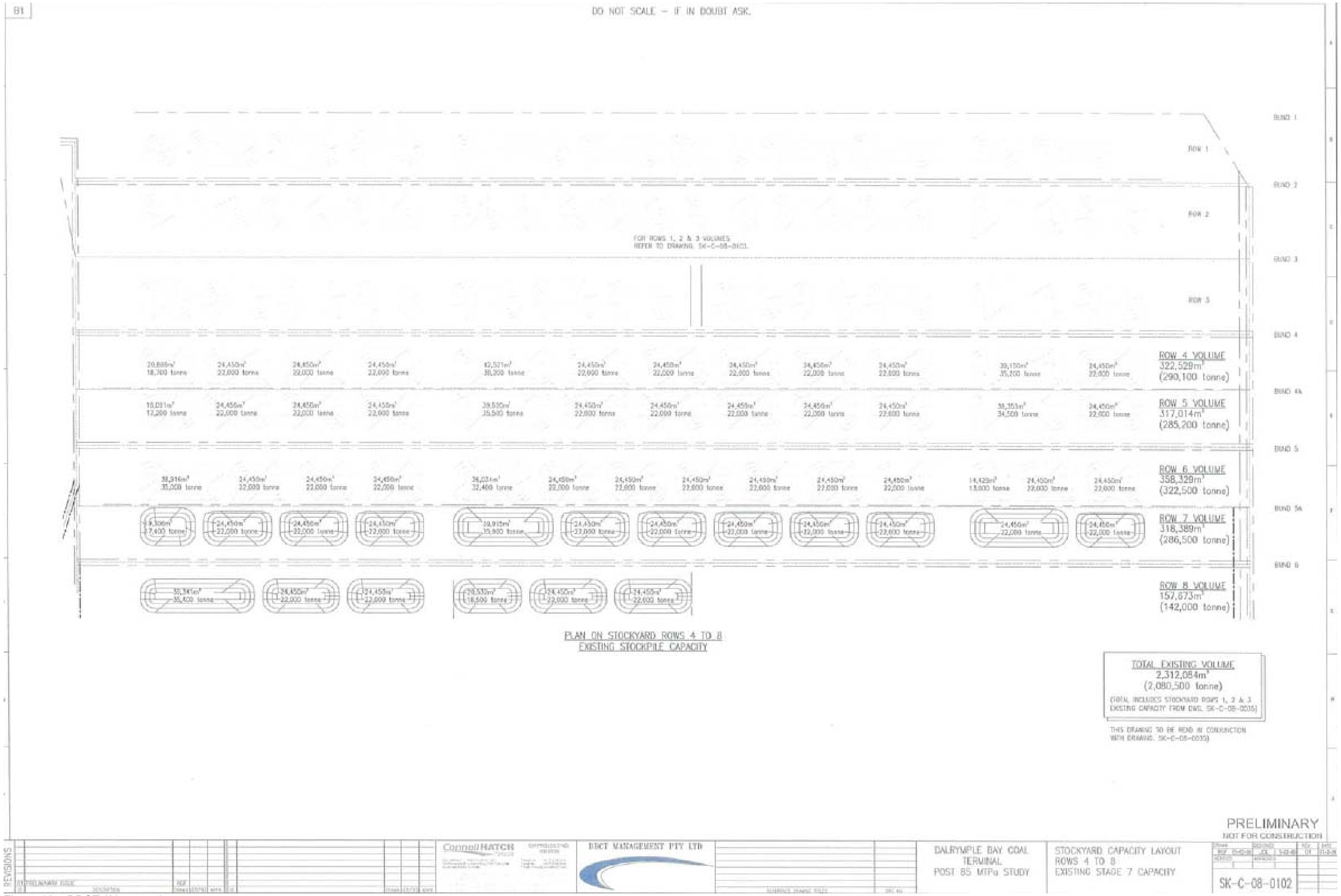


Figure 18 – DBCT 8X expansion

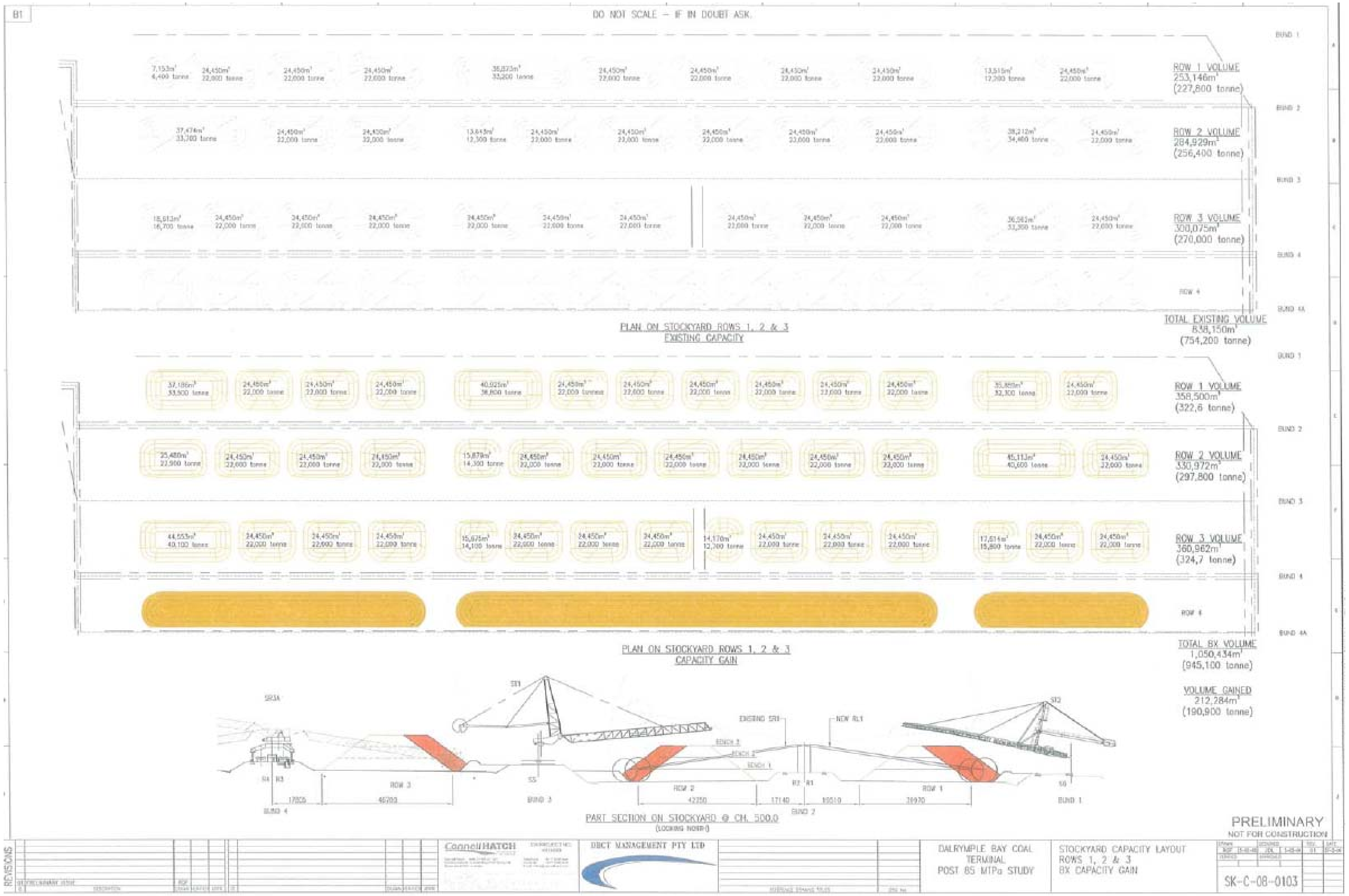


Figure 19 – DBCT 8X expansion

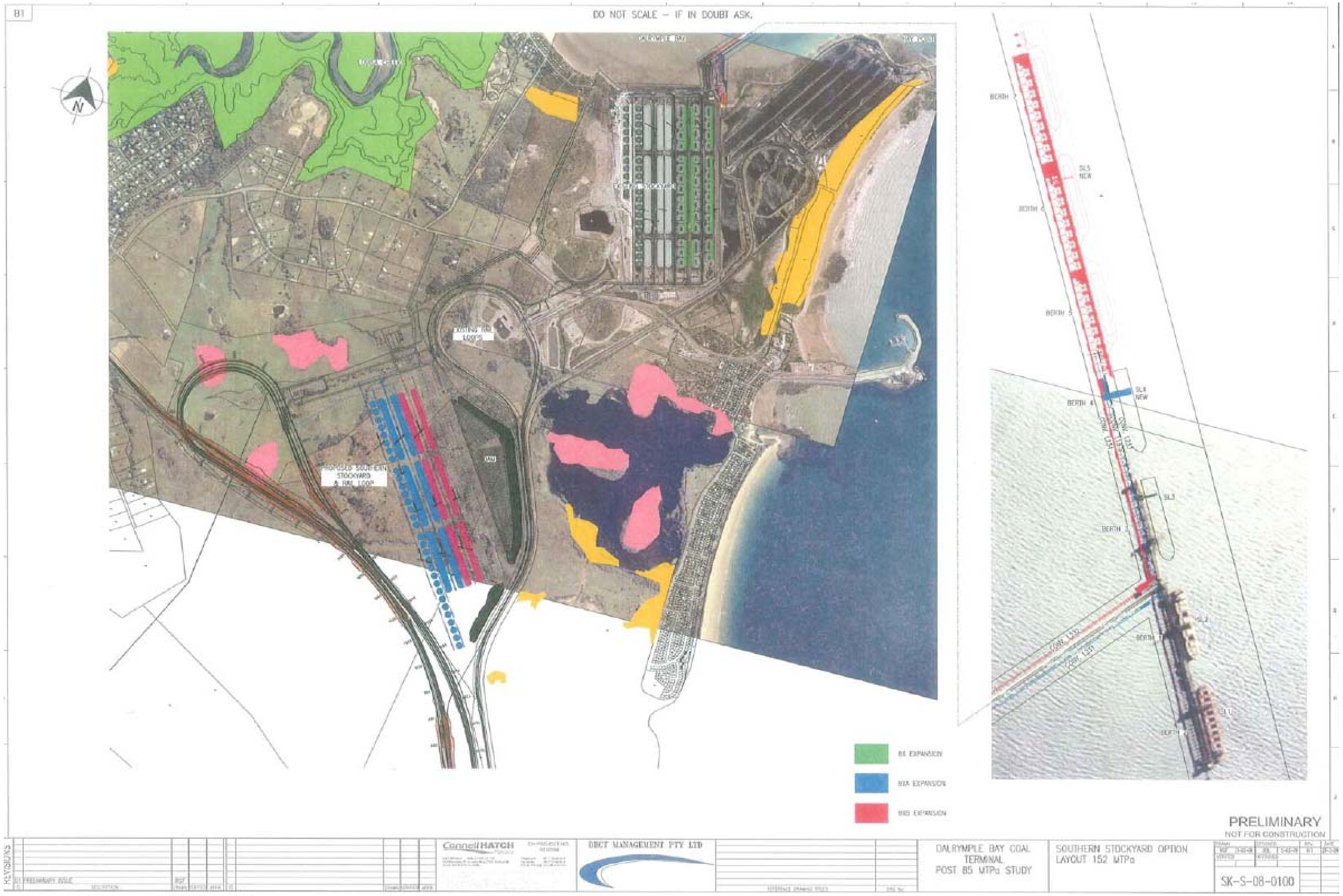


Figure 20 – DBCT 8X/9X expansion Southern Stockyard - overview

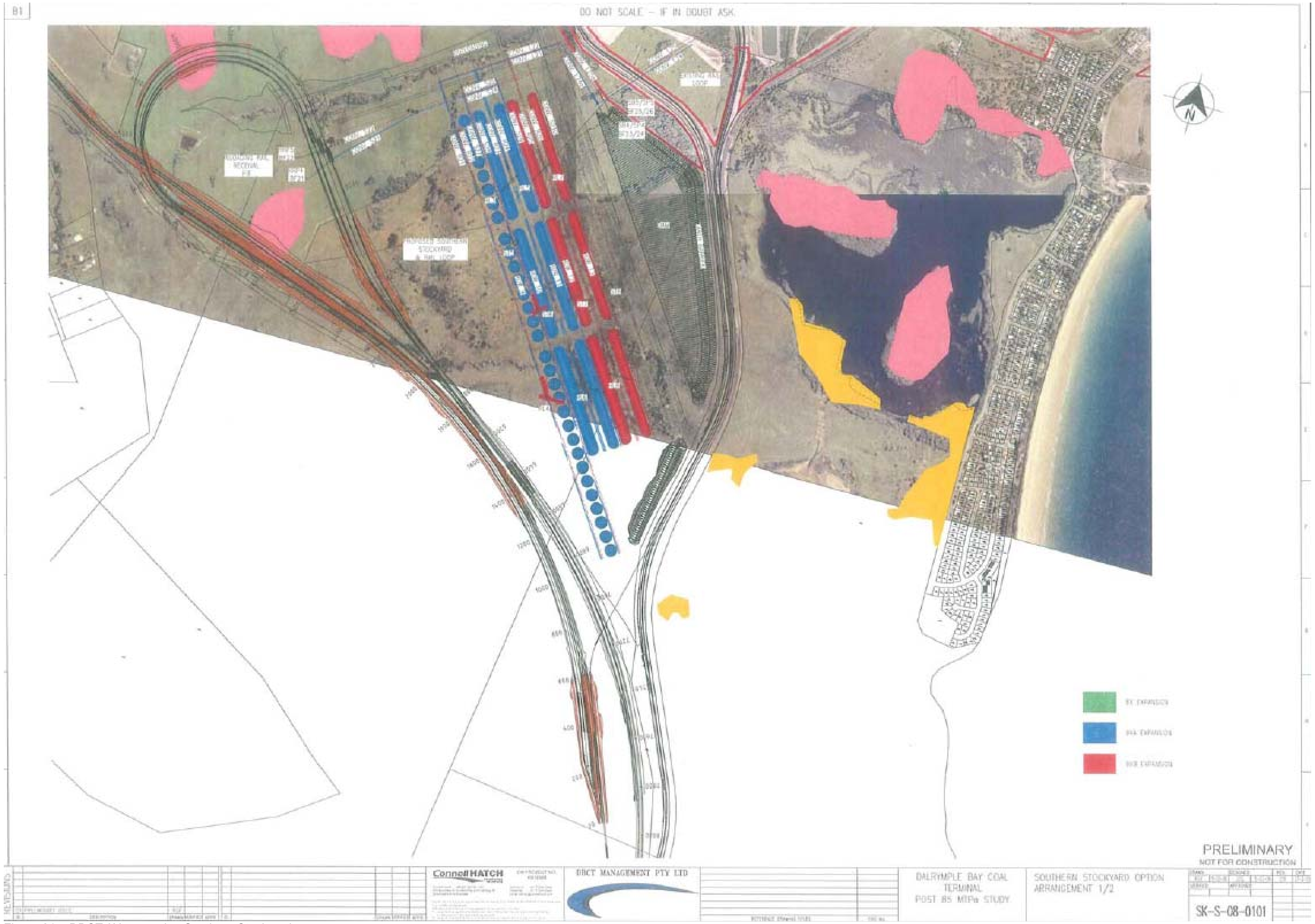


Figure 21 – DBCT 9X expansion Southern Stockyard

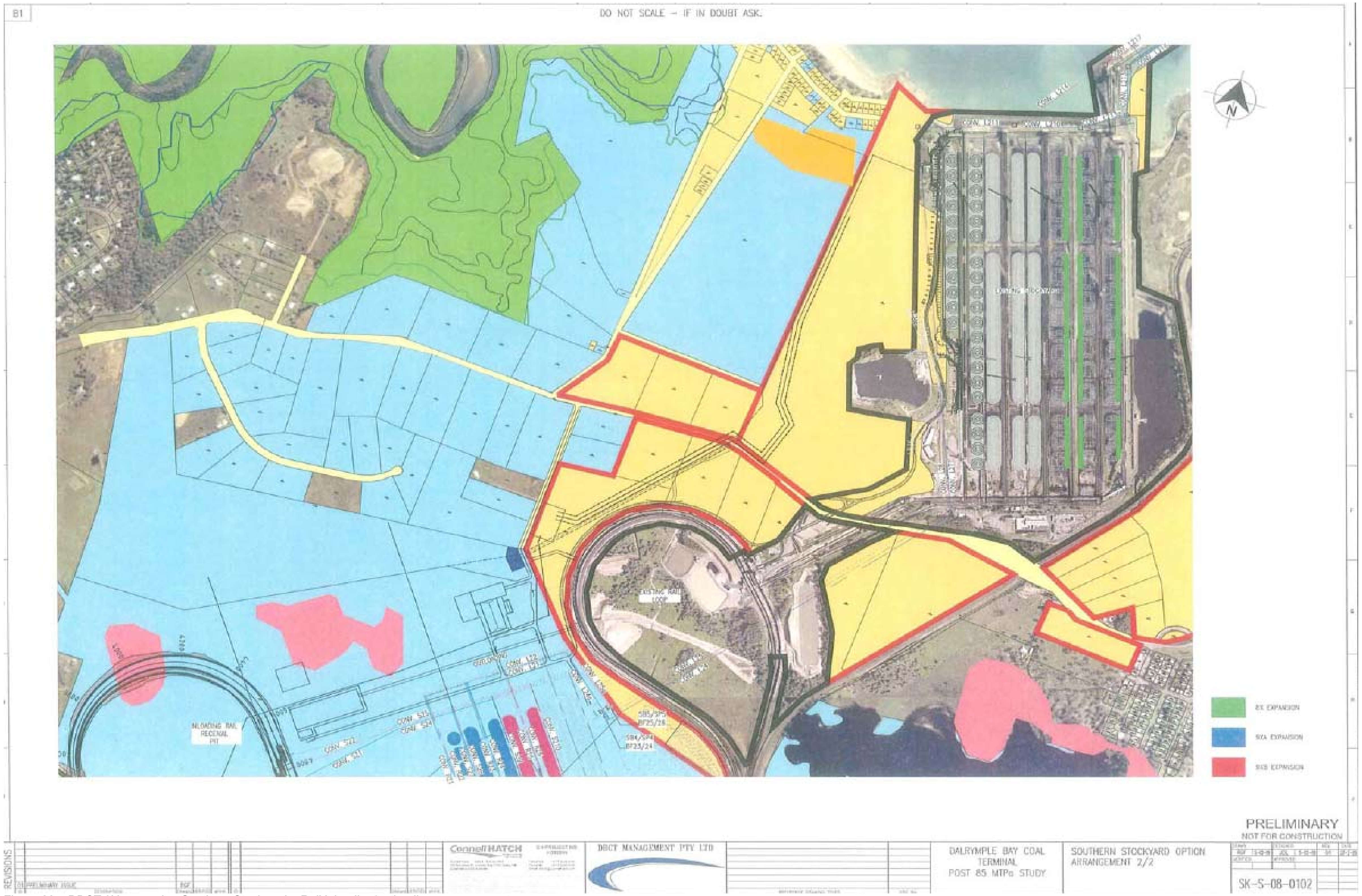


Figure 22 – DBCT 9X expansion Southern Stockyard – Rail inloading/outloading conveyor system

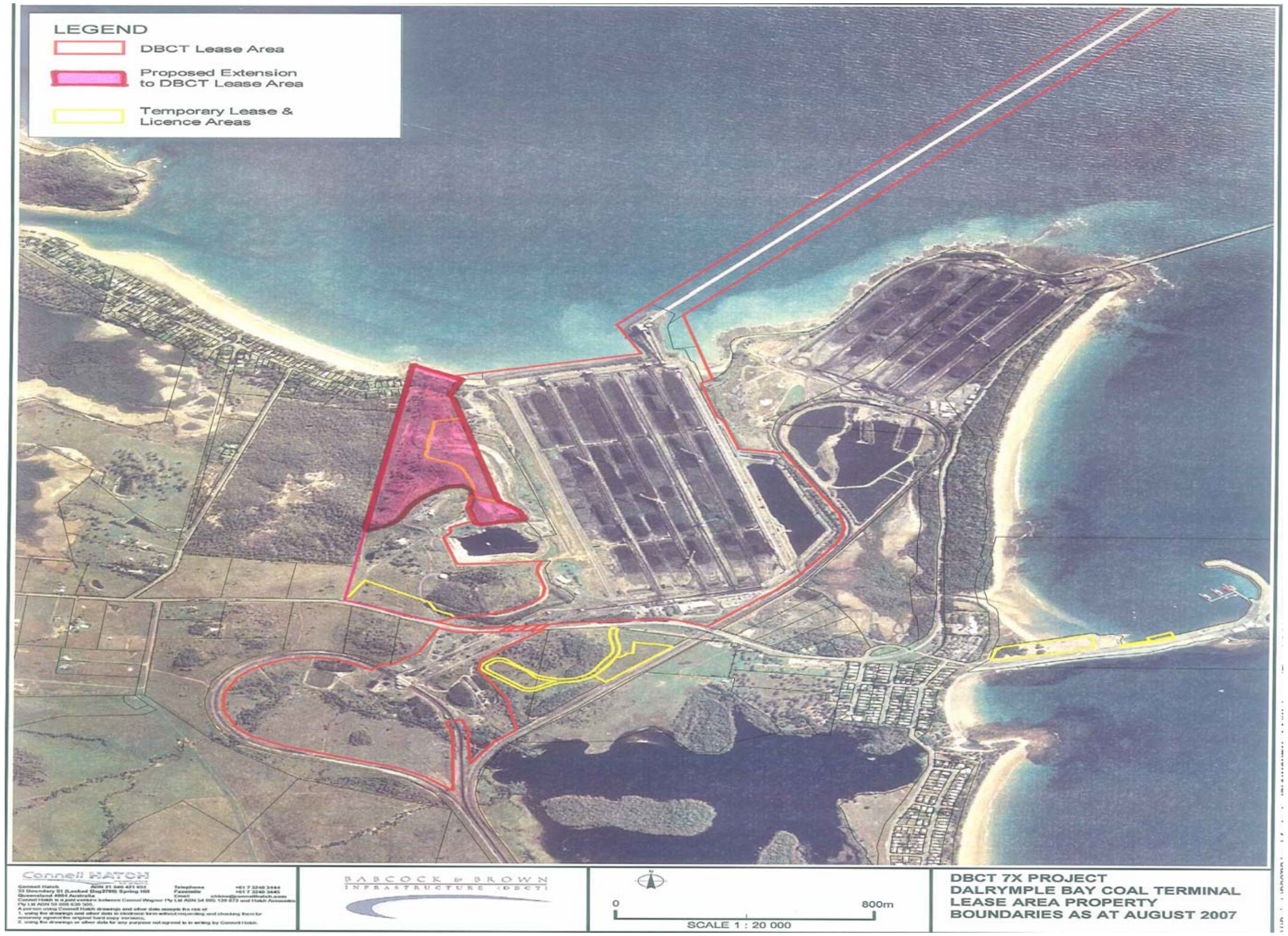


Figure 23 – Additional land requirement for 8X/9X expansion

Figure 24 – DBCT 9X expansion Southern Stockyard – rail loop/inloading and stockyard configuration

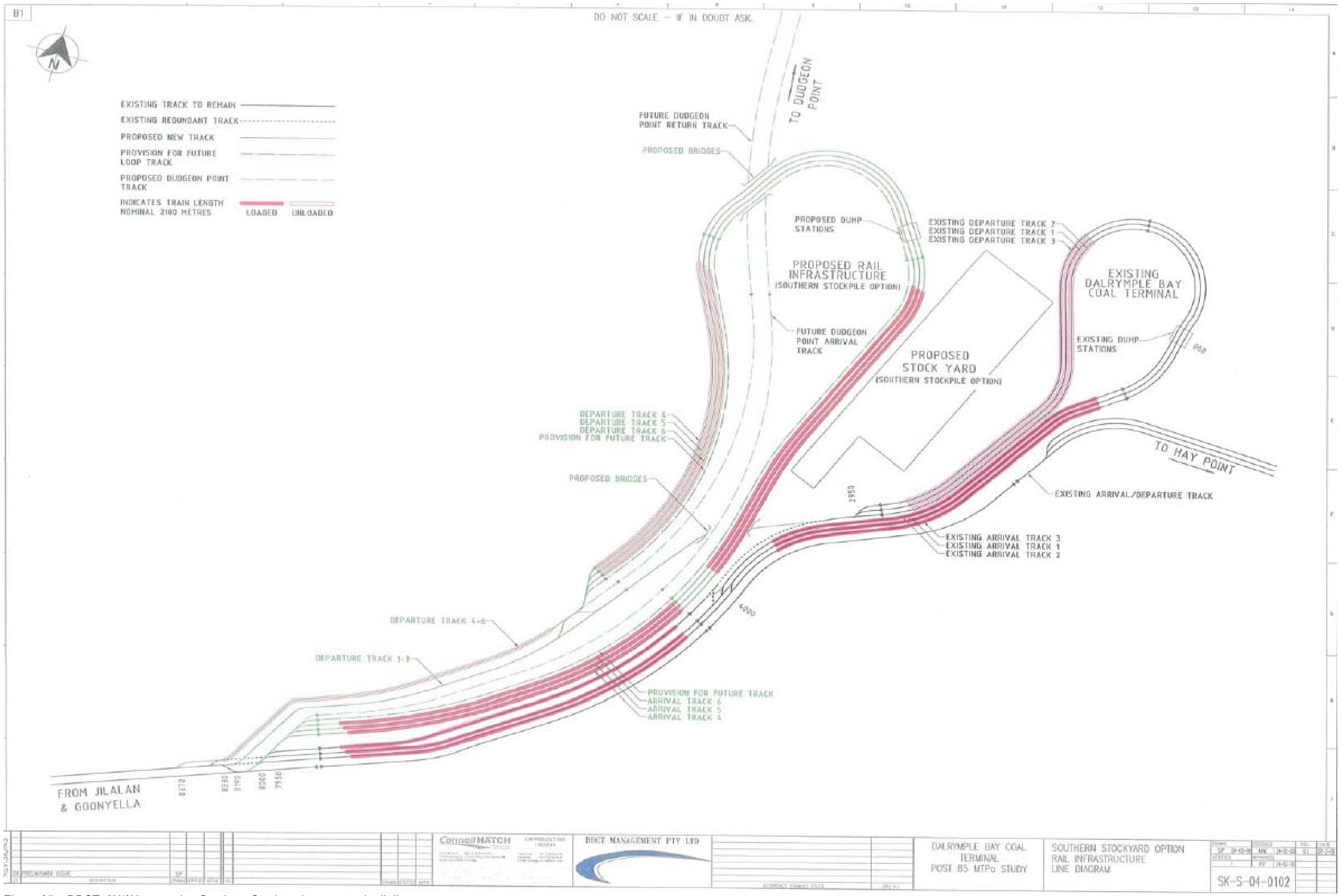


Figure 25 – DBCT 8X/9X expansion Southern Stockyard – proposed rail diagram

Rail Infrastructure

The rail loop infrastructure work associated with new 9X Inloading facilities and any additional QR rail infrastructure upgrade work required will not be included in the Site Selection Study Capital Cost Estimate. However, following initial discussions with QR, Connell Hatch has investigated the likely rail infrastructure work that will be required for the preferred stockyard site (Southern Stockyard).

The rail infrastructure concept for this comparative estimate has been based on standard QR horizontal and vertical geometry suitable for "2.1km" train consists. In addition, QR requires that any new DBCT rail loops be elevated to a minimum height of 5m above existing track level to provide for a grade separation for future Dudgeon Point rail infrastructure. A further QR requirement is that the Southern Stockyard site rail loop design concepts incorporate provision for the possibility of a future additional BMA Hay Point rail loop in the area. The geometry for this requirement has been included in this Master Plan although no allowance has been included in the comparative estimate for this additional loop.

The southern battery limit in the comparative estimate has been adopted as the point where the proposed 9X rail infrastructure connects back into the existing mainline (from Jilalan & Goonyella) alignment at the BMA Hay Point Coal Terminal rail line branch turnout. The extent of rail infrastructure included in this estimate is the earthworks and civil works required up to the top of railway formation for 3 rail loops (IL4, IL5 and future IL6), each with arrival siding capacity for 2 off "2.1km" consists and departure siding capacity for 1 off "2.1km" consist plus one departure passing siding to service all 3 loops for a 1 off "2.1km" consist.

In this comparative estimate we have adopted figures of $2.5M/km (per single track) to cover the cost of ground works up to top of formation (i.e., earthworks, drainage, access and fencing), $5.0M/km (per single mainline track) to cover the cost of rail infrastructure above the formation (i.e., ballast, sleepers, rail, electrification, signalling, etc) and a figure of $5.5M/km per single track within siding & loop areas (due to additional turnouts and more complex signalling requirements). In addition, the comparative estimate also includes the upgrading of the existing IL1, IL2 and IL3 rail loops to match the (2 off "2.1km" arrival, 1 off "2.1km" departure and 1 off "2.1km" departure passing siding) stowage capacity of that proposed for the new IL4, IL5 and future IL6 loops in line with QR's requirement to increase the networks "upstream" stowage capacity (and refuge facilities).

It is believed that the present BMA Hay Point Coal Terminal single branch line, which utilises a single cross-over between the up and down main lines for both arriving and departing trains, is close to capacity under the current DBCT and Hay Point rail traffic volumes. No allowance has been included in this estimate for any upgrade work or modifications to the current track configuration for Hay Point operations should it become necessary due to the increased rail traffic created by the new DBCT Inloading Facilities. Nor has any allowance been included for any upgrade work or modifications that may be required south of the battery limit.

The rail loop horizontal and vertical geometry are in accordance with QR design criteria, based on keeping all new railway works within existing rail corridor's south western boundary or only requiring a minimum extent of additional land. However, this criterion has resulted in the railway formation earthworks clashing with two (2) areas of vegetation classified as Remnant Endangered Region.

Subsequent site assessment of these areas has revealed that the flora and fauna within these mapped areas is significant and any new development should be designed to avoid impacting on these remaining areas. Consequently, Connell Hatch have undertaken an initial review of the rail loop horizontal geometry, disregarding this initial criterion of adhering to the existing rail reserve boundary, and produced a revised layout that does not impact on these Remnant Endangered Regions. As a result, the IL Pits move slightly south west requiring slightly longer IL conveyor routes and additional (PCQ) land needs to be incorporated into the existing railway reserve.

Note, the vertical alignment for this revised arrangement has not been investigated for this study and therefore no bulk earthworks calculations have been determined. This design task should be undertaken in the next stage and it is anticipated that the bulk earthworks quantities will be of a similar magnitude to those already included in the Estimate.

DBCT 4 Berth outloading configuration – DBCTM 2008

6.0 Environment

Dust Emissions

In many countries, the air quality standards for particulates (dust) focus on concentrations in the air, and are therefore of partial value when considering particulates nuisance issues particularly related to bulk material handling activities. Developments such as quarries, open cast coal sites, cement works and material handling terminals may create sufficient particulate emissions to cause soiling of surfaces at nearby communities and hence are perceived as a nuisance. It is appropriate therefore to consider air quality criteria to quantify some agreed level of nuisance.

Unfortunately there are many problems with the measurement of dust in establishing reliable criteria and setting credible limits. Human reaction to overall deposition of dust can relate to the rate of deposition, i.e. how quickly things become dusty, and the degree of dustiness by contrast to clean areas. It also depends on the perception of the person involved. Often there is less total dust, despite the presence of the handling activity, found in sparsely settled areas than in densely settled areas such as capital cities. Significant nuisance is likely when the dust coverage of surfaces is visible in contrast with adjacent clean areas, especially when it happens regularly. For the purposes of the discussion, dust is defined as particulate matter in the size range 1-75μm in diameter.

Dust is considered to be any solid matter occurring from on-site workings. Dust pollution, as for all windborne air pollution, can vary rapidly. In rural areas, dust can be generated from local farming practices such as the burning of sugar cane, while coastal areas contain a portion of sea salt. Dust is most noticeable when meteorological conditions contribute to peaks in airborne dust. Typically peaks may be 2–5 times the monthly average (Bates et al. 1990). Studies indicate that the climatic conditions associated with potentially excessive dust lift-off include:

- temperatures in high 20's to low 30's; or higher;
- wind speed in the range of 25 to 30 km per hour; and
- low rainfall.

Dust Impact Prediction

Many air pollutant problems are often best evaluated by monitoring. This however, is typically expensive in terms of staff time, equipment and laboratory costs. Airborne pollutants (particularly dust) show extremely complex dispersion patterns, especially in coastal environments such as DBCT where there are a large number of emission sources, complex rural environments and variations in environmental conditions. This complexity means that it is often very difficult to model or measure pollutant patterns and trends, and thus to predict levels of human exposure.

One relatively inexpensive and increasingly used alternative is to employ computer-based models to simulate the dispersion of air pollution into the atmosphere. *Katestone Scientific* carried out computer simulation modelling in 2000, 2004 and 2006 to estimate the typical dust emission from various sources within DBCT and have been contracted to provide predictive modelling assessment of post 85 Mtpa terminal expansion.

Stockpile application of veneering agent from bund way – DBCT P/L 2009

Preliminary Environmental Impact Assessment and Comparison

The preferred site selection cannot be based only on engineering and operational parameters. Because of DBCT's geographical location, it is important to assess ecological and social impact of each of the alternatives with due consideration for selection of a preferred option. The three stockyard alternatives have been evaluated using a qualitative review (see Section 9 of Appendix B) based on the following criteria:

- Air Quality
- Noise & Vibration
- Visual Amenity
- Cultural Heritage
- Local Maritime Operations
- Community & Social Impacts
- Coastal Processes

- Marine Ecology
- Terrestrial Ecology
- Soil & Geology
- Surface Water Quality & Hydrology
- Transport & Access
- Waste Management
- Land Tenure & Other Stakeholder Interests

Each of the above are described as follows:

Air Quality

The increased volume of coal to be stored at each site will increase the likelihood of dust emissions affecting residential areas at each of the three site options. However, Louisa Creek is considered to be the preferred option as it effectively requires displacement of the community. Dudgeon Point and the Southern Stockyard are the least preferred given their close proximity to the townships of McEwans Beach, Half Tide, Timberlands and Solonika Beach.

Noise and Vibration

It is anticipated that there will not be a significant increase in noise and vibration impacts as a result of the 8X expansion works given that older machinery will be upgraded. For works during 9XA and 9XB, a substantial increase in noise and vibration emissions is expected for each option, given operations are expected to double. By selecting the Dudgeon Point site option, noise and vibration impacts will primarily occur along the proposed rail corridor and Bally Keel Road, impacting on few residents. The Southern Stockyard option is least favourable given its potential to impact significantly more residents in the nearby townships of Half Tide and Solonika Beach.

Visual Amenity

The Louisa Creek option is the preferred site from a visual amenity viewpoint, given that expansion works are being co-located with existing infrastructure and will have limited impact on visual amenity or views. Dudgeon Point and the Southern Stockyard options are least preferred as the site will result in an expanded DBCT footprint, given their closer proximity to numerous residential communities.

Cultural Heritage

It is anticipated that there will be limited (if any) impact on Cultural Heritage as a result of stage 8X. Given that stages 9XA and 9XB are outside of the existing DBCT footprint, a cultural heritage assessment would need to be undertaken in order to determine if any significant Indigenous or non-Indigenous cultural heritage exists. All options are therefore considered equal from a cultural heritage viewpoint.

Local Maritime Operations

The Southern Stockyard is the preferred site from a maritime operations viewpoint given the reclamation works is not anticipated to have an impact upon local maritime operations. The Louisa Creek option is expected to affect the construction of a boat ramp at Louisa Creek Beach (that is part of the Sarina Beaches Coastal Sustainability Project, a BMA community project) and the Dudgeon Point option is expected to restrict local maritime operations in Dalrymple Bay, owing to the construction of a new jetty.

Community and Social Impacts

The Southern Stockyard option is preferred from a social impact viewpoint as it requires fewer residential property resumptions than the Louisa Creek option. The Southern Stockyard option is also likely to result in less impact upon amenity, recreation and property values given the fewer number of residents being located in close proximity to the site. Selection of Dudgeon Point may result in the communities of Timberlands and McEwans being affected by new impacts including increased noise.

Coastal Processes

Each of the three site options will require further investigation to determine whether the proposed jetty extension will have any significant effect upon geomorphology and sediment transportation processes. At this stage, the Louisa Creek option is anticipated to have greater impact due to the larger area of reclamation and tidal works required.

Marine Ecology

At each of the three sites, impacts upon marine ecology may include water quality impacts as a result of reclamation and piling works, loss of existing barramundi habitat (excluding the Louisa Creek option (Map 6) and potential impacts to seagrasses and other marine plants. Out of the three options, the Southern Stockyard option is preferred given it has minimal additional impacts. The Louisa Creek option may result in additional negative impacts upon turtle nesting sites and the Louisa Creek Marine Plant habitat area, given that the occurrence of turtle nesting upon Louisa Creek Beach has been confirmed by the Mackay and District Turtle Watch Association. The Dudgeon Point option may have an impact on the Sandringham Bay area, as well as new impacts within Dalrymple Bay associated with the jetty and berth.

Terrestrial Ecology

The Louisa Creek option is considered to have a smaller environmental footprint and cumulative impact given its close proximity to the existing DBCT site. However, the Louisa Creek option does have a risk of negatively impacting areas of 'Of Concern' Remnant Regional Ecosystem. The Dudgeon Point option is considered less favourable given its close proximity to the Mount Hector Conservation Park, whilst the Southern Stockyard option may impact on 'Endangered' Remnant Regional Ecosystems. Preliminary field surveys conducted in the study area have confirmed the location and extent of the Regional Ecosystems identified although these systems are surrounded by cleared grazing land.

Soil and Geology

Negative impacts upon soil and geology are anticipated to be similar at each of the three site options. However, the Southern Stockyard option is likely to have less of a risk associated with exposing acid sulphate soils given the elevation of the site on the 20m contour compared with the lower elevations of the other options (possibly <5m).

Surface Water Quality and Hydrology

Each site option has potential to have a negative impact upon nearby waterways, if control measures are not in place. The Southern Stockyard and Dudgeon Point options will require controls to avoid erosion and sedimentation as a result of infrastructure crossing waterways (conveyors and rail line respectively) and new discharge points, while potential negative impacts relating to Louisa Creek will require further investigation.

Transportation and Access

The Southern Stockyard option is preferred given the limited impacts on the local road network compared with Louisa Creek and Dudgeon Point. While the Southern Stockyard option will result in impacts to a State Controlled Road, the Dudgeon Point and Louisa Creek options have the potential to affect access to the local community and Louisa Creek Beach respectively. Dudgeon Point raises additional issues of the proposed rail line crossing three existing roads, one of which is a State Controlled Road.

Waste Management

The risk of additional waste streams being generated is increased at all potential expansion sites.

Land Tenure and Other Stakeholder Interests

The Dudgeon Point option is favoured as the land needed for all expansion stages is owned in Freehold Title by PCQ. In comparison, the Southern Stockyard site will require the resumption of 4 grazing properties and resolution of stakeholder interests. Louisa Creek is the least preferred given the need for tenure/acquisition of all remaining residential properties within Louisa Creek Township which are not currently owned by PCQ.

Environmentally Preferred Option

Table 11 forms the key output of the qualitative assessment of environmental and planning constraints for each of the three expansion site options. This assessment has been undertaken on the basis that should the Louisa Creek option be selected, then the remaining residential properties within the township of Louisa Creek would be acquired and there would be no residents remaining in the area.

In determining the preferred site, this assessment has been based upon the level of risk a site poses to obtaining planning approvals with respect to each of the 14 identified issue/impact categories. In doing so, the level of risk that has been assigned not only reflects the site's constraints themselves, but also the nature and importance of the issue/impact in planning approval terms. Finally, in order to determine a preferred site, an assessment of the number of categories that each site has been considered 'preferred' in has been taken into account. Table 13 summarises the preferred option by impact.

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Air Quality	*M*	*L*	*M*
Noise and Vibration	*M*	*L*	*M*
Visual Amenity	*L*	*L*	*M*
Cultural Heritage	*M*	*M*	*M*
Local Maritime Operations	*L*	*L*	*H*
Community and Social Impacts	*L*	*H*	*M*
Coastal Processes	*L*	*L*	*L*
Marine Ecology	*L*	*H*	*H*
Terrestrial Ecology	*H*	*M*	*M*
Soil and Geology	*L*	*L*	*L*
Surface Water Quality and Hydrology	*M*	*M*	*M*
Transportation and Access	*L*	*L*	*M*
Waste Management	*L*	*L*	*L*
Land Tenure and Other Stakeholder Interests	*M*	*H*	*L*

RISK LEVEL

LOW (L) – *Limited (if any) delays are likely to be experienced during the approvals process as a result of the issues identified.*

MODERATE (M) - *Delays are likely to be experienced during the approvals process as a result of the issues identified; however, issues are expected to be managed / addressed sufficiently to obtain approval, without significant design changes.*

HIGH (H) – *Significant delays are likely to be experienced during the approvals process as a result of the issues identified. Resolution of these issues may require design changes.*

Table 13 – DBCT 9X stockyard site selection evaluation

From the summary above, the preferred site based on environmental and planning constraints is the Southern Stockyard. This conclusion has been reached based on the following outcomes.

- Firstly, the Southern Stockyard option exhibits the lowest level of risk between the three risk levels. That is, the majority of categories were associated with a low risk, with only five of the fourteen issues associated with a medium level of risk.
- Secondly, in comparing the frequency of instances of high level risk, the Southern Stockyard had the lowest number of high risk issues. Taking into account the

number of medium and high risk issues, Louisa Creek was considered to be the least desirable site option of the three considered.

For each impact/issue, comparisons between each of the site options based upon their associated risk to the approvals process as well as their frequency of being the preferred option were made. By identifying the preferred site/s for each separate issue, both the Southern Stockyard and Dudgeon Point were found to be the most frequently preferred overall.

This assessment of environmental constraints and subsequent selection of the Southern Stockyard site as the preferred option is based upon preliminary information obtained through a desktop study only. In conducting this assessment, information gaps have been identified and the need for further investigation on particular issues highlighted. The following is a list of key issues requiring further investigation in order to provide a more accurate assessment:

- Cultural Heritage assessments of potential sites outside the existing DBCT footprint;
- Access restrictions on recreational boating within Dalrymple Bay imposed by the new jetty;
- Likelihood of impact on marine water quality, including impact on local beaches;
- Potential impacts to coastal processes as a result of reclamation works and the new jetty;
- Reclamation and construction impacts upon local turtle nesting sites;
- Potential impacts upon seagrasses and other marine plants;
- Impacts to existing mangrove communities and the need for setbacks;
- Impact to tidal flow regime of Louisa Creek during 9X expansion works;
- Traffic assessment study to determine impacts upon Hay Point Road and the local road network; and
- Noise and dust assessments

Based on this preference, DBCM has commissioned preliminary studies of dust and noise to ensure excessive issues will not develop due to the possible expansion. The results are detailed in the following.

Air quality Post Expansion

Due to their past experience with DBCT, Katestone Environmental ("Katestone") were again commissioned to model air quality for this report, to assess the impacts of the preferred expansion site (to a capacity of approximately 150 Mtpa), including increasing throughput of the existing terminal and adding a new stockyard and related infrastructure associated with the Southern Stockyard. The study was based on the design of the existing dust emission controls for quantifying potential emission rates of coal dust.

The *Environmental Protection Act 1994* (EP Act) provides for the management of the air environment in Queensland. The EP Act gives the Minister for Sustainability, Climate change and Innovation the power to create Environmental Protection Policies that identify and aim to protect environmental values of the atmosphere that are conducive to the health and well-being of humans and biological integrity. The *Environmental Protection (Air) Policy* (EPP(Air)) was recently revised and gazetted in 2008. The administering authority must consider the requirements of the EPP(Air) when it decides an application for an environmental authority (EA), amendment of a licence or approval of a draft environmental management plan.

The air quality objectives that are relevant to DBCT and the Southern Stockyard option are the EPP(Air) objectives, the management objectives specified in the existing Environmental Authority (EA) issued by the EPA for the operation of DBCT (at 85 Mtpa) and the EPA's recommended guideline for deposited dust. A detailed summary of the climate and dust monitoring undertaken by PCQ, HPCT, DBCT and the Bureau of Meteorology is provided in the previous Katestone Environmental (2006) report (See Master Plan 2006).

Note: whilst the EPP(Air) objectives relate to the total amount of dust (TSP, PM_{10} or $PM_{2.5}$) in the atmosphere irrespective of the source of the dust, the DBCT EA management objectives for TSP and coal dust deposition are for the increase in dust level above the background caused by DBCT.

These are summarised in the following table (Table 14):

Pollutant	Averaging period	Standard/goal	Source
Particulates (as $PM_{2.5}$)[1]	24-hour	25 µg/m³	EPP(Air)
	Annual	8 µg/m³	EPP(Air)
Particulates (as PM_{10})[2]	24-hour	50 µg/m³	EPP(Air)[3]
Particulates (as TSP)	24-hour	50 µg/m³	DBCT EA management objective[4]
	Annual	90 µg/m³	EPP(Air)
Dust deposition rate (total insoluble solids)	Annual	120 mg/m²/day	EPA recommended guideline
Dust deposition rate (increase in insoluble solids above background)	Annual	60 mg/m²/day	DBCT EA management objective[4]

Table note:
[1]$PM_{2.5}$ are particles that have aerodynamic diameters that are less than 2.5 µm
[2]PM_{10} are particles that have aerodynamic diameters that are less than 10 µm
[3]5 exceedances allowed per year
[4]Environmental Authority management objective, increase above background

Table 14 – Air Quality Objectives

Meteorology

The winds at Hay Point are strongly influenced by the presence of the Coral Sea and are predominantly moderate, from the southeast. A summary of the seasonal and diurnal winds are included in the full report attached as Appendix C. The seasonal wind is south easterly dominated. During winter, south easterly to south westerly winds are most frequent and are light to moderate in strength. During the day (6 am to 6 pm) moderate winds occur from the south easterly sector. During the evenings the dominant winds shift slightly from the east to east-southeast. During the early mornings the winds are dominated by light south to south westerly winds and moderate east to east-south easterly winds.

Dust Fallout Monitoring

PCQ, DBCT and HPCT jointly operate an extensive environmental monitoring network that consists of four primary monitoring stations that are adjacent to the nearest residential areas. These stations continuously measure meteorological conditions and ambient concentrations of dust. Dust deposition rates are also measured on a monthly basis at each of the primary sites and also at 19 secondary sites (S1 to S19) that are located within the terminals and in the community and at two control sites (C1 and C2) that are located at Grasstree Beach, approximately 10 km to the south.

Katestone Scientific (2000) found the following relationships between the Hay Point TEOM dust concentrations and the standard dust measures of TSP, PM10 and PM2.5 (dust monitoring data from the period January 1998 to March 2005 were reviewed for this study):

- TSP concentrations can be derived by multiplying the TEOM dust measurements by a factor of 2.2
- PM10 levels can be derived from the TEOM PM20 measurements by applying a divisional factor of 1.7
- $PM_{2.5}$ levels can be derived from the TEOM PM_{20} measurements by applying a divisional factor of 8.9

Emissions for DBCT Expansion

At the time of appointing Katestone, the full capacity realisation expected from 8X, 9XA and 9XB was unknown. As such and for the purposes of this study, we requested Katestone to consider an 8X yard capacity to 90 Mtpa and a 9XB capacity to 150 Mtpa. Accordingly, the expansion assumptions involve an increase in the coal handling at the following locations:

- Train unloading
- Conveyor operations
- Surge bins
- Stacking/reclaiming
- Transfer points
- Ship loading
- Miscellaneous other site activities including traffic

As the 8X expansion pertains to bunds 1 and 3, the area of the stockyard will not change significantly as a result of the increase in capacity. As such, a summary of the emission rate change for the existing operations of 85 Mtpa and the considered 90 Mtpa operations are presented in the following table (Table 15). Emissions from the HPS at its current approved throughput are also presented.

Activity	DBCT (g/s)		Percent difference (%)	HPCT (g/s)
	85 Mtpa	90 Mtpa		
Rail receival	0.17	0.18	5.9	0.085
Inloading conveyors – including transfer points	0.49	0.52	5.9	0.2
Stacking	1.69	1.78	5.9	0.56
Reclaiming	1.75	1.86	5.9	0.57
Stockpile liftoff	4.38	4.38	0.0	2.84
Outloading conveyors and transfer points	1.08	1.13	5.9	0.52
Ship loading	0.54	0.57	5.9	0.28
Surge bins	0.32	0.34	5.9	0.49
Other site activities – including traffic	0.28	0.30	5.9	0.22
Total	10.68	11.06	3.5	5.77

Table 15 – 8X predicted dust emissions

Emissions for Southern Stockyard

Dust emission rates from the Southern Stockyard Option were calculated based on the emission rates from DBCT and assuming equivalent dust controls. The following specific features of the Southern Stockyard Option were accounted for:

Activity	Southern Stockyard Option (g/s)
Rail receival	0.12
Inloading conveyors – including transfer points	0.61
Stacking	1.19
Reclaiming	1.24
Stockpile liftoff	3.11
Outloading conveyors and transfer points	1.40
Ship loading	0.38
Surge bins	0.16
Other site activities – including traffic	0.20
Total	8.40

Table 16 – 9X Southern Stockyard predicted dust emissions

Dispersion modelling assessment of DBCT at 150 Mtpa - PM2.5

A summary of the predicted 24-hour and annual average ground-level concentrations of $PM_{2.5}$ due to the Southern Stockyard Option in isolation and in conjunction with DBCT at 90 Mtpa, HPCT at approved capacity plus background levels, for the selected residences and monitoring stations is presented in the following table. The predicted $PM_{2.5}$ concentrations are low and well in compliance with the EPP(Air) objective. The Southern Stockyard Option is predicted to result in a minor increase in $PM_{2.5}$ concentrations. The largest increase is 0.8 µg/m³, which represents 3% of the objective.

Location	24-hour average		Annual average	
	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels
P1	0.1	4.5	0.02	2.6
P2	0.2	5.5	0.05	3.0
P3	0.4	4.5	0.03	2.6
P4	0.2	4.4	0.02	2.5
Louisa Creek	0.2	4.9	0.03	2.8
Timberlands	0.1	4.2	0.01	2.5
Hay Point Road 1	0.3	4.4	0.07	2.6
Hay Point Road 2	0.4	4.4	0.05	2.6
Droughtmaster Drive 1	0.8	4.8	0.09	2.6
Droughtmaster Drive 2	0.5	4.5	0.09	2.6
Hay Point Road 3	0.4	4.4	0.06	2.6
Fenech Street	0.2	4.2	0.02	2.5
Salonika: Pacific Drive 1	0.3	4.4	0.03	2.5
Salonika: Pacific Drive 2	0.1	4.2	0.01	2.5
Half Tide: Tindaridge Court	0.3	4.5	0.03	2.6
Air quality objective	**25**		**8**	

Table 17 – PM2.5 Dispersion modelling results DBCT @ 90 Mtpa + Southern Stockyard

PM10

A summary of the predicted 24-hour average ground-level concentrations of PM_{10} due to the Southern Stockyard Option in isolation and in conjunction with DBCT at 90 Mtpa, HPCT at approved capacity plus background levels, for the selected residences and monitoring stations is presented in the following table:

Location	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels
P1	2.5	29.0
P2	3.3	45.0
P3	6.1	29.4
P4	3.5	26.7
Louisa Creek	3.7	35.3
Timberlands	1.9	23.3
Hay Point Road 1	5.8	26.9
Hay Point Road 2	6.0	26.8
Droughtmaster Drive 1	12.6	33.3
Droughtmaster Drive 2	9.0	29.7
Hay Point Road 3	6.1	26.8
Fenech Street	3.3	24.7
Salonika: Pacific Drive 1	4.6	27.5
Salonika: Pacific Drive 2	2.4	24.5
Half Tide: Tindaridge Court	5.5	28.4
Air quality objective	50	

Table 18 – PM10 Dispersion modelling results DBCT @ 90 Mtpa + Southern Stockyard

The predicted PM_{10} concentrations are in compliance with the EPP(Air) objective at all residences. The Southern Stockyard Option is predicted to result in a minor increase in PM_{10} concentrations. The largest increase is 12.6 µg/m³, which represents 25% of the objective.

Total Suspended Particulate Matter (TSP)

A summary of the predicted 24-hour average and annual average ground-level concentrations of TSP due to the Southern Stockyard Option in isolation and in conjunction with DBCT at 90 Mtpa, HPCT at approved capacity plus background levels, for the selected residences and monitoring stations is presented in the following table:

Location	24-hour average		Annual average	
	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved[1]	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels
P1	3.5	19.2	0.5	52.5
P2	4.7	65.0	1.6	67.6
P3	8.6	19.3	0.8	50.4
P4	5.1	10.4	0.5	49.3
Louisa Creek	5.1	38.1	1.0	57.8
Timberlands	2.4	3.5	0.2	48.9
Hay Point Road 1	10.9	10.9	2.3	51.9
Hay Point Road 2	12.6	12.6	1.6	50.5
Droughtmaster Drive 1	29.1	29.1	3.1	52.1
Droughtmaster Drive 2	21.3	21.3	3.1	51.9
Hay Point Road 3	14.2	14.2	1.9	50.6
Fenech Street	5.9	6.2	0.5	49.2
Salonika: Pacific Drive 1	7.3	11.1	0.7	49.6
Salonika: Pacific Drive 2	3.6	5.2	0.2	48.9
Half Tide: Tindaridge Court	8.4	15.5	0.8	50.1
Air quality objective	**50[1]**		**90**	
Table note [1]Increase above background				

Table 19 – TSP Dispersion modelling results DBCT @ 90 Mtpa + Southern Stockyard

The predicted TSP concentrations are in compliance with the EPP (Air) objective. The Southern Stockyard Option is predicted to result in a minor increase in PM_{10} concentrations. The largest increase is 29.1 µg/m³, which represents 58% of the objective.

Dust deposition

A summary of the predicted annual average dust deposition rates due to the Southern Stockyard Option in isolation and with the DBCT at 90 Mtpa, HPCT at approved capacity plus background levels, for the selected residences and monitoring stations is presented in the following table:

Location	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels
P1	1.8	19.6	55.6
P2	6.6	106.3	142.3
P3	0.4	2.5	38.5
P4	0.3	1.1	37.1
Louisa Creek	3.5	48.6	84.6
Timberlands	0.3	0.5	36.5
Hay Point Road 1	6.6	8.8	44.8
Hay Point Road 2	7.3	7.9	43.9
Droughtmaster Drive 1	13.9	14.5	50.5
Droughtmaster Drive 2	16.8	17.2	53.2
Hay Point Road 3	9.5	9.7	45.7
Fenech Street	0.8	0.9	36.9
Salonika: Pacific Drive 1	0.4	1.4	37.4
Salonika: Pacific Drive 2	0.2	0.6	36.6
Half Tide: Tindaridge Court	0.5	2.1	38.1
Air quality objective	**60**	**60**	**120**

Table 20 – Deposition modelling results DBCT @ 90 Mtpa + Southern Stockyard

The predicted dust deposition rates are in compliance with the EPA's recommended guideline and EA management objective at all residences. The Southern Stockyard Option is predicted to result in a minor increase in dust deposition rate. The largest increase is 16.8 mg/m²/day, which represents 28% of the EA management objective and 14% of the EPA's recommended guideline.

Noise Management

Predictive noise modelling has also been used to ensure that statutory standards as contained in the applicable Development Approvals are not exceeded. Due to their past experience with DBCT, Huson & Associates ("Huson") were again commissioned to model noise levels of the proposed expansion to 150 Mtpa including increasing throughput of the existing terminal and adding a new stockyard and related infrastructure for the Southern Stockyard. At the time of appointing Huson, the full capacity realisation expected from 8X, 9XA and 9XB was unknown. As such and for the purposes of this study, we requested Huson to consider an 8X yard capacity to 90 Mtpa and a 9XB capacity to 150 Mtpa. The study was based on the design of the existing terminal with the noise limits assessed against the latest Environmental Protection (Noise) Policy (NoiseEPP) that came into force on 1 January 2009 as follows:

Sensitive Receptor	Time of day	Acoustic quality objectives (measured at the receptor) *dB(A)*			Environmental value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
Dwelling (for outdoors)	daytime and evening	50	55	65	health and wellbeing
Dwelling (for indoors)	daytime and evening	35	40	45	health and wellbeing
Dwelling (for indoors)	night-time	30	35	40	health and wellbeing, in relation to the ability to sleep

Table 21 – Noise modelling results DBCT @ 90 Mtpa + Southern Stockyard

The existing stockpiles have inloading to the south and outloading to the northern end, in contrast to the proposed southern stock yard that has inloading and outloading equipment both on the northern end of the new stock yard, farthest away from the most populous noise sensitive areas. The most significant noise emissions are from elevated conveyors such as S4 and various drive towers. The arrangement for the southern stock yard concentrates the higher noise emitting equipment in one area at the northern end of the southern stock yard.

This design approach would assist in minimising noise emissions as per the requirement of Part 4, section 9 (2)(b)(i) in the new NoiseEPP. Noise emissions would be further minimised through the use of low noise idlers and choice of quiet drives and transfer tower enclosure design in compliance with Part 4, section 9 (2)(b)(ii). Estimates of noise levels from the 8X works indicate that sound levels of approximately 38dB(A) would occur in the residential strip to the east of the southern stock yard (south of Half Tide). For 9X the sound levels would be approximately 41dB(A) in this area.

Sound levels at Timberlands and for some dwellings to the west and NW of the 8X and 9X inloading and outloading equipment have the advantage of hills blocking line of sight to the equipment (this provides noise attenuation). Unfortunately, a recent complainant in Horsbrough Rd would have an unimpeded view of the new equipment and some dwellings in this area would experience continuous type sound levels of approximately 45dB(A) for 9X and 42dB(A) for 8X. The same dwellings in Horsbrough Rd have recently been surveyed after completion of RRP3 and maximum sound levels of 40dB(A) were found for individual vibrator operations within RRP3. The proposed RRP4 and RRP5 are the same distance away from these dwellings as RRP3 (also having direct line of sight) so it is expected that similar maximum sound levels at this location would be observed for RRP4 and RRP5.

Detailed modelling has not been completed for the Timberland residential area but we would expect sound levels from 8X to be approximately 32dB(A) and 35dB(A) for 9X, due to constant sound from conveyors, transfer towers, drive towers and stacker/reclaimers. Maximum sound levels from wagon vibrator operations at the new rail receival would be less than 33dB(A) in the Timberland area. There are no locations where noise sensitive receptors would experience night time noise limits of more than the current license condition of 53dB(A).

Impacts of CPRS Legislation

It has been determined by Energetics, a consultant employed by Babcock & Brown Infrastructure (BBI), that DBCTM have the following reporting requirements under the National Greenhouse and Energy Reporting System (NGERS):

- DBCTM will need to report Scope 1 and 2 emissions to their parent company, BBI, if BBI trips the corporate reporting thresholds of 125,000t CO_2-e
- this includes emissions from operations and ancillary activities DBCTM, but not emissions related to terminal activities under operational control of DBCT P/L
- DBCTM will need to include the emissions from contractors involved in any expansion of the terminal, as they do fall under operational control of DBCTM rather than DBCT P/L

- the reporting of emissions from operations of the terminal is the responsibility of DBCT P/L
- There is no obligation for DBCTM or its parent entity to acquire emissions permits relating to the terminal operations or ancillary activities as:
    - o the activities related to the facility under DBCTM's control are unlikely to produce Scope 1 emissions of greater than 25,000t CO_2-e inclusive of Expansion Contractor emissions
- Note that the trigger of 25,000t CO_2-e includes emissions from the combustion of liquid petroleum fuels, despite the fact that obligations for acquiring permits related to liquid petroleum fuels (eg. Diesel, Petrol) are acquitted upstream unless DBCTM holds an Obligation Transfer Number (OTN) as a large user
- There will be pass-through costs for various emissions with particular impacts from higher electricity and diesel prices. DBCTM will be subject to higher costs passed on from DBCT P/L and contractors for the expansion project.

Vessel berthing at DBCT

7.0 Stakeholder Consultation

Public Consultation Process

The Port of Hay Point Community Reference Group (CRG) has been a critical link between DBCT and the community. Membership of the CRG currently includes representatives of DBCTM, DBCT P/L, PCQ and the local communities of Louisa Creek, Mirani, Sarina, Half Tide and the Droughtmaster Drive area. The general public is invited to attend meetings as observers with questions taken from the floor. The CRG publishes minutes of meetings, as well as an official newsletter that is made available to communities.

The Port of Hay Point CRG discusses a wide range of local concerns and is kept abreast of general developments at DBCT to provide an ongoing general public forum that ensures the community is well informed about DBCT issues that affect the whole of port stakeholders. In turn, DBCTM and DBCT P/L are able to consider and gauge general community concerns as part of the ongoing DBCT planning process.

Because the more specific issues associated with the operations of DBCT were sometimes confused with the whole of port group, the DBCT terminal Operator undertook to commence its own community working group (DBCT CWG). This group is represented by community members, local government, DBCT P/L, the local State member and DBCTM and has a primary goal of facilitating open two-way communications that enhance understanding of issues specifically associated with the terminal and build trust and potential opportunity between the members.

As environmental performance remains a source of concern for the community, this double strategy ensures community relations are maintained, especially as production increases and environmental risks increase. As part of ongoing efforts to further improve public consultation, DBCTM is investing in other more direct means of engaging with the local community (such as public information sessions and one-on-one briefings for local government).

DBCTM also recognises that expansion projects may create additional community pressures that are not correlated to the terminal Operation. Accordingly, DBCTM takes an active role with the community that provides stakeholder integration with future expansion.

Community Engagement Strategy

The primary objective of a community engagement strategy is to assist in the provision of a stable social operating environment for the business and to allow DBCT to expand to meet industry demand.

DBCTM's successful community engagement strategy is based on:

- informing and educating the community regarding the terminal's operating philosophy and activities including values, history, commitment to sustainability, security etc;
- working to continually improve relations with the immediate community through successful community engagement and relationship building (accomplished through a dedicated liaison officer);
- proactively strengthening key stakeholder relationships outside the immediate

community;

- effectively and efficiently managing complaints and issues; and
- promoting greater integration/interdependence between the community and the terminal over the long term.

A multi-faceted approach to Community liaison has been adopted as no single plan, including attendance at the Port of Hay Point Community Relations Group (CRG), can satisfy all of the expectations of various community groups and individuals.

Typical responsibilities of this liaison role include:

- meet and greet activities, including working with local schools and TAFE colleges, managing site tours, visits and handouts. This forms an integral part of the community information and education campaign;
- management of the CWG local advisory group;
- proactive generation of positive media, locally and at a state/national level;
- production of written material on how the Terminal operates, its values, history, environmental initiatives, etc;
- development of local employment, primarily thorough the DBCT 7X project;
- speaking engagements at local clubs, council, service industries etc;
- receipt of community input or issues; and
- maintaining a web site to better inform interested parties of terminal related matters.

Key Stakeholder Relations Program

While the focus of this strategy is community engagement, external stakeholders also need to be included in terminal information. These external stakeholders include:

- approval agencies, e.g. Environmental Protection Agency;
- elected representatives (State, Federal and local Government);
- Ministers relevant to the operation or expansion of the terminal;
- media;
- environmental groups; and
- Local Government officers from such agencies as Department of Natural Resources & Mines and Queensland Health.

As such, community engagement programs have been extended to include communication with key stakeholders in order to ensure proactive relationships with these parties.

Management of Complaints & Issues

It is important for any organisation undertaking community engagement to field and manage community input and complaints in an efficient and effective manner. Nothing frustrates or nurtures cynicism more in a community than hearing that complaints are taken seriously and then seeing no visible or timely response to concerns or requests. Dedicated channels of communication and protocols have been established to facilitate management of community suggestions and issues which include both the terminal Operator and expansion contractors.

DBCT inloading galleries and stockyard

Glossary of Terms

Access Application	an application for access to DBCT made under Section 5.2 of the approved DBCT Access Undertaking
BBI	Babcock & Brown Infrastructure – parent corporate entity of DBCTM
Barlow Jonker	Barlow Jonker Pty Ltd (specialist consulting firm that provided an independent review of coal mines and production forecast)
Below rail capacity	Rail track and overhead power infrastructure
Brownfield	Construction activity on a site already involved in operations
Buffer capacity	Difference between actual throughput and rated terminal capacity
Bund	An earth or concrete structure which separates rows in the stockyard and supports the yard machines
CL-NQ	Coal Logistics–North Queensland (lessee prior to Prime IPO; includes various CL-NQ entities)
Cape	Vessel of 90,000 – 120,000 tonnes deadweight
Cargo Assembly	Process of assembling coal into the stockyard to form parcels designated to individual ships
Coal Chain	All of the steps involving all stakeholders between the point where coal enters the mine stockpiles and the time the coal is loaded into the hold of a ship. Stakeholders include indirect entities, such as Governmental bodies and infrastructure providers (e.g., QR-NA)
Coke	De-volatilised coal, produced in a coke oven, used as a reductant in a blast furnace and in foundries
Coking Coal	Coal that can be processed into coke
CRG	Port of Hay Point Community Reference Group (community consultation group)
Customer	Coal mine operator and the customer of DBCT (user of the coal chain transportation system). Also referred to as a “Producer” of DBCT

CPRS	Carbon Pollution Reduction Scheme
DBCTM	DBCT Management is the trading name of BBI (DBCT) Management Pty Ltd, the Secondary Lessee under the PSA and as such, the organisation responsible for the development, management and operation of DBCT
Demand pull	Supply chain condition where coal is pulled to the port by shipping demand
Demurrage	Penalty payable to the vessel owner for delaying the ship past the agreed loading time
DBCC	Dalrymple Bay Coal Chain Central Coordinator
DBCT	Dalrymple Bay Coal Terminal (includes all of the physical facilities for the operating coal terminal)
DBCT Holdings P/L	Dalrymple Bay Coal Terminal Holdings Pty Ltd (DBCTH P/L) - Government of Queensland lessor
DBCT P/L	Dalrymple Bay Coal Terminal Pty Ltd (company owned by several of the DBCT customers and contracted to operate and maintain the terminal on a daily basis)
DBCT User Group	A commercial representation of all DBCT Producers
dwt	Dead Weight Tonnes (measurement of the carrying capacity of ships). Deadweight cargo capacity is the weight in tonnes of the cargo required to sink the ship to her loadline after allowing for bunkers, stores, etc.
EIS	Environmental Impact Study
Environmental Assessment Report (EAR)	DBCTM Environmental assessment for expansion to 85 Mtpa
Environmental Strategy	DBCTM's 5 year Environmental Strategy for DBCT
ERA	Environmentally Relevant Activity
Even railings	Operational scheduling based around uniform railing of mine supply to the port
EPCM	Engineering, Procurement, Construction and Management
FY	Financial year

FOB	Free on Board. Stipulates that the seller is to deliver the goods on board the vessel free of cost to the buyer at the port named in the sales contract
Future Operating Mode	A preferred alternative Operating Mode suggested by DBCT P/L to ensure the closest match between terminal capacity and actual throughput
GAP	Goonyella to Abbot Point rail project
Gap	Difference between actual throughput and contracted tonnage
Global Seaborne trade	Volume of traded coal carried by seagoing vessels
Goonyella Coal Chain	The supply chain incorporating mines located in the central Bowen Basin, the two export terminal at Hay Point and the connecting rail system
Handymax	Ships of 20-55,000 tonnes deadweight
HPS	Hay Point Services Terminal (coal terminal neighbouring DBCT and privately owned by a consortium of BHP Billiton and Mitsubishi
Independent Expert	A non-interested expert assigned to determine system and/or terminal capacity at any given time
Inloading	First part of the terminal operation where coal is received from trains and conveyed to the stockyard
IPO	Initial Public Offering (investment instruments and process to develop broad-based public investment in DBCT)
LTS	Long Term Solution
Metallurgical Coal	All types of coal used in the steel making process
ML	Megalitre (measure of volume)
mm	Millimetre (measure of length)
Mtpa	Million tonnes per annum (measure of coal throughput quantity)
Mt	Million tonnes (measure of weight)
Nameplate Capacity	Design capacity of equipment, system or terminal regarding throughput. As an optimal capacity, it does

	not take in account all operational variances although does include maintainability of equipment based on 85% utilisation
NGER	National Greenhouse and Energy Reporting System
OMC	Operations & Maintenance Contract between DBCTM and DBCT P/L
Operational Capacity	Achievable capacity of the terminal, taking into account the current service demands, operational factors and state of the supply chain
Outloading or O/L	3rd part of the terminal operation where coal is reclaimed from stockpiles and conveyed to one of three shiploaders where it is loaded into vessels
Panamax	Ships of 55,000 – 90,000 tonnes deadweight
PCI	Pulverised Coal Injection – replacement for coke in a blast furnace by injecting pulverised coal
PCQ	Ports Corporation of Queensland
PSA	Port Services Agreement (Queensland Government contract governing the lease of DBCT)
Phase 1	On-shore construction phase of the DBCT 7X Project expanding terminal capacity from 59 Mtpa to 68 Mtpa
Phase 2/3	Off-shore construction phase of the DBCT 7X Project expanding terminal capacity from 68 Mtpa to 85 Mtpa
Phase 2/3 – Step A	Incremental capacity enhancement delivering 72 Mtpa total terminal capacity after commissioning Berth 4 between Phase 1 and Phase 2/3
PCQ	Ports Corporation Queensland (Port Authority)
QDOT	Queensland Department of Transport
QMS	Queue Management System – a process to limit the quantity of saleable coal to the capacity of the system in any month
QCA	Queensland Competition Authority (Governmental regulator)
QR-CFS	Queensland Rail Coal and Freight Services (provider of

	train rolling stock and train operations services)
QR-NA	Queensland Rail Network Access (provider of track infrastructure and electric power infrastructure)
Queue Reduction	Process to reduce the design queue in recognition of a shipping build-up that exceeds projections of the QMS Independent Expert
Rangal Coal Measures	Coals of the Bowen Basin that were deposited under fluviatile, lacustrine and paludal conditions and characterised by comparatively low reactive content and low sulphur
Rail Receival	DBCT rail inloading facilities
Reclaimer	Yard reclaiming machine
RL	Reduced level (level to chart datum)
Sandwell	Sandwell Engineering Inc. (consultant to DBCTM in developing Master Plan 2003)
Scenario Base Case	Throughput projections based on contracted tonnage
Scenario Medium Case	Base case plus future expansion tonnage
Scenario High Case	Medium case plus additional non contracted tonnage
Service Levels	User requirements for processing and shipping coal
SL	Ship loader
Shiploader	Terminal machine used to transfer coal conveyed from the surge bin to the ships' hold
Short Gain Expansion	A terminal expansion completed in August 2006 which primarily replaced the collapsed RL1 but also introduced a series of process enhancements increasing the terminal capacity from 55 Mtpa to 59 Mtpa
Slots	Number of available rail paths
SMP	System Master Plan
SR	Stacker Reclaimer
Standard Access Agreement	New Access Undertaking contractual capacity agreement which replaced pre Access Undertaking

	User Agreements
Stacker	Yard stacking machine
Take or Pay	Charging mechanism based on paying for contracted entitlement even if it is not used
TCM	Terminal Capacity Model for DBCT
Terminal Capacity	Throughput capacity permitted by the terminal configuration
Through load	Process of direct loading coal from rail receival to vessels without using the stockyard for storage
tph	Tonnes per hour (measure of coal throughput quantity)
TSP	Total Suspended Particulate Matter (TSP) refers to the total of all particles suspended in the air.
Velocity	Rate at which coal moves through the supply chain
VLC	Ships in excess of 120,000 tonnes deadweight
Vessel Streams	Vessel queues
Upstream	Supply chain process between the mine and terminal
$	Australian dollars
7X Expansion	A two phased expansion of the terminal (with an interim step between) that increases capacity from 59 Mtpa (post-Short Gain) to 85 Mtpa

Appendix A

Connell Hatch
DBCT Expansion Project
ABN 21 646 421 651
6th Floor, 410 Ann Street
(PO Box 425, Spring Hill QLD 4004)
Spring Hill
Queensland 4011 Australia

Telephone: +61 7 3834 7777
Facsimile: +61 7 3832 3042
Email: chbne@connellhatch.com
www.connellhatch.com

Project: Post 85MTPa Studies	Reference: DBCT Post 85MTPa studies

To:	Copy:	Circulate:	Name:	Organisation:	Location/Facsimile:
✓			Peter Wotherspoon	BBI(DBCT)	
	✓		Greg Smith	BBI(DBCT)	
	✓		Mick Wordsworth	BBI(DBCT)	
	✓		Rosemary Johnson	CH	
	✓		Arne Nilsen	CH	

From: John Leech	Date: 27 May 2008	Total Pages: 4 +2 sketches .

Subject: Stockyard Volumes for Regular railing.

Peter,

1. Proposed stockyard expansion for regular railing

As requested, we have examined the extent to which the DBCT stockyard would need to be expanded if coal was to be transported to the terminal using regular scheduled trains in lieu of the existing campaign railing regime.

The attached sketch SK81-00-0001 shows the probable extent of the stockyard expansion to suit a capacity of 85MTPa.

This is based upon an upper bound estimate of the storage requirement at approximately 8.5% of total throughput. However, we believe that a storage capacity of as little as 5.5% may be feasible for regular railing as is explained further below.

Note the proposed stockyard upon completion of the current 7X project will have an estimated capacity of 2.27Million tonnes. The additional stockyard shown on the sketch would contain 120 X 40,000t piles or an additional 4.8 Million tonnes. Hence the combined stockyards as depicted would have a nominal capacity of 7.07 Million tonnes or 8.3% of 85MtPa.

Please note that this proposal is based on an assumption that a cargo assembly stockpiling regime would be maintained in spite of any potential switch to regular railing. The alternative use of dedicated product type stockpiles could be feasibly adopted for certain coal types where there are a large numbers of regular single coal type shipments – e.g. for BAC coal. However, for most of the coal types handled, dedicated product stockpiles would not be an appropriate method of storage at DBCT and, if attempted for all coals, would lead to massively increased storage requirements well in excess of the nominal 8% requirement.

Where dedicated product storage stockpiles can be used, there will be a storage efficiency benefit of between 10 and 15% due to the gap reduction. Therefore, the change in area requirements would not be significant overall.

The reasons for maintaining the cargo assembly method and for stating an upper bound storage requirement of 8.5% of annual throughput are explained below.

2. Reasons for retaining cargo assembly stockpiling

It is important to recognise that the most appropriate method of stockpiling (dedicated product stockpiles versus cargo assembly stockpiles) is not determined according to the chosen rail operating regime but by other factors. In particular, a regular railing operation does not necessarily require the use of dedicated product stockpiles.

It is interesting to refer to other coal terminals where regular railing has been coupled with dedicated storage type stockpiling such as used at RG Tanna Coal Terminal in Gladstone. The RGTCT utilises a dozer stack-out and reclaim system with coal reclaimed by dozing to draw-down openings located at discrete locations. Because these reclaim locations are fixed and because of the dozer handling methods, it is not feasible to accommodate and handle multiple small ship's cargo sized piles around these fixed location reclaim openings, especially considering that these cargo piles must be rapidly turned over. Further, the dozer handling methods offer ease of blending upon out-loading by using multiple dozers from different stockpiles. It is therefore clear that such dozer operating methods are highly unsuitable to cargo assembly methods but are well suited to large dedicated product stockpiles where multiple products are formed upon outloading.

It follows that this type of terminal where the port stockpiles are essentially stockpiles of the primary products as mined, that the terminal is also well suited to a regular railing of coal from the mine on regular scheduled trains generally according to mining rates. This minimises stockpiling requirements at the mine but maximises volume requirements at the port. Therefore, in summary, the choice of a dozer stack/reclaim system essentially drives the requirement for dedicated storage piles and this in turn lends it self to regular railing. However, campaign railing could equally be utilised if space constraints at the port demanded that this be pursued.

In the case of a stacker/reclaimer facility like DBCT, stockyard space within a given row can be flexibly allocated to any product as required since there are no fixed reclaim locations along the length of the row. The handling of multiple smaller piles also presents no difficulty. Further, the use of stacker/reclaimers means that extensive blending upon outloading is not feasible. For example, in the case of DBCT, blending upon outloading is practically limited to approximately 30/70, 2-product blends. Any more substantial blending activities need to be carried out at the mine or by windrow stacking upon inloading.

Therefore, where there is a wide range of products that are formed from the primary mined coals that are required to be handled through such a port, then the choice of a stacker/reclaimer type facility essentially drives the requirement for a cargo assembly stockpiling system. This is particularly the case if a substantial number of these products are not shipped on a sufficiently regular basis to justify continuous storage at the port. Once a cargo assembly system is chosen, there is potential to adopt either regular railing or short period campaign railing. The short period campaign railing offers the ability to minimise storage requirements at the port and that is essentially the basis of the current DBCT operation.

Notwithstanding that the choice of stacker/reclaimers generally suggests the use of cargo assembly processes, there are certain coal types at DBCT that are handled so regularly that it does become optional to store these coals in dedicated product stockpiles at the port. However, even for such coals, care needs to be taken when the terminal is expanded to three outloading systems since this increases the probability that this coal type may need to be reclaimed for more than one outloading system at the same time and this may place impossible demands on reclaimer utilisation. If such coals are loaded mostly in single cargo vessels, this potential problem may be avoided by adopting a zonal system and allocating all such vessels with this coal type to a single berth/outloading stream that correlates to a particular zone in the yard where this coal is stacked. However, if this coal type is actually involved in many multi-cargo vessels, then such a strategy may not be feasible and the stockpiles will need to be split into additional piles in other zones to provide increased reclaimer access. This splitting of the stockpiles may well defeat any storage space efficiency gains brought about by using dedicated single product stockpiles and reverting to a uniform cargo assembly approach may be the best solution.

In summary, given the very large number of products handled at DBCT and lack of consistent shipping for most of these products, only a few coals will suit dedicated product type storage and the terminal will need to continue with a predominantly cargo assembly approach.

However, as mentioned above, regular railing can be adopted with a cargo assembly approach although it may be beneficial to retain some low throughput users on a campaign railing basis.

Although trains would be presented to the mines on a regular basis, coal loaded to these regular trains at a given mine would need to be according to the planned shipping order and to match the specific ship's cargos. This may not necessarily match mining rates and substantial stockpiling may still be required at some mines.

Therefore, for a given shipping schedule, the order of loading coals to trains at a particular mine would be essentially the same as for the current railing operation except that trains would be loaded on a predominantly regular schedule which means certain cargos would begin to be assembled at the port much sooner than currently occurs.

Therefore, regular railing would potentially allow rail performance to be optimised but would drive up the total volume requirements at the port.

3. Estimated volume requirements for regular railing

The extent to which the volume is required to be increased at DBCT depends upon how well each miner's regular train schedule can be matched to the shipping schedule. Users with a naturally more regular shipping schedule will naturally require less space. Further, the space requirements can be reduced by allowing greater variation in the "regular" train frequency. For example, if the "regular" train frequency provided to each mine is based on a two month outlook rather than a six month outlook, then less volume would be required at the port stockyard.

In estimating, the volume requirements likely to exist at DBCT in a regular railing scenario, we have considered that the majority of users in an 85MTPa terminal would be shipping in excess of 4MTPa each. This represents an average loading rate of one average sized vessel per week per user. Considering the likely variation in shipping arrivals, it is also likely that under a regular railing scenario, cargoes would rarely commence stacking in excess of 30 to 35 days in advance of the shipping date. For a typical 4MTPa shipper, daily railing rates would be of order 1 train per day and therefore minimum accumulation times of typical 8 days would be likely for an average vessel. A 19 to 21 day average accumulation period would therefore seem reasonable for such users. Higher throughput users would have reduced average accumulation times.

Calculations have been performed to determine volumetric requirements for a range of accumulation times from 4 days to 30 days as shown on the attached graph. As shown on the graph, stockyard volumes of 5.5 to 6.5% are suggested for an average 19 to 21 day assembly period. A closer examination of the shipping schedules for a range of users would need to be carried out to make a more accurate determination. At this stage an upper bound of 8.5% correlating to 30 days would seem to be a conservative upper bound value.

4. Comparison with volume requirements at dedicated storage terminals

It is interesting to compare this regular railing storage value with typically storage requirements at other coal terminals that use regular railing in combination with dedicated coal type storage areas such as RG Tanna coal terminal at Gladstone. RG Tanna has storage capacity of nominal 10% of throughput. However, in these terminals, stockyard areas are essentially allocated to the mined coal types. Once allocated, the stockyard areas are set aside for a particular brand and the total stockyard capacity of the terminal must equal the sum of the maximum requirements for each brand even though not all brands will require maximum storage volumes at the same time.

For regular railing at a cargo assembly terminal, stockyard areas are not dedicated but shared and this allows the storage volume to be significantly reduced in comparison to dedicated storage type terminals. The peak storage requirement is only the sum of all cargos being assembled at a given time. Given that the overall terminal output is essentially constant this volume requirement should also remain approximately constant.

5. Potential impact of railing performance on 7X capacity

Note that the railing operation assumed for the 7X expansion was for a continuation of the "cluster" campaign railing approach with an average 7 days accumulation period (3 minimum to 11 maximum). As shown on the graph this suggests a theoretical stockpile volume requirement of 2.5% of throughput in comparison to the planned available storage of 2.7% based on 85MTPa.

Based on unconfirmed information regarding latest rail system performances, we are increasingly concerned that the assumed 7 day average railing time may not actually be achieved at or beyond 85MTPa. If railing performance is significantly altered from the assumed average 7 day railing rate, then the proposed 85MTPa capacity of the 7X expansion may not be achieved due to volumetric constraints in the stockyard.

We are also examining this issue as part of the Post 85MTPa studies and will advise further.

Regards

John Leech
(Principal Consultant)

Appendix B

Connell Hatch
ABN 21 646 421 651
433 Boundary Street
Spring Hill
Queensland 4004 Australia

Telephone: +61 7 3135 8444
Facsimile: +61 7 3135 8445
Email: chbne@connellhatch.com
www.connellhatch.com

Site Selection Study
DBCT 8X/9X Expansion Concept Study
DBCT Management Pty Ltd

20 May 2009
Reference 329544-0000-90-124-0001
Revision A

Connell HATCH
Infrastructure for Industry

Document Control

Connell HATCH
Infrastructure for Industry

Document ID: 329544-0000-90-124-0001.doc

Rev No	Date	Revision Details	Typist	Author	Verifier	Approver
01	2 March 2009	Draft for Client Review	KR	RAJ		
A	20 May 2009	Issue for Use	BD	RAJ	JDL	JDL

A person using Connell Hatch documents or data accepts the risk of:

a) Using the documents or data in electronic form without requesting and checking them for accuracy against the original hard copy version.
b) Using the documents or data for any purpose not agreed to in writing by Connell Hatch.

Contents

Executive Summary

Introduction

Dalrymple Bay Coal Terminal Management Pty Ltd (DBCTM) has commissioned Connell Hatch (CH) to identify what capital works are required for a range of capacities for the Dalrymple Bay Coal Terminal (DBCT) up to 185 Mtpa, and to provide a concept layout, cost estimate and schedule for the option to expand to 152 Mtpa. Three sites have been identified for consideration, namely, Southern Stockyard Site, Louisa Creek Site, and Dudgeon Point Site. This report details the finding of this study.

Scope of Study

The study is an initial concept study and, as such, is limited in its scope and depth of investigation. Capital cost estimates have been developed based on initial plan layouts only, and by extrapolating costs from the DBCT 7X Expansion for similar types of works where practical. Capacity estimates in this report are based on simple spreadsheet models for inloading, stockyard, and outloading capacities calibrated to DBCT operational data.

Determining the Building Blocks for Expansion

Capacity increments have been determined for each of the major component parts (the inloading system, the stockyard and the outloading/shiploading system) as described in section 3 of this report.

The stockyard storage capacity has been calculated adopting a “zonal” approach, and adopting a separate area in the stockyard for a remnant management system. The zonal approach means that the stockyard is divided into zones that are each associated with a particular set of reclaimers and a particular outloading system. The separate remnant management system means that the stockpiles assembled in the “main zonal” stockyard would be assembled to achieve a tonnage that is always reliably short of the parcel size that is to be loaded to the vessel. The remainder of the coal brought to the terminal for that parcel would be stacked with the appropriate remnant that is always to be located in the remnant yard rather than in the general stockyard space.

The following factors effect the storage requirements and machine requirements for the stockyard using this approach and need to be discussed confirmed with the Users.

- Stacking whole trains or part trains to remnants. (Whole train stacking is recommended for the terminal at 85Mtpa, but this has been assumed to convert to part train stacking for the 8X/9X expansions to accommodate an increased number of remnant coal types)
- Number of remnant cells to be provisioned i.e. no of coal types to be combined in the remnant yard. (A maximum of 21 is recommended at 85Mtpa. A maximum of 31 has been assumed for the 8X/9X expansions.)

Expansion Scenarios

Based on the capacity estimates for each system, the following expansion scenario has been developed.

Stage and scope of works	Capacity (Mtpa) – Southern Stockyard and Dudgeon Point Stockyard Options		
	Inloading Capacity	Net SY/OL Capacity	Terminal Capacity
7X - Existing	88.8	85.0	85
8X – Walls on bunds 1 and 3, ST2 upgrade, New SR1, rezone	89.5	89.5	89.5
9XA – IL4,OL4,rows 1,2,3 new stockyard	127	111.2	111
9XB – IL5, OL5,rows 4,5 new stockyard, Berth 5and 6	162	152.2	152

Scope of works for interim capacities and future capacities of 122Mtpa, 139Mtpa, 157Mtpa,158Mtpa,179Mtpa, and 185Mtpa have also been developed and are described in the expansion scenario tables in Appendix A.

Description of Options

The expansion stages broadly consist of the following scope of works. A more detailed description of the scope of works and how they vary between the three sites is described in Section 5 of this report.

8X Expansion

- Walls on bunds 1 and 3 to increased stockpile storage capacity of rows 1,2,and 3
- New Reclaimer on bund 2 to suit new stockyard geometry
- Stacker ST2 upgrade from 5500tph to 7500tph to enable IL3 to inload at full capacity into Row 1

9XA Expansion

- Fourth rail loop and inloading system. (rail loop to be provided by QRNA)
- New stockyards for Southern Stockyard and Dudgeon Point options and extension of existing stockyard for the Louisa Creek option.
- Fourth outloading system and shiploader servicing existing berths 3 and 4

9XB Expansion

- Fifth rail loop and inloading system inloading into the new stockyard
- Extension to new stockyard
- Fifth outloading system and shiploader outloading from the new stockyard
- New jetty and jetty roadway (required in 9XA expansion for Dudgeon Point option)
- Two new berths 5 and 6

Rail Infrastructure

The southern battery limit for all 3 site options has been adopted as the point where the proposed 9X rail infrastructure connects back into the existing mainline (from Jilalan & Goonyella) alignment at the BMA Hay Point Coal Terminal rail line branch turnout, in order to provide a consistent comparison cost estimate for the sites. QRNA requirements as they are currently understood at this concept stage, are described in section 6 of this report, and have been incorporated in to the rail loop arrangements.

Land Requirements

Section 7 identifies the land affected by the proposed DBCT expansion for each site.

Capital Cost Estimate Comparison

The concept capital cost estimate for each site is included in Appendix C. A summary of the capital cost estimates are tabulated below.

	Site Option					
Description	**Southern Stockyard**		**Louisa Creek**		**Dudgeon Point**	
	Cost (M$)		**Cost (M$)**		**Cost (M$)**	
8X Feasibility Study and Approvals 8X Total Cost 8X Total Cost/tpa	$2.3 $265.6 $53		$2.3 $265.6 $53		$2.3 $265.6 $53	
9XA/9XB Feasibility Study and Approvals	$54.3		$54.3		$54.9	
9XA Total Cost 9XA Total Cost/tpa	$1,785.3 $78		$1,922.4 $85		$1,959.3 $85	
9XB Total Cost 9XB Total Cost/tpa	$1,970.4 $48		$3,317.9 $82		$1,697.2 $41	
Total DBCT Management Costs **Total DBCT Management Costs/tpa**	**$4,078** **$61**		**$5,562** **$84**		**$3,979** **$59**	
	9XA	9XB	9XA	9XB	9XA	9XB
Rail Infrastructure Sub Total Rail	$267.2	$104.8	$190.9	$75.2	$472	$112
Rail Infrastructure Total	$372		$266		$584	
	9XA	9XB	9XA	9XB	9XA	9XB
Sub Total DBCTM and Rail Sub Total DBCTM and Rail Cost/tpa	$2,052.5 $89	$2,075.2 $51	$2,113.2 $93	$3,393.1 $84	$2,431 $106	$1,809 $44
Total DBCTM and Rail **Total DBCTM and Rail Cost/tpa**	**$4,450** **$66**		**$5,828** **$88**		**$4,563** **$68**	
Percentage Difference compared with Southern Stockyard	Total (inc rail) NA	DBCT Cost NA	Total (inc rail) 24%	DBCT Cost 27%	Total (inc rail) 2%	DBCT Cost -2%

The Louisa Creek site is clearly the least preferred site based on capital cost, being 27% more expensive than the Southern Stockyard and Dudgeon Point sites.

The Southern Stockyard and Dudgeon Point Sites are the same capital cost, within the accuracy of the estimate. Broadly speaking, the additional conveyors required in the outloading system of the Southern Stockyard option, are offset by the rail line, the more complex civil works, and the longer jetty required for the Dudgeon Point option, resulting in a similar total capital cost for each of these options. Therefore the Southern Stockyard and the Dudgeon Point site need to be differentiated by all of the other non-capital cost criteria.

Preliminary Environmental Impact Assessment and Comparison

Section 9 contains a Preliminary Environmental Impact Assessment (PEIA) to determine the extent of impacts associated with each option. The preferred site based on environmental and planning constraints is the Southern Stockyard. Taking into account the number of medium and high risk issues, Louisa Creek was considered to be the least desirable site option of the three considered.

A field survey was undertaken in order to clarify and ground truth the condition and extent of areas of remnant vegetation within the broader DBCT study area. Based on this field study, a number of recommendations are made and are detailed in section 9.4 of this report. The primary recommendation is that the removal of protected vegetation be minimised through avoiding the proposed Southern Stockyard rail loop intersecting with the three portions of 'Endangered' REs by configuring the loop to encircle the vegetation, and designing drainage channels to ensure that channel/s remain in the most natural state possible.

Comparison of Other Criteria

Section 10 contains a qualitative comparison of the three sites against the following criteria:

- Constructability of the proposed expansion – Southern Stockyard site preferred
- Impact to existing operations during construction and operations – Dudgeon Point site preferred
- Extent of offsite infrastructure required – Louisa Creek site preferred
- Operations of the expanded terminal – Southern Stockyard site preferred
- Ultimate capacity of the sites – Southern Stockyard and Dudgeon Point site equally preferred

The critical disadvantages of the Louisa Creek site are its brownfields complexity in interconnection with the existing terminal, and its inability to expand to the ultimate capacity of 5 inloading and 5 outloading strings. The critical disadvantage of the Dudgeon Point site is its separation from the existing terminal and how this effects ongoing operations and maintenance. Although this is an advantage during the relatively short duration of the construction phase, it is a significant disadvantage during the operating life of the expanded terminal. Hence, the Southern Stockyard is the recommended site, based on the criteria assessed in this section.

Assessment Process

Section 11 summarises the approvals processes for each phase of the project by option. The following matrix has been prepared, to indicate the applicable assessment process by option and stage. The applicable assessment process was determined as a result of those environmental impacts identified during the PEIA.

Table 1 Applicable Assessment Process by Construction Phase and Option

	Stage 8X (90 Mtpa)	Stage 9XA (111 Mtpa)	Stage 9XB (152 Mtpa)
Southern Stockyard	Minor Increment	Development Application/s or Environmental Impact Statement	Environmental Impact Statement
Louisa Creek	Minor Increment	Development Application/s or Environmental Impact Statement	Environmental Impact Statement
Dudgeon Point	Minor Increment	Environmental Impact Statement	Environmental Impact Statement

Implementation Schedule

The key differentiator between the sites with respect to schedule is the approvals process. The two types of implementation schedules are attached in Appendix D, and the key milestone dates are summarized below; assuming a start date for ongoing studies of 1 July 2009.

Milestone	9X as EIS process	9XA as development application and 9XB as EIS process	Capacity
8X - Financing and Project Approval	January 2010	January 2010	
9X - Financing and Project Approval	March 2011	March 2011	
8X Completion of Construction	November 2012	November 2012	89.5 Mtpa
9XA Planning Approvals Secured	July 2012	November 2011	
9XA Completion of Construction	February 2015	June 2014	111 Mtpa
9XB Planning Approvals Secured	July 2012	November 2012	
9XB – Interim Commissioning	December 2015	April 2015	122 Mtpa
9XB – Completion of Construction	December 2016	April 2016	152 Mtpa

There is approximately an 8 month advantage if it is possible to undertake the approvals process as 9XA as a development application and 9XB as an EIS process. The Louisa Creek site has this advantage; the Dudgeon Point Site does not have this advantage. There is a possibility that the Southern Stockyard site may have this advantage, but at this stage it is prudent to assume that it will be preferable to adopt an EIS process for the whole 9X expansion project, which will put the Southern Stockyard option it onto the same schedule as the Dudgeon Point option.

Conclusion

It is recommended that the Southern Stockyard is the preferred site for the following reasons:

- The Southern Stockyard site and Dudgeon Point site offer equal lower cost in comparison to the Louisa Creek site by approximately $1.4 billion
- The Southern Stockyard site is the preferred site for environmental criteria.
- The Southern Stockyard site is closer to the existing terminal, so it is less complex to integrate the operations and maintenance of two terminals than the Dudgeon Point site.
- The Southern Stockyard is expected to have lower operations and maintenance costs than the Dudgeon Point terminal.
- The Dudgeon Point site requires more offsite infrastructure to link it back to the existing roads, power supply and water supply.

One the key reasons that the Southern Stockyard is the preferred site at this stage is that it is expected that the operations and maintenance costs for the Southern Stockyard site will be less than the Dudgeon Point site. This is currently based on a qualitative overview assessment. It is recommended that DBCTM consider the option of CH undertaking an additional task of quantifying the comparative operational and maintenance costs for the Southern Stockyard and Dudgeon Point sites, to add more weight to, and confirm, this assessment.

A list of issues/tasks has been identified in Section 13.2 that require further study to further define the scope of the project for the Southern Stockyard option.

1. Introduction

Dalrymple Bay Coal Terminal (DBCT) 7X Expansion is nearing completion. Dalrymple Bay Coal Terminal Management Pty Ltd (DBCTM) has identified demand for export capacity well in excess of the nameplate capacity for DBCT 7X. DBCTM has commissioned Connell Hatch (CH) to identify what capital works are required for a range of capacities up to 185 Mtpa, and to provide a concept layout, cost estimate and schedule for the option to expand to 152 Mtpa. Three sites have been identified for consideration, namely:

- Southern Stockyard Site
- Louisa Creek Site
- Dudgeon Point Site

Concept layouts have been developed for each of these sites, and a multi-factor evaluation of the sites has been undertaken, resulting in a recommendation to proceed with the Southern Stockyard Site. This report documents the results of this work.

1.1 Phased Development Strategy

The underlying basis of the proposed scope of works for a 152 Mtpa expansion is a phased development strategy. The selection of scope of works and order of expansion is based on the ability to deliver some expansion capacity earlier, rather than selecting works that are the lowest capital cost solution to be built first. The following three phases have been identified:

8X Expansion – Minor Increment
Expansion to operate within existing 85 Mtpa licence (within 10%), so minimal environmental approvals required. Expansion works broadly consist of obtaining more storage in the current stockyard by providing walls on bunds 1 and 3, a new reclaimer to replace SR1, and ST2 upgrade.

9XA Expansion
This is a scope of works that may only require a development application for some of the sites. It is also a logical step to commission progressively, if the entire 9X capacity is developed in one project. Expansion works broadly consists of a fourth inloading and outloading system, new stockyard or stockyard expansion, and the implementation of a remnant management system.

9XB Expansion
This is a scope of works that will trigger a controlled action and full EIS process at all sites. Expansion works broadly consist of a fifth inloading and outloading system, three new berths with associated dredging, and a new stockyard.

2. Scope of Study

The study is an initial concept study and, as such, is limited in its scope and depth of investigation as follows:

- The study concentrates on potential options to increase the design throughput of the Terminal but does not consider how the rail network or mines might expand to provide the additional capacity.
- The study relies on and represents options contained in previous studies undertaken for Ports Corporation of Queensland and DBCTM, in addition to identifying new options.
- The study does not consider potential expansion of the Hay Point Services (HPS) Terminal, its effect on the rail network or potential for sharing new facilities. The exceptions being that:
  - Potential new export berths to the south of the existing HPS berths (as identified in previous studies) are now reserved for HPS.
  - In locating future rail loops, arrangements have been developed that would practically accommodate an additional future rail loop that could possibly be dedicated to a future HPS capacity expansion.
- The study has included workshops with DBCTM to discuss required outcomes and potential options. There has been some consultation with the DBCT Users Group and DBCT Pty Ltd (the Operator, DBCT P/L) during the study, but only limited and informal feedback from these groups to date.
- The study has assumed that the design throughput, after completion of the current expansion 7X, is 85 Mtpa.
- The study assumes that the use of the Terminal in the future with regard to operational parameters such as shipping mix, extent of blending, extent of multi-product ships, number of products being serviced, parcel size, train size, railway performance and cargo assembly times, cargo assembly philosophy etc. will be similar to the current usage.
- The study does not consider power upgrade requirements external to the site.
- No assessment has been made at this stage of potential environmental upgrades to existing infrastructure that may be required to keep total environmental outputs (e.g. dust, noise) at acceptable levels.
- No assessment has been made at this stage of extent and durations of shutdowns to tie new facilities into existing facilities.

2.1 Basis of cost estimation in this report

A concept study capital cost estimate for the initial studies, feasibility study, environmental study, project management, engineering, procurement, construction, and commissioning has been prepared for the three alternative sites for DBCT 152 Mtpa expansion. The purpose of the estimate is to provide a high level assessment of possible capital cost of expansion, and to differentiate between the sites.

Accuracy of estimate

The capital cost estimate has been developed in a manner consistent with achieving an overall accuracy of the estimate, including contingency, in the range of + 50% to - 30% which represents an AACE Class 5 Order Of Magnitude estimate.

Estimating methodology

The estimate is based on identifying similar elements for each item of scope from the DBCT 7X expansion project. The contract values including variations from the DBCT 7X project have been used. For elements that were not constructed in DBCT 7X (e.g. many of the civil works items) a reasonable estimate based on historical estimating data and engineering experience has been used. No enquiries to the market have been undertaken for this study. A nominal escalation

factor has been used to bring the DBCT 7X data up to the estimate base date. CH has not provided advice on the appropriate escalation factor to use, as it is understood that DBCTM will provide input into this factor.
An allowance for design growth has been included in the estimate.

Engineering and project management allowances are based on factors derived from analysis of the DBCT 7X project costs.

Base Date and Exchange Rates

The estimate is in Australian Dollars at a base date of February 2009. Escalation beyond the estimate base date is not included.

All foreign currencies have been consolidated into Australian Dollars using exchange rates from the time of the DBCT 7X tenders.

Project Contingency

No explicit project contingency has been included in the estimate.

Estimate Clarifications

- Schedule delays and associated costs, such as those caused by:
  - Unexpected site conditions
  - Unidentified ground conditions
  - Labour disputes
  - Force majeure
  - Permit applications
- Development fees and approval costs of Statutory Authorities
- Changes and additions to scope
- Off site infrastructure costs
- Operating costs including plant start up costs
- Land Acquisitions or licences
- Consequential costs associated with production delays during construction
- GST, import duty, and sales tax
- Escalation beyond the estimate base date
- Working capital
- Marketing
- Foreign exchange
- Sustaining capital/financing costs

2.2 Basis of capacity estimation in this report

Capacity estimates in this report are based on simple spreadsheet models for inloading, stockyard, and outloading capacities as outlined in Section 3

Models for inloading and outloading capacity have been derived from earlier models that were developed for use with the MP03 series of studies in 2004 and which were originally calibrated with historical data regarding DBCT terminal performance. However, the models have not been recalibrated since that time as the terminal has been undergoing expansion and capacity data without the influence of construction has not been available.

New models have also been developed for stockyard capacity requirements based upon a significantly different stockyard management strategy that is proposed for dealing with remnants. This new strategy has only been recently trialled at DBCT and only for the current operation of 2 X outloading systems. Data from these trials has not yet been assembled for calibration of the models.

Whilst the models used for capacity estimation within this study have been rationally developed using sound mathematical principals to predict likely performances, It is recommended that further calibration work be carried out following completion of the current 7X upgrades.

A real time simulation model should also be developed and used to confirm capacity assessments during the preliminary design stage of the expansion.

3. *Determining the Building Blocks for Expansion*

3.1 Component Parts

The overall capacity of a coal export terminal may be considered to be the lesser of the individual capacities of each of the three main component parts, including the inloading system, the stockyard and the outloading/shiploading system. These components must all be upgraded to achieve the target capacity when each is operated in a manner that is compatible with the operating philosophies adopted for the other component parts.

Therefore, to determine the additional plant requirements to achieve a particular target throughput capacity, it is useful to first determine the capacity increments that can typically be associated with:

a) Each additional inloading system – assuming compatible stockyard machinery availabilities
b) Each additional outloading system – assuming compatible stockyard machinery and depending upon whether the outloading system serves a single berth or dual berth.
c) Additional stockyard space as influenced by buffer volume requirements, stockpile placement philosophies and provision of appropriate stockyard machinery.

Once the capacity increments associated with these components are known, it becomes a relatively straight forward process to determine the necessary additions to the materials handling plant and stockyard to achieve a particular target capacity.

Capacity increments have been determined for each of the major component parts as described in the following sections. A detailed description of the spreadsheet models being adopted, and the assumptions used in calculating capacity will be reported in a separate document.

3.2 Inloading System Capacities

T The table below summarises the theoretical inloading capacity for the typical dump stations utilised at DBCT. Note that the existing IL1 and IL2 pits at DBCT are both 5500tph capacity and the new OL3 pit commissioned with the 7X Project is 7500tph capacity (or higher for coals with density > 0.83t/cu.m.)

It is assumed that any future dump station would be constructed to the same capacity as OL3 at 7500tph.

These calculations assume:

a) Conveying system planned availability (97%), mechanical reliability (95%), sticky coal loss factor (95%), operator response times etc are according to typical performances currently achieved.
b) Train availability is such that delays attributed solely to lack of train availability (i.e. when no suitable train has arrived and is waiting to enter the pit when called) amount to no more than 10% of the total average train cycle time through the pit. This amounts to average allowable delays as follows :
   – 14 minutes per train for a 7500 tph pit.
   – 17 minutes per train for a 5500 tph pit. .
c) There is no restriction in the stockyard to prevent stacking at the full design rate of the dump station other than noted in the table below.
d) Trains will be presented to the dump stations in a suitable order that prevents stacker utilisation conflict. That is, trains do not arrive at the same time requiring the same stacker to place the coal at the respective locations in the stockyard.

Considering that not all stackers can stack above 5500tph in the existing stockyard, the actual performance for the 7500tph, OL3 dump station needs to be modified to account for the reduction that will occur when feeding to 5500tph stacking systems.

Inloading System	Capacity (MTPa)	Notes
IL1@5500tph	27.8	
IL2@5500tph	27.8	
IL3 @7500tph within existing 7X configuration.	31.6	Calculated by (4/7.5) X 34.9 + (3.5/7.5) X 27.8 = 31.6 according to the proportions of stockpiles that can be stacked at the lower capacity and higher capacities respectively.
IL3 or any future 7500tph inloading system feeding the existing stockyard.	31.6 to 34.9	Depending upon the extent of upgrades in the existing stockyard to convert any 5500tph stacking machines to 7500tph.
Any future 7500tph inloading system dedicated to a new stockyard.	34.9	

3.3 Outloading System Capacities

Typical outloading system capacities were originally determined for the 7X project as described in the report – “Additional Investigations into upgrade of OL1 and OL2 – Stockyard to surge bin”, 7th Dec 2005 as was prepared to investigate the benefits of upgrading the OL1 and OL2 systems as part of the Phase 1, 7X works.

This report was updated and re-issued (Revision 3) on 17 June 2008 to reflect latest hatch change data and ship mix data from DBCT and also to include OL1 and OL2 capacities relevant to the Phase 2 configuration where OL1 and OL2 would revert to single shiploader, single berth systems.

Referring to that report, capacities for outloading systems may be summarised as follows:

- For a 7200tph Shiploader, 7500 tph ave. bottom bench reclaim capability (6750tph average all benches)
  - 1 Berth/1 Shiploader system 27.4 Mtpa (e.g. OL1 and OL2, 7X Phase 2)
  - 3 Berth/2 Shiploader system 32.8 Mtpa per shiploader (e.g. OL1 and OL2, 7X Phase 1)
  - 2 Berth/1 Shiploader system 33.5 Mtpa
- For a 8650tph Shiploader ,7500 tph ave. bottom bench reclaim capability (6750tph average all benches)
  - 1 Berth/1 Shiploader system 28.4 Mtpa
  - 3 Berth/2 Shiploader system 34.0 Mtpa per shiploader
  - 2 Berth/1 Shiploader system 34.7 Mtpa (e.g. OL3, 7X Phase 3)
- For the 700t surge bin on OL1, the capacities for a 8650tph Shiploader ,7500 tph ave. bottom bench reclaim capability (6750tph average all benches) are reduced as follows:
  - 1 Berth/1 Shiploader system 28.0 Mtpa
  - 3 Berth/2 Shiploader system 33.4 Mtpa

It has also been assumed that any new stockyard reclaim machines would be purchased with the same capacity as the recent new machines RL1, RL2, SR3A and SR4A that have the following performance characteristics. New reclaimer machine capacities have therefore been assumed as follows:

New Reclaimer Machine Performances	
Digging Parameter	Rate
Target digging Rate	5300tph
Surge Rate	6100tph
Average digging rate in bottom bench	4200tph
Average digging rate over 3 benches	3780tph

Within the existing 7X development, new machines of this capacity will typically be matched with smaller machines that exhibit an average digging rate of only 2970tph so that the combined average rate is:

- 2970tph + 3780tph = 6750tph over three benches allowing approx. 56%/44% blending ratio while maintaining optimum digging performance.

In the case that all new machines are procured for any expanded facility, 2 X new machines would be capable of digging at a combined rate of 7560tph for a 50%/50% blend ratio. However, a conservative capacity of 6750 tph has been used for capacity predictions so that a blending ratio of 56%/44% can be maintained without loss of capacity.

However, it is suggested that further consideration should be given to the possible adoption of higher shiploading rates and surge bin sizes in case this might give some capacity advantage for when higher reclaim rates can be achieved with 50/50 blending. This has not been investigated within this study.

3.4 Stockyard Storage Capacities

The alternative zoning/remnant management proposal as discussed in recent meetings with DBCT has been adopted for operation of the terminal at the completion of the 7X expansion. This operating paradigm is also being adopted for the 8X/9X expansions. The following summarises the new operating paradigm for both the 7X facilities, and the proposed 8X/9X expansion. There are two philosophies being adopted, namely, the “zonal” approach and establishment of a separate remnant management yard.

3.4.1 The “zonal” approach

Key to the proposed method is that it will be based upon a “zonal” philosophy. That is, the stockyard will be divided into three zones that are each associated with a particular set of reclaimers and a particular outloading system. This “zonal” philosophy aims to reduce the current complexities involved in selecting stockpile locations to avoid reclaimer utilisation conflicts during simultaneous loading of multiple vessels. The zonal philosophy also aims to minimise potential disruption due to unplanned changes to vessel loading order.

The stockpile rows allocated to each zone are determined to ensure that the volumetric capacity of each respective zone is in proportion to the throughput capacity of the matching outloading system.

At the time of commencing stacking of a vessel’s cargos into the terminal, the vessel is effectively assigned to one of three vessel queues that will be served by a particular zones/outloading system. Once the zone/outloading system is selected, all railed product for that ship would be stacked in that selected zone.

3.4.2 The Remnant Management System Proposal

This new approach differs from the original 7X operating proposal in that it involves separating remnant piles into a dedicated remnant handling area rather than allowing the remnants to remain within the zoned areas.

The proposed allocation of stockyard areas in the existing stockyard to a shared "remnant" area and three "main" stockyard zones is as follows:

Remnants Yard
Rows 7 and 8 (RL2 and SR6)

Main Yard

Zone 1 - OL 1: Rows 1 and 2 (SR1 and RL1) – smallest volume zone matched to OL1 system capacity @ 27.4MTPa.
Zone 2 - OL 2: Rows 3 and 4 (SR2 and SR3A) – next largest volume zone matched to OL2 system capacity @27.4MTPa – OL2 has a larger surge bin and would practically perform better when loading larger vessels.
Zone 3 - OL 3: Rows 5 and 6 (SR4A and SR5) – largest zone matched to highest capacity OL system.

A similar philosophy would be adopted for any future stockyard or stockyard expansion.

The stockpiles assembled in the "main" stockyard zone would be assembled to achieve a tonnage that is always reliably short of the parcel size that is to be loaded to the vessel. The remainder of the coal brought to the terminal for that parcel would be stacked with the appropriate remnant that is always to be located in the remnant yard – Rows 7 and 8 - rather than in the general stockyard space.

Coal would be completely reclaimed from the "main" stockyard upon shiploading and then further coal would be withdrawn from the remnant pile at the end of parcel loading period to make up the final parcel.

It is envisaged that the remnant yard would be divided into set areas (or lengths) that would be permanently allocated to specific users/mines. The user would be responsible for providing advice on how new cargos can be correlated to existing remnants to assist management of the remnant area and so that his available remnant area is not exceeded.

The potential advantages of the alternative proposal are that:

- The need for "cross-zone" reclaiming that can lead to reclaimer utilisation conflicts is removed and this will potentially reduce overall shiploading delays.
- Because remnant piles are kept out of the main stockyard, the storage space is not broken up by the remnants and this should significantly improve overall storage volume efficiency. (Note volumetric storage capacity will be the bottleneck upon completion of the 7X expansion.)
- Vessels can be allocated to zones/outloading systems to optimise performance without regard for existing remnant locations to potentially optimise terminal performance. Eg. All larger vessels can be automatically scheduled to be loaded via OL3 on Berths 3/4.
- Cargos for ships can be laid down in sequence from one end of each half-zone to the other, requiring less complex planning.

Potential Disadvantages are that:

- The proposal requires two reclaim machines (SR6 and RL2) in the remnant yard to be called upon at random to reclaim for three outloading systems. SR6 is also required to be utilised for all remnant stacking tasks to Row 8. There is therefore a significant risk that delays due to SR6 and RL2 machine utilisation conflicts in the remnant yard will exceed delay savings achieved by elimination of the need for "cross-zone" reclaiming.
- The Row 7 and 8 volumes and Row 1 to 6 volumes may not be well matched to the requirements of the remnant area and main stockyard area respectively and this may lead to losses in overall storage efficiency that might prevent throughput targets being reached.

- The strategy will lead to a net larger number of piles since remnants are never used to build main product piles. This may offset volumetric efficiency gains in the main stockpile areas and also drive net lower reclaim efficiencies due to a larger number of smaller piles.

In determining the feasibility of this operating proposal, it needs to be determined:

a) How large an individual remnant pile needs to be?
b) How many remnant piles are required to be accommodated and can these be accommodated in Rows 7 and 8 as proposed? Following this, can this remnant yard also serve any expanded facilities.?
c) What volume is required in the main stockyard zones and is this available in Rows 1 to 6 to maintain target throughput capacities for the 7X stockyard.
d) What extent of delays to shiploading are likely to result due to utilisation conflicts for the SR6 and RL2 reclaim machines that will serve reclaim from the remnant yard.

These matters have been initially investigated for the application of the remnant system philosophy to the 7X facilities. The outcomes may then be extrapolated to determine requirements for the expanded facilities as documented in the following sections.

3.4.3 Determination of remnant cell size and proportion handled as remnants

There are two possibilities for dividing the railed coal to the remnant yard upon inloading:

<u>Option 1 – Stack whole trains to remnants</u>: When the railed amount must exceed the amount to be loaded to the vessel, send one whole train to the remnant yard. (Need not be the last train in the set of trains for that parcel).

<u>Option 2 – Stack part trains to remnants</u>: When the railed amount must exceed the amount to be loaded to the vessel, divide one train in appropriate proportions between the main stockyard and remnant yard to target the parcel size as closely as possible in the main yard. (Ideally, it should be the last train since the volume loaded the main yard is known most accurately once all previous trains have been stacked. Alternatively splitting of two trains per parcel might be useful to allow ideal pile size balancing in the main yard.)

Comparing these options:

- Option 2 offers potential advantages in optimising reclaim rates by allowing good main pile balancing (when surplus product is brought to the terminal) and minimising of the remnant volume that is required to be reclaimed under single machine operation.

- Option 2 also offers a potential disadvantage that it would lead to increased rail inloading delays. Rail inloading delays are created by the need to run out the S3/S4/S13 tripper conveyor, raise and lower trippers and restart the conveyors in order to switch stackers mid-train. Further rail inloading delays will also result due to the “split” trains needing to access two different stackers during their unloading period. This will make the train-to-stacker scheduling process more complex by introducing another restriction on being able to accept certain combinations of trains into parallel queues at the dump stations for simultaneous unloading and this will inevitably lead to some increased delays.**

  **[Note that these rail delay issues can be dealt with by provision of on-the-fly switching of transfers to the remnant yard and by providing stackers that are dedicated to remnant yard tasks as is proposed for Post 85MTPa proposals. However, this is not feasible within the existing 7X yard machine arrangements.]

A spreadsheet model was prepared that essentially models the life of a remnant pile for randomly changing parcel sizes and assumes that such a pile is continuously passed over to new parcel of same or similar coal type for subsequent shiploading jobs. The model assumes the following:

- Nominal train capacity = 9600 t
- Normal variation in actual train capacity = +/- 2%
- Normal variation allowed due to stockpile drying after stacking = -1%
- Normal variation allowed due to stockpile moisture increase = +2.5%

Results are predicted as follows:

Parameter for a given remnant pile.	Option 1 – whole trains	Option 2 – Part trains
Peak remnant pile size rarely exceeded	20,000 t	12,000 t
Average remnant pile size at any time	12,750 t	8,000 t
Average remnant size remaining at end of loading	7,000 t	5,800 t
Average amount stacked into the remnant facility for a given parcel	5,850t	2200 t
Average amount handled through remnant facility	9.5%	5.5%

It should be noted that it will be required to completely dedicate certain machines to remnant handling. Therefore, Rows 7 and 8 must be dedicated to remnant handling and cannot be partially used for main stockpile handling. Therefore, it is particularly interesting to note from these calculations that:

- In the case of Option 1, stacking of whole trains will result in approximately 10% of handled product passing through Rows 7 and 8. The main yard Rows 1 to 6 will need to handle 90% of the throughput coal.
- In the case of Option 2, stacking of split trains will result in approximately 5.5% of product passing through the remnant facility and Rows 1 to 6 will need to handle 95% of the throughput coal.

3.4.4 No. of remnant cells required to be provisioned

Taken at face value, there are almost 100 different types of coal currently shipped through the terminal. It will not be feasible to provide a remnant pile for each coal type to this extent and in order to reduce the number of remnant piles, certain coals have been considered to be treated as the same type from the point of view of handling remnants.

Two methods that are considered likely to be accepted from a technical and commercial point of view have been considered with respect to combining remnants.

Method 1: Users keep remnants separate from other users but are assumed to combine remnants across mines where coals are similar types.

Method 2: Remnants are kept separate for each coal type (coking, PCI and steaming) for each mine.

The following tables indicate a possible derivation of required numbers of separate remnant piles for each of the suggested methods of combining remnants:

Method 1: Users manage piles and combine similar types across different mines:

User	Coking	PCI	Steaming	No. Piles
Rio	1 X (Hail Creek)		1 X (Blair Athol)	2
Anglo/ Foxleigh	1 X (German Creek), 1 X (Moranbah North)	1 X (German Creek /Foxleigh)	1 X (German Creek /Foxleigh)	4
Peabody	1 X (Burton /North Goonyella), 1X (Millennium)	1 X (Burton/Millennium)	1 X (Burton/Millennium /North Goonyella)	4
Xtrata	1 X (Oaky Creek)		1 X (Oaky creek)	2
McCarthur	1 X (Coppabella/Moorvale)	1 X (Coppabella/Moorvale)	1 X (Coppabella/ Moorvale)	3
BMA	1 X (Goonyella/Riverside/South Walker) 1 X (Peak Downs/Norwich Park)	1 X (South Walker)	1 X (South Walker/Norwich Park)	3
Vale/ISP	1 X (Carborough downs/ Broadlea/Isaac plains)	1 X (Carborough downs/ Isaac plains)	1 X (Broadlea/Isaac plains)	3
			TOTAL	21
			Say allow 21 piles	

Method 2: Mines Manage Piles according to type:

User	Mine	Coking	PCI	Steaming	No. Piles
Rio	Hail Creek	1			1
	Blair Athol			1	1
Anglo/Foxleigh	German Creek	1	1	1	3
	Moranbah North	1			1
	Foxleigh		1	1	2
Peabody	Burton	1	1	1	3
	North Goonyella	1		1	2
	Millennium	1	1	1	3
Xtrata	Oaky Creek	1		1	2
McCarthur	Coppabella	1	1	1	3
	Moorvale	1	1	1	3
BMA	Goonyella/Riverside	1			1
	South Walker	1	1	1	3
	Peak Downs	1			1
	Norwich Park	1		1	2
Vale/ISP	Carborough Downs	1	1		2
	Broadlea	1		1	2
	Isaac Plains	1	1	1	3
				TOTAL	38
				Say allow 38 piles	

3.4.5 Accommodating the Remnant Piles in Rows 7 and 8

As discussed in Section 3.4.3 above, each remnant pile will need to be 12,000 t or 20,000t depending on whether train splitting or whole train stacking is employed. The number of piles required depends upon the extent to which the piles are combined as discussed in Section 3.4.4. Between 21 and 38 remnant piles will be the likely requirement at the 7X facilities.

Examining application of these principles to the 7X stockyard, Row 7 and 8 offer an available capacity such that one of the following approaches could be adopted:

- Option 1 – Stack whole trains and offer 21 different piles of 20,000t each.
  - ⇨ 90% of terminal throughput will need to be handled through Rows 1 to 6.
- Option 2 – Stack partial trains and offer 31 different piles of 12,000t each.
  - ⇨ 95% of terminal throughput will need to be handled through Rows 1 to 6.

It is noted that Rows 7 and 8 do not offer sufficient volume for remnants if for than 31 piles are required. Therefore, if segregation of coal types is determined as per Method 2 in Section 3.4.4 above, then there will be a requirement to seek additional space for the remnant yard.

It must also be recognised that with any further expansion beyond 7X, additional users are likely to be involved. Therefore, it is envisaged that there is a reasonable likelihood that the requirement for remnant pile numbers will increase to, say, between 25 and 50 piles with any expansion depending upon the number of users involved and the user requirements for segregation of coal types within remnant piles.

Depending further upon whether ‘part’ or ‘whole’ train stacking is pursued, there may be a desire to extend Row 8 or to adopt a different row pair within the existing stockyard for the remnant area. Use of two full length rows would cause the throughput capacity of the 7X stockyard to be reduced but this would only occur at the time of compensating capacity being added by expansion of the stockyard overall.

Scenarios for accommodating larger numbers of remnant stockpiles (other than the options noted above) have not been examined at this stage.

3.4.6 Remnant stockyard requirements for an expanded terminal

Along with any expansion of the inloading and outloading systems that would accompany any expansion, there is a continuing requirement for all inloading systems and all outloading systems (existing and future) to be capable of both stacking to, and shiploading from, the remnant yard. This would result in an onerous requirement for simultaneous stacking and reclaiming operations being able to be accommodated by the remnant yard materials handling systems and a further onerous requirement for connectivity between all new and existing inloading and outloading systems and the remnant yard. Such access and provisions for simultaneous operations would be very difficult and costly to achieve.

A more practical alternative has therefore been proposed whereby a second remnant yard would be established to serve any new stockyard and its associated inloading or outloading systems. There is then no need for new inloading and outloading systems to connect with the initial ‘7X’ remnant yard or for existing inloading and outloading systems to connect with the new remnant yard.

This relaxation assumes that, where a second remnant area is to be established, the complete set of remnant pile coal types will be duplicated in that second remnant yard. Such duplication can only be avoided if certain groups of coal types can be identified that are frequently shipped together to the exclusion of any grouping with other coal types. In that case, it will be possible to for some remnants to be represented in only one remnant stockyard and for those coal types to be always handled through the associated stockyard. At this stage, no such correlations between coal types have been identified except for a few coal types that tend to be shipped alone in single cargo vessels. Therefore, substantial duplication of remnant stockpiles between the existing and any new stockyard seems likely.

In making allowance for remnant space in any new stockyard, and considering the requirement for duplication of remnant products, it is logical to adopt a base case whereby the new remnant yard is of identical capacity to that which can be accommodated in Rows 7 and 8 of the existing stockyard. This is the minimum size that might be found acceptable in the case that the users agree to a high degree of combining remnant products (Method 1, Section 3.4.4) and if part-train stacking is adopted. This also matches the case of maintaining optimum throughput through the existing stockyard footprint (7X) following any expansion since any need to provide increased space for remnants would have the effect of reducing the available capacity through the existing stockyard footprint.

It is proposed that options for accommodating an increased number of remnant products and/or adoption of full train remnant stacking would be examined at a later stage when further is known about user preferences with respect to combination of coal types within remnant piles.

3.4.7 Storage capacity requirements as a function of throughput

Considering the cargo assembly operating mode where cargos only commence stacking into the stockyard a certain time prior to the commencement of ship loading, it should be possible to determine a simple proportional relationship between stockyard volume requirements in each stockpile zone and the throughput capacity of that zone.

The proportion of throughput that will be required to be accommodated will be determined by the cargo assembly period between commencement of stacking and commencement of loading. This is currently less than 5 days for most cargos. However, this is expected to increase once the rail system is demanded to carry higher capacities.

The relationship of volume to throughput for a 6 day assembly period has therefore also been examined for application to all expansions beyond the 7X development as summarised below. These simple percentage relationships have been developed using suitable approximate methods at this stage. A more rigorous analysis of the relationship between space requirements and throughput capacity is planned for the next phase of investigation.

a) For a typical Zone at 32Mtpa for current 5 days average assembly:

- Target Annual throughput = 32.0 Mtpa.
- Assuming average parcel size of 45,000dwt.
- Assuming an average cargo assembly period of 5 days prior to ship arrival.
- Allowing 10% additional for packing efficiency

For whole train stacking = 1.81% of throughput in average 20,500t piles.
For part train stacking = 1.90% of throughput in average 21,600 t piles

Note that the zone method without remnants throughout the main stockyard allows stockpiles to be placed from one end of a zone half to the other according to the expected ship arrival order. Provided that the planned ship arrival order is approximately maintained, each zone half should be stacked and cleared progressively from one end to the other leaving maximum provision of continuous space to significantly improve stacking efficiency over the existing situation. Therefore the proposed 10% allowance for stockpile volumetric efficiency losses should be adequate to allow for some inefficiency with placing products in the divided pad areas due to cross drain location.

b) Consider a typical Zone at 32Mtpa for future case of 6 days average cargo assembly:

It is considered likely that with increasing pressure upon the railway, the average cargo assembly time will slightly increase with any significant expansion of the terminal. Therefore, the case of a 6 day assembly period has been examined.

- Target Annual throughput = 32.0 Mtpa.
- Assuming average parcel size of 45,000dwt.
- Assuming an average cargo assembly period of 6 days prior to ship arrival.
- Allowing 10% additional for packing efficiency

For whole train stacking = 2.09% of throughput in average 20,500t piles.
For part train stacking = 2.19% of throughput in average 21,600 t piles.

3.4.8 Avoidance of, machine utilisation conflicts in the remnant yard

Both stacker and reclaimer utilisations and the probability of potential machine conflicts have been studied for the proposed new operating paradigm. It has been concluded that the current allowance of 70 hours per million tonnes for reclaimer conflicts and other stockyard related delays in the outloading capacity assessment is still appropriate using this new operating paradigm. This is based on the conclusions that:

For reclaiming: For a remnant stockyard serving three outloading systems it must be possible to allow reclaim of any two products at any time along two independent reclaim systems to feed any two of the three outloading systems simultaneously.

For stacking: For a remnant system fed by three inloading systems:

a) In the case of 'part -train stacking' it will be necessary to have the capability to stack any two inloading systems to the remnant yard simultaneously since it will otherwise be too difficult to queue trains into the pits to avoid stacker conflicts in both the main stockyard and the remnant yard.
b) In the case of 'whole train stacking' it will suffice to provide a single stacking path for the remnant stockyard since remnant trains can be simply scheduled to the remnant stacker as required.

The case of a remnant yard fed by four (4) inloading systems was also examined in case it might be found advantageous to connect four(4) inloading systems to the existing stockyard as a possible first stage of an expansion. This would require four (4) inloading systems to be served by a single remnant yard. It was determined that two(2) independent stacking paths would be adequate for part-train stacking also. If whole train stacking is adopted, a single stacking path remains adequate.

In developing the 8X/9X expansion layouts, sufficient stacking facilities have been included to allow part-train stacking to be pursued. It is expected that the need for this will be revisited when user requirements with respect to remnant combination/segregation are better understood such that final remnant volume requirements can be determined. Part-train stacking is more likely to be pursued if higher numbers of remnant pile types are required to be accommodated.

3.4.9 Application of Part train stacking to the 7X stockyard at 85MTPa

It is considered likely that with increasing pressure upon the railway, the average cargo assembly time will slightly increase with any significant expansion of the terminal. Therefore, the case of a 6 day assembly period has been examined.

- Target Annual throughput = 32.0 Mtpa.
- Assuming average parcel size of 45,000dwt.
- Assuming an average cargo assembly period of 6 days prior to ship arrival.
- Allowing 10% additional for packing efficiency

For whole train stacking = 2.09% of throughput in average 20,500t piles.
For part train stacking = 2.19% of throughput in average 21,600 t piles.

3.4.10 Summary of parameters for the expanded stockyard

Based upon the conclusions described above, stockyard layouts for the expanded facilities have been developed based upon the following parameters:

a) Separate remnant yards to be established for the existing stockyard and any future additional stockyard.

b) Main stockyard zones to be comprised of stockyard row pairs that are centred about a pair of reclaim machines. Zones to be allocated to specific outloading systems/and shiploaders.

c) Up to four (4) inloading systems may feed a single remnant yard. Dual stacking paths to be provided on the conservative assumption that part-train stacking may need to be adopted.

d) Maximum three (3) outloading systems should be fed from a single remnant yard

e) Each remnant yard to accommodate the full range of products and to be sized to suit either:

   - Option 1 – Stack whole trains and offer 21 different piles of 20,000t each. 90% of terminal throughput will need to be handled through Rows 1 to 6.

   - Option 2 – Stack partial trains and offer 31 different piles of 12,000t each. 95% of terminal throughput will need to be handled through Rows 1 to 6.

f) Main stockyard volume for each zone to be provided at 2.19% of throughput capacity for that zone based upon individual piles with average 21,600 t capacity each and set at 10m apart. This volume requirement accounts for the conservative assumption that part train stacking is involved such that only 5% of throughput passes through the remnant yard and therefore 95% of throughput passes through the main yard. (Full train stacking will push 90% of throughput through the main stockyard.)

The assumptions listed above are generally conservative except perhaps with respect to the number of remnant piles able to be accommodated. Only 21 product types can be accommodated if full train stacking is adopted.
As noted in Section 3.4.3, the whole train stacking method is actually preferred to minimise complexity of managing the order of trains into the pits so as to avoid stacker conflicts and therefore to minimise the likelihood of delays to the rail inloading system.

It is therefore proposed that future investigations should seek to better define user requirements with respect to the number of remnant piles required. If it is determined that more than 21 remnant pile types are required along with a preference for whole train stacking, further options for stockyard arrangements are proposed to be developed.

These options would include the possibility that part train stacking might be adopted for the existing stockyard while full train stacking is adopted for the new stockyard. This would probably create a lower reduction of capacity for the existing stockyard (due to rail congestion) than would otherwise occur due to loss of main stockyard area if two whole rows are taken for the remnant use.

4. Expansion Scenarios

4.1 8X Expansion

The 8X expansion is consists of upgrades to stockyard storage capacity and inloading capacity in order to match the predicted outloading capacity of 89.5Mtpa.

4.1.1 Storage capacity upgrade

The storage capacity is increased by providing walls of bunds 1 and 3 to increase the storage volumes in rows 1,2, and 3, and by replacing SR1 with a new reclaimer so that both reclaimers on bund 2 have the same reach on both sides of the bund. The stockyard zones are reallocated in order to best match the outloading system capacities. Rows 3 and 4 (zone 1) are allocated to SL1, rows 5 and 6 (zone 2)are allocated to SL2, and the largest rows 1 and 2 (zone 3) are allocated to SL3, which has additional capacity because it is servicing both berths 3 and 4.

In order to gain the full outloading capacity of 89.5Mtpa, ships with larger parcel sizes need to be prioritised into rows 1 and 2 in order to maximise the stockpile volume allocated to SL3, by minimising the no. of piles in those rows. The average pile size in zone 3 (Rows 1 and 2) needs to be increased to around 26,500t per pile, and the average pile size in zones 1 and 2 decreased to 17,000t per pile in order to maintain the overall average pile size of 20,250t (based on an average parcel size of 45,000t).

4.1.2 Inloading capacity upgrade

The upgrade of stacker 2 on bund 1 and its associated inloading conveyors from 5500tph to 7500tph increases the number of paths through which IL3 can operate at its higher capacity. If the stackers are allocated randomly to inloading systems, IL3 is provided with a high rate stacker 62% of the time, resulting in a capacity for IL3 of 32.2Mtpa, and an overall inloading capacity of 87.8Mtpa.

In order to obtain an inloading capacity of 89.5Mtpa, the IL3 system needs to operate at 33.9Mtpa, i.e. it had to utilise a high speed stacker around 86% of time. It has been assumed that this is feasible with operational planning to direct trains allocated to rows which contain the high speed stackers to the IL3 dump station. This represents around a 50% avoidance of ST1 for IL3, compared with random assignment.

A fallback position is to include the upgrade of ST1 and its associated conveyors to 7500tph in the 8X expansion project. This would result is an IL3 capacity of 34.6Mtpa and an overall inloading capacity of 90.2Mtpa, with random assignment of inloading systems to stackers.

4.1.3 8X expansion capacity risks

At the completion of the 8X expansion, all three components inloading, stockyard and outloading are balanced and being fully utilised. This is not the ideal scenario for terminal operational planning, where it is desirable for there always to be a defined “bottleneck” with some inherent excess capacity in the other components, in order to accommodate the inherent variability experienced in the systems.

The three rail loops need to be operating at high utilisations. At this stage there has not been any consultation or agreement with QRNA or the above rail operators that these inloading capacities are achievable from a rail operation perspective. This issue is currently being raised with QRNA.

The 8X expansion consists of brownfields works that will cause some disruption to existing operations. The possible extent of this disruption is currently being studied.

4.2 9X Expansions

Expansion paths up to 185Mtpa have been created for the Southern Stockyard and Dudgeon Point options, and an expansion path up to 179Mtpa has been created for the Louisa Creek option. These are included in Appendix A.

Each of these expansion paths show logical steps where infrastructure could be provided up to that step, depending on the demand that actually triggers the future expansions.

The 9X expansion has been defied as all steps to get to 152Mtpa, in order to match the current indications of demand.

The 9X expansion has been split into 9XA and 9XB in order to define an initial parcel of works (9XA at 111Mtpa) that may be able to be delivered more quickly.

If demand changes, there are logical expansion steps at 111Mtpa, 122Mtpa,139Mtpa ,152Mtpa,157Mtpa, 179Mtpa, and 185Mtpa for the Southern Stockyard and Dudgeon Point options. The Louisa Creek option is stockyard bound at 179Mtpa.

Also, if the 8X expansion is deleted, additional steps can be generated that are roughly 5Mtpa less than the above steps.

5. Detailed Description of Options

Drawings of the concept layout for the 152Mtpa option for each of the three sites are included in Appendix B of this report. These layouts have been developed for the purposes of developing a concept cost estimate only. The scope of works for the 8X expansion is described in Section 5.1 below, and it is common to all sites. For the scope of works for the 9XA and 9XB expansions, refer to section 5.2 and 5.3 respectively.

Layout options and refinement and optimisation of the layout for the selected site will be undertaken in the next study stage.

5.1 8X Expansion

Overview of Works

- Walls on bunds 1 and 3 to increased stockpile storage capacity of rows 1,2,and 3
- New Reclaimer on bund 2 to suit new stockyard geometry
- Stacker ST2 upgrade from 5500tph to 7500tph to enable IL3 to inload at full capacity into Row 1

Civil Works

- Bulk Earthworks (Quarry) and Material Preparation
- Construct widened Bunds 1, 2 & 3
- Reprofile stockyard bed in Rows 1, 2 & 3
- Demolish & modify existing drainage as necessary
- Install new concrete toe drains, CCP's and subsoil drainage
- Stockyard Bed Preparation

Yard Machines

- New Reclaimer and demolish Stacker Reclaimer SR1
- Modify boom rest, cable/hose pit, hold down, buffer to suit new reclaimer

Upgrade Conveyors

- Upgrade R2
- Upgrade ST2 boom
- Upgrade S6A
- Upgrade S6

Infrastructure and Services

- HV Upgrades
- Stockpile Spray Rework

5.2 9XA Expansion

5.2.1 Overview of Works

- Fourth rail loop and inloading system. New rail loop to be provided by QRNA
- New stockyard
- Fourth outloading system and shiploader servicing existing berths 3 and 4

5.2.2 Southern Stockyard Site

Inloading

- IL4 rail receival pit and tunnel (RRP4)
- IL5 rail receival pit and tunnel (RRP5) (9XB early works)
- RRP4 mechanical fitout including wagon vibrator, BF21 and sound attenuation
- 2 x Inloading conveyors

Stockyard

Civil Works

- Bulk Earthworks (for all of 9X)
- Earthworks and material preparation (for 9XA)
- Construct 2 new reclaimer bunds and two new stacker bunds including foundations and stockpile sprays
- Install new concrete toe drains, CCP's and subsoil drainage
- Construct Drain Lines SA, SB, SC & SD and provide miscellaneous yard drainage
- Stockyard Bed Preparation

Materials Handling

- 2 x yard stacking conveyors
- 3 x yard reclaiming conveyors
- 2 x Stackers
- 3 x Reclaimers
- Yard machine rail

Outloading

Materials Handling

- 5 x onshore outloading conveyors
- Surge bin including 2 x belt feeders and sample plant
- 4 x offshore outloading conveyors
- 1 x shiploader
- Slurry collection/return system

Offshore Marine

- Extension to jetty headstocks
- Extension to transfer tower platform
- Extension behind berths 3 and 4 to support new wharf conveyor

Infrastructure and services

Infrastructure

- Construct new RR Water Harvest Dam
- Construct new RR (IL4) CCP's, Secondary Settlement Pond, Dam and associated Industrial WT Facilities
- Construct new 9X Industrial Dam, Coal Collection Filter Pit , Weirs, Spillways and Pump Station
- Construct Environmental Screening bunds as necessary around rail loop and along eastern side of Stockyard

- Provide new 9X Administration Office, Workshop, Warehouse, Spares area and Security Gate buildings and facilities
- Provide new 9X site access road with security entrance, stockyard perimeter road plus access roads, car parks and area paving for; RR, stockyard bunds, stockyards, 9X Administration Office, Workshop, Warehouse and Spares area
- Upgrade intersection at Hay Point Road
- Provide new link road between 9X site and current DBCT site, including a grade separation bridge over Hay Point Road plus links to QR maintenance tracks
- Provide maintenance access roads along new conveyor routes and to miscellaneous facilities
- Reclamation and armour for OL conveyors
- Dismantle and relocate project site office
- Stormwater Drainage and Creek diversions
- Site fencing
- Soil Stabilisation, Vegetation and Landscaping

Services

- HV & Communication underground cables from new substation(s)
- Electrical site power supply upgrades and 3.3kV switchgear
- Provide new Industrial Water and Fire Services Systems from new Industrial Dam, including Pumping Station, Stockyard ring main plus services to RR facility, Administration areas, IL conveyors and OL conveyors
- Provide new Water Reservoir
- Provide a new link main back into current terminal industrial water system
- Water reticulation upgrade offshore

Capital Spares

- Capital Spares

5.2.3 Louisa Creek Site

The Louisa Creek Site has the same scope of works (excluding stockyard) as the Southern Stockyard site, except for the following differences:

- Fourth rail loop and inloading system connected to rows 6 to 10 of the stockyard.
- Fourth outloading system connected to rows 7-10 of the stockyard.
- Completion of stockpile row 8 and new stockpile rows 9 and 10
- Implementation of a remnant management system with remnants stored in rows 9 and 10
- Extend and Upgrade industrial water system to include the full length of Row 8 plus new Rows 9 & 10
- 5 x inloading conveyors (2 for Southern Stockyard option)
- Addition of trippers to S1, S2 and S11
- Modifications to existing conveyors S3, S4 and S13
- 8 x remanent yard stacking conveyors
- 4 x yard reclaiming conveyors
- 1 x yard stacking conveyor
- Relocation of reclaimer RL2 and 2 x new reclaimers
- 3 x stackers

Stockyard

Civil Works

- Bulk Earthworks can be undertaken incrementally for Stage 8X, 9XA and then Stage 9XB. Therefore this option only includes Bulk Earthworks for Stage 9XA however this will produce surplus of material which will be stockpiled for Stage 9XB
- Construct Retaining Walls on western and southern sides of Substation 1
- Provide batter stabilisation between Bunds 7 & 8
- Extend existing Drain Lines A, B, C & D
- Install RCBC section of (9XB) Drain Line LC

Infrastructure and services

Infrastructure

- Construct new 9X Industrial Dam #2, Coal Collection Filter Pit and Pump Station plus water main to existing Quarry Dam
- Construct new Quarry Dam wall and spillway. Note, Stockyard earthworks will require a reduction in existing Quarry Dam total capacity
- No new Water Reservoir required
- Demolish and replace Learning Centre building and Control Tower facilities
- Modify existing (western) Construction entrance access road to provide access to relocated site office and security entrance, to provide a new western access road to L1/L2 Road and to S3/S4 Road
- Provide new access road from existing RR facilities to new IL4 facility. Note, this stage does not include a dedicated (grade separated) DBCT access between RR areas and existing Terminal facilities over Hay Point Road
- Note, provision of new Administration Office, Workshop, Warehouse, Spares area and Security Gate buildings and facilities is not included (deferred until Stage 9XB) for this site option

Services

- Relocate HV and Communication underground cables between Substation 1 and S3/S4
- Relocate HV supply overhead lines to Substation 1
- Extend and Upgrade existing Industrial Water and Fire Services System to include full length of Row 8, new Rows 9 and 10, new OL conveyors plus IL4 Facilities

5.2.4 Dudgeon Point Site

The Dudgeon Point Site has the same scope of works as the Southern Stockyard site, except for the following differences:

- 2 x outloading onshore conveyors (compared to 5 for Southern Stockyard option)
- 2 x outloading offshore conveyors (compared to 4 for Southern Stockyard option)
- New jetty structure constructed at 9XA (compared to 9XB for Southern and Louisa options)

Stockyard

Civil Works

- Bulk Earthworks (for all of 9X) including ground improvement works required to compensate for wet compressible ground conditions

Infrastructure and services

Infrastructure

- Construct new 3.7km access road to site including new intersection at Hay point Road and bridge over Louisa Creek
- Construct 2km of re-aligned public access road clear of terminal facilities
- Provide ground improvement works to compensate for wet compressible ground conditions within all infrastructure and terminal facilities areas
- Reclamation, including armour, to form causeway for OL conveyors
- Provide additional Causeway Runoff Dam, complete with lining and pumping Station
- Provide flood protection dam wall stabilisation and lining for Dudgeon Point Industrial Dam
- Construct Environmental Screening bunds as necessary around rail loop and along south eastern, southern and north western sides of Stockyard
- Provide additional 9.4km of rail access to site IL loop (refer Section 6.4 – Dudgeon Point Site)

Services

- Provide additional 4.6km of HV & Communication underground cables from existing services to site
- Provide new 3.8km water main from existing Sunwater main to site. Note, there is connection to the existing terminal's Industrial Water system for this site option

5.3 9XB Expansion

5.3.1 Overview of Works

- Fifth rail loop and inloading system inloading into the new stockyard
- Fifth outloading system and shiploader outloading from the new stockyard
- New jetty and jetty roadway
- Two new berths 5 and 6

5.3.2 Southern Stockyard Site

Inloading

- IL5 rail receival pit and tunnel (RRP5)
- RRP5 mechanical fitout including wagon vibrator, BF22 and sound attenuation
- 2 x Inloading conveyors
- Extension of conveyor S24 for IL5 stockyard width

Stockyard

Civil Works

- Earthworks and material preparation
- Reclamation and armour
- Construct one new reclaimer bund and one new stacker bund including foundations and stockpile sprays
- Install new concrete toe drains, CCP's and subsoil drainage
- Install concrete lining of Drain Lines SA, SB, SC & SD plus miscellaneous yard drainage
- Stockyard Bed Preparation

Materials Handling

- 2 x yard stacking conveyors
- 3 x yard reclaim conveyors

- 1 x Stacker
- 3 X Reclaimers
- Yard machine rail supply

Outloading

Materials Handling

- 5 x onshore outloading conveyors
- Surge bin SB5 including 2 x belt feeders and sample plant SP5
- 3 x offshore outloading conveyors

- Extension of conveyors L219 (from 9XA) and existing conveyor L17
- 1 x Shiploader and rail
- OL5 Slurry return system

Offshore Marine

- New jetty and jetty roadway
- Extension to transfer tower platform
- New berths 5 and 6,including Moormaster systems
- Dredging for new berths 5 and 6
- Wharf amenities building
- Wharf Extension behind Berth 3 and 4 to support Ol5 Wharf Conveyor and roadway

Infrastructure and services

Infrastructure

- Provide new access roads to stockyard bunds and stockyards
- Provide maintenance access roads along new conveyor routes and to miscellaneous facilities
- Modify or reinstate existing roadways
- Stormwater drainage
- Soil Stabilisation

Services

- Extend and Upgrade industrial water system to include new stockyard facilities
- Extend and Upgrade industrial water system to include IL5 Facility
- Water reticulation upgrade offshore

Capital Spares

- Capital Spares

5.3.3 Louisa Creek Site

The Louisa Creek Site has the same scope of works as the Southern Stockyard site, except for the following differences:

Stockyard

Civil Works

- Bulk Earthworks for all of Stage 9XB
- Reclamation and armour for Stockyard
- Construct Drain Lines LA, LB, LC & LD

Infrastructure and services

Infrastructure

- Construct new 9X Industrial Dam #3 and Coal Collection Filter Pit plus relocate Pump Station from Industrial Dam #2
- Provide concrete lined drains to connect Industrial Dam #2 to new Industrial Dam #3 and Industrial Dam #3 to existing terminal Industrial Dam
- Provide new 9X Administration Office, Workshop, Warehouse, Spares area and Security Gate buildings and facilities
- Provide new 9XB site access road with security entrance, stockyard perimeter road plus access roads, car parks and area paving for; stockyard bunds, stockyards, 9XB Administration Office, Workshop, Warehouse and Spares area
- Upgrade intersection at Hay Point Road and Louisa Creek Road plus provide 1.5km replacement access road for existing Louisa Creek Road
- Provide new link road between 9XB site, RR area and current DBCT site, including a grade separation bridge over Hay Point Road
- Reclamation and armour for OL conveyors
- Stormwater Drainage and Creek diversion
- Site fencing
- Construct Environmental Screening bunds as necessary along western and southern sides of Stockyard
- Soil Stabilisation, Vegetation and Landscaping

5.3.4 Dudgeon Point Site

The Dudgeon Point Site has the same scope of works as the Southern Stockyard site, except for the following differences:

- 2 x outloading onshore conveyors (compared to 5 for Southern Stockyard option)
- 2 x outloading offshore conveyors (compared to 3 for Southern Stockyard option)
- Jetty structure already completed at 9XA compared to being constructed at 9XB for Southern Stockyard option.

6. Rail Infrastructure

The rail loop infrastructure work associated with new 9X Inloading facilities, and any additional QR rail infrastructure upgrade work required, will not be included in DBCTM's Capital Cost Estimate. Following initial discussions with QR, we have investigated the likely rail infrastructure work that will be required for each of the 3 site options so that a comparative estimate could be produced to enable a better evaluation of sites to be made for this Study.

6.1 Basis for Comparative Estimate

The rail infrastructure concept for this Comparative Estimate has been based on standard QR horizontal and vertical geometry suitable for "2.1km" train consists. In addition, QR require that any new DBCT rail loops be elevated to a minimum height of 5m above existing track level to provide for a grade separation for future Dudgeon Point rail infrastructure.

A further QR requirement is that the Southern Stockpile site and Louisa Creek site rail loop design concepts incorporate provision for the possibility of a future additional BMA Hay Point rail loop in the area. The geometry for this requirement has been included in our investigation but no allowance has been included in the Comparative Estimate for this additional loop.

The southern battery limit for all 3 site options in this Comparative Estimate has been adopted as the point where the proposed 9X rail infrastructure connects back into the existing mainline (from Jilalan & Goonyella) alignment at the BMA Hay Point Coal Terminal rail line branch turnout.

The extent of rail infrastructure included in this estimate is the earthworks and civil works required up to the top of railway formation for 3 rail loops (IL4, IL5 and future IL6), each with arrival siding capacity for 2 off "2.1km" consists and departure siding capacity for 1 off "2.1km" consist plus one departure passing siding to service all 3 loops for a 1 off "2.1km" consist. In this Comparative Estimate we have adopted figures of $2.5M/km (per single track) to cover the cost of ground works up to top of formation (i.e., earthworks, drainage, access and fencing), $5.0M/km (per single mainline track) to cover the cost of rail infrastructure above the formation (i.e., ballast, sleepers, rail, electrification, signalling, etc) and a figure of $5.5M/km per single track within siding & loop areas (due to additional turnouts and more complex signalling requirements).

In addition, the Comparative Estimate also includes the upgrading of the existing IL1, IL2 and IL3 rail loops to match the (2 off "2.1km" arrival, 1 off "2.1km" departure and 1 off "2.1km" departure passing siding) stowage capacity of that proposed for the new IL4, IL5 and future IL6 loops in line with QR's requirement to increase the networks "upstream" stowage capacity (and refuge facilities).

It is believed that the present BMA Hay Point Coal Terminal single branch line, which utilises a single cross-over between the Up and Down main lines for both arriving and departing trains, is close to capacity under the current DBCT and Hay Point rail traffic volumes. No allowance has been included in this estimate for any upgrade work or modifications to the current track configuration for Hay Point operations should it become necessary due to the increased rail traffic created by the new DBCT Inloading Facilities. Nor has any allowance been included for any upgrade work or modifications that may be required south of the battery limit.

6.2 Southern Stockyard Site

The rail loop horizontal and vertical geometry are in accordance with QR design criteria, as noted above.

The rail loop location and horizontal geometry, as shown on SK-S-04-0103, has also been based on keeping all new railway works within existing rail corridor's south western boundary or only requiring a minimum extent of additional land. This criterion has resulted in the railway formation earthworks clashing with two (2) areas of vegetation classified as Remnant Endangered Region. Subsequent site assessment of these areas has revealed that the flora and fauna within these mapped areas is significant and any new development should be designed to avoid impacting on these remaining areas.

Consequently, we have undertaken an initial review of the rail loop horizontal geometry, disregarding this initial criterion of adhering to the existing rail reserve boundary, and produced a revised layout shown on SK-S-04-0104, that does not impact on these Remnant Endangered Regions. As a result, the IL Pits move slightly south west requiring slightly longer IL conveyor routes and additional (PCQ) land needs to be incorporated into the existing railway reserve.

Note, the vertical alignment for this revised arrangement has not been investigated for this Study and therefore no bulk earthworks calculations have been determined. This design task should be undertaken in the next stage and it is anticipated that the bulk earthworks quantities will be of a similar magnitude to those already included in the Estimate.

6.3 Louisa Creek Site

This site can be serviced by a slightly shorter rail loop.

However, more investigation and design work is required to achieve track layout that is fully compliant with QR geometry requirements. It is expected that this will result in an increase in bulk earthworks.

6.4 Dudgeon Point Site

The significant difference for this site option is the requirement for an additional 9.4km of formation, track and electrification to connect from the Jilalan-Goonyella lines to the start of the Dudgeon Point loop. Along this route there will need to be a grade separation bridge over Hay Point Road, a bridge over Louisa Creek and a second road traffic grade separation near the new coal terminal.

It is likely that noise attenuation walls will be required to be constructed along this route where it passes through or near residences. The full extent of this environmental work is unknown until further study work is undertaken.

As previously noted, there will be the requirement of ground improvement work required for foundation stability of the new infrastructure in the wet compressive soils of this site

7. Land Requirements

The following sections is a preliminary identification of the land affected by the DBCT expansion, by project option and staging. Each table includes all lots which are subject to terminal operations at each of the three expansion stages. The land owner details for each lot have also been identified.

7.1 Southern Stockyard Site

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
Property Description	Owner	Property Description	Owner	Property Description	Owner
131 SP136318	PCQ	131 SP136318	PCQ	131 SP136318	PCQ
132 SP136318	PCQ	132 SP136318	PCQ	132 SP136318	PCQ
133 SP136320	PCQ	133 SP136320	PCQ	133 SP136320	PCQ
41 SP136319	DNRW	41 SP136319	DNRW	41 SP136319	DNRW
42 SP136319	DNRW	42 SP136319	DNRW	42 SP136319	DNRW
43 SP185559	DNRW	43 SP185559	DNRW	43 SP185559	DNRW
126 SP123776	DNRW	126 SP123776	DNRW	126 SP123776	DNRW
130 SP205841	DNRW	130 SP205841	DNRW	130 SP205841	DNRW
134 SP185573	DNRW	134 SP185573	DNRW	134 SP185573	DNRW
135 SP185580	DNRW	135 SP185580	DNRW	135 SP185580	DNRW
135 SP136320	PCQ	135 SP136320	PCQ	135 SP136320	PCQ
Hay Point Road	DMR	Hay Point Road	DMR	Hay Point Road	DMR
		13 SP201849	Kylemore Pty Ltd	13 SP201849	Kylemore Pty Ltd
		45 SP187033	Kylemore Pty Ltd	45 SP187033	Kylemore Pty Ltd
		1 RP715633	Heloupip Pty Ltd	1 RP715633	Heloupip Pty Ltd
		7 RP906312	Heloupip Pty Ltd	7 RP906312	Heloupip Pty Ltd
		44 SP187032	PCQ	44 SP187032	PCQ
		7 SP187032	QT	7 SP187032	QT
		32 SP187032	QT	32 SP187032	QT
		31 RP733239	PCQ	31 RP733239	PCQ
		Tidal waters	DNRW	Tidal waters	DNRW
		14 RP896821	PCQ	14 RP896821	PCQ
		11 RP742354	Kylemore Pty Ltd	11 RP742354	Kylemore Pty Ltd

7.2 Louisa Creek Site

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
Property Description	Owner	Property Description	Owner	Property Description	Owner
131 SP136318	PCQ	131 SP136318	PCQ	131 SP136318	PCQ
132 SP136318	PCQ	132 SP136318	PCQ	132 SP136318	PCQ
133 SP136320	PCQ	133 SP136320	PCQ	133 SP136320	PCQ
41 SP136319	DNRW	41 SP136319	DNRW	41 SP136319	DNRW
42 SP136319	DNRW	42 SP136319	DNRW	42 SP136319	DNRW
43 SP185559	DNRW	43 SP185559	DNRW	43 SP185559	DNRW
126 SP123776	DNRW	126 SP123776	DNRW	126 SP123776	DNRW
130 SP205841	DNRW	130 SP205841	DNRW	130 SP205841	DNRW
134 SP185573	DNRW	134 SP185573	DNRW	134 SP185573	DNRW
135 SP185580	DNRW	135 SP185580	DNRW	135 SP185580	DNRW
135 SP136320	PCQ	135 SP136320	PCQ	135 SP136320	PCQ
Hay Point Road	DMR	Hay Point Road	DMR	Hay Point Road	DMR
		13 SP201849	Kylemore Pty Ltd	13 SP201849	Kylemore Pty Ltd
		45 SP187033	Kylemore Pty Ltd	45 SP187033	Kylemore Pty Ltd
		1 RP715633	Heloupip Pty Ltd	1 RP715633	Heloupip Pty Ltd
		7 RP906312	Heloupip Pty Ltd	7 RP906312	Heloupip Pty Ltd
		44 SP187032	PCQ	44 SP187032	PCQ
		25 RP733239	PCQ	25 RP733239	PCQ
		43 SP187031	PCQ	43 SP187031	PCQ
		Road reserve	DNRW	Road reserve	DNRW
		11 RP733237	PCQ	11 RP733237	PCQ
		Tidal waters	DNRW	Tidal waters	DNRW
				26 RP723960	Cavallo Family
				9 RP733237	PCQ
				10 RP733237	PCQ
				1 RP731451	PCQ
				2 RP731451	PCQ

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
				3 RP731451	PCQ
				1 RP733836	PCQ
				2 RP733836	PCQ
				4 RP739432	PCQ
				6 RP841006	PCQ
				11 RP720239	Catherine Ryan
				5 RP718169	Catherine Ryan
				21 RP715578	PCQ
				22 RP715578	PCQ
				25 RP715578	PCQ
				26 RP715578	PCQ
				27 RP715578	PCQ
				28 RP715578	PCQ
				23 RP744480	PCQ
				24 RP744480	PCQ
				1 RP716112	PCQ
				2 RP716112	PCQ
				3 RP716112	PCQ
				4 RP718169	Robert Neilson
				5 RP718169	Catherine Ryan
				6 RP718283	PCQ
				7 RP718283	PCQ
				8 RP718283	PCQ
				24 RP723960	PCQ
				25 RP723960	PCQ
				9 RP718283	PCQ
				10 RP718283	PCQ
				12 RP721267	B & C Denney
				13 RP721276	Greg Trembath
				14 RP721612	PCQ

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
				15 RP722125	PCQ
				16 RP722125	PCQ
				17 RP722126	PCQ
				19 RP722823	PCQ
				20 RP723391	PCQ
				21 RP723391	PCQ
				22 RP723391	PCQ
				18 RP722330	PCQ
				23 RP723960	PCQ
				11 RP715578	PCQ
				12 RP715578	Michelle Rea
				13 RP715578	A & B Waddington
				14 RP715578	PCQ
				15 RP715578	PCQ
				16 RP715578	PCQ
				17 RP715578	PCQ
				18 RP715578	PCQ
				19 RP715578	PCQ
				20 RP715578	PCQ
				3 RP732272	PCQ
				4 RP732272	PCQ
				5 RP732272	PCQ
				1 RP726757	PCQ
				2 RP726757	PCQ
				3 RP726757	PCQ
				4 RP726757	PCQ
				5 RP841006	L & S Pomeroy
				1 RP727863	C & T Fredericks
				1 RP725964	Dudley Hobbs
				2 RP725964	Dudley Hobbs
				1 RP715578	PCQ
				2 RP715578	PCQ

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
				3 RP715578	PCQ
				4 RP715578	Dianne Kuncir-Webb
				5 RP715578	PCQ
				6 RP715578	Jill Johansen
				7 RP715578	W & A Macdonald
				8 RP715578	PCQ
				9 RP715578	PCQ
				10 RP715578	PCQ
				13 RP732022	PCQ
				14 RP732022	PCQ
				15 RP732022	PCQ
				16 RP732022	PCQ
				17 RP732022	PCQ
				18 RP732022	PCQ
				19 RP732022	PCQ
				1 RP736813	PCQ
				2 RP736813	PCQ
				1 RP734101	PCQ
				2 RP734101	J & M Maher
				6 RP734101	J & S Streeter
				17 RP907586	PCQ
				18 RP907586	-
				5 RP740772	PCQ
				6 RP740772	PCQ
				7 RP740772	PCQ
				8 RP740772	B & M Cumming
				1 RP740772	PCQ
				2 RP740772	PCQ
				3 RP740772	PCQ
				4 RP740772	PCQ
				1 RP735090	PCQ
				2 RP735090	PCQ

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
				3 RP735090	Steven Townson
				4 RP735090	PCQ
				5 RP735090	PCQ
				6 RP736810	PCQ
				7 RP736810	PCQ
				8 RP736810	E & P Springate
				9 RP736810	PCQ
				10 RP736810	PCQ
				1 RP735089	PCQ
				2 RP735089	C and M Porter
				3 RP735089	PCQ
				4 RP735089	PCQ
				5 RP735089	PCQ
				6 RP735089	-
				7 RP735089	-
				8 RP735089	-
				9 RP735089	-
				10 RP735089	-
				10 RP732022	PCQ
				11 RP732022	PCQ
				12 RP732022	PCQ
				29 RP732834	PCQ
				30 RP732834	PCQ
				31 RP732834	PCQ
				32 RP732834	Charles Muscat
				33 RP732834	PCQ
				34 RP732834	PCQ
				35 RP732617	PCQ
				36 RP732617	PCQ
				37 RP732617	PCQ
				38 RP732617	PCQ

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
				39 RP732617	PCQ
				21 RP733532	PCQ
				22 RP733532	PCQ
				23 RP733532	PCQ
				1 H5316	PCQ
				2 H5316	PCQ
				3 H5316	PCQ
				4 H5316	PCQ
				5 H5316	PCQ
				7 H5318	PCQ
				6 H5319	PCQ
				4 H53111	PCQ
				1 RP740775	PCQ
				2 RP740775	M & R Fitzgerald
				5 H5314	PCQ
				2 H5317	Lorraine Ford
				1 RP728831	G & F Ford
				2 RP728831	G & F Ford
				3 RP728831	G & F Ford
				12 H5311	PCQ
				1 RP720486	PCQ
				2 RP720486	Bessie Wegner
				3 H53110	Annette Wegner
				202 H53110	PCQ
				6 H53110	D & M Townson
				7 H53110	PCQ
				4 RP737115	PCQ
				5 RP737115	PCQ
				9 RP731354	PCQ
				1 RP737649	PCQ
				2 RP737649	PCQ

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
				65 CI3470	DNRW
				109 CI3470	DNRW
				1 RP733256	M & N Hamill
				5 RP733256	-
				5 RP738316	PCQ
				6 RP738316	B & E Osborne
				6 RP893224	Heath Osborne
				3 RP898362	B & E Osborne
				4 RP898362	B & E Osborne
				8 RP733237	Geoffrey Johnson
				7 RP906312	Heloupip Pty Ltd
				44 SP187032	PCQ
				25 RP733239	PCQ
				43 SP187031	PCQ
				11 RP733237	PCQ
				132 SP136318	PCQ
				126 SP123776	PCQ

7.3 Dudgeon Point Site

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
Property Description	Owner	Property Description	Owner	Property Description	Owner
131 SP136318	PCQ	131 SP136318	PCQ	131 SP136318	PCQ
132 SP136318	PCQ	132 SP136318	PCQ	132 SP136318	PCQ
133 SP136320	PCQ	133 SP136320	PCQ	133 SP136320	PCQ
41 SP136319	DNRW	41 SP136319	DNRW	41 SP136319	DNRW
42 SP136319	DNRW	42 SP136319	DNRW	42 SP136319	DNRW
43 SP185559	DNRW	43 SP185559	DNRW	43 SP185559	DNRW
126 SP123776	DNRW	126 SP123776	DNRW	126 SP123776	DNRW
130 SP205841	DNRW	130 SP205841	DNRW	130 SP205841	DNRW
134 SP185573	DNRW	134 SP185573	DNRW	134 SP185573	DNRW
135 SP185580	DNRW	135 SP185580	DNRW	135 SP185580	DNRW
135 SP136320	PCQ	135 SP136320	PCQ	135 SP136320	PCQ
Hay Point Road	DMR	Hay Point Road	DMR	Hay Point Road	DMR
		47 SP187035	PCQ	47 SP187035	PCQ
		14 RP896821	PCQ	14 RP896821	PCQ
		16 RP896821	PCQ	16 RP896821	PCQ
		17 RP896821	PCQ	17 RP896821	PCQ
		7 RP742355	PCQ	7 RP742355	PCQ
		Road reserve	DNRW	Road reserve	DNRW
		19 RP896822	PCQ	19 RP896822	PCQ
		20 RP896822	PCQ	20 RP896822	PCQ
		1 RP742350	PCQ	1 RP742350	PCQ
		2 RP742350	PCQ	2 RP742350	PCQ
		7 RP742350	PCQ	7 RP742350	PCQ
		8 RP742350	-	8 RP742350	-
		3 RP742351	PCQ	3 RP742351	PCQ
		29 RP742352	PCQ	29 RP742352	PCQ
		1375 C124275	PCQ	1375 C124275	PCQ
		1 RP736532	PCQ	1 RP736532	PCQ
		747 C14509	-	747 C14509	-
		1 C14509	-	1 C14509	-

8X Expansion (Terminal Operations at 90 Mtpa)		9XA Expansion (Terminal Operations at 111 Mtpa)		9XB Expansion (Terminal Operations at 152 Mtpa)	
		1 C24538	-	1 C24538	-
		1 RP736532	PCQ	1 RP736532	PCQ
		1543 C124313	PCQ	1543 C124313	PCQ
		2 C124538	PCQ	2 C124538	PCQ
		135 C124538	PCQ	135 C124538	PCQ
		136 C124538	PCQ	136 C124538	PCQ
		137 C124538	PCQ	137 C124538	PCQ
		Tidal Waters	DNRW	Tidal Waters	DNRW
				6 C124538	PCQ
				7 C124538	PCQ
				8 C124538	PCQ

8. Capital cost estimate comparison

The concept capital cost estimate for each site is included in Appendix C. Refer to section 2.1 of this report for a description of the basis of the cost estimate.

A summary of the capital cost estimates are tabulated below.

DBCT Management Costs

Description	Site Option		
	Southern Stockyard	Louisa Creek	Dudgeon Point
	Cost (M$)	Cost (M$)	Cost (M$)
8X Feasibility Study and Approvals	**$2.3**	**$2.3**	**$2.3**
8X Project			
Construction	$189.8	$189.8	$189.8
Engineering	$41.1	$41.1	$41.1
Contingency	$34.6	$34.6	$34.6
8X Total Cost	**$265.6**	**$265.6**	**$265.6**
8X Total Cost/tpa	**$53**	**$53**	**$53**
9XA/9XB Feasibility Study and Approvals	**$54.29**	**$54.29**	**$54.93**
9XA Project			
Construction	$1,261.5	$1,358.8	$1,386.6
Engineering	$290.9	$312.9	$317.2
Contingency	$232.9	$250.7	$255.6
9XA Total Cost	**$1,785.3**	**$1,922.4**	**$1,959.3**
9XA Total Cost/tpa	**$78**	**$85**	**$85**
9XB Project			
Construction	$1,394.8	$2,348.4	$1,202.1
Engineering	$318.5	$536.7	$273.7
Contingency	$257.0	$432.8	$221.4
9XB Total Cost	**$1,970.4**	**$3,317.9**	**$1,697.2**
9XB Total Cost/tpa	**$48**	**$82**	**$41**
Total DBCT Management Costs	**$4,078**	**$5,562**	**$3,979**
Total DBCT Management Costs/tpa	**$61**	**$84**	**$59**

Rail Infrastructure Costs

Description	Site Option					
	Southern Stockyard		Louisa Creek		Dudgeon Point	
	Cost (M$)		Cost (M$)		Cost (M$)	
Rail Infrastructure	**9XA**	**9XB**	**9XA**	**9XB**	**9XA**	**9XB**
Below Rail	$147.1	$52.5	$98.6	$34.8	$227	$58
Rail Formation	$49.5	$24.7	$41.8	$20.5	$120	$25
Owners and Engineering Cost	$35.7	$14.0	$25.5	$10.1	$63	$15
Contingency	$34.9	$13.7	$24.9	$9.8	$62	$15
Sub Total Rail	**$267.2**	**$104.8**	**$190.9**	**$75.2**	**$472**	**$112**
Total Rail	**$372**		**$266**		**$584**	

Combined DBCT Management and Rail Costs

Description	Site Option					
	Southern Stockyard		Louisa Creek		Dudgeon Point	
	Cost (M$)		Cost (M$)		Cost (M$)	
	9XA	**9XB**	**9XA**	**9XB**	**9XA**	**9XB**
Sub Total DBCTM and Rail	**$2,052.5**	**$2,075.2**	**$2,113.2**	**$3,393.1**	**$2,431**	**$1,809**
Sub Total DBCTM and Rail Cost/tpa	**$89**	**$51**	**$93**	**$84**	**$106**	**$44**
Total DBCTM and Rail	**$4,450**		**$5,828**		**$4,563**	
Total DBCTM and Rail Cost/tpa	**$66**		**$88**		**$68**	
Percentage Difference compared with Southern Stockyard	**Total (inc rail)**	**DBCT Cost**	**Total (inc rail)**	**DBCT Cost**	**Total (inc rail)**	**DBCT Cost**
	NA	NA	24%	27%	2%	-2%

For the purposes of comparing the sites, the capital cost estimates have been generated from a common point at the take-off from the existing rail line into the Port of Hay Point. The rail and rail loop costs are the responsibility of Queensland Rail Network Access (QRNA), not DBCTM. However, these costs need to be incorporated into the site comparison, to ensure a “apples with apples” comparison. The Dudgeon Point option has additional rail line, which reduces the length of inloading and outloading conveyors required, compared with Southern Stockyard and Louisa Creek.

The rail costs have been added below the line, so that the total project cost to DBCTM can also be reported.

The Louisa Creek site is clearly the least preferred site based on capital cost, being 27% more expensive than the Southern Stockyard and Dudgeon Point sites. Broadly speaking, this is due to the additional conveyors required to set up a remnant management system and the existing stockyard servicing four outloading strings instead of three, the extent of brownfield works, and the more complex civil works.

The Southern Stockyard and Dudgeon Point Sites are the same capital cost, within the accuracy of the estimate. Broadly speaking, the additional conveyors required in the outloading system of the Southern Stockyard option, are offset by the rail line, the more complex civil works, and the longer jetty required for the Dudgeon Point option, resulting in a similar total capital cost for each of these options.

Therefore the Southern Stockyard and the Dudgeon Point site need to be differentiated by all of the other non-capital cost criteria.

9. Preliminary Environmental Impact Assessment and comparison

The following section contains a Preliminary Environmental Impact Assessment (PEIA) to determine the extent of impacts associated with each option. Section 9.1 compares each option against a suite of environmental interests whilst highlighting the risks, associated with that option, in obtaining approvals. Section 9.2 then compares and contrasts the environmental impacts of each option and Section 9.3 identifies the preferred option based on the comparison undertaken in Section 9.1 and 9.2.

9.1 Preliminary Environmental Impact Assessment

Table 1 summarises the comparative environmental impacts of each option. Each impact has been colour coded to indicate the extent of risk in obtaining approvals. Table 2 provides a summary of the findings of Table 1.

Table 2 Preliminary Environmental Impact Assessment (PEIA)

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Air Quality	• The increased volume of coal to be stored at each site is expected to increase the likelihood of dust emissions affecting residential areas. • Dust impacts can be minimised through the implementation of a Dust Control Plan to ensure emissions are appropriately monitored and managed. • Prevailing south-east winds may result in ongoing dust impacts upon the residential community of Timberlands •	• The increased volume of coal to be stored at each site is expected to increase the likelihood of dust emissions in surrounding areas. However this impact would be reduced if acquisition of the remaining properties in Louisa Creek occurs. • Dust impacts can be minimised through the implementation of a Dust Control Plan to ensure emissions are appropriately monitored and managed.	• The increased volume of coal to be stored at each site is expected to increase the likelihood of dust emissions affecting residential areas. • Dust impacts can be minimised through the implementation of a Dust Control Plan to ensure emissions are appropriately monitored and managed. • The current DBCT dust monitoring program does not include deposition monitoring sites at Dudgeon Point. • The site is relatively isolated from residential development.
Noise and Vibration	• Increased stockpiling, loading and unloading is expected result in increased noise and vibration impacts as a consequence of both construction and operational activities. • It is not anticipated that there will be a significant increase as part of 8X given older machinery will be upgraded (Stacker Reclaimer). • As stages 9XA and 9XB involve an increase in operations and subsequently more machinery being used onsite, it is reasonable to anticipate a commensurate increase in noise and vibration impacts. • A Noise Management Plan will need to be implemented to monitor and manage all adverse noise and vibration emissions. • The environmental bund on the inside of the proposed rail loop may result in noise being deflected towards the residential communities of Half Tide and Solonika Beach. • Prevailing south-east winds may result in ongoing noise impacts upon the residential community of Timberlands	• Increased stockpiling, loading and unloading is expected to result in increased noise and vibration impacts as a result of both construction and operational activities. However this impact would be reduced if acquisition of the remaining properties in Louisa Creek occurs. • It is not anticipated that there will be a significant increase as part of 8X given older machinery will be upgraded (Stacker Reclaimer). • As stages 9XA and 9XB involve an increase in operations and subsequently more machinery being used onsite, it is reasonable to anticipate a commensurate increase in noise and vibration impacts. • A Noise Management Plan will need to be implemented to monitor and manage all adverse noise and vibration emissions.	• Increased stockpiling, loading and unloading is expected to result in increased noise and vibration impacts as a result of both construction and operational activities. • It is not anticipated that there will be a significant increase as part of 8X given older machinery will be upgraded (Stacker Reclaimer). • As stages 9XA and 9XB involve an increase in operations and subsequently more machinery being used onsite, it is reasonable to anticipate a commensurate increase in noise and vibration impacts. • A Noise Management Plan will need to be implemented to monitor and manage all adverse noise and vibration emissions. • Decreased rural residential amenity is likely to occur as a result of increased traffic and noise along the proposed rail corridor and Bally Keel Road. • The stockyard is relatively isolated from residential development.
Visual Amenity	• The proposal is likely to have a greater impact on visual amenity owing to the proposed stockyard being located remotely from the existing stockyard. • The new stockyard has been co-located with an existing rail line and loop. • This option may result in decreased visual amenity for the communities of Half Tide and Solonika Beach.	• The proposal is likely to have an impact on visual amenity owing to the expansion of the DBCT footprint, partially where reclamation in tidal waters is proposed.	• The proposed expansion will result in a significant decrease in visual amenity at this site, likely to be greater than the Southern Stockyard option. • Given that this option involves the expansion of the DBCT footprint at a significant distance to the existing site, in addition to new access infrastructure (rail line and jetty) and stockyards, visual amenity of the local area including the Mount Hector Conservation Park and Bakers Creek Aggregation Wetlands is expected to be affected. • This option will result in reduced visual amenity for residents at McEwens Beach.

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Cultural Heritage	• The port area is the traditional territory of the Yuibera (Yuwiburra) clan group of the Birri Gubba tribe. • Land occupied by the current DBCT footprint has been extensively disturbed and previous studies have deemed the land to have no archaeological potential, with the exception of a stone fish trap, located in the small bay between DBCT and HPS. As such it is anticipated that there will be limited (if any) impact on Cultural Heritage as a result of stage 8X. • Given that 9XA and 9XB are outside of the existing DBCT footprint, a cultural heritage assessment would need to be undertaken to determine if any significant Indigenous or Non-Indigenous cultural heritage exists. A Cultural Heritage Management Plan would need to be implemented to ensure the adequate recognition and appropriate management of cultural heritage and historic values.	• The port area is the traditional territory of the Yuibera (Yuwiburra) clan group of the Birri Gubba tribe. • Land occupied by the current DBCT footprint has been extensively disturbed and previous studies have deemed the land to have no archaeological potential, with the exception of a stone fish trap, located in the small bay between DBCT and HPS. As such it is anticipated that there will be limited (if any) impact on Cultural Heritage as a result of stage 8X. • Given that 9XA and 9XB are outside of the existing DBCT footprint, a cultural heritage assessment would need to be undertaken to determine if any significant Indigenous or Non-Indigenous cultural heritage exists. A Cultural Heritage Management Plan would need to be implemented to ensure the adequate recognition and appropriate management of cultural heritage and historic values. • A cultural heritage survey, undertaken by PCQ in 2000, observed some sub-surface shell material on the beach to the north-west of the current DBCT site. This material has the potential to be Indigenous midden material. It should be noted that the exact location of the middens was not specified in the survey.	• The port area is the traditional territory of the Yuibera (Yuwiburra) clan group of the Birri Gubba tribe. • Land occupied by the current DBCT footprint has been extensively disturbed and previous studies have deemed the land to have no archaeological potential, with the exception of a stone fish trap, located in the small bay between DBCT and HPS. As such it is anticipated that there will be limited (if any) impact on Cultural Heritage as a result of stage 8X. • Given that 9XA and 9XB are outside of the existing DBCT footprint, a cultural heritage assessment would need to be undertaken to determine if any significant Indigenous or Non-Indigenous cultural heritage exists. A Cultural Heritage Management Plan would need to be implemented to ensure the adequate recognition and appropriate management of cultural heritage and historic values.
Local Maritime Operations	• Reclamation as part of 9XA and 9XB is unlikely to impact upon maritime operations including the upgrade works associated with the Sarina Beaches Coastal Sustainability Project.	• Reclamation as part of 9XA and 9XB may impact on construction of a new boat ramp at Louisa Creek Beach (proposed as part of the Sarina Beaches Coastal Sustainability Project).	• It is anticipated that the location of the new jetty would restrict recreational boating within Dalrymple Bay. Further investigation will need to be undertaken to determine whether the proposed new jetty would be restrictive in terms of access to Louisa Creek and surrounding waters by private recreational boaters.
Community and Social Impacts	• Expansion at this site would require the resumption of approximately 4 properties currently used for cattle grazing. • The construction of the new rail loop would result in negative impacts to residents along Benson's Road, with the nearest sensitive receptor being located 470 m from the rail loop. • Expansion of DBCT will generate additional employment opportunities within the local area.	• Expansion of DBCT will require the resumption of all properties not currently owned by the Ports Corporation of Queensland, resulting in the loss of the township of Louisa Creek and associated amenity and recreational values of the area. • Further investigation will need to be undertaken to determine potential impacts upon the recreational value of Louisa Creek Beach, such as the quantity and size of coal washed ashore. • Consideration of an appropriate buffer would need to be made given the proposed expansion will be in closer proximity to the nearby community of Timberlands. • Expansion of DBCT will generate additional employment opportunities within the local area.	• The communities of Timberlands and McEwans Beach will in closer proximity to DBCT activities respectively as a result of the expansion, impacting upon amenity and property values. At present, DBCT does not pose any negative impacts upon the community of McEwans Beach. • Further investigation will need to be undertaken to determine potential impacts upon beach recreational values. • The construction of the new rail corridor will result in impacts to residents along Bensons and Hay Point Roads, with the nearest sensitive receptor being located 150 m from the rail corridor. • Further investigation will need to be undertaken to establish if the construction of the new jetty will result in restricted access to the waters of Dalrymple Bay for recreational boaters. • Expansion of DBCT will generate additional employment opportunities within the local area.

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Coastal Processes	• Further investigation will be needed to determine whether the proposed new jetty will have any effect upon geomorphology and sediment transportation processes.	• Further investigation will be needed to determine whether the proposed new jetty will have any effect upon geomorphology and sediment transportation processes.	• Further investigation will be needed to determine whether the proposed new jetty will have any effect upon geomorphology and sediment transportation processes.
Marine Ecology	• Reclamation and piling will need to be undertaken in order to allow for conveyor and vehicular access during 9X regardless of the chosen expansion site. Water quality impacts would need to be controlled. It is assumed that the Louisa Creek Beach area will not be affected by reclamation and piling works. • The existing DBCT footprint is not known to be an important area for marine mammal populations and does not contain dugong protection or fish habitat areas. • The proposed rail loop is likely to traverse an existing barramundi habitat (Planning Scheme Overlay COM2). Refer to the mapping contained in Appendix D • A Flora and Fauna Management Plan will need to be implemented to minimise disturbance to flora and fauna and their habitats in proximity to the expansion site. • Seagrasses and other Marine Plants are unlikely to be affected as a result of 9XA and 9XB. Detailed investigation will need to be undertaken to determine any potential impact that reclamation and construction works may have upon any seagrass beds and the marine fauna they support.	• Extensive reclamation and piling will need to be undertaken in order to allow for conveyor and vehicular access during 9X regardless of the chosen expansion site. Water quality impacts would need to be controlled. • The existing DBCT footprint is not thought to represent an important area for marine mammal populations and does not contain dugong protection or fish habitat areas. • The resumption of properties and a portion of the beach at Louisa Creek may impact on turtle nesting habitat. Sandy beaches in Sarina are turtle nesting sites, with the local area known to be frequented by four turtle species including the Flatback and Green turtles. Communication with Fay Griffin from the Mackay and District Turtle Watch Association has confirmed that Louisa Creek Beach is a turtle nesting site and this year has seen the number of nesting sites increase compared to last year. • Further investigation will need to be undertaken as to the impacts associated with reclamation and construction upon turtle nesting areas and the potential to undertake works outside of the turtle nesting season (October-April). • Seagrasses and other Marine Plants are unlikely to be affected as a result of 9XA and 9XB. Detailed investigation will need to be undertaken to determine any potential impact that reclamation and construction works may have upon any seagrass beds and the marine fauna they support. • Marine Plants could be affected as part of 9XB, given the stockyard is proposed to extend into the Louisa Creek Marine Plant habitat. It should be noted that as part of stage 7X BBI were required to undertake a Marine Plant survey around Louisa Creek as part of a compensation package to DPI and F for the removal of marine plants. • A Flora and Fauna Management Plan will need to be implemented to minimise disturbance to flora and fauna and their habitats in proximity to the expansion site.	• Reclamation and piling will need to be undertaken in order to allow for conveyor and vehicular access during 9X regardless of the chosen expansion site. Water quality impacts will need to be controlled. • The existing DBCT footprint is not thought to represent an important area for marine mammal populations and does not contain dugong protection or fish habitat areas. • The proposed rail line is likely to traverse an existing barramundi habitat (Planning Scheme Overlay COM2). Refer to the mapping contained in Appendix D • The expansion may result in a risk to values of the Sandringham Bay area. As wetlands of national importance, it includes freshwater creeks, wetlands, estuarine habitat and extensive inter-tidal flats and is an area of national and international significance for migratory shorebirds. • Construction of the proposed new jetty and conveyors may impact on the areas turtle nesting habitat. Sandy beaches in Sarina are known turtle nesting sites, with the local area known to be frequented by four turtle species including the Flatback and Green turtles. Further investigation will need to be undertaken as to the impacts associated with reclamation and construction upon turtle nesting areas and the potential to undertake works outside of the turtle nesting season (October-April). • Seagrasses and other Marine Plants may be affected as a result of 9XA and 9XB. Detailed investigation will need to be undertaken to determine any potential impact that reclamation and construction works may have upon seagrass beds and the marine fauna they support. • A Flora and Fauna Management Plan will need to be implemented to minimise disturbance to flora and fauna and their habitats in proximity to the expansion site.

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Terrestrial Ecology	• Expansion during 8X phase will be contained within the existing DBCT footprint and therefore has limited potential to impact on terrestrial ecology. • As part of the 9X expansion works, the proposed location of the new rail loop may result in three areas of 'Endangered' Remnant Regional Ecosystems (REs) being impacted. This may include the clearing of approximately one third of the RE located on the inside of the rail loop in addition to the clearing of a substantial portion through the centre of a second RE located further west along the rail loop line. Consideration of the terrain and subsequent large amounts of cut required could potentially result in a larger portion of these endangered regional ecosystems being destroyed. Relocation of the proposed rail loop so as to avoid all REs is recommended. • As a result of the expansion, terminal activities would have a reduced separation distance from Lake Barfield to the east. Listed on the Register of the National Estate, Lake Barfield is an important natural area, known to be frequented by numerous migratory bird species protected under migratory bird agreements with Japan and China. • The proposed drainage points for the stockyard may impact upon areas of Concern RE. Design should ensure that impacts on this vegetation are minimised. • A Flora and Fauna Management Plan will need to be implemented to ensure the appropriate monitoring and management of flora and fauna.	• Expansion during 8X phase will be contained within the existing DBCT footprint and therefore has limited potential to impact on terrestrial ecology. • The environmental footprint and cumulative impacts associated with this option on terrestrial ecology are considered to be less than the two alternative options given the close proximity to the existing DBCT site. • A portion of 'Of Concern' Remnant Regional Ecosystem (RE) and 1.3 ha of remnant woodland in the north-west corner of the current DBCT site, currently known to be a fauna refuge, is expected to be negatively impacted as a result of reclamation works. • Reclamation of a section of Louisa Creek Beach will prevent work already planning for and commenced under the Sarina Coastal Sustainable Landscapes Project. Works commenced in July 2007 and are planned until June 2010 and are being undertaken by Council in partnership with Sarina Landcare, Reef Catchments and the BHP Billiton Mitsubishi Alliance. Works are to include revegetation and weed control as well as construction of walkways and a boat jetty within the proposed 9X expansion footprint. • Further investigation will need to be undertaken regarding the appropriate size of the setback in order to minimise negative impacts to existing adjacent mangrove communities.	• Expansion during 8X phase will be contained within the existing DBCT footprint and therefore has limited potential to impact on terrestrial ecology. • Expansion at this site will occur in close proximity to the Mount Hector Conservation Park, with the existing access road off Bally Keel Road cutting through a section of Dominant Remnant 'Of Concern' Regional Ecosystem (RE). • The removal of foreshore vegetation for the proposed new jetty may be required. Further investigation will need to be undertaken to determine the extent of vegetation to be cleared. • Given that increased traffic along the road is likely to occur as a result of the need to access the jetty and conveyor, the risk of negative impact to the area is high. Ground truthing needs to be undertaken within the area and the access road relocated so as to avoid this RE. • Further investigation will need to be undertaken as to the likelihood of impacts on the recreational value of the beaches. Given the natural, pristine environment of Dudgeon Point and Mount Hector Conservation Park, any negative impacts will need to be identified and managed.
Soil and Geology	• Extensive cut through will be required for the construction of the proposed new rail loop and 9X stockyards. • Reclamation works within the intertidal zone as part of 9X expansion works will result in the temporary disturbance of soils, which in turn may increase turbidity levels within the adjacent coastal waters if not appropriately managed. • Earthworks at this site are unlikely to expose potential acid sulphate soils; however these will be less likely at this site given the 20m elevation. • An acid sulphate soil management plan along with an investigation of contaminated land will need to be undertaken and implemented to ensure the appropriate management of potential soil impacts.	• Extensive cut through will be required for the construction of the proposed new rail loop and 9X stockyards. • Reclamation and piling works within the intertidal zone as part of 9X expansion works will result in the temporary disturbance of soils, which in turn may increase turbidity levels within the adjacent coastal waters if not appropriately managed. • Earthworks at this site may expose potential acid sulphate soils within the 5m contour. • An acid sulphate soil management plan along with an investigation of contaminated land will need to be undertaken and implemented to ensure the appropriate management of potential soil impacts.	• Extensive cut through will be required for the construction of the proposed new rail loop. • Reclamation works within the intertidal zone as part of 9X expansion works will result in the temporary disturbance of soils, which in turn may increase turbidity levels within the adjacent coastal waters if not appropriately managed. • It is anticipated that special grades offill will need to be sourced off site as part of the 9X expansion works. • Earthworks at this site may expose potential acid sulphate soils within the 5m contour. • An acid sulphate soil management plan along with an investigation of contaminated land will need to be undertaken and implemented to ensure the appropriate management of potential soil impacts.

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Surface Water Quality and Hydrology	• Proposed conveyors S24 and L23 are likely to cross through Grendon Creek, which runs through the existing rail loop and discharges into Lake Barfield. This raises potential risks of coal spillage from conveyors, erosion of banks and sedimentation, which will need to be managed. • Investigation into the location of the new industrial dam, potential storm water runoff volumes and discharge point releases will need to be undertaken to determine potential impacts on adjacent Lake Barfield. • Impacts associated with surface water quality and hydrology can be managed through the implementation of an appropriate Erosion and Sediment Control Plan.	• Further investigation into the impacts upon Louisa Creek, particularly on surface water flows and associated water quality as a result of the 9X expansion phase being located in close proximity to Louisa Creek, will need to be conducted.	• The expansion site will result in a decreased separation distance to Sandringham Bay and Louisa Creek, with the proposed rail line crossing Louisa Creek south of Timberlands. This highlights the potential increased risk of decreased water quality including issues of erosion and sedimentation, which will need to be managed. • Investigation into potential storm water runoff volumes and discharge point releases will need to be undertaken to determine potential impacts on adjacent Lake Barfield.
Transportation and Access	• Given the nature of the works during 8X, involving establishing additional rows, some civil works and the delivery of new machinery, only a small amount of traffic is expected during the construction of this stage. • Stages 9XA and 9XB will result in limited impacts on the local road network. • Hay Point Road (a State Controlled Road) may be impacted as a result of the project. • Impacts upon Hay Point Road and the local road network will need to be further investigated in a Traffic Assessment study, with particular consideration being given to the impacts associated on roads, pavement and local intersections during construction if fill material is to be sourced off-site.	• Given the nature of the works during 8X, involving establishing additional rows, some civil works and the delivery of new machinery, only a small amount of traffic is expected during the construction of this stage. • Stages 9XA and 9XB will result in no direct access by road to Louisa Creek as the new footprint and environmental bund extend across numerous road reserves. Access to the proposed boat ramp and walkways at Louisa Creek Beach will also be obstructed. • Hay Point Road (a State Controlled Road) may be impacted as a result of the project. • Impacts upon Hay Point Road will need to be further investigated in a Traffic Assessment study, with particular consideration being given to the impacts associated on roads, pavement and local intersections during construction if fill material is to be sourced off-site.	• Given the nature of the works during 8X, involving establishing additional rows, some civil works and the delivery of new machinery, only a small amount of traffic is expected during the construction of this stage. • Stages 9XA and 9XB will result in significant impacts on the local road network as the new footprint extends across numerous road reserves and has the potential to change access to local communities. • Hay Point Road (a State Controlled Road) may be impacted as a result of the project. • Impacts upon Hay Point Road and the local road network will need to be further investigated in a Traffic Assessment study, with particular consideration being given to the impacts associated on roads, pavement and local intersections during construction if fill material is to be sourced off-site. • The proposed rail line to Dudgeon Point crosses three roads Bensons Road, Bally Keel Road and Hay Point Road, the latter being a State Controlled Road south of the community of Timberlands. Discussions with Main Roads will need to undertaken to determine the associated impacts of crossing Hay Point Road to minimise the number of intersections of local roads and ensure safe operation in accordance with Main Roads and QR's standards.
Waste Management	• The risk of numerous additional waste streams being generated as a result of bulk earthworks, reclamation works and the construction of new infrastructure is likely at all potential expansion sites. • An appropriate Waste Management Plan should be developed to appropriately manage the generation, transport and disposal of waste materials both during construction and operational phases.	• The risk of numerous additional waste streams being generated as a result of bulk earthworks, reclamation works and the construction of new infrastructure is likely at all potential expansion sites. • An appropriate Waste Management Plan should be developed to appropriately manage the generation, transport and disposal of waste materials both during construction and operational phases.	• The risk of numerous additional waste streams being generated as a result of bulk earthworks, reclamation works and the construction of new infrastructure is likely at all potential expansion sites. • An appropriate Waste Management Plan should be developed to appropriately manage the generation, transport and disposal of waste materials both during construction and operational phases.

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Land Tenure and Other Stakeholder Interests	• Requires tenure/acquisition of 7 properties. • Two existing constraints exist on site including a QR feeder station located south of the existing rail loop entrance point as well as an existing transmission line which will need to be relocated as part of 9XA. • Landing strip and associated safety zones to the south may be affected.	• Will require tenure/acquisition of 53 residential properties not currently owned by the Ports Corporation of Queensland.	• Land needed for all expansion stages is held in Freehold Title by the Ports Corporation of Queensland except for the small portions of road reserve needed for the project.

RISK LEVEL

	LOW – *Limited (if any) delays are likely to be experienced during the approvals process as a result of the issues identified.*
	MODERATE - *Delays are likely to be experienced during the approvals process as a result of the issues identified; however, issues are expected to be managed / addressed sufficiently to obtain approval, without significant design changes.*
	HIGH – *Significant delays are likely to be experienced during the approvals process as a result of the issues identified. Resolution of these issues may require design changes.*

Table 3 Summary of Preliminary Environmental Impact Assessment

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Air Quality	*M*	*L*	*M*
Noise and Vibration	*M*	*L*	*M*
Visual Amenity	*L*	*L*	*M*
Cultural Heritage	*M*	*M*	*M*
Local Maritime Operations	*L*	*L*	*H*
Community and Social Impacts	*L*	*H*	*M*
Coastal Processes	*L*	*L*	*L*
Marine Ecology	*L*	*H*	*H*
Terrestrial Ecology	*H*	*M*	*M*
Soil and Geology	*L*	*L*	*L*
Surface Water Quality and Hydrology	*M*	*M*	*M*
Transportation and Access	*L*	*L*	*M*
Waste Management	*L*	*L*	*L*
Land Tenure and Other Stakeholder Interests	*M*	*H*	*L*

RISK LEVEL

LOW (L) – *Limited (if any) delays are likely to be experienced during the approvals process as a result of the issues identified.*

MODERATE (M) - *Delays are likely to be experienced during the approvals process as a result of the issues identified; however, issues are expected to be managed / addressed sufficiently to obtain approval, without significant design changes.*

HIGH (H) – *Significant delays are likely to be experienced during the approvals process as a result of the issues identified. Resolution of these issues may require design changes.*

9.2 Preferred Option/s by Environmental Impacts

The following section identifies a 'preferred' option for each environmental impact.

Air Quality

The increased volume of coal to be stored at each site will increase the likelihood of dust emissions affecting residential areas at each of the three site options. However, Louisa Creek is considered to be the preferred option as it is more isolated from residential development. Dudgeon Point and the Southern Stockyard are the least preferred given their close proximity to the townships of McEwans Beach, Timberlands, Half Tide and Solonika Beach.

Noise and Vibration

It is anticipated that there will not be a significant increase in noise and vibration impacts; as a result of the 8X expansion works given that older machinery will be upgraded. For works during 9XA and 9XB, a proprtionate increase in noise and vibration emissions is expected for each option, given operations are expected to double. By selecting the Dudgeon Point site option, noise and vibration impacts will primarily occur along the proposed rail corridor and Bally Keel Road, impacting on few residents. The

Southern Stockyard option is least favourable given its potential to impact significantly more residents in the nearby townships of Timberlands, Half Tide and Solonika Beach.

Visual Amenity

The Louisa Creek option is the preferred site from a visual amenity viewpoint, given that expansion works are being co-located with existing infrastructure and will have limited impact on visual amenity or views. Dudgeon Point and the Southern Stockyard options are least preferred as the site will result in an expanded DBCT footprint, given their closer proximity to numerous residential communities.

Cultural Heritage

It is anticipated that there will be limited (if any) impact on Cultural Heritage as a result of stage 8X. Given that stages 9XA and 9XB are outside of the existing DBCT footprint, a cultural heritage assessment would need to be undertaken in order to determine if any significant Indigenous or Non-Indigenous cultural heritage exists. All options are therefore considered equal from a cultural heritage viewpoint.

Local Maritime Operations

The Southern Stockyard is the preferred site from a maritime operations viewpoint given the reclamation works are not anticipated to have an impact upon local maritime operations. The Louisa Creek option is expected to affect the construction of a boat ramp at Louisa Creek Beach (that is part of the Sarina Beaches Coastal Sustainability Project, a BMA community project) and the Dudgeon Point option is expected to restrict local maritime operations in Dalrymple Bay, owing to the construction of a new jetty.

Community and Social Impacts

The Southern Stockyard option is preferred from a social impact viewpoint as it requires fewer residential property resumptions than the Louisa Creek option. The Southern Stockyard option is also likely to result in less impact upon amenity, recreation and property values given the fewer number of residents being located in close proximity to the site. Selection of Dudgeon Point may result in the communities of Timberlands and McEwans being affected by new impacts including increased noise.

Coastal Processes

Each of the three site options will require further investigation to determine whether the proposed jetty extension will have any significant effect upon geomorphology and sediment transportation processes. At this stage, the Louisa Creek option is anticipated to have greater impact due to the larger area of reclamation and tidal works required.

Marine Ecology

At each of the three sites, impacts upon marine ecology may include water quality impacts as a result of reclamation works, loss of existing barramundi habitat (excluding the Louisa Creek option), and potential impacts to seagrasses and other marine plants. Out of the three options, the Southern Stockyard option is preferred given it has minimal additional impacts. The Louisa Creek option may result in additional negative impacts upon turtle nesting sites and the Louisa Creek Marine Plant habitat area, given that the occurrence of turtle nesting upon Louisa Creek Beach has been confirmed by the Mackay and District Turtle Watch Association. The Dudgeon Point option may have an impact on the Sandringham Bay area, as well as new impacts within Dalrymple Bay associated with the jetty and berth.

Terrestrial Ecology

The Louisa Creek option is considered to have a smaller environmental footprint and cumulative impact given its close proximity to the existing DBCT site. However, the Louisa Creek option does have a risk of negatively impacting areas of ‘Of Concern’ Remnant Regional Ecosystem. The Dudgeon Point option is considered less favourable given its close proximity to the Mount Hector Conservation Park, whilst the Southern Stockyard option is the least preferred given it may impact on ‘Endangered’ Remnant Regional Ecosystems. Preliminary field surveys conducted in the study area have confirmed the location and extent of the Regional Ecosystems identified.

Soil and Geology

Negative impacts upon soil and geology are anticipated to be similar at each of the three site options. However, the Southern Stockyard option is likely to have less of a risk associated with exposing acid sulphate soils given the elevation of the site on the 20m contour compared with the 5m elevation of the other options.

Surface Water Quality and Hydrology

Each site option has potential to have a negative impact upon nearby waterways, if control measures are not in place. The Southern Stockyard and Dudgeon Point options will require controls to avoid erosion and sedimentation as a result of infrastructure crossing waterways (conveyors and rail line respectively) and new discharge points, while potential negative impacts relating to Louisa Creek will require further investigation.

Transportation and Access

The Southern Stockyard option is preferred given the limited impacts on the local road network compared with Louisa Creek and Dudgeon Point. While the Southern Stockyard option will result in impacts to a State Controlled Road, the Dudgeon Point and Louisa Creek options have the potential to affect access to the local community and Louisa Creek Beach respectively. Dudgeon Point raises additional issues of the proposed rail line crossing three roads, one of which is a State Controlled Road.

Waste Management

The risk of additional waste streams being generated is increased at all potential expansion sites.

Land Tenure and Other Stakeholder Interests

The Dudgeon Point option is favoured as the land needed for all expansion stages is owned in Freehold Title by PCQ. In comparison, the Southern Stockyard site will require the resumption of 4 grazing properties and resolution of stakeholder interests. Louisa Creek is the least preferred given the need for tenure/acquisition of all remaining residential properties within Louisa Creek Township which are not currently owned by PCQ.

9.3 Preferred Option

Table 1 forms the key output of a qualitative assessment of environmental and planning constraints for each of the three expansion site options. This assessment has been undertaken on the basis that should the Louisa Creek option be selected, then the remaining residential properties within the township of Louisa Creek would be acquired and there would be no residents remaining in the area.

In determining the preferred site, this assessment has been based upon the level of risk a site poses to obtaining planning approvals with respect to each of the 14 identified issue/impact categories. In doing so, the level of risk that has been assigned not only reflects the site’s constraints themselves, but also the nature and importance of the issue/impact in planning approval terms. Finally, in order to determine a preferred site, an assessment of the number of categories that each site has been considered 'preferred' in has been taken into account. Table 3 summarises the preferred option by impact.

Table 4 Summary of Preferred Option by Impact

Issue / Impact	Option One - Southern Stockyard	Option Two - Louisa Creek	Option Three - Dudgeon Point
Air Quality	2	1	2
Noise and Vibration	2	1	2
Visual Amenity	1	1	2
Cultural Heritage	2	2	2
Local Maritime Operations	1	1	3
Community and Social Impacts	1	3	2
Coastal Processes	1	1	1
Marine Environment	1	3	3
Terrestrial Ecology	3	2	2
Soil and Geology	1	1	1
Surface Water Quality and Hydrology	2	2	2
Transportation and Access	1	1	2
Waste Management	1	1	1
Land Tenure and Other Stakeholder Interests	2	3	1

1	*Preferred*
2	*Moderately Preferred*
3	*Least Preferred*

From the summary above, the preferred site based on environmental and planning constraints is the Southern Stockyard. This conclusion has been reached based on the following outcomes. Firstly, the Southern Stockyard option exhibits the lowest level of risk between the three risk levels. That is, the majority of categories were associated with a low risk, with only five of the fourteen issues associated with a medium level of risk. Secondly, in comparing the frequency of instances of high level risk, the Southern Stockyard had the lowest number of high risk issues. Taking into account the number of medium and high risk issues, Louisa Creek was considered to be the least desirable site option of the three considered.

For each impact/issue, comparisons between each of the site options based upon their associated risk to the approvals process as well as their frequency of being the preferred option were made. By identifying the preferred site/s for each separate issue, both the Southern Stockyard and Dudgeon Point were found to be the most frequently preferred overall.

This assessment of environmental constraints and subsequent selection of the Southern Stockyard site as the preferred option is based upon preliminary information obtained through a desktop study only. In conducting this assessment, information gaps have been identified and the need for further investigation on particular issues highlighted. The following is a list of key issues requiring further investigation in order to provide a more accurate assessment:

- Cultural Heritage assessments of potential sites outside the existing DBCT footprint
- Access restrictions on recreational boating within Dalrymple Bay imposed by the new jetty
- Likelihood of impact on marine water quality, including impact on local beaches
- Potential impacts to coastal processes as a result of reclamation works and the new jetty
- Reclamation and construction impacts upon local turtle nesting sites
- Potential impacts upon seagrasses and other marine plants
- Impacts to existing mangrove communities and the need for setbacks
- Impact to tidal flow regime of Louisa Creek during 9X expansion works
- Traffic assessment study to determine impacts upon Hay Point Road and the local road network
- Noise and dust assessments

9.4 Terrestrial Ecological Field Survey of Regional Ecosystems

The following section details the findings of an initial field survey undertaken in February 2009, within the Louisa Creek and Southern Stockyard option areas. The field survey was undertaken in order to clarify and ground truth the condition and extent of areas of remnant vegetation within the broader DBCT study area and to identify potential constraints and opportunities applicable to each option, to accurately inform the design process.

It is important to note that due to seasonal limitations and access restrictions, all flora species within the Louisa Creek and Southern Stockyard option areas were not recorded. This can be attributed to the extent of the areas traversed, plants being unidentifiable due to lack of fertile material, or plants lying dormant (eg terrestrial orchids) at the time of the survey.

9.4.1 Southern Stockyard Option

Preliminary field investigations undertaken on the three portions of remnant vegetation located in the vicinity of the proposed rail loop (identified as RE8.12.27) have confirmed the Environmental Protection Agency's (EPA's) Regional Ecosystem (RE) mapping and description of 'Endangered' RE as true and accurate. In terms of the condition of the vegetation, the majority of the vegetation patches' edges contained regrowth, with a low-moderate level of dieback within the canopy of some patches. These characteristics are consistent with current land use practices of the general area and the exclusion of fire.

Due to inclement weather and accessibility issues at the time of surveying, it was not possible to assess the condition of the riparian vegetation east of the existing rail line. However, aerial and distant observations indicate the riparian condition to vary greatly according to the presence of grazing stock. A rainforest understorey is generally present within the freshwater systems; however, the area appears highly disturbed and subject to weed invasion. The riparian vegetation closest to the rail lines (identified as RE8.3.5) is classified as 'Of Concern' and contains some large mature trees.

9.4.2 Louisa Creek Option

Mangrove vegetation located downstream towards the mouth of Louisa Creek (identified as RE8.1.1) was confirmed during field observations. Despite being classified as 'Not of Concern' RE under the *Vegetation Management Act 1999,* any disturbance would trigger the requirement for a Marine Plant Removal permit under the *Fisheries Act 1994*. A Mud crab (*Scylla serrata*) and a school of juvenile whiting (*Silago* sp.) were observed indicating that water quality within Louisa Creek is reasonably good.

Further ecological assessment of the flora and fauna, including downstream impacts on the Great Barrier Reef Marine Park, will be required to verify the potential impacts of the Project.

9.4.3 Legislative Provisions for Protected Vegetation

REs are significant remnant vegetation communities gazetted under the *Vegetation Management Act 1999* (VM Act). The removal and/or disturbance of any portion of RE within the study area will require a vegetation clearing permit under the VM Act and may require vegetation offsets.

Furthermore, all native plants in Queensland are protected plants under the *Nature Conservation Act 1992* (NC Act). All clearing of native vegetation that is not triggered by the VM Act or *Fisheries Act 1994* will require a clearing permit and appropriate biodiversity offsets under the NC Act.

No threatened flora species were identified during the field activities; however, *Xanthorrhoea johnsonii* (Grass tree), a species listed under the NC Act, was observed in the lower stratum of vegetation communities within the study area. Due to their commercial value, a permit to remove the species along with an accompanying translocation plan may be required.

Under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), actions that have, or are likely to have, a significant impact on a matter of national environmental significance (NES), including listed threatened species and ecological communities, require approval from the Australian Government Minister for the Environment, Heritage and the Arts (the Minister). A protected matters report generated for the Louisa Creek and Dudgeon Point options indicates the potential for a number of rare and threatened terrestrial fauna species to be present. These include: Red Goshawk (Erythrotriorchis radiatus), Squatter pigeon (Geophaps scripta scripta - southern subspecies), False Water-rat (Xeromys myoides) and Yakka Skink (Egernia rugosa).

9.4.4 Vegetation Offsets

A management offset (offset) is a means of meeting the relevant performance requirements of a Regional Vegetation Management Code for a relevant purpose under the VM Act. Offsets are not a suitable option where the impacts of development have an irreversible effect on biodiversity.

They may apply to:

- Regional ecosystems
- Essential habitat
- Vegetation associated with watercourses, natural wetlands and natural significant wetlands.

Offsets also apply to community infrastructure and state significant projects.

A proposed offset must:

- Be within the same bioregion (and preferably subregion)
- Be geographically close to the proposed clearing (generally within 20km)
- Have the same pre-clearing regional ecosystem as that to be cleared
- Have the same or a higher conservation status than that to be cleared, on the same landzone
- Be of sufficient size to be mappable as remnant vegetation
- Must achieve ecological equivalence to the area being cleared
- Attain remnant status within five years and in some cases 20 years.

- Include an ongoing management plan to ensure it achieves ecological equivalence (this will require at least a five year commitment)
- Be legally secured for conservation purposes in the long term

In general there is a requirement that the proposed offset has less than 25% (or in some cases 10%) weed cover at the start of the process. The ratio of cleared area to offset required varies from 1:1 to 1:4 depending on the management code performance requirement that the offset is meant to address.

9.4.5 Recommendations

The following mitigation measures should be undertaken to avoid significant impacts on terrestrial vegetation and faunal habitats and will demonstrate DBCTM's commitment to delivering sustainable environmental outcomes.

- Minimise the removal of protected vegetation through the following design measures:
  - Avoid the proposed Southern Stockyard rail loop intersecting with the three portions of 'Endangered' REs by configuring the loop to encircle the vegetation.
  - Design drainage channels to ensure that channel/s remain in the most natural state possible.
- Undertake liaison with the Department of Natural Resources and Water and the Environmental Protection Agency at milestone stages of the Project to ensure that appropriate input into the design is sought and departmental concerns are addressed. Communication will also assist in the design team remaining informed of any legislative changes and policy amendments, in particular the Draft Biodiversity Offsets Policy.
- Where removal of protected vegetation cannot be avoided then suitable offsets will need to be provided in accordance with the VM Act and relevant policies. Additional measures could include:
  - Rehabilitating degraded habitats
  - Improving the quality of existing portions
  - Implementing appropriate management processes and procedures during construction and operation
  - Encourage connectivity between portions to facilitate movement of terrestrial fauna by planting wildlife corridors and/or constructing faunal underpasses or bridges
- Implement an appropriate weed management program during construction and operation to minimise the spread of weeds.

10. Comparison of other criteria

The following section contains a qualitative comparison of the three sites against the following criteria:

- Constructability of the proposed expansion
- Impact to existing operations during construction and operations
- Extent of offsite infrastructure required
- Operations of the expanded terminal
- Ultimate capacity of the sites

These criteria are assessed in the following table and results are summarised in the sections below. The 8X expansion is the same scope of works for all three sites, so it is not discussed in this section.

Factor	Southern Stockyard Site		Louisa Creek Site		Dudgeon Point Site	
	Notes	Ranking	Notes	Ranking	Notes	Ranking
Constructability of the proposed expansion		1		3		2
Onshore	Good access to greenfield site	1	9XA – Site is very constrained – difficult to work on multiple fronts – limited lay down area	3	Good access to greenfield site	1
Offshore	Jetty delayed to 9XB - minimise piling/offshore construction risk in 9XA. For whole of project, type and scope of works very similar across sites	1	Same as Southern SY	1	Jetty needs to be constructed in 9XA – more piling/offshore construction risk in 9XA than other sites. For whole of project, type and scope of works very similar across sites.	2
Extent of Offsite Infrastructure required		2		1		3
Power supply	Site is close to incoming power supply.	1	Same as Southern SY	1	Site is approx. 4km away from incoming power supply.	3
Water Supply	Could either offtake from Sunwater-Sarina line, or could supply from existing terminal offtake. Needs to be considered in more detail.	2	Does not require new offtake from Sunwater- Sarina line	1	Requires new offtake from the Sunwater – Sarina Line	3
Road access	0.9 km access road from Hay Point road and 2.2km between terminal Administration areas.	2	0.2 km access road from Hay Point Road and 1.7km between terminal Administration areas.	1	3.7 km access road from Hay Point Road and 8.4km between terminal Administration areas.	3
Impact to existing operations during construction		2		3		1
Extent of brownfields work and shared access/interaction between construction and						

Factor	Southern Stockyard Site		Louisa Creek Site		Dudgeon Point Site	
operations.						
o Inloading system	Greenfield	1	Conveyors S23, S24 cross over Hay Point Road. Brownfield works for IL4 (9XA). RS1 and RS2 are fed from existing S1, S11, S2, and cross over Hay Point Road. Conveyor S14 feeds existing conveyor R8. 9XB is essentially Greenfield, with single tie-in from S23 to S25.	3	Greenfield	1
o Stockyard	Greenfield	1	S9 is fed from existing conveyors S3,S4,S13. (9XA) 9XB is greenfield	3	Greenfield	1
o Outloading System	Onshore outloading strings - L24, L25 cross over existing rail loop, dam (could take alternative route around loop), and Hay Point road. L27, L28 cross under existing S4,S3 and S13. Conveyor L213a crosses over existing L3,L4. Conveyor L213a, L213 of OL4 being constructed in heavily utilised area at commencement of jetty (Alternative jetty route to be considered.) Offshore outloading system - Conveyor L216 of OL4 being constructed adjacent to jetty roadway. Jetty/Wharf transfer	2	Onshore outloading system – 9XA - L12a is being fed from existing conveyors R7, R8. L14 crosses over existing L3,L4,L15a. L16 crosses under existing L15a. Surge bin and conveyors L14, L16a being constructed in heavily utilised area at commencement of jetty. 9XB – is essentially Greenfield with single-tie in from L21 to L12. Offshore outloading system - OL4 jetty conveyor being constructed adjacent to jetty roadway. Jetty/Wharf	3	Onshore outloading system – Greenfield Offshore outloading system - OL4 jetty conveyor and Jetty – Greenfield. Jetty/Wharf transfer tower platform and transfer tower brownfield extension of existing structures. Wharf extension behind Berths 3 and 4 similar for all options.	1

Factor	Southern Stockyard Site		Louisa Creek Site		Dudgeon Point Site	
	tower platform and transfer tower brownfield extension of existing structures. Wharf extension behind Berths 3 and 4 similar for all options.		transfer tower platform and transfer tower brownfield extension of existing structures. Wharf extension behind Berths 3 and 4 similar for all options.			
Extent of shutdowns and tie-ins	No tie-ins to existing conveyors. May be some shutdowns while working around existing operations and augmenting power supply etc. yet to be defined.	2	14 tie-ins to the existing conveyor system, that will require numerous shut-downs to various components of the existing plant.	3	No-tie ins to the existing conveyor system. Minimal work around existing plant.	1
Operations of the expanded terminal		1		2		3
Operations cost - Power	Southern SY has 29 conveyors, and therefore second least drives (Alternative OL string layout reduces this to 25 Conveyors) => Second best power cost	2	Louisa Creek has most new conveyors (41), and therefore most drives => highest power cost	3	Dudgeon Point has least new conveyors (22), and therefore fewer drives. => Lower power cost.	1
Operations cost - Maintenance	15% more conveyors to maintain than Dudgeon Point, and fair proximity to existing operations/maintenance hub (approx 2km away).	1	85% more conveyors to maintain than Dudgeon Point, but good proximity to existing operations/maintenance hub (approx. 1 km away).	3	Least conveyors to maintain, but poor proximity to operations/maintenance hub (approx. 9 km away). Either need to run as a separate terminal with duplication of resources, or loose time in travelling between terminals	2
Integration of operations of existing and new terminal	Good proximity to integrate the operations and maintenance of	2	Excellent proximity to integrate the operations and	1	Poor proximity to integrate the operations and maintenance of	3

Factor	Southern Stockyard Site		Louisa Creek Site		Dudgeon Point Site	
	the new terminal.		maintenance of the new terminal.		the new terminal.	
Port and Terminal Security	Both terminals could have single security gate for access to the terminal. Would need to consider whether the port security point is moved to the commencement of the jetty (second security gate), or whether both terminals are monitored with a security perimeter road.	1	Same as Southern SY	1	Two separate security gates for access to the terminal would be required. Security perimeter road surveillance would be required on both terminals, or an additional two security gates would be required at the commencement of each jetty for port security.	3
Third party access	Single access point for customs, ships crews, providores, sampling etc.	1	Same as southern SY	1	Two separate access points for customs, ships crews, providores, sampling etc.	2
Integration of Water management	Industrial water supply system connects the dams from the new terminal with the dams of the existing terminal, giving flexibility of water management.	1	Same as Southern SY	1	Separate industrial water supply system is required. More pumps are also required, increasing maintenance.	2
Ultimate capacity of the sites						
Ability to expand past the 152Mtpa nominated capacity	Has sufficient room for two additional stockpile rows, which provides enough storage (based on the current assumptions) to fully service IL6 and OL6, resulting in an ultimate capacity of around 185 Mtpa	1	Only has enough room for one additional stockpile row without impacting the mangrove area, which limits ultimate capacity to around 179 Mtpa.	3	Same as Southern SY	1

10.1 Constructability of the proposed expansion

The Louisa Creek site is the least preferred site based on this criteria, as the 9XA expansion (Rows 8,9,10 of the existing stockyard) has restricted access and is constrained by a lack of laydown area in the immediate vicinity of the construction, making construction more difficult.

The Dudgeon Point and Southern Stockyard sites onshore both have good access and plenty of room, so are judged to be similar for this criteria onshore.

Offshore, the 9XA expansion is assessed to be more difficult to construct for the Dudgeon Point site, because a new jetty is required at this stage, which exposes the project to a larger amount of marine works, which has an associated risk profile relating to weather and marine conditions and geotechnical risk associated with piling. The new jetty is also required for Louisa Creek and the Southern Stockyard, but not until 9XB expansion is required.

10.2 Extent of Offsite Infrastructure required

As Dudgeon Point is the site furtherest away from the existing road network, power supply, and water supply, it is the least preferred site on this criteria.

The Louisa Creek site is marginally better than the Southern Stockyard on this criteria, because it is closer to the existing terminal.

10.3 Impact to existing operations during construction

The Louisa Creek site is clearly the least preferred site based on this criteria, because of the extent of interlinking of new conveyor systems with existing conveyor systems to achieve the remnant management system in 9XA expansion.

The Dudgeon Point site is the most preferred site because it is essentially a greenfield site, and has no tie-ins to the existing terminal. The Southern stockyard site also has no tie-ins to the existing terminal, but some of the outloading conveyors are crossing over and under other conveyors. Compared with the extent of brownfield work in the 7X Expansion, these interactions will be considerably less involved, and much easier to manage.

10.4 Operations of expanded terminal

There are two primary factors that effect this criteria. Firstly, the proximity of the terminal to the existing terminal, which effects ease and cost of operations and maintenance, security and third party access, and the ability to integrate the operations of the terminal. The second factor is the extent of works (number of conveyors) required for the site, which effect the power demand, and extent of maintenance required.

The Louisa Creek site is closest to the terminal, but has the most new conveyors (41). The Southern Stockyard is next closest to the existing terminal, and has 25 new conveyors depending on which onshore outloading is selected. The Dudgeon Point stockyard is remote to the existing terminal, but has the least new conveyors (22). A more detailed quantitative assessment would be required to determine the relative extent to which each of this factor effect the overall operations and maintenance cost for the expanded terminal.

Qualitatively at this stage, it is assessed that the proximity of the two terminals to each other is a primary issue that will cause ongoing operations and maintenance challenges for the expanded terminal. Hence, it is assessed that Southern Stockyard is the most preferred site, and the Dudgeon Point the least preferred site, based on this criteria.

10.5 Ultimate capacity of sites

The Southern Stockyard and the Dudgeon Point sites and ranked similarly on this criteria, as they both have the space to expand to 185Mtpa with two additional stockpile rows in the new stockyard. The Louisa Creek site is the least preferred for this option, as it can only accommodate one additional stockpile row in the new stockyard, which results in an ultimate capacity of 179 Mtpa.

10.6 Preferred option/s by other criteria

Below is a summary table of the rankings for the sites against the various criteria.

	Southern Stockyard Site	Louisa Creek Site	Dudgeon Point Site
Constructability of the proposed expansion	1	3	2
Extent of Offsite Infrastructure required	2	1	3
Impact to existing operations during construction	2	3	1
Operations of the expanded terminal	1	2	3
Ultimate capacity of the sites	1	3	1

It can be seen that the Southern Stockyard is never the least preferred site, and is most often the most preferred site.

The critical disadvantages of the Louisa Creek site are its brownfields complexity in interconnection with the existing terminal, and its inability to expand to the ultimate capacity of 5 inloading and 5 outloading strings.

The critical disadvantage of the Dudgeon Point site is its separation from the existing terminal and how this effects ongoing operations and maintenance. Although this is an advantage during the relatively short duration of the construction phase, it is a significant disadvantage during the operating life of the expanded terminal.

Hence, the Southern Stockyard is the recommended site, based on the criteria assessed in this section.

11. Assessment process

The following section summarises the approvals processes for each phase of the project by option. To assist in the interpretation of this section the following matrix has been prepared, to indicate the applicable assessment process by option and stage. The applicable assessment process was determined as a result of those environmental impacts identified during the PEIA.

11.1 Key drivers

The key drivers influencing the recommended assessment process are those environmental impacts and issues that have the potential to significantly affect the timing and delivery of the project.

Southern Stockyard

The crucial issue that will affect the delivery of the Southern Stockyard option is the existence of 'Endangered' Regional Ecosystem (RE) within the project footprint. Current design indicates that the proposed rail loop will intersect the three (3) Endangered REs in Phase 9XA of the expansion. This has significant implications in the selection of the assessment process given that Development Applications to remove vegetation can only be lodged in certain specific circumstances.

Section 22A of the *Vegetation Management Act 1999* states that a Development Application to remove vegetation cannot be accepted and assessed by an agency, under the *Integrated Planning Act 1997* (IPA), if it is not for a defined 'relevant purpose'.

Given the only instance in which DBCTM would be able to lawfully lodge a Development Application to remove the 'Endangered' RE, under Section 22A, would be, *(a) a project declared to be a significant project under the State Development and Public Works Organisation Act 1971 (SDPWOA), section 26,* it is necessary that the project move through an EIS process, from Phase 9XA, otherwise approvals cannot be obtained.

Alternatively the rail loop can be designed to completely avoid intersecting with the 'Endangered' REs. This will enable Phase 9XA of the Southern Stockyard option to move through the Development Application process.

It has been assumed that the project designers will ensure that the REs in question will not be intersected by the proposed rail loop and as a result it will not be necessary to utilise the EIS process to address the impact on the 'Endangered' REs.

There are no other significant ecological impacts identified that will affect the delivery of Phase 9XA of the Southern Stockyard option.

Phase 9XB will require an EIS regardless, given it is anticipated that the works will be considered a 'controlled action' under the EPBC Act, owing to the nature and scale of the environmental impacts relating to the required offshore works.

Louisa Creek

The Louisa Creek option has a number of issues that could affect the successful delivery of the project. The preliminary environmental impact assessment highlighted significant impacts associated with community and social issues, the marine environment and land tenure/stakeholder interests, in addition to the 'Endangered' RE that may be impacted upon by the rail loop as part of 9XA, similar to the Southern Stockyard option.

It is anticipated, assuming that the 'Endangered' REs will not be affected by the proposed rail loop, that the environmental impacts associated with Phase 9XA will be limited, as this phase will primarily involve the development of rows 8, 9 and 10, as add ons to the existing DBCT stockyard, with a small amount of reclamation to accommodate the full length of those rows. The Phase 9XA works are not expected to trigger a ‘controlled action’ and impacts can be appropriately addressed through the Development Application process.

Phase 9XB works are expected to have significant ecological impacts on a number of federally protected issues, as a result of the proposed new stockyard being located on reclaimed land, over known and recorded turtle nesting sites, and dredging activities to accommodate the additional berths within the Great Barrier Reef Marine Park. As such an EIS will be required, because the work is expected to be considered a ‘controlled action’ owing to the nature and scale of the environmental impacts.

Dudgeon Point

The Dudgeon Point option has a number of environmental issues. Unlike the Southern Stockyard and Louisa Creek options, the majority of Dudgeon Point environmental impacts occur in Phase 9XA owing to the infrastructure works that are required to support the operation of the proposed isolated stockyard, including the construction of a new rail line, jetty and berth.

Given that the development works from Phase 9XA onwards are anticipated to have significant ecological impacts on a number of federally protected issues an EIS will be required, because the works are expected to be considered a ‘controlled action’ owing to the nature and scale of the environmental impacts.

The following table summarises the approvals processes for each phase of the project by option.

Table 5 Applicable Assessment Process by Construction Phase and Option

	Stage 8X (90 Mtpa)	Stage 9XA (111 Mtpa)	Stage 9XB (152 Mtpa)
Southern Stockyard	Minor Increment	Development Application/s or Environmental Impact Statement	Environmental Impact Statement
Louisa Creek	Minor Increment	Development Application/s or Environmental Impact Statement	Environmental Impact Statement
Dudgeon Point	Minor Increment	Environmental Impact Statement	Environmental Impact Statement

11.2 Minor increment

The existing environmental licence (EPA Permit IPDE0040706C11) for ERA 74 (stockpiling, loading or unloading goods in bulk) allows the terminal to operate up to 85 Mtpa. It is anticipated that the capacity of the terminal will increase from 85 to 90 Mtpa as part of the 8X. When determining whether the increase in capacity (to 90Mtpa) constitutes a Material Change of Use (MCU) reference should be made to the EPA’s Operational Policy *Material Change intensity or scale for an environmentally relevant activity*, which outlines EPA’s policy position in determining whether changes to an ERA require a Development Application to be made. For ERA 74, the EPA’s Operational Policy identifies two instances where a Development Application will be required:

- 20% change in total site area
- 10% change in design storage volume or design storage capacity

It is therefore anticipated that 8X will not trigger a MCU for an ERA.

As part of 8X, additional laydown area is also proposed outside the terminal and potentially on land beyond Strategic Port Land (SPL) boundaries. If required, the project schedule has assumed that PCQ will declare the subject land SPL (and will subsequently amend the Port of Hay Point Land Use Plan).This will ensure that PCQ will be the primary Assessing Authority (Assessment Manager) for the laydown area, with the activities only requiring a Ports Application as opposed to a Development Application made to Council under the Integrated Planning Act (IPA).

SPL is declared by the Transport Minister pursuant to Section 286 of the Transport Infrastructure Act. This is a process outside of DBCTM's control and has no associated statutory timeframes. Once the land is gazetted as SPL, DBCTM will be required to lodge a Ports Application for PCQ's assessment and approval. The assessment process commonly takes no longer than three months.

Critical Issues

The following are critical issues for 8X:

- Ensuring that those activities approved under EPA Permit IPDE0040706C11 do not exceed the triggers identified in the Operational Policy.
- Declaration of any additional land required by the project as SPL by the Transport Minister
- Obtaining the required Owner's Consent to be able to lodge a Ports Application
- Native Title and any Cultural Heritage Matters resolved

11.3 Development Application/s

To support this process it is necessary to undertake background research and field studies associated with all potential impacts, such as:

- Terrestrial Fauna and Flora
- Marine habitat
- Air quality (dust)
- Noise impacts
- Coastal processes
- Cultural heritage
- Soils and geology
- Surface water and hydrology
- Waste management
- Socio-economic

This information will assist in identifying and supporting all planning and environmental approvals and will be used in the preparation of the Environmental Assessment Report (EAR); however, in the first instance this information should be used as part of the referral to the Federal Department of the Environment, Water, Heritage and the Arts under the Environmental Protection and Biodiversity Conservation (EPBC) Act, given the potential impacts of the project on matters of National Environmental Significance (NES).

The purpose of this referral process is to determine whether or not a proposed action will need formal assessment and approval under the EPBC Act. It is anticipated that impacts associated with 9X Phase 1 for both the Louisa Creek and Southern Stockyard options can be managed appropriately and will not trigger a controlled action.

An Environmental Assessment Report will then be prepared based on the findings from the background research, field studies and EPBC referral. This information will be used to support the required Material Change of Use and Operational Works Development Applications. Figure 1 illustrates the IDAS process for Code Assessable applications and Figure 2 illustrates the IDAS process for Impact Assessable applications.

Critical Issues

The following are critical issues for this process:

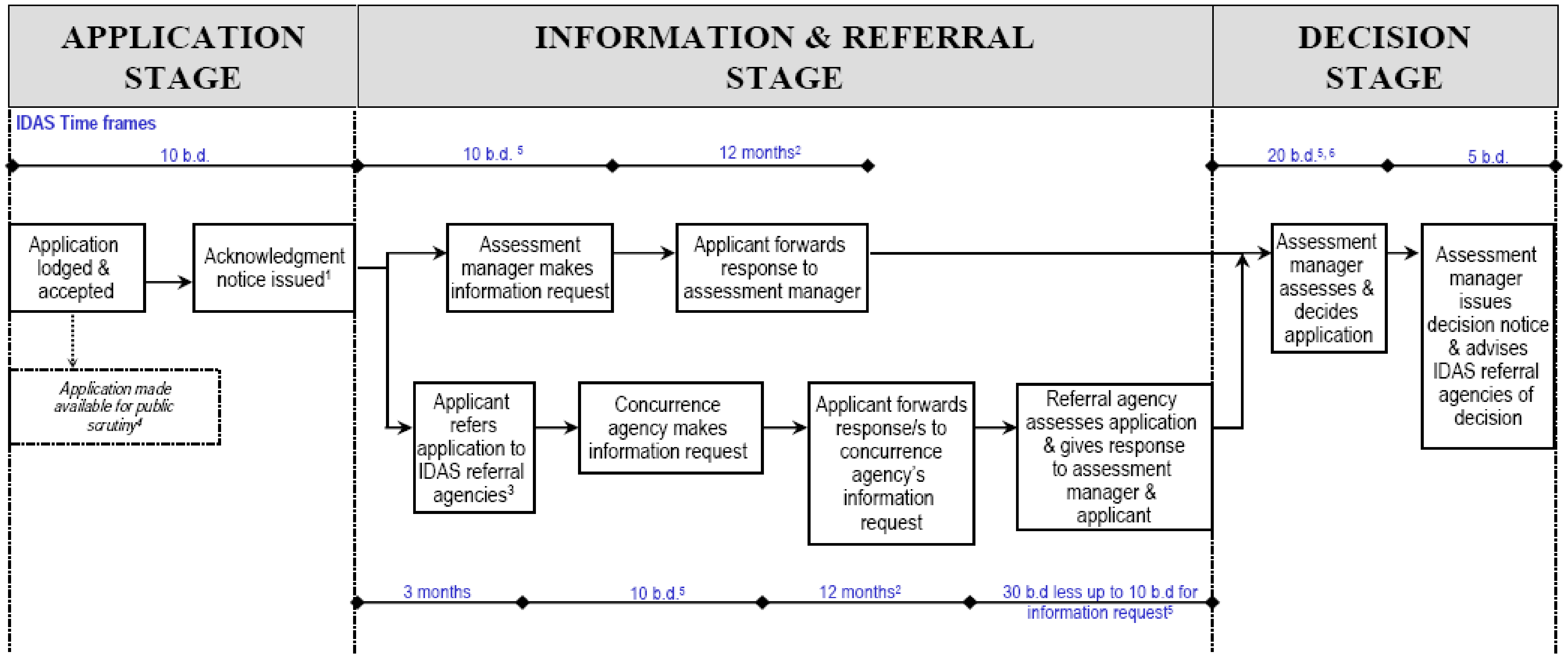
- Federal Minister not declaring the project as a controlled action
- Obtaining Owner's Consent and Resource Entitlement to be able to lodge the required Development Applications
- Native Title and any Cultural Heritage Matters resolved
- Road closures and land acquisition are resolved

Figure 1 IDAS Process - Code Assessment

IDAS FLOWCHART 11

As at Tuesday 25 June, 2007

For an application involving –
- Code assessment only
- IDAS referral agencies
- Information request issued



Note: b.d. = business days

1 *If the application is for a brothel, the assessment manager must also provide the Prostitution Licensing Authority with a copy of the application and a written notice stating whether the development application is required to be subject to Code or Impact Assessment, within 10 business days after receiving the development application.*

2 *If the application is in response to a show cause notice or an enforcement notice, the applicant will only have 3 months to respond to an information request.*

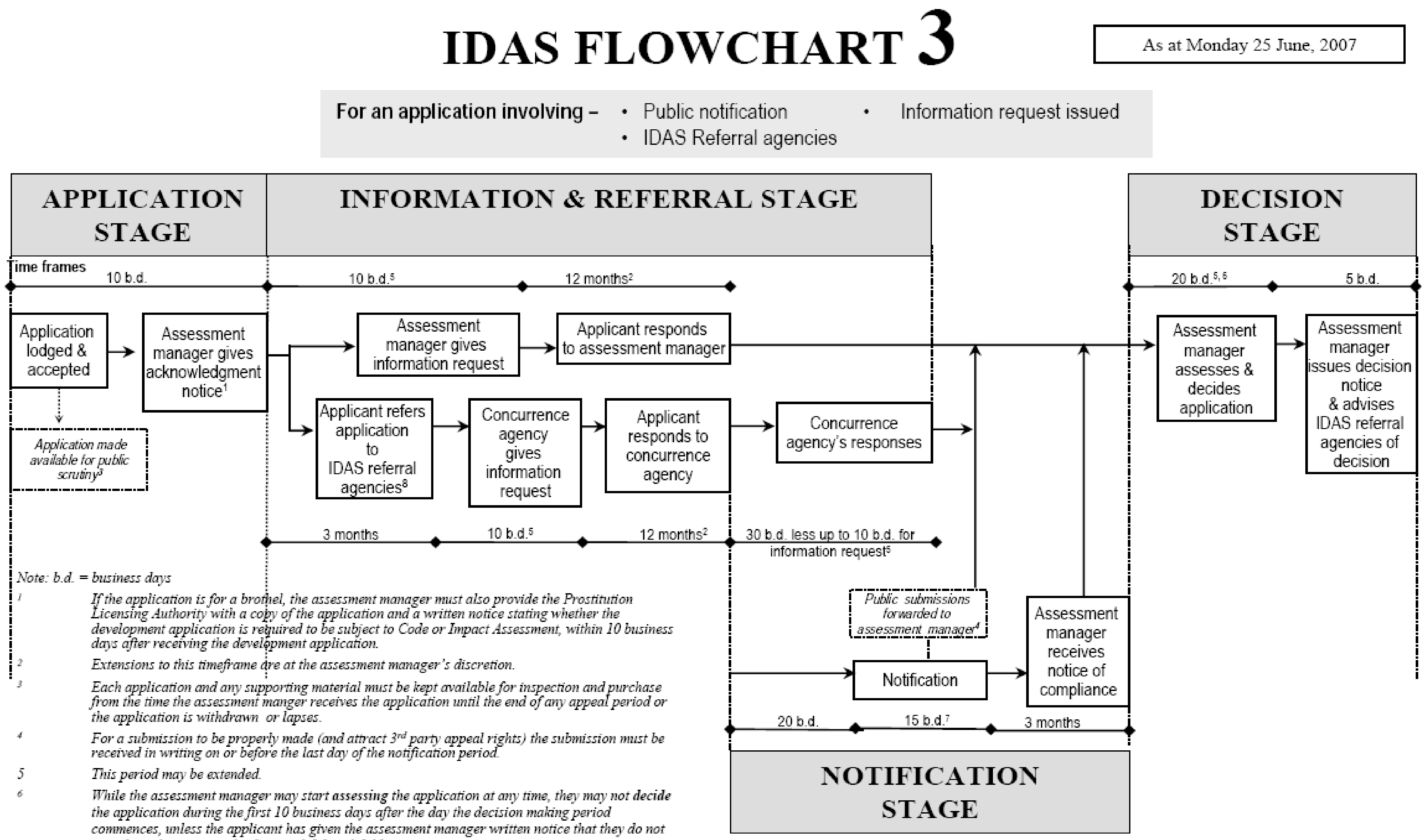
3 *Note: applicant provides the assessment manager with written notice as to when the application was referred.*

4 *Each application and any supporting material must be kept available for inspection and purchase from the time the assessment manger receives the application until the end of any appeal period or the application is withdrawn or lapses.*

5 *This period may be extended.*

6 *While the assessment manager may start assessing the application at any time, they may not* **decide** *the application during the first 10 business days after the day the decision making period commences, unless the applicant has given the assessment manager written notice that they do not intend to take action under Section 3.5.9 or 3.5.10.*

Figure 2 IDAS Process - Impact Assessment



Note: b.d. = business days

1 *If the application is for a brothel, the assessment manager must also provide the Prostitution Licensing Authority with a copy of the application and a written notice stating whether the development application is required to be subject to Code or Impact Assessment, within 10 business days after receiving the development application.*

2 *Extensions to this timeframe are at the assessment manager's discretion.*

3 *Each application and any supporting material must be kept available for inspection and purchase from the time the assessment manger receives the application until the end of any appeal period or the application is withdrawn or lapses.*

4 *For a submission to be properly made (and attract 3rd party appeal rights) the submission must be received in writing on or before the last day of the notification period.*

5 *This period may be extended.*

6 *While the assessment manager may start* ***assessing*** *the application at any time, they may not* ***decide*** *the application during the first 10 business days after the day the decision making period commences, unless the applicant has given the assessment manager written notice that they do not intend to take action under Section 3.5.9 or 3.5.10.*

7 *This period must not include business days between 20 December and 5 January of the following year. For applications made after 31March 2007, a 30 b.d. notification period applies instead of a 15 b.d. notification period if the application involves any of the following—*

- *3 or more concurrence agencies*
- *All or part of the development is assessable under a planning scheme AND is prescribed under a regulation*
- *The application is for a preliminary approval under IPA s3.1.6*

8 *Applicant provides assessment manager with written notice of when the application was referred.*

11.4 Environmental Impact Statement (EIS)

Background research and field studies will be necessary, as part of this process, to assist in identifying and supporting the required planning and environmental approvals. An EPBC referral to the Department of the Environment, Water, Heritage and the Arts will be required. It is anticipated that those phases and options identified in Table 2 earmarked as being subject to the 'Environmental Impact Statement' process will trigger a controlled action, and will subsequently require an EIS to be prepared under the EPBC Act (in accordance with the bilateral agreement).

As the works will involve complex state and local government approvals, in addition to being considered a controlled action, it is recommended that DBCTM apply to the Queensland Coordinator General for the project to be declared a Significant Project under the State Development and Public Works Organisation (SDPWO) Act. This will allow the project to be assessed through a single and streamlined impact assessment process which meets both State and Federal environmental impact assessment requirements under the bilateral agreement.

For the project to be declared a Significant Project under the SDPWO Act, application is made to the Coordinator General, in the form of an Initial Advice Statement (IAS) which identifies potential impacts of the project and addresses how the project meets the criteria of a Significant Project, as identified in the SDPWO Act. Commonly a draft Terms of Reference (TOR) is prepared and submitted by DBCTM with the IAS.

Once the IAS is lodged, the Coordinator General assesses the material submitted against the SDPWO Act criteria and advises DBCTM that the project will be declared. The draft TOR for the project will then be finalised and the Coordinator General will declare the project as a Significant Project through gazette and will also undertake public notification of the project inviting public comment. The TOR is then finalised and DBCTM undertakes the EIS in accordance with the TOR. Common tasks undertaken during the EIS process are illustrated in Figure 3.

The EIS is publicly notified once the EIS has been completed to the satisfaction of the Coordinator General. Submissions on the EIS can then be made by the public and government agencies. Whilst there is no statutory timeframe associated with the notification, the Coordinator General commonly takes 20 business days to complete this task. All submissions on the project are evaluated by the Coordinator General and in most instances a Supplementary EIS is required to address any further matters identified as part of the evaluation.

The Coordinator General then assesses the EIS, Supplementary EIS, comments from government agencies and submissions made by the public and prepares an Evaluation Report that assesses the environmental effects of the project and outlines conditions on how the project should proceed.

The Evaluation Report is publicly notified and is then forwarded to the Federal Minister of Environment for approval under the EPBC Act. The Federal Minister will then provide a proposed decision on whether or not to approve an action and conditions (if any) to DBCTM before making a final decision. The Minister will consider:

- the principles of ecologically sustainable development
- the outcomes of the assessment of the impacts of the proposed action
- referral documentation
- community and stakeholder comment
- any other relevant information available on the impacts of the proposed action
- relevant comments from other Australian Government and state and territory government ministers
- environmental history of the individual or company proposing to take the action

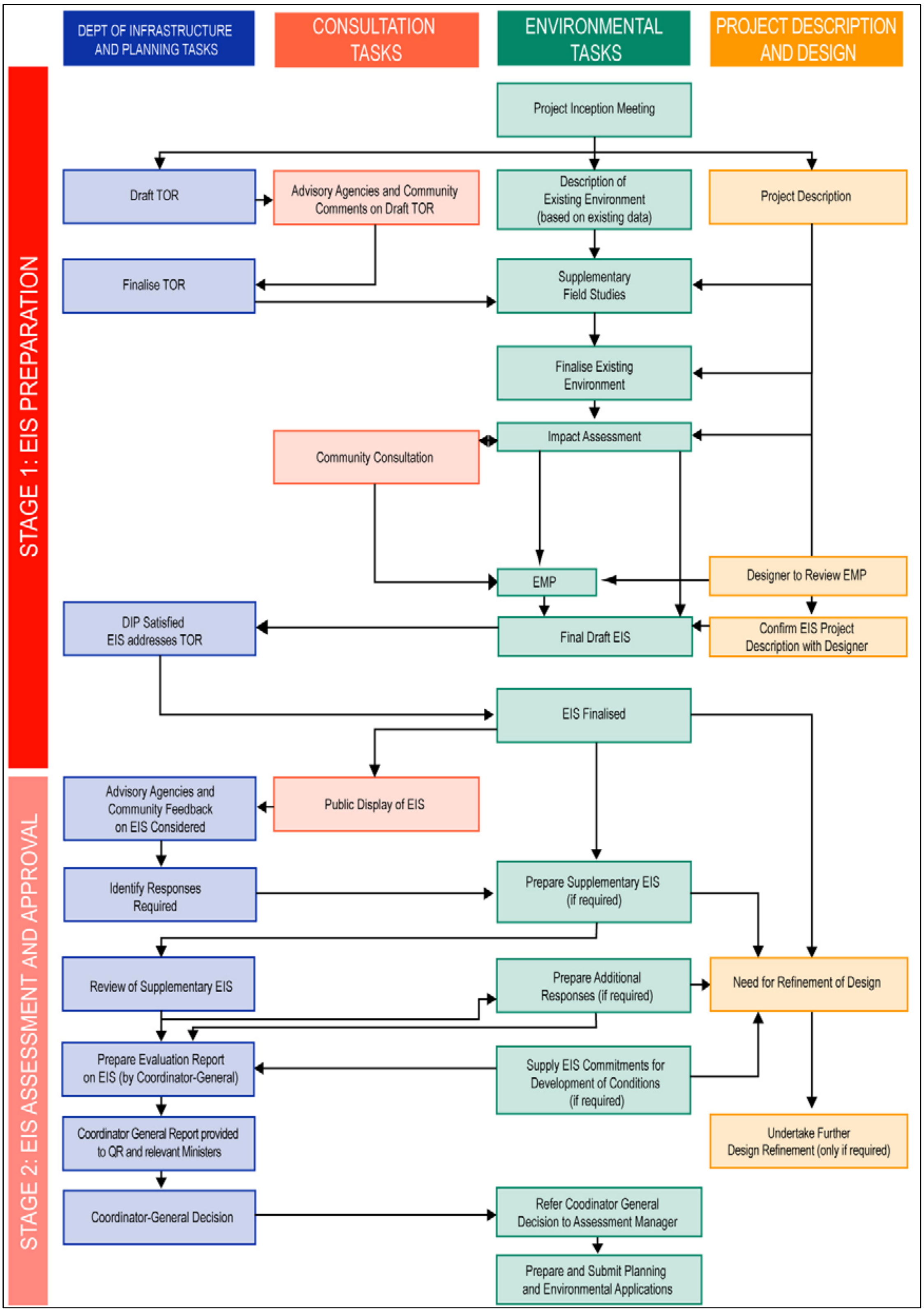
Once the Minister has made a decision DBCTM receives a copy of the approval or notice of the refusal, and if approved DBCTM can proceed with obtaining the required Material Change of Use and Operational Works Development Permits.

Critical Issues

The following are critical issues for this process:

- Declaration of the project as a Significant Project by the Coordinator General under the SDPWO Act
- Obtaining Owner's Consent and Resource Entitlement (for all land required for the expansion) to be able to lodge the required Development Applications
- Native Title and any Cultural Heritage Matters resolved
- Road closures and land acquisition are resolved

Figure 3 EIS Process



12. Implementation Schedule

12.1 Basis of schedule

The implementation schedule for the study phase of the project assumes that a preliminary engineering/ feasibility phase will need to be undertaken prior to project approval, but that a lot of the design will be similar in detail to the current DBCT 7X expansion.

The implementation schedule for the planning and environmental approvals process and timing is based on our current knowledge of the planning and environmental issues for the various sites and on our experience with the timing associated with these processes for other similar projects.

It is assumed that the DBCT 8X/9X project will be delivered with an EPCM process. The implementation schedule for the engineering, procurement and construction of the works has been developed by adopting durations for similar scope of works from the DBCT 7X Expansion Project, where applicable. No detailed construction scheduling for the proposed scope of works has been undertaken to date.

The schedule has been developed as an optimistic target schedule. No time contingency has been allowed. We believe the following items are tight and have a risk on overrunning this schedule;

- All items involving tenure, as this is dependent on third party input – i.e. Native Title, Owner's Consent and Resource Entitlement, and Gazettal of land as Strategic Port Land.
- Options Studies and Project Definition – 6 months is tight considering the large scope of works, and that detailed design of 8X is occurring concurrently with the concept design/scope definition of 9X. This is especially a challenge for the civil works, because all of the elements are new works.
- Construction period for 9X stockyard is quite tight. It is assumed around three times the equipment/labour etc. compared with 7X stockyard construction will be able to be mobilised. Also there is some overlap of civil works with SME works which may or may not be achievable when considered in more detail.
- The approach for developing the engineering and construction durations has been to adopt times for similar items from 7X. No allowance has been made for the increased complexity of interfaces and management during engineering, construction, and commissioning due to the increased scope of works.

12.1.1 8X Expansion

For the 8X expansion, it is assumed that preliminary engineering and a cost estimate will be sufficient to secure funding and project approval from DBCTM Pty Ltd. It is also assumed that detailed engineering will be undertaken concurrently with this process. It is assumed that detailed design will not be complete at the time of tender. The study and engineering for this phase is compressed and is the critical path for this phase.

The target date for funding secured, project approved, and first contract awarded is end of January 2010. The target date for completion of construction is November 2012. Construction has the potential to have a significant impact on the capacity of existing stockyard Rows 1, 2, and 3 if not well scheduled and co-ordinated with Operations. The duration and extent of this impact is currently being studied.

12.1.2 9XA Expansion

It is assumed that a feasibility study be undertaken for 9XA and 9XB in one single process. Funding and project approval can then be sought for the entire 9X expansion. It is assumed that detailed engineering can commence prior to project funding and approval. It is assumed that project approval will be subject to environmental and planning approvals being in place and that construction contracts cannot be let until environmental and planning approvals are in place. The environmental and planning approvals process and detailed engineering are both critical paths for this phase, through to the stockyard construction.

12.2 Comparison of Schedule for different sites

It has been assumed that the construction durations for each of the sites is similar for the 9X expansion. Dudgeon Pt and Southern Stockyard sites both have more civil infrastructure to construct (e.g. industrial dam, access roads, buildings and facilities) than the 9XA expansion for the Louisa Creek Site where the existing stockyard is expanded. However, Rows 8,9,10 of the existing stockyard are a very constrained site where it will be more difficult to work on multiple fronts and more conveyors are required. So, at this stage it is assumed that construction durations will be similar.

Hence the key differentiator between the sites with respect to schedule is the approvals process. There are primarily two types of approvals processes that could be adopted, namely, adopting an EIS process for the whole of the 9X Expansion, or adopting a Development application for 9XA and an EIS process for 9XB

The two types of implementation schedules are attached in Appendix D, and the key milestone dates are summarized below:

Milestone	9X as EIS process	9XA as development application and 9XB as EIS process	Capacity
8X - Financing and Project Approval	January 2010	January 2010	
9X - Financing and Project Approval	March 2011	March 2011	
8X Completion of Construction	November 2012	November 2012	88 Mtpa
9XA Planning Approvals Secured	July 2012	November 2011	
9XA Completion of Construction	February 2015	June 2014	111 Mtpa
9XB Planning Approvals Secured	July 2012	November 2012	
9XB – Interim Commissioning	December 2015	April 2015	122 Mtpa
9XB – Completion of Construction	December 2016	April 2016	152 Mtpa

There is approximately an 8 month advantage if it is possible to undertake the approvals process as 9XA as a development application and 9XB as an EIS process. The Louisa Creek site definitely has this advantage; the Dudgeon Point Site definitely does not have this advantage. There is a possibility that the Southern Stockyard site may have this advantage, but at this stage it is prudent to assume that it will be preferable to adopt an EIS process for the whole 9X expansion project, which will put the Southern Stockyard option it onto the same schedule as the Dudgeon Point option.

13. Conclusion

13.1 Recommendation of the preferred site

The Louisa Creek site is the least preferred site because:

- It has the highest capital cost.
- It has the most number of individual owners of land, making the land acquisition task more complex.
- It is less preferred than the Southern Stockyard option based on a preliminary environmental impact assessment, and an assessment of the risks of causing delays to the planning and approvals process.
- It is the most difficult to construct, particularly for the 9XA scope of works.
- It has the most brownfield's works, resulting in the most disturbance to operations during construction.
- It is land constrained, and has an ultimate future capacity of 179 Mtpa

The Southern Stockyard site and the Dudgeon Point site have a similar capital cost estimate for the project, and a similar ability to expand to a ultimate capacity of 186 Mtpa which fully utilises six outloading strings. Therefore the sites need to be differentiated on the other non-capital cost criteria.

It is recommended that the Southern Stockyard is the preferred site for the following reasons:

- The Southern Stockyard site is the preferred site for environmental criteria, based on a preliminary environmental impact assessment, and an assessment of the risks of causing delays to the planning and approvals process.
- The Southern Stockyard site is closer to the existing terminal, so it is less complex to integrate the operations and maintenance of two terminals than the Dudgeon Point site.
- The Southern Stockyard is expected to have lower operations and maintenance costs than the Dudgeon Point terminal.
- The Dudgeon Point site requires more offsite infrastructure to link it back to the existing roads, power supply and water supply.
- At this stage it is recommended that the implementation programme be based on adopting an EIS Approvals process for the entire 9X expansion (9XA and 9XB) for both sites. The Dudgeon Point site will definitely need to adopt an EIS process for the entire 9X expansion, because of the extent of works proposed in 9XA. Depending on more detailed studies, there may be an opportunity for the Southern Stockyard option to adopt a development application process for 9XA and an EIS process for 9XB, resulting in a potential time saving for implementation of the project of up to 8 months. But at this stage, when all of the environmental issues are not yet defined, this time saving should not be relied upon.

The Dudgeon Point site does have the advantage of less interaction with the existing terminal during construction than the Southern Stockyard site. But this advantage is judged to be less important than the ongoing disadvantage of more complex operations and maintenance with the Dudgeon Point site being more remote to the Southern Stockyard site. The Southern Stockyard site does not require any conveyor tie-ins with the existing terminal ,so even though the interaction with the existing terminal during construction is more than the Dudgeon Point site, it is still significantly less than the current 7X expansion (by an order of magnitude), and can be appropriately managed.

On the basis of this assessment the Southern Stockyard is recommended to be the preferred site.

It is noted that one the key reasons that the Southern Stockyard is the preferred site at this stage is that it is expected that the operations and maintenance costs for the Southern Stockyard site will be less than the Dudgeon Point site. This is currently based on a qualitative overview assessment. It is recommended that DBCTM consider the option of undertaking an additional task of quantifying the comparative operational and maintenance costs for the Southern Stockyard and Dudgeon Point sites, to add more weight to, and confirm, this assessment.

13.2 Future studies and investigations

As mentioned in Section 2 of this report, this study is based on conceptual layout and high level assessment of scope of works and capital cost estimate. Many tasks are still required to be undertaken to further define the scope of the project for any given site. It is considered that the extent of work undertaken to date is sufficient to compare the sites. The only possible additional work on site comparison that may be beneficial is as described in Section 13.1 above, a quantitative comparison of operations and maintenance costs for the Southern Stockyard and Dudgeon Point sites.

Assuming that DBCTM adopt the recommendation of the Southern Stockyard as the preferred site, the following issues/tasks have been identified that require further study to further define the scope of the project. Not all of these items will be able to be addressed prior to the development of a P90 estimate at a cost/risk workshop at the beginning of May 2009. Hence, the items that are judged to have the biggest impact on scope of works/cost/risk will be selected in conjunction with DBCTM, to be studied prior to the cost/risk workshop.

Area	Item No.	Item
Existing Terminal (8X)	1	Preliminary design of civil works in Rows 1,2 3.
	2	Review potential logic of including OL2 upgrade to 8650tph to achieve potential +1.0MTPa at 8X stage to match stockyard zone 2 potential.
Rail Loop	3	Relayout Loop to ensure feasibility and identify land acquisition issues, and to locate dump station, and hence inloading conveyors.
Inloading	4	Dump Station - cost range of concrete shell depending on extent of cut/fill and varying geotechnical conditions.
Stockyard	5	Review remnant pile philosophy with respect to the numbers of piles required and the preference for part or full train stacking. May have significant impact on space required for remnant yard. Possible outcomes are additional row in southern yard to accommodate remnants and extension of Row 8 + stacker to accommodate remnants. Will require survey of user preferences with respect to no. brands/user to be kept separate.
	6	Optimisation of cut/fill balance and assessment of any requirements for retaining structures etc. Cost range on civil works depending on types of geotechnical conditions encountered.
	7	Capacity requirements of industrial dam, and how/where overflow is handled. Overall assessment and scope definition of hydraulic and drainage requirements for the site.
	8	Drainage concept for new stockyard - is there a way to avoid cross drains splitting the stockyard.

Area	Item No.	Item
	9	Option of sloped bund walls on Stacker bunds with longer Stacker booms.
	10	Advice to what extent, if any, the environmental bund will increase rail noise for Salonika Beach.
Outloading - general	11	Option of adoption of higher shiploading rates and surge bin sizes in case this might give some capacity advantage for when higher reclaim rates can be achieved with 50/50 blending with the new large reclaimers.
Outloading Onshore	12	Overland route - comparison of routes over and around existing rail loop.
Outloading Offshore	13	Cost range on offshore piling depending on types of geotechnical conditions encountered.
	14	Functionality at wharf/jetty transfer, which jetty conveyors should feed which shipping conveyors. How much flexibility is desirable?
	15	Jetty Alignment Study - Option 1 - adjacent to existing structure, but stand alone Option 2 - laterally supported off existing jetty - wind tunnel test to confirm viability Option 3 - new alignment to simplify onshore conveyor access to jetty Option 4 - new alignment feeding directly into Berth No. 5
	16	Layout of SL5 tail end to define location of OL5 shipping conveyor - can it be inboard of the OL4 slot?
	17	Layout of rear portion of wharf on Berth 3/4 - Are two piles required per 28m span, or is it possible to support OL4,OL5, and second roadway with one pile per 28m span?
	18	Layout of typical wharf cross-section - Berth 5/6 - Is there a better structural form given that the full width wharf will be built in one stage?
	19	Layout of OL4 transfer tower and platform - to better define the scope of works at this location
	20	Layout of OL5 transfer tower and platform (2 possible locations depending on jetty alignment study) - may be required to a certain extent to feed into item 2 - location of OL5 shipping conveyor.
Onsite Infrastructure	21	Assessment and layout of HV requirements. Assessment and definition of all electrical, control, IT, and communications scope of works
	22	Definition of requirements and location for buildings/carpark etc.
Offsite Infrastructure	23	Is power supply adequate?
	24	Definition of scope of works for external road upgrades.
	25	Is water supply adequate?

Appendix A

Expansion Matrix and Outloading Capacity Spreadsheet

DBCT Post 85 Mtpa Options Study

Expansion Path - Southern Stockyard and Dudgeon Stockyard Options

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Notes
7X	7X	**Existing - Rows 7 and 8 used for remnants**	IL1	27.8	Row 1,2	23.5	OL1	27.4	OL1	23.5	Based upon Remnant system with whole trains stacked.(1.81% * throughput in main stockyard.)
			IL2	27.8	Row 3,4	29.1	OL2	27.4	OL2	27.4	
			IL3	31.6	Row 5,6	34.0	OL3	34.7	OL3	34.0	
			TOTAL	**87.2**	TOTAL	**86.7**	TOTAL	**89.5**	TOTAL	**84.9**	**84.9**

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Notes
8x	a	**Minor Increment - Walls on Bunds 1 & 3, ST2 upgrade, New SR1 - Rezone**	IL1	27.8	Row 3,4	29.3	OL1	27.4	OL1	27.4	Based upon Remnant system with whole trains stacked.(1.81% * throughput in main stockyard.)
			IL2	27.8	Row 5,6	29.0	OL2	27.4	OL2	27.4	
			IL3	33.9	Row 1,2	35.0	OL3	34.7	OL3	34.7	
			TOTAL	**89.5**	TOTAL	**93.3**	TOTAL	**89.5**	TOTAL	**89.5**	**89.5**

The shaded value of 33.9MTPa requires some avoidance of operation of IL3 via stacker ST1 to remove about 50% of the IL3 stacking tasks that might otherwise have been directed to ST1 with no limit on use of ST1 from IL3. Note that use of IL3 with no limitation on the destination stacker would yield 32.26MTPa capacity through IL3. Complete avoidance of ST1 but allowing for stacking to Row 8 remnant yard via SR6 (or upgrading ST1) would yield 34.6MTPa.

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL		Notes
9XA	b	**IL4, OL4, Rows 1,2,3 New stockyard**	IL1	27.8	Zone 1	27.3	OL1	27.4	OL1	27.3	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	29.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	28.1	OL3	28.4	OL3	28.1	
			IL4	34.9	Zone 4	35.2	OL4	28.4	OL4	28.4	
			TOTAL	**123.1**	TOTAL	**119.7**	TOTAL	**111.6**	TOTAL	**111.2**	**111.2**

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL		Notes
9XB	c	**Berth 5 North, Add half Row 4of NFD, OL5 connector to OL1,OL2,OL3 only**	IL1	27.8	Zone 1	29.1	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	28.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	37.1	OL3	34	OL3	34.0	
			IL4	34.9	Zone 4	35.2	OL4	34	OL4	34.0	
			TOTAL	**123.1**	TOTAL	**129.5**	TOTAL	**122.8**	TOTAL	**122.8**	**122.8**
	d	**IL5, OL5 , Complete Row 4 and add Row 5 to NFD**	IL1	27.8	Zone 1	27.3	OL1	27.4	OL1	27.3	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	29.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	28.1	OL3	28.4	OL3	28.1	
			IL4	34.9	Zone 4	35.2	OL4	28.4	OL4	28.4	
			IL5	34.9	Zone 5	35.2	OL5	28.4	OL5	28.4	
			TOTAL	**158**	TOTAL	**154.9**	TOTAL	**140**	TOTAL	**139.6**	**139.6**
	e	**Berth 6 North,**	IL1	27.8	Zone 1	27.3	OL1	27.4	OL1	27.3	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	29.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	28.1	OL3	28.4	OL3	28.1	
			IL4	34.9	Zone 4	35.2	OL4	34.7	OL4	34.7	
			IL5	34.9	Zone 5	35.2	OL5	34.7	OL5	34.7	
			TOTAL	**158**	TOTAL	**154.9**	TOTAL	**152.6**	TOTAL	**152.2**	**152.2**

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL		Notes
Future	f	**Berth 7 North, Add half of 6th stockpile in NFD, OL6 Connector to OL3.**	IL1	27.8	Zone 1	29.1	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	28.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	37.1	OL3	34.7	OL3	34.7	
			IL4	34.9	Zone 4	35.2	OL4	34	OL4	34.0	
			IL5	34.9	Zone 5	35.2	OL5	34	OL5	34.0	
			TOTAL	**158**	TOTAL	**164.7**	TOTAL	**157.5**	TOTAL	**157.5**	**157.5**

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL		Notes
Future	g1	**IL6, OL6, Complete Row 6 and add 7th Row in NFD**	IL1	27.8	Zone 1	27.3	OL1	27.4	OL1	27.3	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	29.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	28.1	OL3	28.4	OL3	28.1	
			IL4	34.9	Zone 4	35.2	OL4	34	OL4	34.0	
			IL5	34.9	Zone 5	35.2	OL5	34	OL5	34.0	
			IL6	34.9	Zone 6	35.2	OL6	28.4	OL6	28.4	
			TOTAL	**192.9**	TOTAL	**190.0**	TOTAL	**179.6**	TOTAL	**179.2**	**179.2**
	h1	**Berth 8 North**	IL1	27.8	Zone 1	27.3	OL1	27.4	OL1	27.3	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	29.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	28.1	OL3	28.4	OL3	28.1	
			IL4	34.9	Zone 4	35.2	OL4	34	OL4	34.0	
			IL5	34.9	Zone 5	35.2	OL5	34	OL5	34.0	
			IL6	34.9	Zone 6	35.2	OL6	34.7	OL6	34.7	
			TOTAL	**192.9**	TOTAL	**190.0**	TOTAL	**185.9**	TOTAL	**185.5**	**185.5**

step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL		Notes
g2	**Berth 2A South, complete 6th**	IL1	27.8	Zone 1	27.6	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
		IL2	27.8	Zone 2	41.4	OL2	33.5	OL2	33.5	
		IL3	32.6	Zone 3	38.9	OL3	34.7	OL3	34.7	
		IL4	34.9	Zone 4	36.1	OL4	34	OL4	34.0	
		IL5	34.9	Zone 5	36.1	OL5	34	OL5	34.0	
		TOTAL	**158**	TOTAL	**180.0**	TOTAL	**163.6**	TOTAL	**163.6**	**158.0**

DBCT Post 85 Mtpa Options Study

Expansion Path - Louisa Creek Option

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Notes
7X	7	Existing - Rows 7 and 8 used for remnants	IL1	27.8	Zone 1	23.5	OL1	27.4	OL1	23.5	Based upon Remnant system with whole trains stacked.(1.81% * throughput in main stockyard.)
			IL2	27.8	Zone 2	29.1	OL2	27.4	OL2	27.4	
			IL3	31.6	Zone 3	34.0	OL3	34.7	OL3	34.0	
			TOTAL	**87.2**	TOTAL	**86.7**	TOTAL	**89.5**	TOTAL	**84.9**	**84.9**

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Notes
8x	a	Minor Increment - Walls on Bunds 1 & 3, ST2 upgrade, New SR1 - Rezone	IL1	27.8	Row 3,4	29.3	OL1	27.4	OL1	27.4	Based upon Remnant system with whole trains stacked.(1.81% * throughput in main stockyard.)
			IL2	27.8	Row 5,6	29.0	OL2	27.4	OL2	27.4	
			IL3	33.9	Row 1,2	35.0	OL3	34.7	OL3	34.7	
			TOTAL	**89.5**	TOTAL	**93.3**	TOTAL	**89.5**	TOTAL	**89.5**	**89.5**

The shaded value of 33.9MTPa requires some avoidance of operation of IL3 via stacker ST1 to remove about 50% of the IL3 stacking tasks that might otherwise have been directed to ST1 with no limit on use of ST1 from IL3. Note that use of IL3 with no limitation on the destination stacker would yield 32.26MTPa capacity through IL3. Complete avoidance of ST1 but allowing for stacking to Row 8 remnant yard via SR6 (or upgrading ST1) would yield 34.6MTPa.

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Notes
9XA	b	Maximise Existing Footprint Development - IL4, OL4, Row 8, plus remnant store in Rows 9 and 10	IL1	27.8	Zone 1	29.1	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	27.3	OL2	27.4	OL2	27.3	
			IL3	32.6	Zone 3	28.1	OL3	28.4	OL3	28.1	
			IL4	34.9	Zone 4	28.1	OL4	28.4	OL4	28.1	
			TOTAL	**123.1**	TOTAL	**112.6**	TOTAL	**111.6**	TOTAL	**110.9**	**110.9**

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Notes
9XB	c	Berth 5 North, Add Row 1of NFD	IL1	27.8	Zone 1	29.1	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard). OL4 only needs to be connected to Row 4
			IL2	27.8	Zone 2	28.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	36.3	OL3	34	OL3	34.0	
			IL4	34.9	Zone 4	38.5	OL4	34	OL4	34.0	
			TOTAL	**123.1**	TOTAL	**132.0**	TOTAL	**122.8**	TOTAL	**122.8**	**122.8**
	d	IL5, OL5, add rows 2,3 and 4 to NFD (2 rows are for remnants)	IL1	27.8	Zone 1	29.1	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	27.3	OL2	27.4	OL2	27.3	
			IL3	32.6	Zone 3	28.1	OL3	28.4	OL3	28.1	
			IL4	34.9	Zone 4	28.1	OL4	28.4	OL4	28.1	
			IL5	34.9	Zone 5	34.0	OL5	28.4	OL5	28.4	
			TOTAL	**158**	TOTAL	**146.6**	TOTAL	**140**	TOTAL	**139.3**	**139.3**
	e	Berth 6 North, Add 5th stockpile row in NFD	IL1	27.8	Zone 1	29.1	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	28.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	36.3	OL3	34	OL3	34.0	
			IL4	34.9	Zone 4	38.7	OL4	34	OL4	34.0	
			IL5	34.9	Zone 5	34.0	OL5	28.4	OL5	28.4	
			TOTAL	**158**	TOTAL	**166.2**	TOTAL	**151.2**	TOTAL	**151.2**	**151.2**

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Notes
Future	f	Berth 7 North	IL1	27.8	Zone 1	29.1	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
			IL2	27.8	Zone 2	28.1	OL2	27.4	OL2	27.4	
			IL3	32.6	Zone 3	36.3	OL3	34.7	OL3	34.7	
			IL4	34.9	Zone 4	38.7	OL4	34	OL4	34.0	
			IL5	34.9	Zone 5	34.0	OL5	34	OL5	34.0	
			TOTAL	**158**	TOTAL	**166.2**	TOTAL	**157.5**	TOTAL	**157.5**	**157.5**

Stage	step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Terminal Capacity
Future	g1	IL6, OL6, Add 6th stockpile row in NFD	IL1	27.8	Zone 1	29.1	OL1	27.4	OL1	27.4	No stockyard space identified for Row 7
			IL2	27.8	Zone 2	27.3	OL2	27.4	OL2	27.3	
			IL3	32.6	Zone 3	28.1	OL3	28.5	OL3	28.1	
			IL4	34.9	Zone 4	28.1	OL4	28.5	OL4	28.1	
			IL5	34.9	Zone 5	34.0	OL5	34	OL5	34.0	
			IL6	34.9	Zone 6	35.2	OL6	34	OL6	34.0	
			TOTAL	**192.9**	TOTAL	**181.8**	TOTAL	**179.8**	TOTAL	**178.9**	**178.9**

step	Modification	Capacity: Inload		Stockyard		Outload		Net SY/OL Capacity		Terminal Capacity
g2	Berth 2A South, Add a 6th stockpile row in NFD	IL1	27.8	Zone 1	27.6	OL1	27.4	OL1	27.4	Based upon Remnant system with part trains stacked.(2.19% * throughput in main stockyard).
		IL2	27.8	Zone 2	41.4	OL2	33.5	OL2	33.5	
		IL3	32.6	Zone 3	43.3	OL3	34.7	OL3	34.7	
		IL4	34.9	Zone 4	34.5	OL4	34	OL4	34.0	
		IL5	34.9	Zone 5	36.1	OL5	34	OL5	34.0	
		TOTAL	**158**	TOTAL	**182.9**	TOTAL	**163.6**	TOTAL	**163.6**	**158.0**

Appendix B

Drawings

Drawing List

DBCT POST 85MTPa STUDY	
Drawing No.	Title
SK–C-00-0100	PROPERTY BOUNDARIES ARRANGEMENT – SHEET 1/6
SK–C-00-0101	PROPERTY BOUNDARIES ARRANGEMENT – SHEET 2/6
SK–C-00-0102	PROPERTY BOUNDARIES ARRANGEMENT – SHEET 3/6
SK–C-00-0103	PROPERTY BOUNDARIES ARRANGEMENT – SHEET 4/6
SK–C-00-0104	PROPERTY BOUNDARIES ARRANGEMENT – SHEET 5/6
SK–C-00-0105	PROPERTY BOUNDARIES ARRANGEMENT – SHEET 6/6
SK–C-03-0100	DALRYMPLE BAY COAL TERMINAL – APPROACH JETTY OPTIONS - SECTIONS
SK–C-03-0101	DALRYMPLE BAY COAL TERMINAL – NEW BERTHS 5, 6 & 7 – GENERAL ARRANGEMENT
SK–C-04-0100	DBCT TERMINAL – CURRENT RAIL INFRASTRUCTURE – LINE DIAGRAM
SK–C-08-0100	POST 85 CONCEPT STUDY – OPTIONS OVERVIEW ARRANGEMENT
SK–C-08-0101	8X STOCKYARD UPGRADE – ROWS 1, 2 & 3
SK–C-08-0102	STOCKYARD CAPACITY LAYOUT – ROWS 4 TO 8 – EXISTING STAGE 7 CAPACITY
SK–C-08-0103	STOCKYARD CAPACITY LAYOUT – ROWS 4 TO 8 – 8X CAPACITY GAIN

SOUTHERN STOCKYARD OPTION	
Drawing No.	Title
SK–S-08-0100	SOUTHERN STOCKYARD OPTION – LAYOUT 152MTPa
SK–S-08-0101	SOUTHERN STOCKYARD OPTION – ARRANGEMENT 1/2
SK–S-08-0102	SOUTHERN STOCKYARD OPTION – ARRANGEMENT 2/2
SK–S-08-0103	SOUTHERN STOCKYARD OPTION – OUTLOADING CONVEYORS ARRANGEMENT
SK–S-08-0104	SOUTHERN STOCKYARD – RAIL RECEIVAL & CONVEYOR S21 ELEVATION
SK–S-08-0105	SOUTHERN STOCKYARD – INLOADING & OUTLOADING CONVEYORS S24/S25 & L21/L22 – PLAN & LONG SECTIONS
SK–S-08-0106	SOUTHERN STOCKYARD – STOCKYARD LONG SECTIONS
SK–S-08-0107	SOUTHERN STOCKYARD – OUTLOADING CONVEYORS L24a/L25a – PLAN & LONG SECTIONS
SK–S-08-0108	SOUTHERN STOCKYARD – OUTLOADING CONVEYORS L24/L25
SK–S-08-0109	SOUTHERN STOCKYARD – OUTLOADING CONVEYORS L27/L28 –

	THROUGH EXISTING STOCKYARD AREA
SK–S-08-0110	SOUTHERN STOCKYARD – OUTLOADING CONVEYORS L27
SK–S-08-0111	SOUTHERN STOCKYARD – OUTLOADING CONVEYORS L210, L211 – ACROSS NORTHERN END OF EXISTING STOCKYARD
SK–S-04-0100	SOUTHERN STOCKYARD OPTION – CIVIL WORKS – SITE ARRANGEMENT
SK–S-04-0101	SOUTHERN STOCKYARD OPTION – RAIL INFRASTRUCTURE – LINE DIAGRAM
SK–S-04-0102	SOUTHERN STOCKYARD OPTION – RAIL INFRASTRUCTURE – RAIL LOOP ARRANGEMENT
SK–S-04-0103	SOUTHERN STOCKYARD OPTION – ALTURNATE RAIL INFRASTRUCTURE – RAIL LOOP ARRANGEMENT

LOUISA CREEK OPTION	
Drawing No.	Title
SK–L-08-0100	DALRYMPLE BAY COAL TERMINAL – LAYOUT 152MTPa – LOUISA CREEK OPTION
SK–L-08-0101	LOUISA CREEK OPTION – NEW RAIL LOOP
SK–L-08-0102	LOUISA CREEK OPTION – STOCKYARD ARRANGEMENT
SK–L-08-0103	LOUISA CREEK OPTION – EXISTING STOCKYARD EXPANSION - PLAN
SK–L-08-0104	LOUISA CREEK OPTION – EXISTING STOCKYARD EXPANSION – CROSS SECTIONS
SK–L-08-0105	LOUISA CREEK OPTION – NEW STOCKYARD - PLAN
SK–L-08-0106	LOUISA CREEK OPTION – NEW STOCKYARD - CROSS SECTIONS
SK–L-08-0107	LOUISA CREEK OPTION – SCHEMATIC LAYOUT 1
SK–L-08-0108	LOUISA CREEK OPTION – SCHEMATIC LAYOUT 2
SK–L-04-0100	LOUISA CREEK OPTION – CIVIL WORKS – SITE ARRANGEMENT
SK–L-04-0101	LOUISA CREEK OPTION – RAIL INFRASTRUCTURE – LINE DIAGRAM
SK–L-04-0102	LOUISA CREEK OPTION – RAIL INFRASTRUCTURE – RAIL LOOP ARRANGEMENT

DUDGEON POINT OPTION	
Drawing No.	Title
SK–D-08-0100	DALRYMPLE BAY COAL TERMINAL – LAYOUT 152MTPa – DUDGEON POINT OPTION
SK–D-08-0101	DUDGEON POINT OPTION – NEW STOCKYARD - PLAN
SK–D-04-0100	DUDGEON POINT OPTION - CIVIL WORKS – SITE ARRANGEMENT
SK–D-04-0101	DUDGEON POINT OPTION – RAIL INFRASTRUCTURE – LINE DIAGRAM

Appendix C

Preliminary Cost Estimate

Job No: H329544
Project: 8X/9X Expansion Site Selection Study

Subject: **DBCT 8X/9X Southern Stockyard Option**

8X Feasibility Study and Approvals

FEASIBILITY		Hrs	Ave rate ($/Hr)		
Study Management		400	325		$ 130,000.00
Data Collection	Geotech				
	CH	1000	$ 230	$ 230,000	
	Contractor			$ 210,000	$ 440,000
	Topographical Survey			$ 250,000	$ 250,000
Planning and Environment Approvals				$ 45,000	$ 45,000
Preliminary Engineering and Cost Estimates	Including SR1 to Tender	3,700	250	$ 925,000	$ 925,000
DBCT Managment Costs	20% of planing + Eng			$ 194,000	$ 194,000
SUBTOTAL	8X Feasibility Study				$ 1,984,000
CONTINGENCY					
	15%				$ 297,600.00
TOTAL 8X Feasibility					$ 2,281,600

8X Project

Area	Component Name	% factor (where used)	Proprietary free issue	Other	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)
CONSTRUCTION WORKS							
Civil	Civils for Row 1, 2, 3 stockyard upgrade, Bunds 1 & 3 upgrade			$ 83,764,800	$ 83,764,800	10%	$ 92,141,280
	Development of north end of Row 9 & 10 only, and preparation of laydown areas			$ 43,367,400	$ 43,367,400	10%	$ 47,704,140
Machines	Stacker Reclaimer SR1A			$ 23,137,326	$ 23,137,326	20%	$ 27,764,791
	Boom rest mods, cable/hose pit mods, hold/down mods, Buffer Mods on Bund.			$ 304,421	$ 304,421	10%	$ 334,863
Upgrade Conveyors	Upgrade R2		$ 1,480,324	$ 6,798,440	$ 8,278,764	10%	$ 9,106,640
	Upgrade ST2 Boom		$ 451,260	$ 300,000	$ 751,260	10%	$ 826,386
	Upgrade S6A		$ 496,610	$ 300,000	$ 796,610	10%	$ 876,271
	Upgrade S6		$ 1,116,660	$ 500,000	$ 1,616,660	10%	$ 1,778,325
HV upgrades	25% of conveyor costs	25%	$ 3,544,854	$ 7,898,440	$ 2,860,823	10%	$ 3,146,906
Stockpile Spray Rework			$ 536,007	$ 5,016,076	$ 5,552,083	10%	$ 6,107,291
SUBTOTAL	8X Construction Works				$ 170,430,147		$ 189,786,894
ENGINEERING							
Detailed Engineering	(exc. SR1) % of Capital Works	4.72%		$ 7,640,688	$ 7,640,688		
Project Management - Home office and Site	% of Capital Works	11.34%		$ 21,515,415	$ 21,515,415		
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 324,676	$ 324,676		
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 690,887	$ 690,887		
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 237,581	$ 237,581		
		16.71%					
Control Systems Software				$ 125,000	$ 125,000		
Manuals and Training	% of Capital Works	0.43%		$ 806,909	$ 806,909		
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 9,791,830	$ 9,791,830		
SUBTOTAL	8X Engineering				$ 41,132,986		
CONTINGENCY							
	Scope Growth During Engineering Development (15%)				$ 34,637,982		
TOTAL 8X Project					$ 265,557,863	$/Tpa	
						$ 80	

Job No: H329544

Project: 8X/9X Expansion Site Selection Study

Subject: DBCT 8X/9X Southern Stockyard Option

PHASE 9XA/B Feasibility Study and Approvals					
ENGINEERING and PLANNING		Hrs	Ave rate ($/Hr)		
Options Study		18,000	250	$ 4,500,000	$ 4,500,250
Data Collection	Geotech offshore - Seismic Investigation			$ 465,000	$ 465,000
	Geotech Offshore - boreholes				
	CH			$ 2,750,000	$ 2,750,000
	Contractor			$ 9,650,000	$ 9,650,000
	Geotech Onshore				
	CH			$ 689,500	$ 689,500
	Contractor			$ 588,000	$ 588,000
	Topographical Survey			$ 585,200	$ 585,200
	Marine Conditions modelling and Simulation			$ 300,000	$ 300,000
Planning and Environment Approvals	8X early works			$ 70,000	$ 70,000
	9X A			$ 1,000,000	$ 1,000,000
	9X B			$ 1,750,000	$ 1,750,000
Preliminary Engineering and Cost Estimates		70,000	250	$ 17,500,000	$ 17,500,000
Simulation modelling -	Terminal Performance Modelling			$ 2,000,000	$ 2,000,000
DBCT Management Costs	20% of planing + Eng + Simulation			$ 5,364,000	$ 5,364,000
SUBTOTAL	9XA/B Feasibility Engineering				$ 47,211,950
CONTINGENCY					
	15%				$ 7,081,793
TOTAL 9XA/B feasibility					$ 54,293,743

9XA PROJECT			BASED ON 7X Costs					
Area	Component Name	% factor (where used)	Proprietary free issue	Other	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)	Total for Area (escalated to Feb 09)
CONSTRUCTION WORKS								
Civil Works	MOBILISATION AND DEMOBILISATION			$ 18,306,750	$ 18,306,750	10%	$ 20,137,425	
	PROVISION FOR TRAFFIC			$ 2,190,000	$ 2,190,000	10%	$ 2,409,000	
	DRAINAGE			$ 6,181,850	$ 6,181,850	10%	$ 6,800,035	
	EARTHWORKS			$ 326,684,838	$ 326,684,838	10%	$ 359,353,321	
	ROAD AND HARDSTANDS			$ 24,043,667	$ 24,043,667	10%	$ 26,448,033	
	ENVIRONMENTAL CONTROLS			$ 11,489,600	$ 11,489,600	10%	$ 12,638,560	
	SIGNAGE AND LINEMARKING			$ 766,933	$ 766,933	10%	$ 843,627	
	UNDERGROUND SERVICES			$ 1,000,000	$ 1,000,000	10%	$ 1,100,000	
	SUPERVISION AND ADMINISTRATION			$ 11,719,909	$ 11,719,909	10%	$ 12,891,900	$ 442,621,901
Inloading No. 4	IL4 Pit and Tunnel			$ 22,028,637	$ 22,028,637	10%	$ 24,231,501	
	IL5 Pit and Tunnel			$ 22,028,637	$ 22,028,637	10%	$ 24,231,501	
	RRP4 Wagon Vibrator		$ 1,754,645		$ 1,754,645	10%	$ 1,930,110	
	Rail Receival Pit RRP4 inc BF21		$ 791,704	$ 46,658,302	$ 47,450,006	10%	$ 52,195,006	
	Rail Receival sound attenuation			$ 100,000	$ 100,000	10%	$ 110,000	
	Conveyor S21		$ 1,979,578	$ 12,079,388	$ 14,058,966	10%	$ 15,464,863	
	Conveyor S24		$ 2,257,641	$ 27,331,088	$ 29,588,728	10%	$ 32,547,601	$ 150,710,581
New Stockyard	Conveyor S27		$ 3,911,282	$ 16,071,175	$ 19,982,456		$ 19,982,456	
	Conveyor S29		$ 3,377,493	$ 14,040,125	$ 17,417,618	10%	$ 19,159,380	
	Conveyor R21		$ 3,989,888	$ 16,874,704	$ 20,864,592	10%	$ 22,951,052	
	Conveyor R23		$ 3,447,657	$ 14,867,834	$ 18,315,491	10%	$ 20,147,040	
	Conveyor R24		$ 3,447,657	$ 14,867,834	$ 18,315,491	10%	$ 20,147,040	
	Reclaimer RL3			$ 20,483,026	$ 20,483,026	20%	$ 24,579,631	
	Reclaimer RL5			$ 20,483,026	$ 20,483,026	20%	$ 24,579,631	
	Reclaimer RL6			$ 20,483,026	$ 20,483,026	20%	$ 24,579,631	
	Stacker ST5			$ 13,083,439	$ 13,083,439	20%	$ 15,700,127	
	Stacker ST7			$ 13,083,439	$ 13,083,439	20%	$ 15,700,127	
	Yard Machine Rail		$ 3,061,740		$ 3,061,740	10%	$ 3,367,914	$ 210,894,028
Outloading No. 4 onshore	Conveyor L21		$ 2,190,811	$ 22,412,815	$ 24,603,626	10%	$ 27,063,989	
	Conveyor L24A		$ 1,645,397	$ 20,472,206	$ 22,117,603	10%	$ 24,329,363	
	Surge Bin 4 inc BF23/BF24 and SP4		$ 1,005,852	$ 40,144,777	$ 41,150,629	10%	$ 45,265,692	
	Conveyor L24		$ 3,983,563	$ 26,821,342	$ 30,804,905	10%	$ 33,885,396	
	Conveyor L27		$ 3,524,223	$ 21,028,831	$ 24,553,054	10%	$ 27,008,360	
	Conveyor L210		$ 1,802,612	$ 13,858,025	$ 15,660,637	10%	$ 17,226,701	$ 174,779,500
Outloading No. 4 offshore	Piling principal supply for all of expansion 9X A			$ 823,655	$ 823,655	10%	$ 906,021	
	Jetty conveyor support struts			$ 1,512,410	$ 1,512,410	10%	$ 1,663,651	
	Transfer tower platform extension			$ 8,892,403	$ 8,892,403	10%	$ 9,781,643	
	Wharf Structure			$ 21,978,578	$ 21,978,578	10%	$ 24,176,435	
	Conveyor L213a		$ 976,565	$ 9,696,374	$ 10,672,939	10%	$ 11,740,233	
	Conveyor L213		$ 1,003,094	$ 14,079,322	$ 15,082,416	10%	$ 16,590,657	
	Conveyor L216		$ 8,999,989	$ 56,854,805	$ 65,854,794	10%	$ 72,440,273	
	Conveyor L219 at 9A		$ 3,048,311	$ 33,164,340	$ 36,212,651	10%	$ 39,833,916	
	Shiploader SL4			$ 48,948,669	$ 48,948,669	3%	$ 50,417,129	
	OL4 Slurry Return			$ 3,440,605	$ 3,440,605	10%	$ 3,784,665	
	Amenities building			$ 643,680	$ 643,680	10%	$ 708,048	$ 232,042,672
Electrical Site Power Supply Upgrades and 3.3kV Switchgear	7X Cost scaled to P85 according to conveyor drive cost ratio.			$ 39,611,759	$ 39,611,759	10%	$ 43,572,934	$ 43,572,934
Water Reticulation Upgrades	water reticulation upgrade - offshore			$ 1,551,794	$ 1,551,794	10%	$ 1,706,973	
	Supply of stockpile sprays sprays (remainder sprays in bund costs)		$ 804,011		$ 804,011	10%	$ 884,412	
	General water supply upgrade onshore		$ 633,725	$ 1,267,450	$ 1,901,175	10%	$ 2,091,293	$ 4,682,677
Offices and Workshops	Warehousing			$ 1,000,000	$ 1,000,000	10%	$ 1,100,000	$ 1,100,000
Capital Spares				$ 1,000,000	$ 1,000,000	10%	$ 1,100,000	$ 1,100,000
SUBTOTAL	9XA Construction Works				$ 1,143,788,501		$ 1,261,504,294	$ 1,261,504,294
ENGINEERING								
Detailed Engineering	% of Capital Works	4.72%		$ 59,490,407.24	$ 59,490,407			
Project Management - Home office and Site	% of Capital Works	11.34%		$ 143,011,920.71	$ 143,011,921			
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 2,158,107.22	$ 2,158,107			
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 4,592,295.61	$ 4,592,296			
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 1,579,188.18	$ 1,579,188			
		16.71%						
Control Systems Software	Scaled from 7X according to conveyor drive costs.			$ 9,634,466	$ 9,634,466			
Manuals and Training	% of Capital Works	0.43%		$ 5,363,485.17	$ 5,363,485			
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 65,085,819.40	$ 65,085,819			
SUBTOTAL	9XA Engineering				$ 290,915,689			
CONTINGENCY								
	Scope Growth During Engineering Development (15%)				$ 232,862,998			
TOTAL 9XA Project					$ 1,785,282,981	$/Tpa		
						$ 78		

Job No: H329544
Project: 8X/9X Expansion Site Selection Study
Subject: DBCT 8X/9X Southern Stockyard Option

9XB PROJECT			BASED ON 7X Costs					
Area	Component Name	% factor (where used)	Proprietary free issue	Other	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)	Total for Area (escalated to Feb 09)
CONSTRUCTION WORKS								
							$ -	
Civil Works	MOBILISATION AND DEMOBILISATION			$ 6,102,250	$ 6,102,250	10%	$ 6,712,475	
	PROVISION FOR TRAFFIC			$ 730,000	$ 730,000	10%	$ 803,000	
	DRAINAGE			$ -	$ -	10%	$ -	
	EARTHWORKS			$ 68,242,700	$ 68,242,700	10%	$ 75,066,970	
	ROAD AND HARDSTANDS			$ 10,896,833	$ 10,896,833	10%	$ 11,986,517	
	ENVIRONMENTAL CONTROLS			$ 5,744,800	$ 5,744,800	10%	$ 6,319,280	
	SIGNAGE AND LINEMARKING			$ 383,467	$ 383,467	10%	$ 421,813	
	UNDERGROUND SERVICES			$ 500,000	$ 500,000	10%	$ 550,000	
	SUPERVISION AND ADMINISTRATION			$ 2,778,002	$ 2,778,002	10%	$ 3,055,802	$ 104,915,857
Inloading 5	Rail Receival Pit RRP5 inc BF22		$ 791,704	$ 46,658,302	$ 47,450,006	10%	$ 52,195,006	
	Rail Receival sound attenuation			$ 100,000	$ 100,000	10%	$ 110,000	
	RRP5 Wagon Vibrator		$ 1,754,645		$ 1,754,645	10%	$ 1,930,110	
	Conveyor S22		$ 1,979,578	$ 12,079,388	$ 14,058,966	10%	$ 15,464,863	
	Conveyor S25		$ 2,257,641	$ 38,819,816	$ 41,077,457	10%	$ 45,185,202	$ 114,885,181
	Conveyor S24 Extend		$ 668,193	$ 10,133,057				
					$ -		$ -	
New Stockyard	Conveyor S210		$ 3,377,493	$ 38,819,816	$ 42,197,309	10%	$ 46,417,040	
	Conveyor S28		$ 3,911,282	$ 16,071,175	$ 19,982,456	10%	$ 21,980,702	
	Conveyor R22		$ 3,989,888	$ 16,874,704	$ 20,864,592	10%	$ 22,951,052	
	Conveyor R25		$ 3,447,657	$ 14,867,834	$ 18,315,491	10%	$ 20,147,040	
	Conveyor R26		$ 3,447,657	$ 14,867,834	$ 18,315,491	10%	$ 20,147,040	
	Stacker ST6			$ 13,083,439	$ 13,083,439	20%	$ 15,700,127	
	Reclaimer RL4			$ 20,483,026	$ 20,483,026	20%	$ 24,579,631	
	Reclaimer RL7			$ 20,483,026	$ 20,483,026	10%	$ 22,531,328	
	Reclaimer RL8			$ 20,483,026	$ 20,483,026	10%	$ 22,531,328	
	Yard Machine Rail		$ 1,224,696		$ 1,224,696	10%	$ 1,347,166	$ 218,332,454
New Outloading 5 - Onshore	Conveyor L22		$ 2,190,811	$ 26,105,205	$ 28,296,015	10%	$ 31,125,617	
	Conveyor L25A		$ 1,645,397	$ 20,472,206	$ 22,117,603	10%	$ 24,329,363	
	Surge Bin 5 inc BF25/BF26 and SP5		$ 1,005,852	$ 40,144,777	$ 41,150,629	10%	$ 45,265,692	
	Conveyor L25		$ 3,983,563	$ 26,821,342	$ 30,804,905	10%	$ 33,885,396	
	Conveyor L28		$ 4,025,013	$ 21,028,831	$ 25,053,844	10%	$ 27,559,229	
	Conveyor L211		$ 1,352,053	$ 11,848,395	$ 13,200,448	10%	$ 14,520,492	$ 176,685,789
New Outloading No. 5 - offshore								
	Piling principal supply for all of 9X phase 2			$ 7,104,028	$ 7,104,028	10%	$ 7,814,431	
	Berth 5			$ 143,942,631	$ 143,942,631	10%	$ 158,336,894	
	Berth 5 Moormaster system			$ 5,000,000	$ 5,000,000	10%	$ 5,500,000	
	Berth 5 dredging			$ 10,000,000	$ 10,000,000	10%	$ 11,000,000	
	Berth 6			$ 140,580,494	$ 140,580,494	10%	$ 154,638,543	
	Berth 6 Moormaster system			$ 5,000,000	$ 5,000,000	10%	$ 5,500,000	
	Berth 6 dredging			$ 10,000,000	$ 10,000,000	10%	$ 11,000,000	
	L219 Extension - marine substructure			$ 3,173,644	$ 3,173,644	10%	$ 3,491,008	
	L220 Marine structures			$ 26,469,457	$ 26,469,457	10%	$ 29,116,403	
	Amenities building			$ 538,434	$ 538,434	10%	$ 592,277	
	OL5 Jetty marine structure			$ 83,308,841	$ 83,308,841	10%	$ 91,639,725	
	Transfer tower platform extension			$ 18,596,076	$ 18,596,076	10%	$ 20,455,683	
	Conveyor L214		$ 1,669,049	$ 12,908,028	$ 14,577,077	10%	$ 16,034,785	
	Conveyor L217		$ 9,119,425	$ 56,654,805	$ 65,774,230	10%	$ 72,351,653	
	L219 Extension for 9B		$ 509,710	$ 11,823,991	$ 12,333,701	10%	$ 13,567,071	
	L17 Extension for Berth 5		$ 581,069	$ 10,466,188	$ 11,047,258	10%	$ 12,151,984	
	Conveyor L220		$ 4,092,387	$ 46,307,925	$ 50,400,313	10%	$ 55,440,344	
	OL5 Slurry Return			$ 3,440,605	$ 3,440,605	10%	$ 3,784,665	
	Shiploader SL5			$ 48,948,669	$ 48,948,669	10%	$ 53,843,536	
	Shiploader Rail		$ 1,476,888		$ 1,476,888	10%	$ 1,624,577	$ 727,883,577
Electrical Site Power Supply Upgrades and 3.3kV Switchgear	7X Cost scaled to P85 according to conveyor drive cost ratio.			$ 30,960,637	$ 30,960,637	10%	$ 34,056,700	$ 34,056,700
Water Reticulation Upgrades	water reticulation - offshore			$ 1,309,650	$ 1,309,650	10%	$ 1,440,615	
	Supply of stockpile sprays sprays (remainder sprays in bund costs)		$ 428,806		$ 428,806	10%	$ 471,686	
	General water supply upgrade onshore		$ 1,901,175	$ 3,802,350	$ 5,703,525	10%	$ 6,273,878	$ 8,186,179
Offices and Workshops	Admin Building			$ 2,000,000	$ 2,000,000	10%	$ 2,200,000	
	Warehousing			$ 1,000,000	$ 1,000,000	10%	$ 1,100,000	
	Maintenance Facilities			$ 3,000,000	$ 3,000,000	10%	$ 3,300,000	$ 6,600,000
Capital Spares				$ 3,000,000	$ 3,000,000	10%	$ 3,300,000	$ 3,300,000
SUBTOTAL	9XB Construction Works				$ 1,264,990,082		$ 1,394,845,737	$ 1,394,845,737
ENGINEERING								
Detailed Engineering	% of Capital Works	4.72%		$ 65,778,563.97	$ 65,778,564			
Project Management - Home office and Site	% of Capital Works	11.34%		$ 158,128,330.44	$ 158,128,330			
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 2,386,219.90	$ 2,386,220			
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 5,077,702.85	$ 5,077,703			
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 1,746,108.92	$ 1,746,109			
		16.71%						
Control Systems Software	Scaled from 7X according to conveyor drive costs.			$ 7,530,319	$ 7,530,319			
Manuals and Training	% of Capital Works	0.43%		$ 5,930,407.42	$ 5,930,407			
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 71,965,413.13	$ 71,965,413			
SUBTOTAL	9XB Engineering				$ 318,543,066			
CONTINGENCY								
	Scope Growth During Engineering Development (15%)				$ 257,008,320			
TOTAL 9XB Project					$ 1,970,397,123	$/Tpa		
						$ 48		
TOTAL 8X/9X Projects and Studies					$4,077,813,309	$/Tpa		
						$ 61		

Rail Infrastructure Costs				
Area	Component Name	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)
9XA RAIL CONSTRUCTION WORKS				
Rail Formation and Civil Works Costs	Civil Cost	$ 133,746,440	10%	$ 147,121,084
	Rail formation, rail and signals	$ 45,000,000	10%	$ 49,500,000
Engineering and Owners Cost	20%	$ 35,749,288		$ 35,749,288
SubTOTAL 9XA RAIL		$ 214,495,728		$ 232,370,372
CONTINGENCY				
	15%			$ 34,855,556
TOTAL 9XA Rail				$ 267,225,928
9XB RAIL CONSTRUCTION WORKS				
Rail Formation and Civil Works Costs	Civil Cost	$ 47,714,385	10%	$ 52,485,823
	Rail formation, rail and signals	$ 22,418,919	10%	$ 24,660,811
Engineering and Owners Cost	20%	$ 14,026,661		$ 14,026,661
SubTOTAL 9XB RAIL		$ 84,159,964		$ 91,173,294
CONTINGENCY				
	15%			$ 13,675,994
TOTAL 9XB Rail				$ 104,849,289
Total Rail				$ 372,075,217

TOTAL 8X/9XA/9XB Projects, Studies and Rail				$4,449,888,526	$/Tpa
					$ 66

ob No: H329544
Project: 8X/9X Expansion Site Selection Study

Subject: **DBCT 8X/9X Louisa Creek Option**

8X Feasibility Study and Approvals

FEASIBILITY		Hrs	Ave rate ($/Hr)		
Study Management		400	325		130,000.00
Data Collection	Geotech				
	CH	1000	$ 230	$ 230,000	
	Contractor			$ 210,000	440,000
	Topographical Survey			$ 250,000	250,000
Planning and Environment Approvals				$ 45,000	45,000
Preliminary Engineering and Cost Estimates	Including SR1 to tender	3,700	250	$ 925,000	925,000
DBCT Management	20% of planing + Eng			$ 194,000	194,000
SUBTOTAL	Phase 1 Feasibility Study				1,984,000
CONTINGENCY					
	15%				297,600.00
TOTAL 8X Feasibility					2,281,600

8X Project

Area	Component Name	% factor (where used)	Proprietary free issue	Other	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)
CONSTRUCTION WORKS							
Civil	Civils for Row 1, 2, 3 stockyard upgrade, Bunds 1 & 3 upgrade			$ 83,764,800	$ 83,764,800	10%	92,141,280
	Development of north end of Row 9 & 10 only, and preparation of laydown areas			$ 43,367,400	$ 43,367,400	10%	47,704,140
Machines	Stacker Reclaimer SR1A			$ 23,137,326	$ 23,137,326	20%	27,764,791
	Boom rest mods, cable/hose pit mods, hold/down mods, Buffer Mods on Bund.			$ 304,421	$ 304,421	10%	334,863
Upgrade Conveyors	Upgrade R2		$ 1,480,324	$ 6,798,440	$ 8,278,764	10%	9,106,640
	Upgrade ST2 Boom		$ 451,260	$ 300,000	$ 751,260	10%	826,386
	Upgrade S6A		$ 496,610	$ 300,000	$ 796,610	10%	876,271
	Upgrade S6		$ 1,116,660	$ 500,000	$ 1,616,660	10%	1,778,325
HV upgrades	25% of conveyor costs	25%	$ 3,544,854	$ 7,898,440	$ 2,860,823	10%	3,146,906
Stockpile Spray Rework			$ 536,007	$ 5,016,076	$ 5,552,083	10%	6,107,291
SUBTOTAL	8X Construction Works				$ 170,430,147		189,786,894
ENGINEERING							
Detailed Engineering	(exc. SR1) % of Capital Works	4.72%		$ 7,640,688	7,640,688		
Project Management - Home office and Site	% of Capital Works	11.34%		$ 21,515,415	21,515,415		
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 324,676	324,676		
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 690,887	690,887		
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 237,581	237,581		
		16.71%					
Control Systems Software				$ 125,000	125,000		
Manuals and Training	% of Capital Works	0.43%		$ 806,909	806,909		
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 9,791,830	9,791,830		
SUBTOTAL	8X Engineering				41,132,986		
CONTINGENCY							
	Scope Growth During Engineering Development (15%)				34,637,982		
TOTAL 8X Project					265,557,863	/Tpa	
						80	

ob No: H329544
Project: 8X/9X Expansion Site Selection Study
Subject: **DBCT 8X/9X Louisa Creek Option**

PHASE 9XA/B Feasibility Study and Approvals

ENGINEERING and PLANNING		Hrs	Ave rate ($/Hr)		
Options Study		18,000	250	$ 4,500,000	4,500,250
Data Collection	Geotech offshore - Seismic Investigation			$ 465,000	465,000
	Geotech Offshore - boreholes				
	CH			$ 2,750,000	2,750,000
	Contractor			$ 9,650,000	9,650,000
	Geotech Onshore				
	CH			$ 689,500	689,500
	Contractor			$ 588,000	588,000
	Topographical Survey			$ 585,200	585,200
	Marine Conditions modelling and Simulation			$ 300,000	300,000
Planning and Environment Approvals	8X early works			$ 70,000	70,000
	9X A			$ 1,000,000	1,000,000
	9X B			$ 1,750,000	1,750,000
Preliminary Engineering and Cost Estimates		70,000	250	$ 17,500,000	17,500,000
Simulation modelling -	Terminal Performance Modelling			$ 2,000,000	2,000,000
DBCT Management Costs	20% of planing + Eng + Simulation			$ 5,364,000	5,364,000
SUBTOTAL	9XA/B Feasibility Engineering				47,211,950
CONTINGENCY					
	15%				7,081,793
TOTAL 9XA/B feasibility					54,293,743

9XA PRO ECT

Area	Component Name	% factor (where used)	BASED ON 7X Costs: Proprietary free issue	BASED ON 7X Costs: Other	BASED ON 7X Costs: Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)	Total for Area (escalated to Feb 09)
CONSTRUCTION WORKS								
Civil Works	MOBILISATION AND DEMOBILISATION			$ 10,102,250	$ 10,102,250	10%	11,112,475	
	PROVISION FOR TRAFFIC			$ 2,190,000	$ 2,190,000	10%	2,409,000	
	DRAINAGE			$ 17,760,650	$ 17,760,650	10%	19,536,715	
	EARTHWORKS			$ 289,391,113	$ 289,391,113	10%	318,330,224	
	ROAD AND HARDSTANDS			$ 17,230,167	$ 17,230,167	10%	18,953,183	
	ENVIRONMENTAL CONTROLS			$ 5,744,800	$ 5,744,800	10%	6,319,280	
	WATER SUPPLY			$ 11,000,000	$ 11,000,000	10%	12,100,000	
	SIGNAGE AND LINEMARKING			$ 766,933	$ 766,933	10%	843,627	
	UNDERGROUND SERVICES			$ 1,000,000	$ 1,000,000	10%	1,100,000	
	SUPERVISION AND ADMINISTRATION			$ 10,325,577	$ 10,325,577	10%	11,358,135	402,062,639
Inloading No. 4	IL4 Pit and Tunnel			$ 22,028,637	$ 22,028,637	10%	24,231,501	
	IL5 Pit and Tunnel			$ 22,028,637	$ 22,028,637	10%	24,231,501	
	RRP4 Wagon Vibrator		$ 1,754,645		$ 1,754,645	10%	1,930,110	
	Rail Receival Pit RRP4 inc BF21		$ 791,704	$ 46,658,302	$ 47,450,006	10%	52,195,006	
	Rail Receival sound attenuation			$ 100,000	$ 100,000	10%	110,000	
	Conveyor S21a		$ 3,100,940	$ 17,909,217	$ 21,010,157	10%	23,111,172	
	Conveyor S21		$ 2,387,346	$ 13,622,578	$ 16,009,924	10%	17,610,916	
	Conveyor S23		$ 2,133,647	$ 15,829,467	$ 17,963,114	10%	19,759,425	
	Conveyor S25a		$ 1,899,180	$ 14,719,519	$ 16,618,699	10%	18,280,569	
	Conveyor S14		$ 1,536,473	$ 25,084,611	$ 26,621,083	10%	29,283,191	
	Mods to S3,S4, S13		$ 475,049	$ 14,234,057	$ 14,709,106	10%	16,180,016	226,923,408
Remanent Stockyard	Trippers S1, S2, S11		$ 514,742	$ 15,686,881	$ 16,201,623	10%	17,821,786	
	Conveyor RS1		$ 1,213,944	$ 14,079,322	$ 15,293,266	10%	16,822,592	
	Conveyor RS2		$ 1,213,944	$ 14,079,322	$ 15,293,266	10%	16,822,592	
	Conveyor RS3		$ 1,234,332	$ 11,307,793	$ 12,542,125	10%	13,796,338	
	Conveyor RS4		$ 1,234,332	$ 11,307,793	$ 12,542,125	10%	13,796,338	
	Conveyor RS5		$ 2,879,290	$ 12,057,434	$ 14,936,724	10%	16,430,397	
	Conveyor RS6		$ 1,468,799	$ 12,647,210	$ 14,116,009	10%	15,527,610	
	Conveyor RS6a		$ 626,610	$ 7,465,343	$ 8,091,953	10%	8,901,149	
	Conveyor RS7		$ 2,161,269	$ 10,147,280	$ 12,308,549	10%	13,539,404	
	Conveyor R9		$ 3,176,542	$ 13,828,130	$ 17,004,672	10%	18,705,139	
	Conveyor R10		$ 3,176,542	$ 13,828,130	$ 17,004,672	10%	18,705,139	
	Conveyor R11		$ 1,287,173	$ 17,097,549	$ 18,384,722	10%	20,223,194	
	Conveyor R12		$ 1,287,173	$ 17,097,549	$ 18,384,722	10%	20,223,194	
	Machine rail supply		$ 2,449,392		$ 2,449,392	10%	2,694,331	
	Reclaimer RL2 Relocation			$ 11,759,009	$ 11,759,009	20%	14,110,811	
	Reclaimer RL4			$ 19,733,026	$ 19,733,026	20%	23,679,631	
	Stacker ST5			$ 13,083,439	$ 13,083,439	20%	15,700,127	
	Stacker ST7			$ 13,083,439	$ 13,083,439	20%	15,700,127	283,199,898
Row 8 completion	Conveyor S9		$ 3,021,634	$ 12,879,525	$ 15,901,159	10%	17,491,275	
	Stacker ST6			$ 13,083,439	$ 13,083,439	20%	15,700,127	
	Reclaimer RL3			$ 20,483,026	$ 20,483,026	20%	24,579,631	
	Boom rest mods, cable/hose pit mods, anchor mods			$ 304,421	$ 304,421	10%	334,863	58,105,896
Outloading No. 4 onshore	Conveyor L12a		$ 866,009	$ 16,025,154	$ 16,891,163	10%	18,580,280	
	Conveyor L12b		$ 733,213	$ 7,465,343	$ 8,198,556	10%	9,018,412	
	Conveyor L12		$ 2,048,529	$ 12,333,520	$ 14,382,049	10%	15,820,254	
	Conveyor L14		$ 1,574,256	$ 20,743,368	$ 22,317,624	10%	24,549,386	
	Surge Bin 4 inc BF16/BF18 and SP4		$ 1,005,852	$ 40,144,777	$ 41,150,629	10%	45,265,692	
	L16A conveyor		$ 1,135,739	$ 14,079,322	$ 15,215,061	10%	16,736,567	129,970,591
Outloading No. 4 offshore	Piling principal supply for all of expansion 9XA			$ 823,655	$ 823,655	10%	906,021	
	Jetty conveyor support struts			$ 1,512,410	$ 1,512,410	10%	1,663,651	
	Transfer tower platform extension			$ 8,892,403	$ 8,892,403	10%	9,781,643	
	Wharf Structure			$ 21,978,578	$ 21,978,578	10%	24,176,435	
	Amenities building			$ 643,680	$ 643,680	10%	708,048	
	OL4 Slurry Return			$ 3,440,605	$ 3,440,605	10%	3,784,665	
	Conveyor L16		$ 9,327,924	$ 56,654,805	$ 65,982,729	10%	72,581,002	
	Conveyor L18 at 9XA		$ 2,808,756	$ 33,164,340	$ 35,973,096	10%	39,570,405	
	SL4			$ 48,948,669	$ 48,948,669	10%	53,843,536	207,015,407
Electrical Site Power Supply Upgrades and 3.3kV Switchgear	7X Cost scaled to P85 according to conveyor drive cost ratio.			$ 40,694,283	$ 40,694,283	10%	44,763,711	44,763,711
Water Reticulation Upgrades	water reticulation upgrade - offshore			$ 1,309,650	$ 1,309,650	10%	1,440,615	
	Supply of stockpile sprays sprays (remainder sprays in bund costs)		$ 893,345		$ 893,345	10%	982,680	
	General water supply upgrade onshore		$ 633,725	$ 1,267,450	$ 1,901,175	10%	2,091,293	4,514,587
Offices and Workshops	Warehousing			$ 1,000,000	$ 1,000,000	10%	1,100,000	1,100,000
					$ -		-	
Capital Spares				$ 1,000,000	$ 1,000,000	10%	1,100,000	1,100,000
SUBTOTAL	9XA Construction Works				$ 1,226,939,635		1,358,756,136	1,358,756,136
ENGINEERING								
Detailed Engineering	% of Capital Works	4.72%		$ 64,076,639.50	64,076,640			
Project Management - Home office and Site	% of Capital Works	11.34%		$ 154,036,990.37	154,036,990			
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 2,324,479.94	2,324,480			
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 4,946,324.69	4,946,325			
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 1,700,930.90	1,700,931			
		16.71%						
Control Systems Software	Scaled from 7X according to conveyor drive costs.			$ 9,897,760	9,897,760			
Manuals and Training	% of Capital Works	0.43%		$ 5,776,966.77	5,776,967			
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 70,103,412.96	70,103,413			
SUBTOTAL	9XA Engineering				312,863,505			
CONTINGENCY								
	Scope Growth During Engineering Development (15%)				250,742,946			
TOTAL 9XA Project					1,922,362,587	/Tpa		
						85		

ob No: H329544
Project: 8X/9X Expansion Site Selection Study
Subject: **DBCT 8X/9X Louisa Creek Option**

Connell HATCH

9XB PRO ECT			BASED ON 7X Costs					
Area	Component Name	% factor (where used)	Proprietary free issue	Other	Total component (without escalation to P85)	Escalation to Sep 08	Total component (escalated to Sep 08)	Total for Area (escalated to Sep 08)
CONSTRUCTION WORKS								
Civil Works	MOBILISATION AND DEMOBILISATION			$ 18,306,750	18,306,750	10%	20,137,425	
	PROVISION FOR TRAFFIC			$ 730,000	730,000	10%	803,000	
	DRAINAGE			$ 10,806,000	10,806,000	10%	11,886,600	
	EARTHWORKS			$ 681,096,400	681,096,400	10%	749,206,040	
	ROAD AND HARDSTANDS			$ 21,760,333	21,760,333	10%	23,936,367	
	ENVIRONMENTAL CONTROLS			$ 11,489,600	11,489,600	10%	12,638,560	
	WATER SUPPLY			$ -	-	10%	-	
	SIGNAGE AND LINEMARKING			$ 383,467	383,467	10%	421,813	
	UNDERGROUND SERVICES			$ 500,000	500,000	10%	550,000	
	SUPERVISION AND ADMINISTRATION			$ 22,352,177	22,352,177	10%	24,587,394	844,167,199
Inloading 5	Rail Receival Pit RRP5 inc BF22		$ 791,704	$ 46,658,302	47,450,006	10%	52,195,006	
	Rail Receival sound attenuation			$ 100,000	100,000	10%	110,000	
	RRP5 Wagon Vibrator		$ 1,754,645		1,754,645	10%	1,930,110	
	Conveyor S22a		$ 3,100,940	$ 17,909,217	21,010,157	10%	23,111,172	
	Conveyor S22		$ 2,387,346	$ 13,622,578	16,009,924	10%	17,610,916	
	Conveyor S24		$ 2,133,647	$ 15,027,241	17,160,888	10%	18,876,976	
	Conveyor S26		$ 1,921,232	$ 30,577,902	32,499,134	10%	35,749,048	149,583,228
Inloading 4 connection to New Stockyard	Conveyor S25		$ 1,921,232	$ 30,577,902	32,499,134	10%	35,749,048	35,749,048
New Stockyard	Conveyor S10		$ 3,377,493	$ 14,161,021	17,538,514	10%	19,292,365	
	Conveyor RS9		$ 3,341,907	$ 13,919,229	17,261,136	10%	18,987,250	
	Conveyor RS8		$ 3,288,528	$ 13,691,945	16,980,473	10%	18,678,521	
	Conveyor R16		$ 3,375,360	$ 15,238,180	18,613,540	10%	20,474,894	
	Conveyor R15		$ 3,375,360	$ 15,238,180	18,613,540	10%	20,474,894	
	Conveyor R14		$ 3,303,062	$ 15,020,567	18,323,630	10%	20,155,993	
	Conveyor R13		$ 3,303,062	$ 15,020,567	18,323,630	10%	20,155,993	
	Conveyor R12		$ 3,266,914	$ 14,783,612	18,050,525	10%	19,855,578	
	Conveyor R11		$ 3,266,914	$ 14,783,612	18,050,525	10%	19,855,578	
	Yard Machine Rail Supply		$ 4,898,784		4,898,784	10%	5,388,662	
	RL5			$ 19,733,026	19,733,026	20%	23,679,631	
	RL6			$ 20,483,026	20,483,026	20%	24,579,631	
	RL7			$ 19,733,026	19,733,026	20%	23,679,631	
	RL8			$ 20,483,026	20,483,026	20%	24,579,631	
	RL9			$ 19,733,026	19,733,026	20%	23,679,631	
	RL10			$ 20,483,026	20,483,026	20%	24,579,631	
	ST8			$ 13,083,439	13,083,439	20%	15,700,127	
	ST9			$ 13,083,439	13,083,439	20%	15,700,127	
	ST10			$ 13,083,439	13,083,439	20%	15,700,127	375,197,893
Outloading 4 connection from New Stockyard	Conveyor L21		$ 3,567,390	$ 20,302,920	23,870,309	10%	26,257,340	26,257,340
Outloading No. 4 Extension to Berth 5	L18 extension to Berth 5 - marine structures			$ 6,646,342	6,646,342	10%	7,310,977	
	L18 extension to Berth 5- conveyor		$ 1,686,132	$ 37,229,739	38,915,870	10%	42,807,457	
	Modifications to L17 head to allow SL4 to pass to Berth 5		$ 581,069	$ 6,000,000	6,581,069	10%	7,239,176	57,357,610
New Outloading 5 - Onshore	Conveyor L22		$ 3,567,390	$ 20,302,920	23,870,309	10%	26,257,340	
	Conveyor L24		$ 1,574,256	$ 20,743,368	22,317,624	10%	24,549,386	
	Surge Bin 5 inc BF26,BF28 and SP5		$ 1,005,852	$ 40,144,777	41,150,629	10%	45,265,692	
	L26A weigher conveyor		$ 1,135,739	$ 14,079,322	15,215,061	10%	16,736,567	112,808,986
New Outloading No. 5 - offshore	Piling principal supply for all of phase 9XB			$ 7,104,028	7,104,028	10%	7,814,431	
	Berth 5			$ 143,942,631	143,942,631	10%	158,336,894	
	Berth 5 Moormaster system			$ 5,000,000	5,000,000	10%	5,500,000	
	Berth 5 dredging			$ 10,000,000	10,000,000	10%	11,000,000	
	Berth 6			$ 140,580,494	140,580,494	10%	154,638,543	
	Berth 6 Moormaster system			$ 5,000,000	5,000,000	10%	5,500,000	
	Berth 6 dredging			$ 10,000,000	10,000,000	10%	11,000,000	
	L18 Extension - marine substructure			$ 3,173,644	3,173,644	10%	3,491,008	
	L17 Extension for Berth 5		$ 581,069	$ 10,466,188	11,047,258	10%	12,151,984	
	L28 Marine structures			$ 26,469,457	26,469,457	10%	29,116,403	
	Amenities building			$ 538,434	538,434	10%	592,277	
	OL5 Jetty marine structure			$ 83,308,841	83,308,841	10%	91,639,725	
	Transfer tower platform extension			$ 18,596,076	18,596,076	10%	20,455,683	
	L26		$ 9,298,579	$ 56,654,805	65,953,383	10%	72,548,722	
	L28		$ 3,526,594	$ 19,533,955	23,060,549	10%	25,366,604	
	OL5 Slurry Return System			$ 3,440,605	3,440,605	10%	3,784,665	
	SL5			$ 48,948,669	48,948,669	10%	53,843,536	
	Shiploader Rail		$ 1,476,888		1,476,888	10%	1,624,577	668,405,051
Electrical Site Power Supply Upgrades and 3.3kV Switchgear	7X Cost scaled to P85 according to conveyor drive cost ratio.			$ 53,813,580	53,813,580	10%	59,194,938	59,194,938
Water Reticulation Upgrades	water reticulation - offshore			$ 1,551,794	1,551,794	10%	1,706,973	
	Supply of stockpile sprays sprays (remainder sprays in bund costs)		$ 1,646,323		1,646,323	10%	1,810,955	
	General water supply upgrade onshore		$ 1,901,175	$ 3,802,350	5,703,525	10%	6,273,878	9,791,806
Offices and Workshops	Admin Building			$ 2,000,000	2,000,000	10%	2,200,000	
	Warehousing			$ 1,000,000	1,000,000	10%	1,100,000	
	Maintenance Facilities			$ 3,000,000	3,000,000	10%	3,300,000	6,600,000
Capital Spares				$ 3,000,000	3,000,000	10%	3,300,000	3,300,000
SUBTOTAL	9XB Construction Works				2,120,384,774		2,348,413,098	2,348,413,098
ENGINEERING								
Detailed Engineering	% of Capital Works	4.72%		$ 110,747,186.71	110,747,187			
Project Management - Home office and Site	% of Capital Works	11.34%		$ 266,230,617.99	266,230,618			
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 4,017,526.76	4,017,527			
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 8,549,005.51	8,549,006			
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 2,939,812.59	2,939,813			
		16.71%						
Control Systems Software	Scaled from 7X according to conveyor drive costs.			$ 13,088,666	13,088,666			
Manuals and Training	% of Capital Works	0.43%		$ 9,984,649.99	9,984,650			
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 121,163,591.36	121,163,591			
SUBTOTAL	9XB Engineering				536,721,057			
CONTINGENCY								
	Scope Growth During Engineering Development (15%)				432,770,123			
TOTAL 9XB Project					3,317,904,279	/Tpa		
						82		
TOTAL 8X/9X Projects and Studies					5,562,400,072	/Tpa		
						84		

Rail Infrastructure Costs					
Area	Component Name	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)	
9XA RAIL CONSTRUCTION WORKS					
Civil Cost		$ 89,661,146	10%	98,627,261	
Rail formation, rail and signals		$ 38,000,000	10%	41,800,000	
Engineering and Owners Cost	20%	$ 25,532,229		25,532,229	
SubTOTAL 9XA RAIL		153,193,376		165,959,490	
CONTINGENCY					
	15%			24,893,924	
TOTAL 9XA Rail				190,853,414	
9XB RAIL CONSTRUCTION WORKS					
Civil Cost		$ 31,651,719	10%	34,816,891	
Rail formation, rail and signals		$ 18,635,135	10%	20,498,649	
Engineering and Owners Cost	20%	$ 10,057,371		10,057,371	
SubTOTAL 9XB RAIL		60,344,225		65,372,910	
CONTINGENCY					
	15%			9,805,937	
TOTAL 9XB Rail				75,178,847	
Total Rail				266,032,261	
TOTAL 8X/9XA/9XB Projects, Studies and Rail				5,828,432,332	/Tpa
					88

Job No: H329544
Project: 8X/9X Expansion Site Selection Study

Subject: **DBCT 8X/9X Dudgeon Point Option**

8X Feasibility Study and Approvals

FEASIBILITY		Hrs	Ave rate ($/Hr)		
Study Management		400	325		$ 130,000.00
Data Collection	Geotech				
	CH	1000	$ 230	$ 230,000	
	Contractor			$ 210,000	$ 440,000
	Topographical Survey			$ 250,000	$ 250,000
Planning and Environment Approvals				$ 45,000	$ 45,000
Preliminary Engineering and Cost Estimates	Including SR1 to Tender	3,700	250	$ 925,000	$ 925,000
DBCT Managment Costs	20% of planing + Eng			$ 194,000	$ 194,000
SUBTOTAL	8X Feasibility Study				$ 1,984,000
CONTINGENCY					
	15%				$ 297,600.00
TOTAL 8X Feasibility					$ 2,281,600

8X Project

Area	Component Name	% factor (where used)	Proprietary free issue	Other	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)
CONSTRUCTION WORKS							
Civil	Civils for Row 1, 2, 3 stockyard upgrade, Bunds 1 & 3 upgrade			$ 83,764,800	$ 83,764,800	10%	$ 92,141,280
	Development of north end of Row 9 & 10 only, and preparation of laydown areas			$ 43,367,400	$ 43,367,400	10%	$ 47,704,140
Machines	Stacker Reclaimer SR1A			$ 23,137,326	$ 23,137,326	20%	$ 27,764,791
	Boom rest mods, cable/hose pit mods, hold/down mods, Buffer Mods on Bund.			$ 304,421	$ 304,421	10%	$ 334,863
Upgrade Conveyors	Upgrade R2		$ 1,480,324	$ 6,798,440	$ 8,278,764	10%	$ 9,106,640
	Upgrade ST2 Boom		$ 451,260	$ 300,000	$ 751,260	10%	$ 826,386
	Upgrade S6A		$ 496,610	$ 300,000	$ 796,610	10%	$ 876,271
	Upgrade S6		$ 1,116,660	$ 500,000	$ 1,616,660	10%	$ 1,778,325
HV upgrades	25% of conveyor costs	25%	$ 3,544,854	$ 7,898,440	$ 2,860,823	10%	$ 3,146,906
Stockpile Spray Rework			$ 536,007	$ 5,016,076	$ 5,552,083	10%	$ 6,107,291
SUBTOTAL	8X Construction Works				$ 170,430,147		$ 189,786,894
ENGINEERING							
Detailed Engineering	(exc. SR1) % of Capital Works	4.72%		$ 7,640,688	$ 7,640,688		
Project Management - Home office and Site	% of Capital Works	11.34%		$ 21,515,415	$ 21,515,415		
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 324,676	$ 324,676		
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 690,887	$ 690,887		
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 237,581	$ 237,581		
		16.71%					
Control Systems Software				$ 125,000	$ 125,000		
Manuals and Training	% of Capital Works	0.43%		$ 806,909	$ 806,909		
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 9,791,830	$ 9,791,830		
SUBTOTAL	8X Engineering				$ 41,132,986		
CONTINGENCY							
	Scope Growth During Engineering Development (15%)				$ 34,637,982		
TOTAL 8X Project					$ 265,557,863	$/Tpa	
						$ 80	

Job No: H329544
Project: 8X/9X Expansion Site Selection Study
Subject: **DBCT 8X/9X Dudgeon Point Option**

Connell HATCH

9XA/B Feasibility Study and Approvals

ENGINEERING and PLANNING		Hrs	Ave rate ($/Hr)		
Options Study		18,000	250	$ 4,500,000	$ 4,500,250
Data Collection	Geotech offshore - Seismic Investigation			$ 1,014,200	$ 1,014,200
	Geotech Offshore- boreholes				
	CH			$ 2,750,000	$ 2,750,000
	Contractor			$ 9,650,000	$ 9,650,000
	Geotech Onshore				
	CH			$ 689,500	$ 689,500
	Contractor			$ 588,000	$ 588,000
					$ -
	Topographical Survey			$ 585,200	$ 585,200
	Marine Conditions modelling and Simulation			$ 300,000	$ 300,000
Planning and Environment Approvals	8X early works			$ 70,000	$ 70,000
	9XA			$ 1,000,000	$ 1,000,000
	9XB			$ 1,750,000	$ 1,750,000
Preliminary Engineering and Cost Estimates		70,000	250	$ 17,500,000	$ 17,500,000
Simulation modelling -	Terminal Performance Modelling			$ 2,000,000	$ 2,000,000
DBCT Management Costs	20% of planing + Eng + Simulation			$ 5,364,000	$ 5,364,000
SUBTOTAL	9XA/B Feasibility Engineering				$ 47,761,150
CONTINGENCY					
	15%				$ 7,164,173
TOTAL 9XA/B feasibility					$ 54,925,323

9XA PROJECT

Area	Component Name	% factor (where used)	BASED ON 7X Costs: Proprietary free issue	Other	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)	Total for Area (escalated to Feb 09)
CONSTRUCTION WORKS								
							$ -	
Civil Works	MOBILISATION AND DEMOBILISATION			$ 18,306,750	$ 18,306,750	10%	$ 20,137,425	
	PROVISION FOR TRAFFIC			$ 2,190,000	$ 2,190,000	10%	$ 2,409,000	
	DRAINAGE			$ 9,361,015	$ 9,361,015	10%	$ 10,297,116	
	EARTHWORKS			$ 372,636,462	$ 372,636,462	10%	$ 409,900,108	
	ROAD AND HARDSTANDS			$ 25,875,333	$ 25,875,333	10%	$ 28,462,867	
	ENVIRONMENTAL CONTROLS			$ 12,822,933	$ 12,822,933	10%	$ 14,105,227	
	WATER RETICULATION			$ 1,333,333	$ 1,333,333	10%	$ 1,466,667	
	SIGNAGE AND LINEMARKING			$ 766,933	$ 766,933	10%	$ 843,627	
	UNDERGROUND SERVICES			$ 1,000,000	$ 1,000,000	10%	$ 1,100,000	
	SUPERVISION AND ADMINISTRATION			$ 13,328,783	$ 13,328,783	10%	$ 14,661,661	$ 503,383,697
					$ -		$ -	
Inloading No. 4	IL4 Pit and Tunnel			$ 22,028,637	$ 22,028,637	10%	$ 24,231,501	
	IL5 Pit and Tunnel			$ 22,028,637	$ 22,028,637	10%	$ 24,231,501	
	RRP4 Wagon Vibrator		$ 1,754,645		$ 1,754,645	10%	$ 1,930,110	
	Rail Receival Pit RRP4 inc BF21		$ 791,704	$ 46,658,302	$ 47,450,006	10%	$ 52,195,006	
	Rail Receival sound attenuation			$ 100,000	$ 100,000	10%	$ 110,000	
	Conveyor S21		$ 1,979,578	$ 14,136,975	$ 16,116,553	10%	$ 17,728,208	
	Conveyor S24		$ 2,257,641	$ 27,331,088	$ 29,588,728	10%	$ 32,547,601	$ 152,973,926
							$ -	
							$ -	
New Stockyard	Conveyor S27		$ 3,911,282	$ 16,071,175	$ 19,982,456		$ 19,982,456	
	Conveyor S29		$ 3,377,493	$ 14,040,125	$ 17,417,618	10%	$ 19,159,380	
	Conveyor R21		$ 3,989,888	$ 16,874,704	$ 20,864,592	10%	$ 22,951,052	
	Conveyor R23		$ 3,447,657	$ 14,867,834	$ 18,315,491	10%	$ 20,147,040	
	Conveyor R24		$ 3,447,657	$ 14,867,834	$ 18,315,491	10%	$ 20,147,040	
	Reclaimer RL3			$ 20,483,026	$ 20,483,026	20%	$ 24,579,631	
	Reclaimer RL5			$ 20,483,026	$ 20,483,026	20%	$ 24,579,631	
	Reclaimer RL6			$ 20,483,026	$ 20,483,026	20%	$ 24,579,631	
	Stacker ST5			$ 13,083,439	$ 13,083,439	20%	$ 15,700,127	
	Stacker ST7			$ 13,083,439	$ 13,083,439	20%	$ 15,700,127	
	Yard Machine Rail		$ 3,061,740		$ 3,061,740	10%	$ 3,367,914	$ 210,894,028
Outloading No. 4 onshore	Conveyor L21		$ 2,190,811	$ 21,902,211	$ 24,093,022	10%	$ 26,502,324	
	Conveyor L24A		$ 1,645,397	$ 19,929,883	$ 21,575,280	10%	$ 23,732,808	
	Surge Bin 4 inc BF23/BF24 and SP4		$ 1,005,852	$ 40,144,777	$ 41,150,629	10%	$ 45,265,692	$ 95,500,824
Outloading No. 4 offshore	Piling principal supply for all of expansion 9X A			$ 823,655	$ 823,655	10%	$ 906,021	
	Jetty conveyor support struts			$ 2,023,785	$ 2,023,785	10%	$ 2,226,163	
	Transfer tower platform extension			$ 44,038,322	$ 44,038,322	10%	$ 48,442,154	
	Wharf Structure			$ 21,978,578	$ 21,978,578	10%	$ 24,176,435	
	Jetty marine structure			$ 113,037,251	$ 113,037,251	10%	$ 124,340,976	
	Conveyor L216		$ 10,910,962	$ 67,142,738	$ 78,053,700	10%	$ 85,859,070	
	Conveyor L219 at 9A		$ 3,048,311	$ 33,164,340	$ 36,212,651	10%	$ 39,833,916	
	Shiploader SL4			$ 48,948,669	$ 48,948,669	3%	$ 50,417,129	
	OL4 Slurry Return			$ 3,440,605	$ 3,440,605	10%	$ 3,784,665	
	Amenities building			$ 643,680	$ 643,680	10%	$ 708,048	$ 380,694,578
Electrical Site Power Supply Upgrades and 3.3kV Switchgear	7X Cost scaled to P85 according to conveyor drive cost ratio.			$ 32,818,329	$ 32,818,329	10%	$ 36,100,162	$ 36,100,162
Water Reticulation Upgrades	water reticulation upgrade - offshore			$ 1,712,264	$ 1,712,264	10%	$ 1,883,491	
	Supply of stockpile sprays sprays (remainder sprays in bund costs)		$ 804,011		$ 804,011	10%	$ 884,412	
	General water supply upgrade onshore		$ 633,725	$ 1,267,450	$ 1,901,175	10%	$ 2,091,293	$ 4,859,195
Offices and Workshops	Warehousing			$ 1,000,000	$ 1,000,000	10%	$ 1,100,000	$ 1,100,000
Capital Spares				$ 1,000,000	$ 1,000,000	10%	$ 1,100,000	$ 1,100,000
SUBTOTAL	9XA Construction Works				$ 1,257,517,697		$ 1,386,606,410	$ 1,386,606,410
ENGINEERING								
Detailed Engineering	% of Capital Works	4.72%		$ 65,390,011.25	$ 65,390,011			
Project Management - Home office and Site	% of Capital Works	11.34%		$ 157,194,269.42	$ 157,194,269			
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 2,372,124.54	$ 2,372,125			
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 5,047,708.96	$ 5,047,709			
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 1,735,794.69	$ 1,735,795			
		16.71%						
Control Systems Software	Scaled from 7X according to conveyor drive costs.			$ 7,982,152	$ 7,982,152			
Manuals and Training	% of Capital Works	0.43%		$ 5,895,376.62	$ 5,895,377			
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 71,540,314.82	$ 71,540,315			
SUBTOTAL	9XA Engineering				$ 317,157,752			
CONTINGENCY								
	Scope Growth During Engineering Development (15%)				$ 255,564,624			
TOTAL 9XA Project					$ 1,959,328,786	$/Tpa		
						$ 85		

Job No: H329544
Project: 8X/9X Expansion Site Selection Study
Subject: **DBCT 8X/9X Dudgeon Point Option**

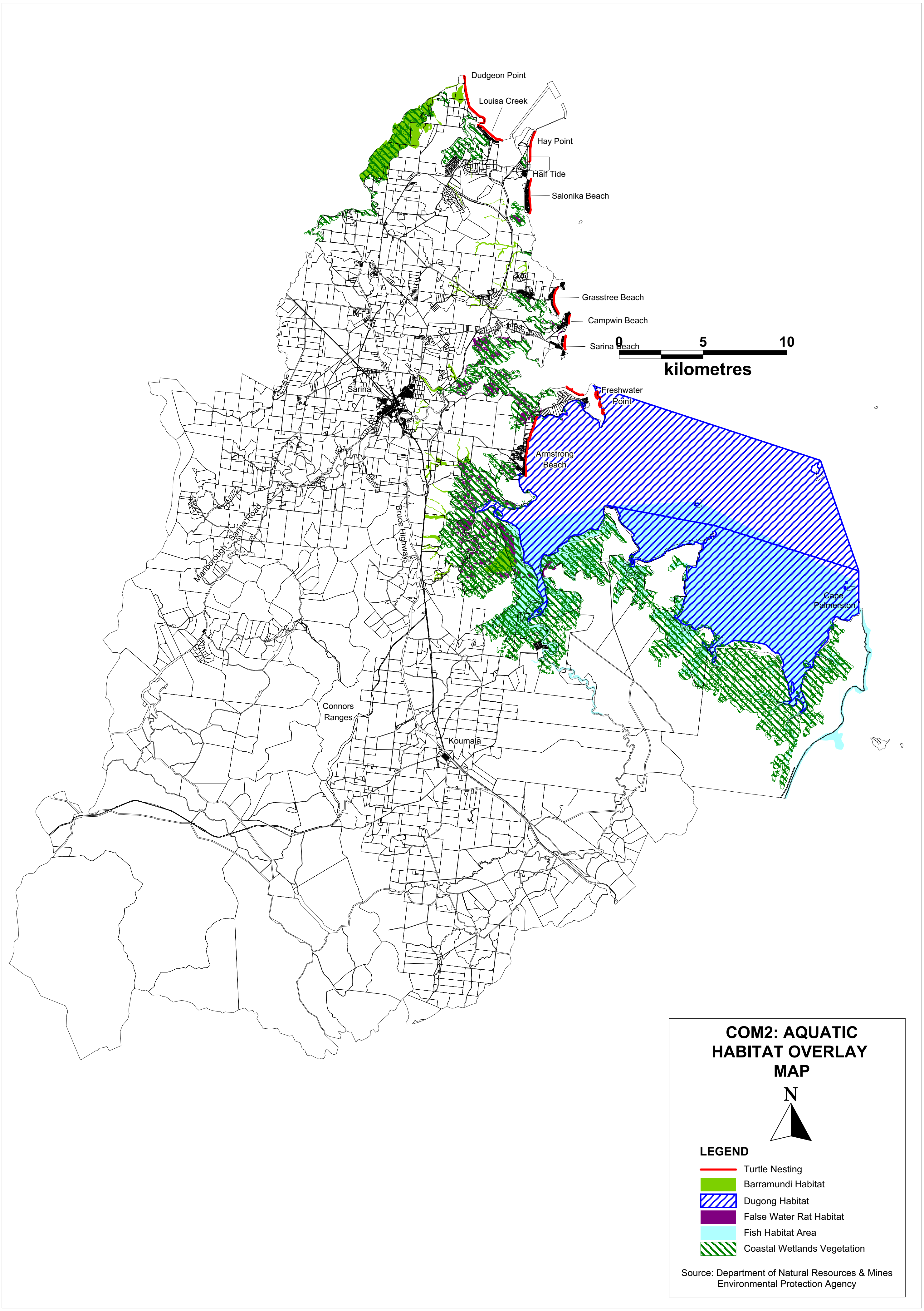
Connell HATCH

9XB PROJECT			BASED ON 7X Costs					
Area	Component Name	% factor (where used)	Proprietary free issue	Other	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)	Total for Area (escalated to Feb 09)
CONSTRUCTION WORKS								
Civil Works	MOBILISATION AND DEMOBILISATION			$ 6,102,250	$ 6,102,250	10%	$ 6,712,475	
	PROVISION FOR TRAFFIC			$ 730,000	$ 730,000	10%	$ 803,000	
	DRAINAGE			$ 144,000	$ 144,000	10%	$ 158,400	
	EARTHWORKS			$ 59,915,010	$ 59,915,010	10%	$ 65,906,511	
	ROAD AND HARDSTANDS			$ 12,937,667	$ 12,937,667	10%	$ 14,231,433	
	ENVIRONMENTAL CONTROLS			$ 5,411,467	$ 5,411,467	10%	$ 5,952,613	
	WATER RETICULATION			$ 666,667	$ 666,667	10%	$ 733,333	
	SIGNAGE AND LINEMARKING			$ 383,467	$ 383,467	10%	$ 421,813	
	UNDERGROUND SERVICES			$ 500,000	$ 500,000	10%	$ 550,000	
	SUPERVISION AND ADMINISTRATION			$ 2,603,716	$ 2,603,716	10%	$ 2,864,087	$ 98,333,667
Inloading 5	Rail Receival Pit RRP5 inc BF22		$ 791,704	$ 46,658,302	$ 47,450,006	10%	$ 52,195,006	
	Rail Receival sound attenuation			$ 100,000	$ 100,000	10%	$ 110,000	
	RRP5 Wagon Vibrator		$ 1,754,645		$ 1,754,645	10%	$ 1,930,110	
	Conveyor S22		$ 1,979,578	$ 13,879,776	$ 15,859,354	10%	$ 17,445,290	
	Conveyor S25		$ 2,257,641	$ 38,819,816	$ 41,077,457	10%	$ 45,185,202	
	Conveyor S24 Extend		$ 668,193	$ 10,133,057	$ 10,801,250	10%	$ 11,881,375	$ 128,746,982
New Stockyard	Conveyor S210		$ 3,377,493	$ 38,819,816	$ 42,197,309	10%	$ 46,417,040	
	Conveyor S28		$ 3,911,282	$ 16,071,175	$ 19,982,456	10%	$ 21,980,702	
	Conveyor R22		$ 3,989,888	$ 16,874,704	$ 20,864,592	10%	$ 22,951,052	
	Conveyor R25		$ 3,447,657	$ 14,867,834	$ 18,315,491	10%	$ 20,147,040	
	Conveyor R26		$ 3,447,657	$ 14,867,834	$ 18,315,491	10%	$ 20,147,040	
	Stacker ST6			$ 13,083,439	$ 13,083,439	20%	$ 15,700,127	
	Reclaimer RL4			$ 20,483,026	$ 20,483,026	20%	$ 24,579,631	
	Reclaimer RL7			$ 20,483,026	$ 20,483,026	10%	$ 22,531,328	
	Reclaimer RL8			$ 20,483,026	$ 20,483,026	10%	$ 22,531,328	
	Yard Machine Rail		$ 1,224,696		$ 1,224,696	10%	$ 1,347,166	$ 218,332,454
New Outloading 5 - Onshore	Conveyor L22		$ 2,190,811	$ 25,333,610	$ 27,524,420	10%	$ 30,276,863	
	Conveyor L25A		$ 1,645,397	$ 19,658,721	$ 21,304,118	10%	$ 23,434,530	
	Surge Bin 5 inc BF25/BF26 and SP5		$ 1,005,852	$ 40,144,777	$ 41,150,629	10%	$ 45,265,692	$ 98,977,084
New Outloading No. 5 - offshore								
	Piling principal supply for all of 9X phase 2			$ 7,104,028	$ 7,104,028	10%	$ 7,814,431	
	Berth 5			$ 143,942,631	$ 143,942,631	10%	$ 158,336,894	
	Berth 5 Moormaster system			$ 5,000,000	$ 5,000,000	10%	$ 5,500,000	
	Berth 5 dredging			$ 10,000,000	$ 10,000,000	10%	$ 11,000,000	
	Berth 6			$ 140,580,494	$ 140,580,494	10%	$ 154,638,543	
	Berth 6 Moormaster system			$ 5,000,000	$ 5,000,000	10%	$ 5,500,000	
	Berth 6 dredging			$ 10,000,000	$ 10,000,000	10%	$ 11,000,000	
	L219 Extension - marine substructure			$ 3,173,644	$ 3,173,644	10%	$ 3,491,008	
	L220 Marine structures			$ 26,469,457	$ 26,469,457	10%	$ 29,116,403	
	Amenities building			$ 538,434	$ 538,434	10%	$ 592,277	
	Conveyor L217		$ 10,910,962	$ 66,942,738	$ 77,853,700	10%	$ 85,639,070	
	L219 Extension for 9B		$ 509,710	$ 11,823,991	$ 12,333,701	10%	$ 13,567,071	
	L17 Extension for Berth 5		$ 581,069	$ 10,466,188	$ 11,047,258	10%	$ 12,151,984	
	Conveyor L220		$ 4,092,387	$ 46,307,925	$ 50,400,313	10%	$ 55,440,344	
	OL5 Slurry Return			$ 3,440,605	$ 3,440,605	10%	$ 3,784,665	
	Shiploader SL5			$ 48,948,669	$ 48,948,669	10%	$ 53,843,536	
	Shiploader Rail		$ 1,476,888		$ 1,476,888	10%	$ 1,624,577	$ 613,040,802
Electrical Site Power Supply Upgrades and 3.3kV Switchgear	7X Cost scaled to P85 according to conveyor drive cost ratio.			$ 23,521,085	$ 23,521,085	10%	$ 25,873,194	$ 25,873,194
Water Reticulation Upgrades	water reticulation - offshore			$ 1,913,606	$ 1,913,606	10%	$ 2,104,967	
	Supply of stockpile sprays sprays (remainder sprays in bund costs)		$ 428,806		$ 428,806	10%	$ 471,686	
	General water supply upgrade onshore		$ 1,901,175	$ 3,802,350	$ 5,703,525	10%	$ 6,273,878	$ 8,850,530
Offices and Workshops	Admin Building			$ 2,000,000	$ 2,000,000	10%	$ 2,200,000	
	Warehousing			$ 1,000,000	$ 1,000,000	10%	$ 1,100,000	
	Maintenance Facilities			$ 3,000,000	$ 3,000,000	10%	$ 3,300,000	$ 6,600,000
Capital Spares				$ 3,000,000	$ 3,000,000	10%	$ 3,300,000	$ 3,300,000
SUBTOTAL	9XB Construction Works				$ 1,089,725,516		$ 1,202,054,714	$ 1,202,054,714
ENGINEERING								
Detailed Engineering	% of Capital Works	4.72%		$ 56,686,865.65	$ 56,686,866			
Project Management - Home office and Site	% of Capital Works	11.34%		$ 136,272,348.95	$ 136,272,349			
Off-site Inspection and Expediting	% of Capital Works	0.17%		$ 2,056,404.38	$ 2,056,404			
Site Offices - offices, security, waste collection, cleaning etc.	% of Capital Works	0.36%		$ 4,375,879.35	$ 4,375,879			
Ambulance and First Aid Services	% of Capital Works	0.13%		$ 1,504,767.45	$ 1,504,767			
		16.71%						
Control Systems Software	Scaled from 7X according to conveyor drive costs.			$ 5,720,854	$ 5,720,854			
Manuals and Training	% of Capital Works	0.43%		$ 5,110,725.87	$ 5,110,726			
Owners Costs - DBCT Management	% of Capital Works	5.16%		$ 62,018,588.72	$ 62,018,589			
SUBTOTAL	9XB Engineering				$ 273,746,434			
CONTINGENCY								
	Scope Growth During Engineering Development (15%)				$ 221,370,172			
TOTAL 9XB Project					$ 1,697,171,320	$/Tpa		
						$ 41		
TOTAL 8X/9XA/9XB Projects and Studies					$3,979,264,891	$/Tpa		
						$ 59		

Rail Infrastructure Costs					
Area	Component Name	Total component (without escalation to P85)	Escalation to Feb 09	Total component (escalated to Feb 09)	
9XA RAIL CONSTRUCTION WORKS					
Rail Formation and Civil Works Costs	Civil Cost	$ 206,206,690	10%	$ 226,827,359	
	Rail formation, rail and signals	$ 109,394,125	10%	$ 120,333,538	
Engineering and Owners Cost	20%	$ 63,120,163		$ 63,120,163	
SubTOTAL 9XA RAIL		$ 378,720,978		$ 410,281,060	
CONTINGENCY					
	15%			$ 61,542,159	
TOTAL 9XA Rail				$ 471,823,219	
9XB RAIL CONSTRUCTION WORKS					
Rail Formation and Civil Works Costs	Civil Cost	$ 52,660,564	10%	$ 57,926,621	
	Rail formation, rail and signals	$ 22,418,919	10%	$ 24,660,811	
Engineering and Owners Cost	20%	$ 15,015,897		$ 15,015,897	
SubTOTAL 9XB RAIL		$ 90,095,380		$ 97,603,328	
CONTINGENCY					
	15%			$ 14,640,499	
TOTAL 9XB Rail				$ 112,243,827	
Total Rail				$ 584,067,046	
TOTAL 8X/9XA/9XB Projects, Studies and Rail				$4,563,331,937	$/Tpa
					$ 68

Appendix D

Barramundi Habitat



Dudgeon Point
Louisa Creek
Hay Point
Half Tide
Salonika Beach
Grasstree Beach
Campwin Beach
Sarina Beach
0
5
10
kilometres
Freshwater Point
Sarina
Armstrong Beach
Marlborough - Sarina Road
Bruce Highway
Cape Palmerston
Connors Ranges
Koumala
COM2: AQUATIC HABITAT OVERLAY MAP
N
LEGEND
Turtle Nesting
Barramundi Habitat
Dugong Habitat
False Water Rat Habitat
Fish Habitat Area
Coastal Wetlands Vegetation
Source: Department of Natural Resources & Mines
Environmental Protection Agency

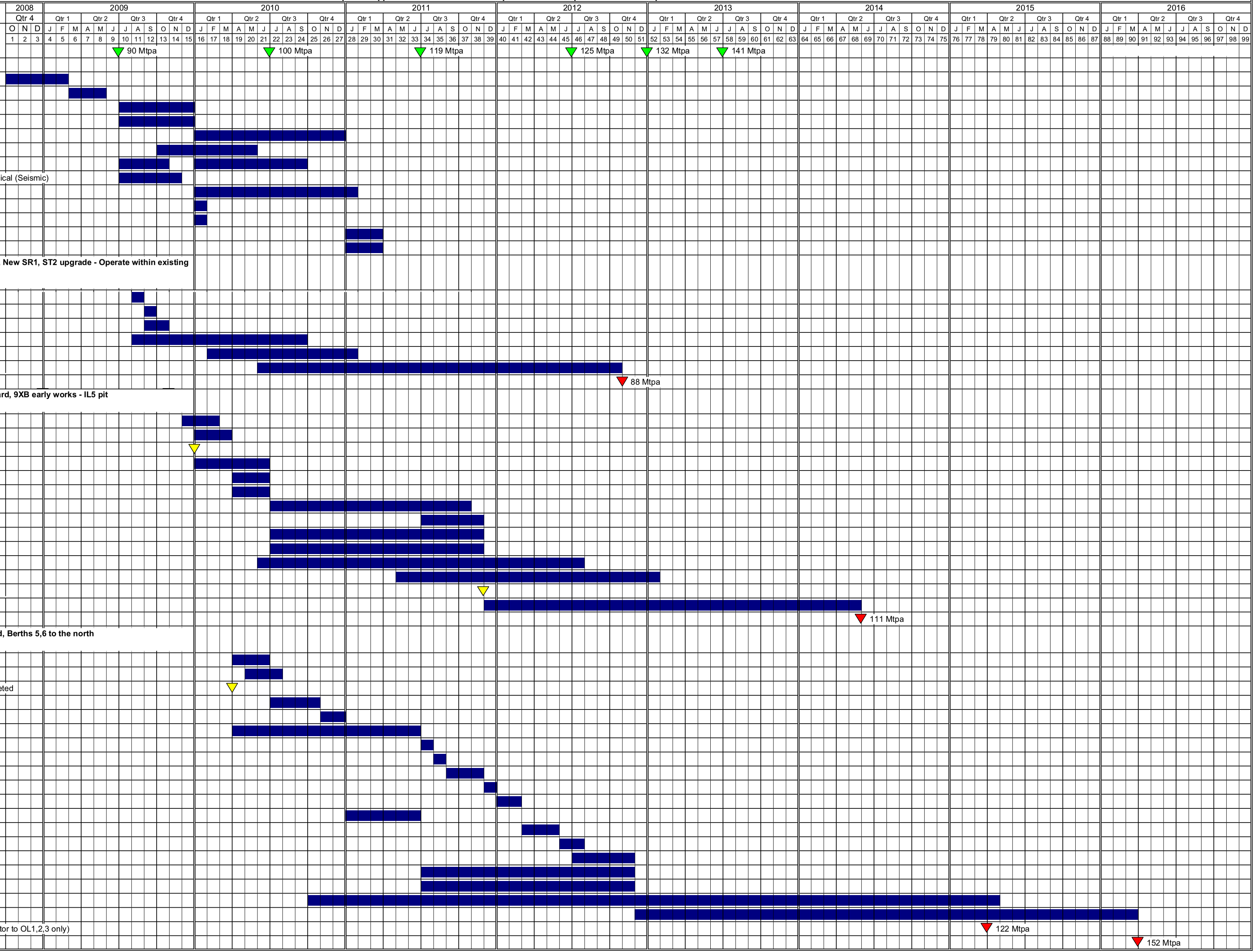
Appendix E

Optimistic Target Implementation Schedule

![Connell HATCH — Infrastructure for Industry]

DBCT 152Mtpa Expansion - Implementation Schedule - Optimistic Target Schedule
Development Application Process for 9XA expansion and EIS process for 9XB Expansion

ID	Task Name	Duration
	Demand Profile as at Sept 2008	
1	**Studies and Project Approval**	
1.1	Site Selection Study	
1.2	Development of P90 Cost Estimate	
1.3	Options Studies and Project Definition	
1.4	Prelim Eng. and Cost Est (8X)	
1.5	Prelim Eng. / Feasibility Study (9XA and 9XB)	
1.6	Environmental Field Investigations	
1.7	Onshore Geotechnical Investigations	
1.8	Survey - Onshore, Offshore Hydrographic and Geophysical (Seismic)	
1.9	Offshore Geotechnical Investigations	
1.10	Financing (8X & portion of 9XA early works)	
1.11	Project Approval (8X & portion of 9XA early works)	
1.12	Financing (9XA & 9XB)	
1.13	Project Approval (9XA & 9XB)	
2	**8X Expansion - Minor Increment - Walls on Bunds 1 and 3, New SR1, ST2 upgrade - Operate within existing 85Mtpa licence (within 10%)**	
2.1	Review existing Development Approval	
2.2	Prepare advice on 10% Issue	
2.3	Liaison with EPA	
2.4	Engineering	
2.5	Procurement	
2.6	Mobilise and Construction	
2.7	88 Mtpa available	
3	**9XA Expansion - IL4, OL4, SL4, Rows 1,2,3 of new stockyard, 9XB early works - IL5 pit**	
3.1	Background Research and Field Studies	
3.2	EPBC Referral	
3.3	Concept design completed	
3.4	Environmental Assessment Report	
3.5	Native Title	
3.6	Owner's Consent and Resource Entitlement	
3.7	Development Application - MCU	
3.8	Development Application - Operational Works	
3.9	Road closures	
3.10	Land Acquisition	
3.11	Engineering	
3.12	Procurement	
3.13	First Contract Awarded	
3.14	Mobilise and Construction	
	111 Mtpa available	
4	**9XB Expansion - IL5, OL5, SL5, Rows 4,5 of new stockyard, Berths 5,6 to the north**	
4.1	Background Research and Field Studies	
4.2	EPBC Referral	
4.3	Concept design completed & 9XA EPBC referral completed	
4.4	IAS and 'significant project' declaration	
4.5	Terms of Reference Approved and Agreed	
4.6	EIS Preparation	
4.7	EIS Public Display	
4.8	Response to submissions	
4.9	Supplementary EIS	
4.10	CoG Evaluation and Approval	
4.11	EPBC Approval	
4.12	Native Title	
4.13	Owner's Consent and Resource Entitlement	
4.14	Development Application - MCU	
4.15	Development Application - Operational Works	
4.16	Land Acquisition	
4.17	Road closures	
4.18	Engineering, Procurement	
4.19	Mobilise and Construction **	
	122 Mtpa available (Berth 5, half of Row 4, OL5 connector to OL1,2,3 only)	
	152 Mtpa available	



** Assumes roughly three times as much plant, labour etc compared with 7X for the stockyard development

DBCT 152Mtpa Expansion - Implementation Schedule - Optimistic Target Schedule
EIS process for all of 9X expansion

ID	Task Name	Duration	Milestones
	Demand Profile as at Sept 2008		90 Mtpa; 100 Mtpa; 119 Mtpa; 125 Mtpa; 132 Mtpa; 141 Mtpa
1	**Studies and Project Approval**		
1.1	Site Selection Study		
1.2	Development of P90 Cost Estimate		
1.3	Options Studies and Project Definition		
1.4	Prelim Eng. and Cost Est (8X)		
1.5	Prelim Eng. / Feasibility Study (9XA and 9XB)		
1.6	Environmental Field Investigations		
1.7	Onshore Geotechnical Investigations		
1.8	Survey - Onshore, Offshore Hydrographic and Geophysical (Seismic)		
1.9	Offshore Geotechnical Investigations		
1.10	Financing (8X & portion of 9XA early works)		
1.11	Project Approval (8X & portion of 9XA early works)		
1.12	Financing (9XA & 9XB)		
1.13	Project Approval (9XA & 9XB)		
2	**8X Expansion - Minor Increment - Walls on Bunds 1 and 3, New SR1, ST2 upgrade - Operate within existing 85Mtpa licence (within 10%)**		
2.1	Review existing Development Approval		
2.2	Prepare advice on 10% Issue		
2.3	Liaison with EPA		
2.4	Engineering		
2.5	Procurement		
2.6	Mobilise and Construction		
2.7	88 Mtpa available		88 Mtpa
3	**9X Expansion - IL4, OL4, SL4, Rows 1,2,3 of new stockyard - IL5, OL5,SL5, Rows 4,5 of new stockyard, Berths 5, 6 to the north**		
4.1	Background Research and Field Studies		
4.2	EPBC Referral		
4.3	Concept design completed		
4.4	IAS and 'significant project' declaration		
4.5	Terms of Reference Approved and Agreed		
4.6	EIS Preparation		
4.7	EIS Public Display		
4.8	Response to submissions		
4.9	Supplementary EIS		
4.10	CoG Evaluation and Approval		
4.11	EPBC Approval		
4.12	Native Title		
4.13	Owner's Consent and Resource Entitlement		
4.14	Development Application - MCU		
4.15	Development Application - Operational Works		
4.16	Land Acquisition		
4.17	Road closures		
4.18	Engineering, Procurement		
4.19	Mobilise and Construction **		
	111 Mtpa available		111 Mtpa
	122 Mtpa available (IL4,OL4 to NFD, Berth 5, Row 11)		122 Mtpa
	151 Mtpa available		152 Mtpa

** Assumes roughly three times as much plant, labour etc compared with 7X for the stockyard development

Appendix C

DALRYMPLE BAY COAL TERMINAL PRELIMINARY AIR QUALITY CONSTRAINTS STUDY - SOUTHERN STOCKYARD OPTION

Prepared for

Babcock & Brown Infrastructure Group Ltd

KE0902671

MARCH 2009

Draft

Prepared by

Katestone Environmental Pty Ltd

ABN 92 097 270 276
Terrace 5, 249 Coronation Drive
PO Box 2217
Milton, Queensland, Australia 4064

www.katestone.com.au
environmental@katestone.com.au
Ph +61 7 3369 3699
Fax +61 7 3369 1966

Document Quality Details

Job Number: KE0902671

Title: DALRYMPLE BAY COAL TERMINAL PRELIMINARY AIR QUALITY CONSTRAINTS STUDY - SOUTHERN STOCKYARD OPTION

Client: Babcock & Brown Infrastructure Group Ltd

Document reference: BBI Southern Option Rev 0.0.docx

Prepared by: Lena Jackson

Reviewed by: Simon Welchman

Revision	Date	Approved	Signature
Rev 0.0	06/03/09	SW	S. Welch

Contents

Tables

Figures

1. Introduction

Katestone Environmental was commissioned by Babcock & Brown Infrastructure Group Ltd (BBI) to prepare a preliminary air quality assessment of one option to expand the Dalrymple Bay Coal Terminal (DBCT) to a capacity of 150 million tonnes per annum (Mtpa). The option involves increasing the throughput of the existing DBCT terminal and the addition of a new stockyard and related infrastructure to be referred to here as the Southern Stockyard Option.

The DBCT currently has an approved capacity to ship 85 Mtpa. Due to increasing demand for coal exports, BBI is investigating options for expansion of this capacity.

The expansion to 150 Mtpa that is the subject of this preliminary air quality study would be achieved by:

- Improvements in DBCT to allow an increase in capacity to 90 Mtpa
- The construction of a new stockyard and associated infrastructure including rail loop, inloading and outloading facilities with a capacity of 60 Mtpa.

The Southern Stockyard Option is located about 1.7 km to the south-southeast of the existing DBCT stockyard. The Southern Stockyard Option is currently at a conceptual stage and detail design information is not yet available. Hence, this study relies upon the design of the existing DBCT and its dust emission controls as a basis for quantifying potential emission rates of coal dust.

Katestone Environmental previously conducted an air quality assessment for the DBCT titled "Dalrymple Bay Coal Terminal Expansion from 70 to 85 Mtpa Air Quality Impact Assessment Study, March 2006". The information provided in this report for the emission calculations has been adopted in the proposed expansion of the DBCT to 90 Mtpa and the Southern Stockyard Option with a 60 Mtpa capacity.

2. Air quality objectives

The *Environmental Protection Act 1994* (EP Act) provides for the management of the air environment in Queensland. The EP Act gives the Minister for Sustainability, Climate change and Innovation the power to create Environmental Protection Policies that identify and aim to protect environmental values of the atmosphere that are conducive to the health and well-being of humans and biological integrity. The *Environmental Protection (Air) Policy* (EPP(Air)) was recently revised and gazetted in 2008. The administering authority must consider the requirements of the EPP(Air) when it decides an application for an environmental authority (EA), amendment of a licence or approval of a draft environmental management plan.

The air quality objectives that are relevant to DBCT and the Southern Stockyard Option are the EPP(Air) objectives, the management objectives specified in the existing Environmental Authority (EA) issued by the EPA for the operation of DBCT and the EPA's recommended guideline for deposited dust. These are summarised in Table 1.

Note that, whilst the EPP(Air) objectives relate to the total amount of dust (TSP, PM_{10} or $PM_{2.5}$) in the atmosphere irrespective of the source of the dust, the DBCT EA management objectives for TSP and coal dust deposition are for the increase in dust level above the background caused by DBCT.

Table 1 Ambient air quality standards and goals used in Queensland

Pollutant	Averaging period	Standard/goal	Source
Particulates (as $PM_{2.5}$)[1]	24-hour	25 µg/m³	EPP(Air)
	Annual	8 µg/m³	EPP(Air)
Particulates (as PM_{10})[2]	24-hour	50 µg/m³	EPP(Air)[3]
Particulates (as TSP)	24-hour	50 µg/m³	DBCT EA management objective[4]
	Annual	90 µg/m³	EPP(Air)
Dust deposition rate (total insoluble solids)	Annual	120 mg/m^2/day	EPA recommended guideline
Dust deposition rate (increase in insoluble solids above background)	Annual	60 mg/m^2/day	DBCT EA management objective[4]

Table note:
[1]$PM_{2.5}$ are particles that have aerodynamic diameters that are less than 2.5 µm
[2]PM_{10} are particles that have aerodynamic diameters that are less than 10 µm
[3]5 exceedances allowed per year
[4]Environmental Authority management objective, increase above background

3. Existing environment

A detailed summary of the climate and dust monitoring undertaken by PCQ, HPCT, DBCT and the Bureau of Meteorology is provided in the previous Katestone Environmental (2006) report.

3.1 Meteorology

The winds at Hay Point are strongly influenced by the presence of the Coral Sea. The winds at Hay Point are predominantly moderate and from the southeast. A summary of the seasonal and diurnal winds are provided in Figure 2 and Figure 3. The seasonal wind roses show the summer, autumn and spring winds to be dominated by moderate to strong winds from the southeasterly sector. During winter, southeasterly to southwesterly winds are most frequent and are light to moderate in strength. During the day (6 am to 6 pm) moderate winds occur from the southeasterly sector. During the evenings the dominant winds shift slightly to the east to east-southeast. During the early mornings the winds are dominated by light south to southwesterly winds and moderate east to east-southeasterly winds.

3.2 Existing air quality

Coal dust is the major air pollutant that is emitted from coal transport and storage activities. Coal dust is most frequently associated with nuisance impacts in surrounding communities such as soiling of surfaces in residential areas. Most community complaints occur due to elevated levels of coal dust deposition and this is likely to be dominated by particles in the fine to coarse size range rather than the very fine size range.

PCQ, DBCT and HPCT jointly operate an extensive environmental monitoring network that consists of four primary monitoring stations that are adjacent to the nearest residential areas. These stations continuously measure meteorological conditions and ambient concentrations of dust. Dust deposition rates are also measured on a monthly basis at each of the primary sites and also at 19 secondary sites (S1 to S19) that are located within the terminals and in the community and at two control sites (C1 and C2) that are located at Grasstree Beach, approximately 10 km to the south.

The primary monitoring stations at Louisa Creek (P1 and P2), Half Tide (P3) and Salonika (P4) record 10-minute average dust concentrations using a Tapered Element Oscillating Microbalance (TEOM). The TEOMs have been operating since 1996 and have been found to measure particle sizes up to 20 µm. Katestone Scientific (2000) found the following relationships between the Hay Point TEOM dust concentrations and the standard dust measures of TSP, PM_{10} and $PM_{2.5}$:

- TSP concentrations can be derived by multiplying the TEOM dust measurements by a factor of 2.2
- PM_{10} levels can be derived from the TEOM PM_{20} measurements by applying a divisional factor of 1.7
- $PM_{2.5}$ levels can be derived from the TEOM PM_{20} measurements by applying a divisional factor of 8.9

Dust monitoring data from the period January 1998 to March 2005 were reviewed for this study.

The background dust level is generally defined as the level that is experienced without the influence of anthropogenic dust sources. The EPA recommends using the 95th percentile of 24-hour average concentrations to represent the background level for air quality assessments. Table 2 presents the background levels determined for each of the monitoring sites. The annual average is calculated for the period included in the modelling. The PM_{10} data recorded by the EPA at Mackay is also included in this table. The EPA site records higher concentrations than the Hay Point monitoring sites. This is due to the EPA site being located in a light industrial area and is closer to the more urban area of Mackay where a greater amount of dust generation is likely to occur.

The monitoring site at Salonika (P4) is located the furthest from the terminals and least likely to be impacted by anthropogenic dust sources. This site has been chosen as the most representative of the background levels at Hay Point. A summary of these background levels is presented in Table 2.

Table 2 Background dust levels for TSP, PM_{10}, $PM_{2.5}$ and dust deposition rate

Particle size	Averaging period	Salonika (P4)
$PM_{2.5}$ (µg/m^3)	24-hour	4.0
	Annual	2.5
PM_{10} (µg/m^3)	24-hour	20.7
TSP (µg/m^3)	Annual	48.5
Dust deposition (mg/m^2/day)	Annual	36

4. Dust emissions

Details on the equations included in the dust assessment are provided in Appendix 3 of Katestone Environmental (2006). The details below summarise how the Katestone Environmental (2006) emissions were adjusted for the proposed expansion of the DBCT to 90 Mtpa and the inclusion of the Southern Stockyard Option.

4.1 Emissions for DBCT expansion

The DBCT expansion from 85 Mtpa to 90 Mtpa will involve an increase in the coal handling at the following locations:

- Train unloading
- Conveyor operations
- Surge bins
- Stacking/reclaiming
- Transfer points
- Ship loading
- Miscellaneous other site activities including traffic

The area of the stockyard will not change significantly as a result of the increase in capacity to 90 Mtpa. A summary of the emission rate change for the existing operations of 85 Mtpa and the proposed 90 Mtpa operations are presented in Table 3. Emissions from the HPCT at its current approved throughput are also presented in Table 3.

Table 3: Average emission rates for important dust producing activities at DBCT for current approved capacity and expanded to 90 Mtpa and for HPCT at current approved capacity

Activity	DBCT (g/s)		Percent difference (%)	HPCT (g/s)
	85 Mtpa	90 Mtpa		
Rail receival	0.17	0.18	5.9	0.085
Inloading conveyors – including transfer points	0.49	0.52	5.9	0.2
Stacking	1.69	1.78	5.9	0.56
Reclaiming	1.75	1.86	5.9	0.57
Stockpile liftoff	4.38	4.38	0.0	2.84
Outloading conveyors and transfer points	1.08	1.13	5.9	0.52
Ship loading	0.54	0.57	5.9	0.28
Surge bins	0.32	0.34	5.9	0.49
Other site activities – including traffic	0.28	0.30	5.9	0.22
Total	10.68	11.06	3.5	5.77

4.2 Emissions for Southern Stockyard Option

Dust emission rates from the Southern Stockyard Option were calculated based on the emission rates from DBCT and assuming equivalent dust controls. The following specific features of the Southern Stockyard Option were accounted for:

- Southern Stockyard Option capacity is 60 Mtpa
- Southern Stockyard Option area is approximately 40 hectares
- Inloading and outloading conveyor lengths were estimated from drawings prepared for BBI by Connell Hatch
- Southern Stockyard Option has two surge bins which were assumed to be similar to the newest surge bins at DBCT

A summary of the emission rate for the Southern Stockyard Option at 60 Mtpa is presented in Table 4.

Table 4 Average emission rates for important dust producing activities at the Southern Stockyard Option

Activity	Southern Stockyard Option (g/s)
Rail receival	0.12
Inloading conveyors – including transfer points	0.61
Stacking	1.19
Reclaiming	1.24
Stockpile liftoff	3.11
Outloading conveyors and transfer points	1.40
Ship loading	0.38
Surge bins	0.16
Other site activities – including traffic	0.20
Total	8.40

5. Modelling

5.1 Methodology

The modeling was conducted using the same methodology as for previous air quality assessments conducted by Katestone Environmental for DBCT (Katestone Environmental, 2006). The ISC3 dispersion model has been used to estimate ground-level concentrations of $PM_{2.5}$, PM_{10}, TSP and dust deposition rates for the following scenarios:

- Southern Stockyard Option in isolation
- Southern Stockyard Option operating with DBCT at 90 Mtpa and HPCT at approved operations.

$PM_{2.5}$ has been considered in this study, but was not considered in previous studies. This is because the EPP(Air) has recently been revised to include $PM_{2.5}$. The $PM_{2.5}$ fraction of the PM_{10} was assumed to be 6% based on studies by Cowherd and Donaldson (2005), Ono (2005) and US EPA (2006).

5.2 Potential impacts of existing activities on air quality

A summary of the predicted ground-level concentrations of air pollutants for the existing approved operations of DBCT (85 Mtpa) and HPCT plus the background levels shown in Table 2 are presented in Table 5.

Table 5 Predicted modelling results of DBCT at 85 Mtpa and approved HPCT with background levels

Location	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)	TSP (µg/m³)		Dust deposition (mg/m²/day)
	24-hour	Annual	24-hour	24-hour[1]	Annual	
P1	4.5	2.6	27.6	17.7	52.4	53.6
P2	5.3	2.9	42.4	60.0	66.1	134.0
P3	4.5	2.5	28.7	19.2	50.1	38.1
P4	4.2	2.5	23.6	6.9	49.3	36.7
Louisa Creek	4.8	2.7	33.5	35.2	57.1	80.4
Timberlands	4.1	2.5	21.9	2.4	49.1	36.1
Hay Point Road 1	4.4	2.5	26.6	10.1	49.5	38.1
Hay Point Road 2	4.3	2.5	26.5	8.6	49.0	36.5
Droughtmaster Drive 1	4.3	2.5	25.1	7.2	48.9	36.6
Droughtmaster Drive 2	4.3	2.5	26.1	8.0	48.9	36.4
Hay Point Road 3	4.2	2.5	23.5	4.0	48.7	36.2
Fenech Street	4.2	2.5	23.9	3.9	48.7	36.2
Salonika: Pacific Drive 1	4.3	2.5	25.1	8.7	48.9	36.9
Salonika: Pacific Drive 2	4.2	2.5	23.4	3.5	48.7	36.4
Half Tide: Tindaridge Court	4.4	2.5	27.4	14.0	49.2	37.5
Air quality objective	**25**	**8**	**50**	**50[1]**	**90**	**60/120**

Table note
[1]Increase above background

The levels shown in Table 5 suggest that the EA management objective for 24-hour average concentrations of TSP and dust deposition rates and the EPA's recommended guideline for dust deposition rate may be exceeded at the primary monitoring site P2. These potential exceedances were identified in the previous modelling assessment conducted for the DBCT expansion to 85 Mtpa (Katestone Environmental, 2006). That study demonstrated the tendency of the dispersion model to over-estimate ground-level concentrations of air pollutants at site P2 and therefore concluded that the elevated levels that were predicted were unlikely to occur in practice.

5.3 Dispersion modelling assessment of DBCT at 150 Mtpa

5.3.1 $PM_{2.5}$

A summary of the predicted 24-hour and annual average ground-level concentrations of $PM_{2.5}$ due to the Southern Stockyard Option in isolation and in conjunction with DBCT at 90 Mtpa, HPCT at approved capacity plus background levels, for the selected residences and monitoring stations is presented in Table 6.

The predicted $PM_{2.5}$ concentrations are low and well in compliance with the EPP(Air) objective. The Southern Stockyard Option is predicted to result in a minor increase in $PM_{2.5}$ concentrations. The largest increase is 0.8 µg/m³, which represents 3% of the objective.

Table 6 Predicted 24-hour and annual average $PM_{2.5}$ concentrations (µg/m³)

Location	24-hour average		Annual average	
	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels
P1	0.1	4.5	0.02	2.6
P2	0.2	5.5	0.05	3.0
P3	0.4	4.5	0.03	2.6
P4	0.2	4.4	0.02	2.5
Louisa Creek	0.2	4.9	0.03	2.8
Timberlands	0.1	4.2	0.01	2.5
Hay Point Road 1	0.3	4.4	0.07	2.6
Hay Point Road 2	0.4	4.4	0.05	2.6
Droughtmaster Drive 1	0.8	4.8	0.09	2.6
Droughtmaster Drive 2	0.5	4.5	0.09	2.6
Hay Point Road 3	0.4	4.4	0.06	2.6
Fenech Street	0.2	4.2	0.02	2.5
Salonika: Pacific Drive 1	0.3	4.4	0.03	2.5
Salonika: Pacific Drive 2	0.1	4.2	0.01	2.5
Half Tide: Tindaridge Court	0.3	4.5	0.03	2.6
Air quality objective	**25**		**8**	

Figure 4 to Figure 7 show the predicted 24-hour and annual average $PM_{2.5}$ concentrations for the Southern Stockyard Option in isolation (Figure 4 and Figure 6) and with DBCT (90 Mtpa), HPCT and background levels (Figure 5 and Figure 7). Higher concentrations from the Southern Stockyard Option occur close to the site and to the northwest of the stockpiles.

5.3.2 PM_{10}

A summary of the predicted 24-hour average ground-level concentrations of PM_{10} due to the Southern Stockyard Option in isolation and in conjunction with DBCT at 90 Mtpa, HPCT at approved capacity plus background levels, for the selected residences and monitoring stations is presented in Table 7.

The predicted PM_{10} concentrations are in compliance with the EPP(Air) objective at all residences. The Southern Stockyard Option is predicted to result in a minor increase in PM_{10} concentrations. The largest increase is 12.6 µg/m³, which represents 25% of the objective.

Table 7 Predicted 24-hour average PM_{10} concentrations (µg/m³)

Location	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels
P1	2.5	29.0
P2	3.3	45.0
P3	6.1	29.4
P4	3.5	26.7
Louisa Creek	3.7	35.3
Timberlands	1.9	23.3
Hay Point Road 1	5.8	26.9
Hay Point Road 2	6.0	26.8
Droughtmaster Drive 1	12.6	33.3
Droughtmaster Drive 2	9.0	29.7
Hay Point Road 3	6.1	26.8
Fenech Street	3.3	24.7
Salonika: Pacific Drive 1	4.6	27.5
Salonika: Pacific Drive 2	2.4	24.5
Half Tide: Tindaridge Court	5.5	28.4
Air quality objective	50	

Figure 8 and Figure 9 show the predicted 24-hour average PM_{10} concentrations for the Southern Stockyard Option in isolation and with DBCT (90 Mtpa), HPCT and background levels. Higher concentrations from the Southern Stockyard Option occur close to the site and to the northwest of the stockpiles.

5.3.3 TSP

A summary of the predicted 24-hour average and annual average ground-level concentrations of TSP due to the Southern Stockyard Option in isolation and in conjunction with DBCT at 90 Mtpa, HPCT at approved capacity plus background levels, for the selected residences and monitoring stations is presented in Table 8.

The predicted TSP concentrations are in compliance with the EPP(Air) objective. The Southern Stockyard Option is predicted to result in a minor increase in PM_{10} concentrations. The largest increase is 29.1 µg/m³, which represents 58% of the objective.

Table 8 Predicted 24-hour and annual average TSP concentrations (µg/m³)

Location	24-hour average		Annual average	
	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved[1]	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels
P1	3.5	19.2	0.5	52.5
P2	4.7	65.0	1.6	67.6
P3	8.6	19.3	0.8	50.4
P4	5.1	10.4	0.5	49.3
Louisa Creek	5.1	38.1	1.0	57.8
Timberlands	2.4	3.5	0.2	48.9
Hay Point Road 1	10.9	10.9	2.3	51.9
Hay Point Road 2	12.6	12.6	1.6	50.5
Droughtmaster Drive 1	29.1	29.1	3.1	52.1
Droughtmaster Drive 2	21.3	21.3	3.1	51.9
Hay Point Road 3	14.2	14.2	1.9	50.6
Fenech Street	5.9	6.2	0.5	49.2
Salonika: Pacific Drive 1	7.3	11.1	0.7	49.6
Salonika: Pacific Drive 2	3.6	5.2	0.2	48.9
Half Tide: Tindaridge Court	8.4	15.5	0.8	50.1
Air quality objective	**50[1]**		**90**	
Table note [1]Increase above background				

Figure 10 and Figure 11 show the predicted annual average TSP concentrations for the Southern Stockyard Option in isolation and with DBCT (90 Mtpa), HPCT and background levels. Higher concentrations from the Southern Stockyard Option occur close to the site and to the northwest of the stockpiles.

5.3.4 Dust deposition

A summary of the predicted annual average dust deposition rates due to the Southern Stockyard Option in isolation and with the DBCT at 90 Mtpa, HPCT at approved capacity plus background levels, for the selected residences and monitoring stations is presented in Table 9.

The predicted dust deposition rates are in compliance with the EPA's recommended guideline and EA management objective at all residences. The Southern Stockyard Option is predicted to result in a minor increase in dust deposition rate. The largest increase is 16.8 mg/m²/day, which represents 28% of the EA management objective and 14% of the EPA's recommended guideline.

Table 9 Predicted annual average dust deposition rates (mg/m²/day)

Location	Southern Stockyard Option in isolation	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved	Southern Stockyard, DBCT at 90 Mtpa, HPCT approved plus background levels
P1	1.8	19.6	55.6
P2	6.6	106.3	142.3
P3	0.4	2.5	38.5
P4	0.3	1.1	37.1
Louisa Creek	3.5	48.6	84.6
Timberlands	0.3	0.5	36.5
Hay Point Road 1	6.6	8.8	44.8
Hay Point Road 2	7.3	7.9	43.9
Droughtmaster Drive 1	13.9	14.5	50.5
Droughtmaster Drive 2	16.8	17.2	53.2
Hay Point Road 3	9.5	9.7	45.7
Fenech Street	0.8	0.9	36.9
Salonika: Pacific Drive 1	0.4	1.4	37.4
Salonika: Pacific Drive 2	0.2	0.6	36.6
Half Tide: Tindaridge Court	0.5	2.1	38.1
Air quality objective	**60**	**60**	**120**

Figure 12 and Figure 13 show the predicted annual average dust deposition rates for the Southern Stockyard Option in isolation and with DBCT (90 Mtpa), HPCT and background levels. Higher concentrations from the Southern Stockyard Option occur close to the site and to the northwest of the stockpiles.

6. Conclusions

A preliminary air quality assessment was conducted for the expanded operations of DBCT to 90 Mtpa operating with the Southern Stockyard Option. The assessment included dispersion modelling using methodologies used previously by Katestone Environmental at Hay Point. Based on this assessment the following conclusions can be drawn:

- The predicted $PM_{2.5}$ concentrations are low and well in compliance with the EPP(Air) objective. The Southern Stockyard Option is predicted to result in a minor increase in $PM_{2.5}$ concentrations. The largest increase is 0.8 µg/m³, which represents 3% of the objective
- The predicted PM_{10} concentrations are in compliance with the EPP(Air) objective at all residences. The Southern Stockyard Option is predicted to result in a minor increase in PM_{10} concentrations. The largest increase is 12.6 µg/m³, which represents 25% of the objective
- The predicted TSP concentrations are in compliance with the EPP(Air) objective. The Southern Stockyard Option is predicted to result in a minor increase in PM_{10} concentrations. The largest increase is 29.1 µg/m³, which represents 58% of the objective.
- The predicted dust deposition rates are in compliance with the EPA's recommended guideline and EA management objective at all residences. The Southern Stockyard Option is predicted to result in a minor increase in dust deposition rate. The largest increase is 16.8 mg/m²/day, which represents 28% of the EA management objective and 14% of the EPA's recommended guideline.

7. References

Cowherd, C. And Donaldson, J. 2005. *Analysis of the Fine Fraction of Particulate Matter in Fugitive Dust.* Final report prepared for the Wester Governor's Association, Western Regional Partnership (WRAP), MRI Project No. 110397

Katestone Environmental,2006, Dalrymple Bay Coal Terminal Expansion from 70 to 85 Mtpa Air Quality Impact Assessment Study, for Connell Hatch March 2006.

Katestone Scientific, 2000, Air Quality Impact Assessment of the Proposed Expansion of Dalrymple Bay Coal Terminal, report to Woodward Clyde.

Ono, D. 2005. "Ambient PM2.5/PM10 ratios for Dust Events from the Keeler Dunes." Great Basin UAPCD, Bishop, CA.

US EPA 2006, Background Document for Revisions to Fine Fraction Ratios Used for AP-42 Fugitive Dust Emission Factors. Midwest Research Institute, Western Governor's Association Wester Regional Air Partnership (WRAP), 1515 Cleveland Place, Suite 200, Denver Colorado 80202. MRI Project No. 110397.

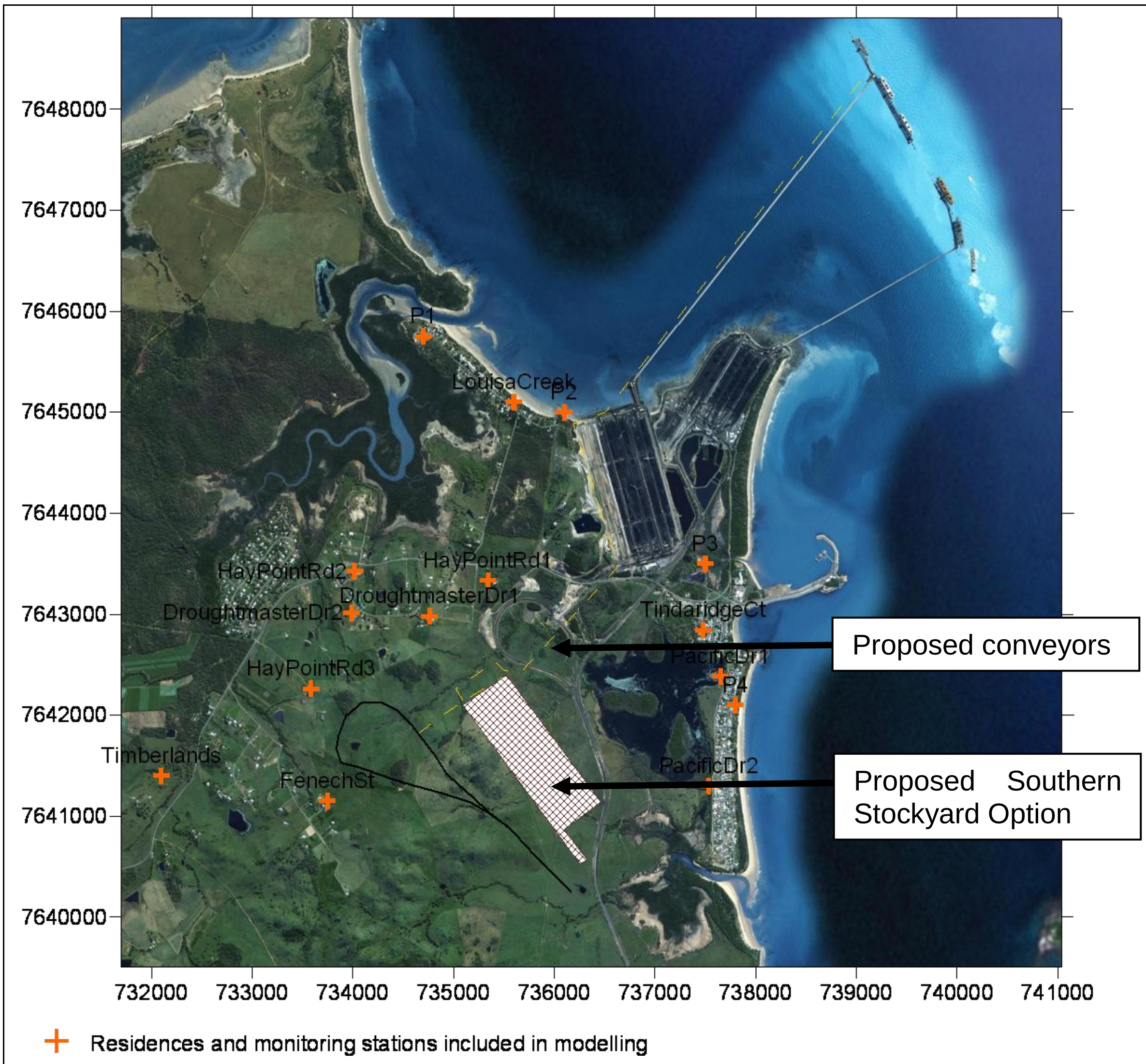


Figure 1 Location of Southern Stockyard Option and nearest residences and monitoring stations included in the assessment

Location: Port of Hay Point	**Period:** N/a	**Data source:** Google Earth	**Units:** Australian Map Grid coordinates – MGA94 1994 AMG Zone 55.
Type: Aerial map		**Prepared by:** Lena Jackson/ Alex Schloss	**Date:** 3/3/2009

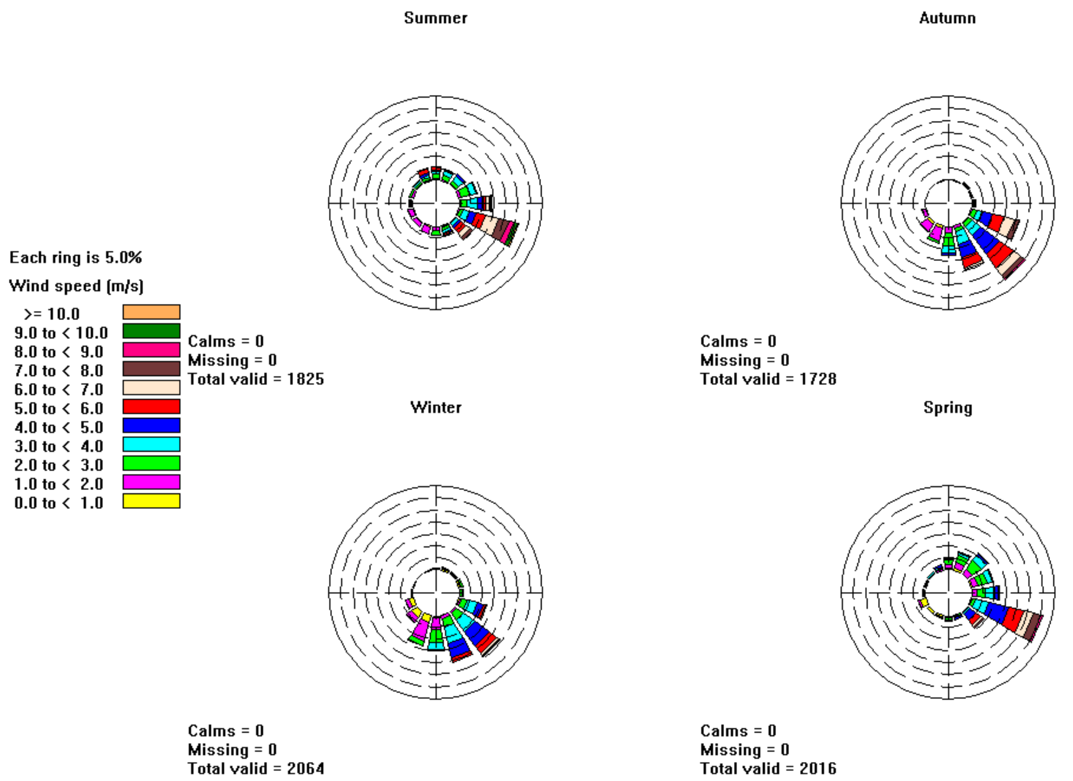


Figure 2 Seasonal wind roses for the Hay Point area

Location: Port of Hay Point	**Period:** January 1998 to March 2005	**Data source:** Half Tide (P3)	**Units:** Metres per second
Type: Wind rose		**Prepared by:** Lena Jackson	**Date:** 3/3/2009

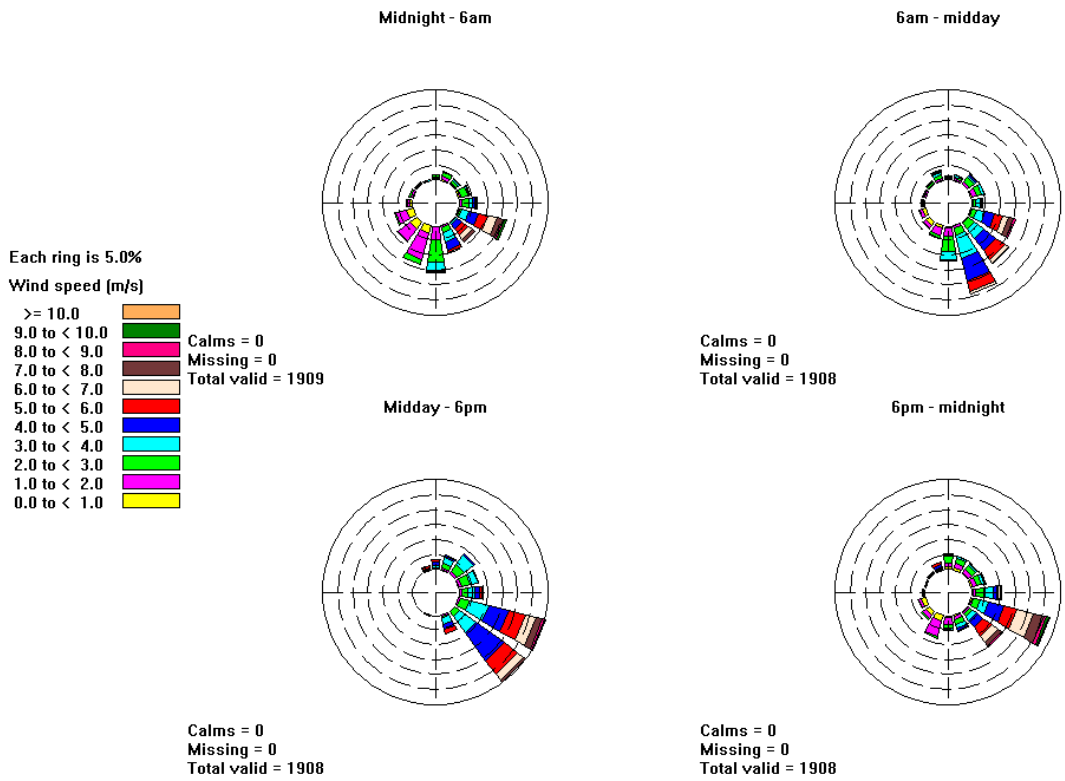


Figure 3 Diurnal wind roses for Hay Point area

Location: Port of Hay Point	**Period:** January 1998 to March 2005	**Data source:** Half Tide (P3)	**Units:** Metres per second
Type: Wind rose		**Prepared by:** Lena Jackson	**Date:** 3/3/2009

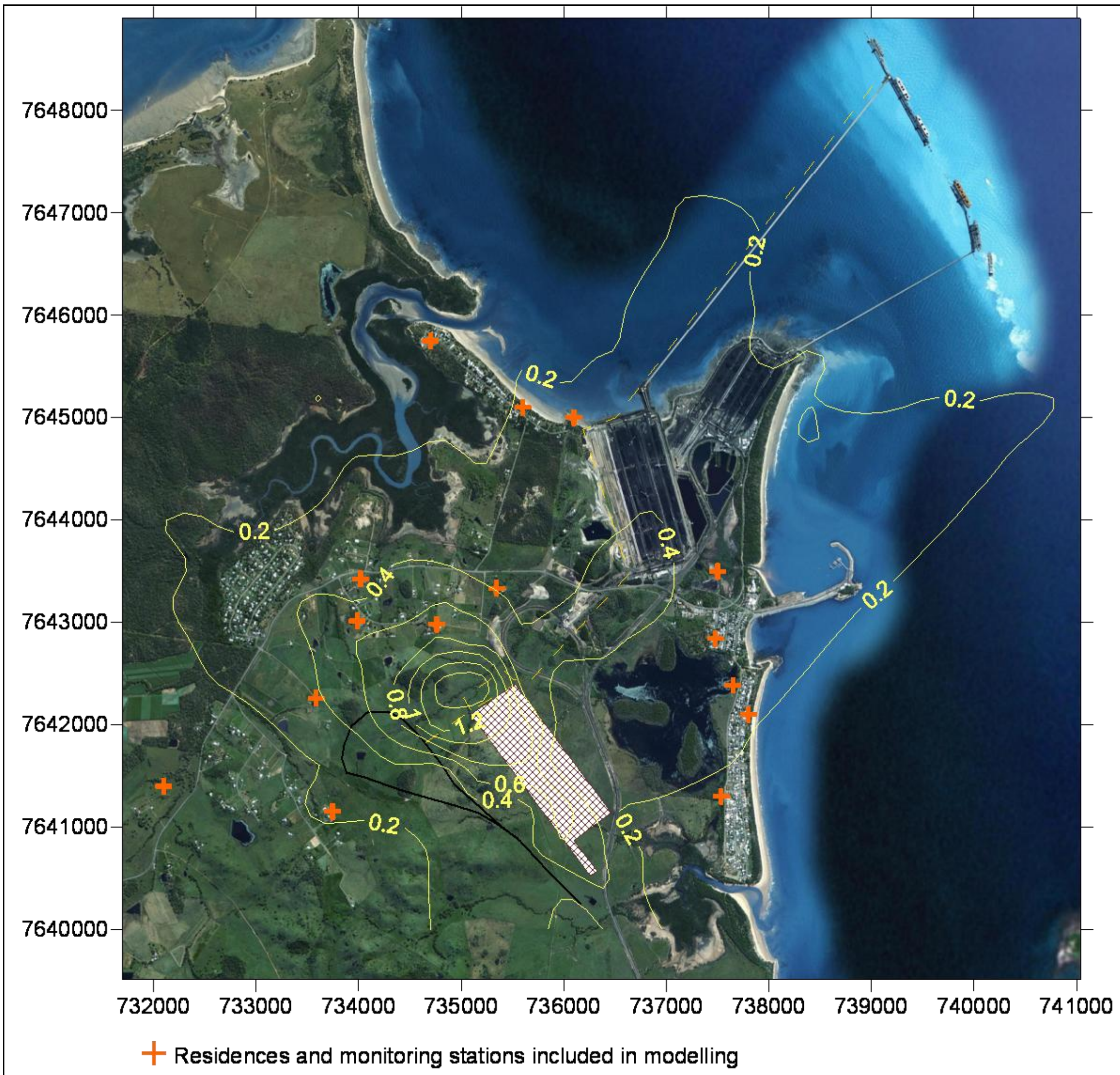


Figure 4 **Predicted 24-hour average $PM_{2.5}$ ground-level concentrations for the Southern Stockyard Option in isolation**

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** Micrograms per cubic metre
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

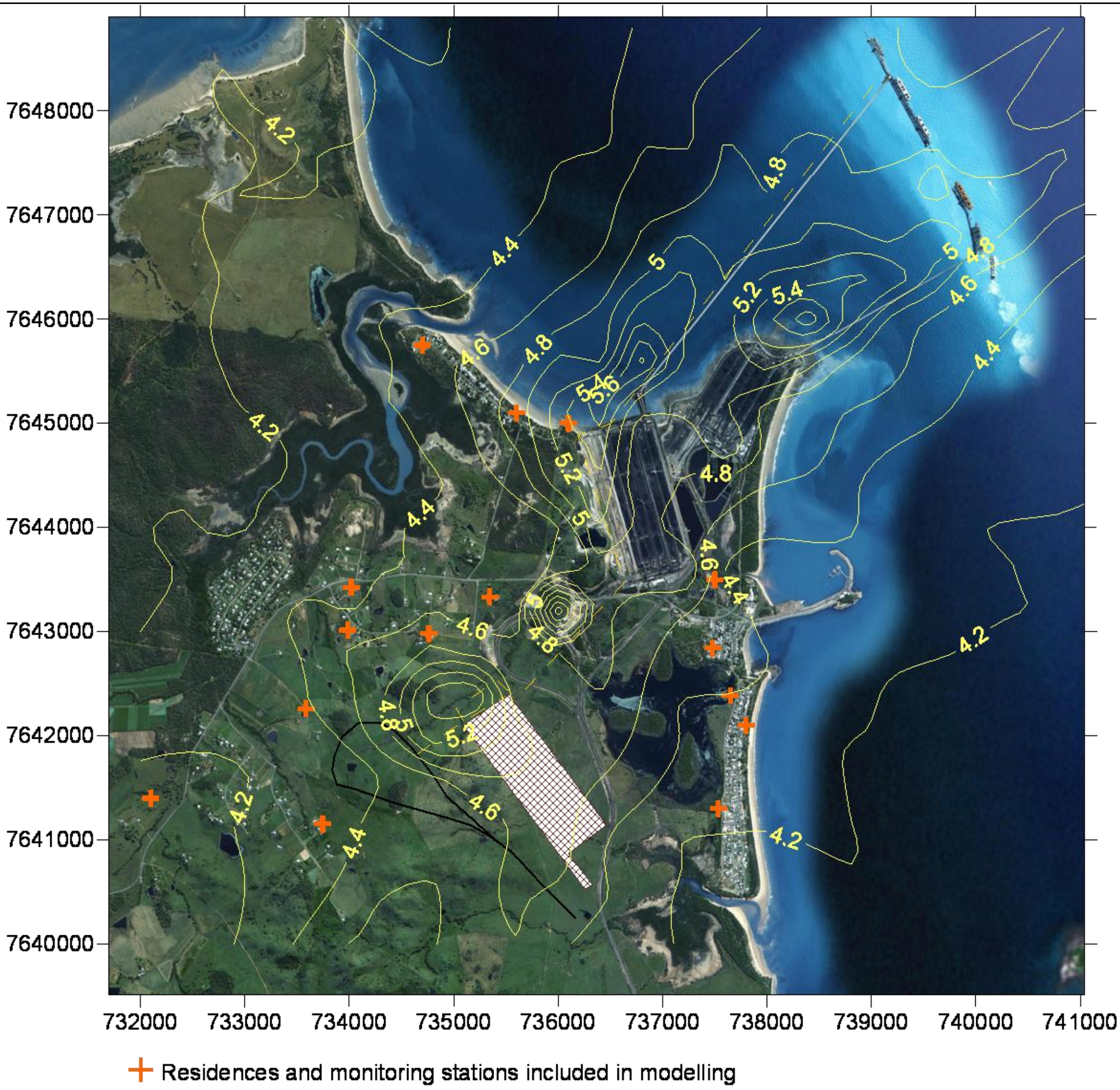


Figure 5 **Predicted 24-hour average $PM_{2.5}$ ground-level concentrations for the Southern Stockyard Option with DBCT at 90 Mtpa, HPCT approved plus background levels**

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** Micrograms per cubic metre
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

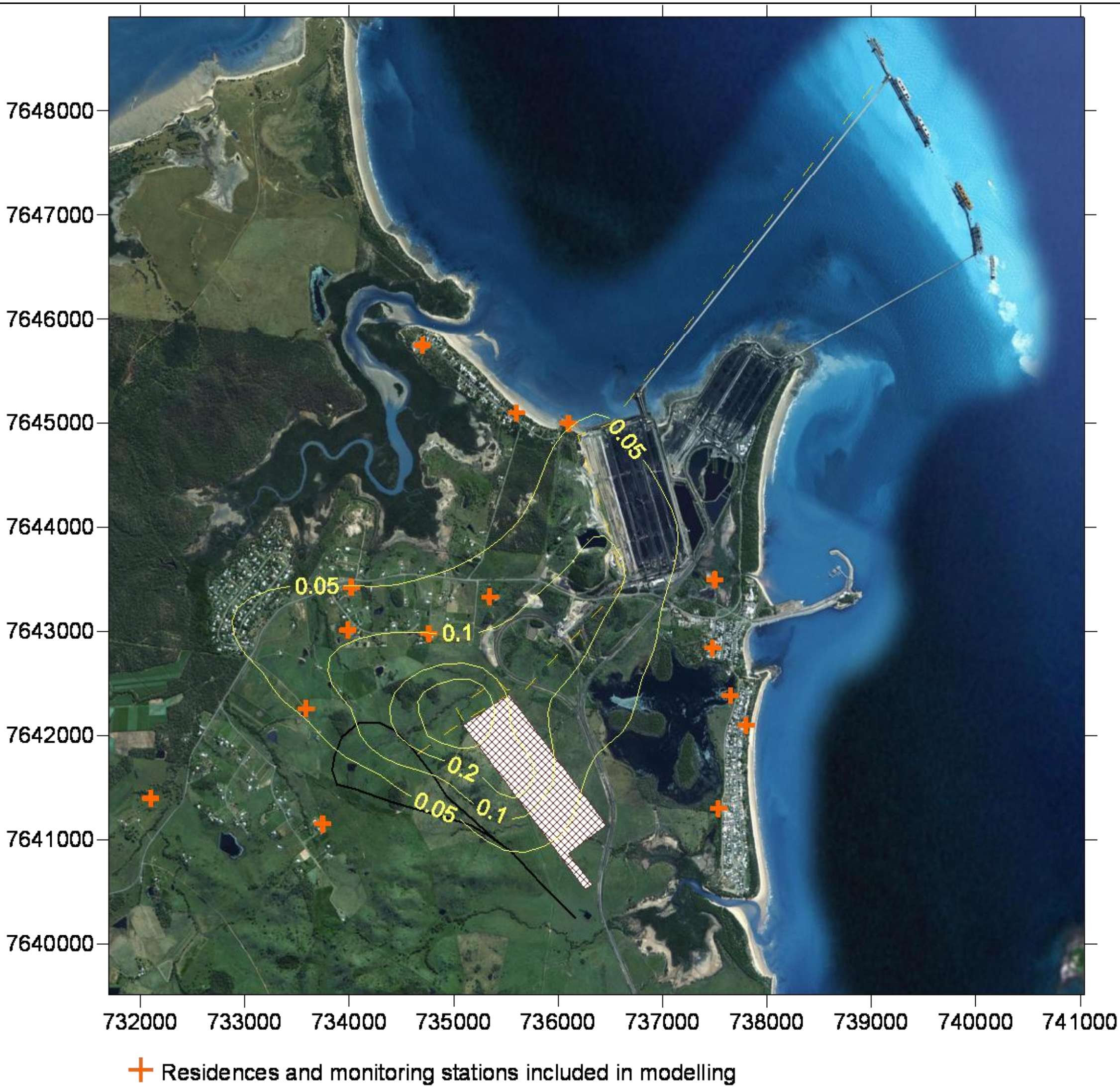


Figure 6 Predicted annual average $PM_{2.5}$ ground-level concentrations for the Southern Stockyard Option in isolation

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** Micrograms per cubic metre
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

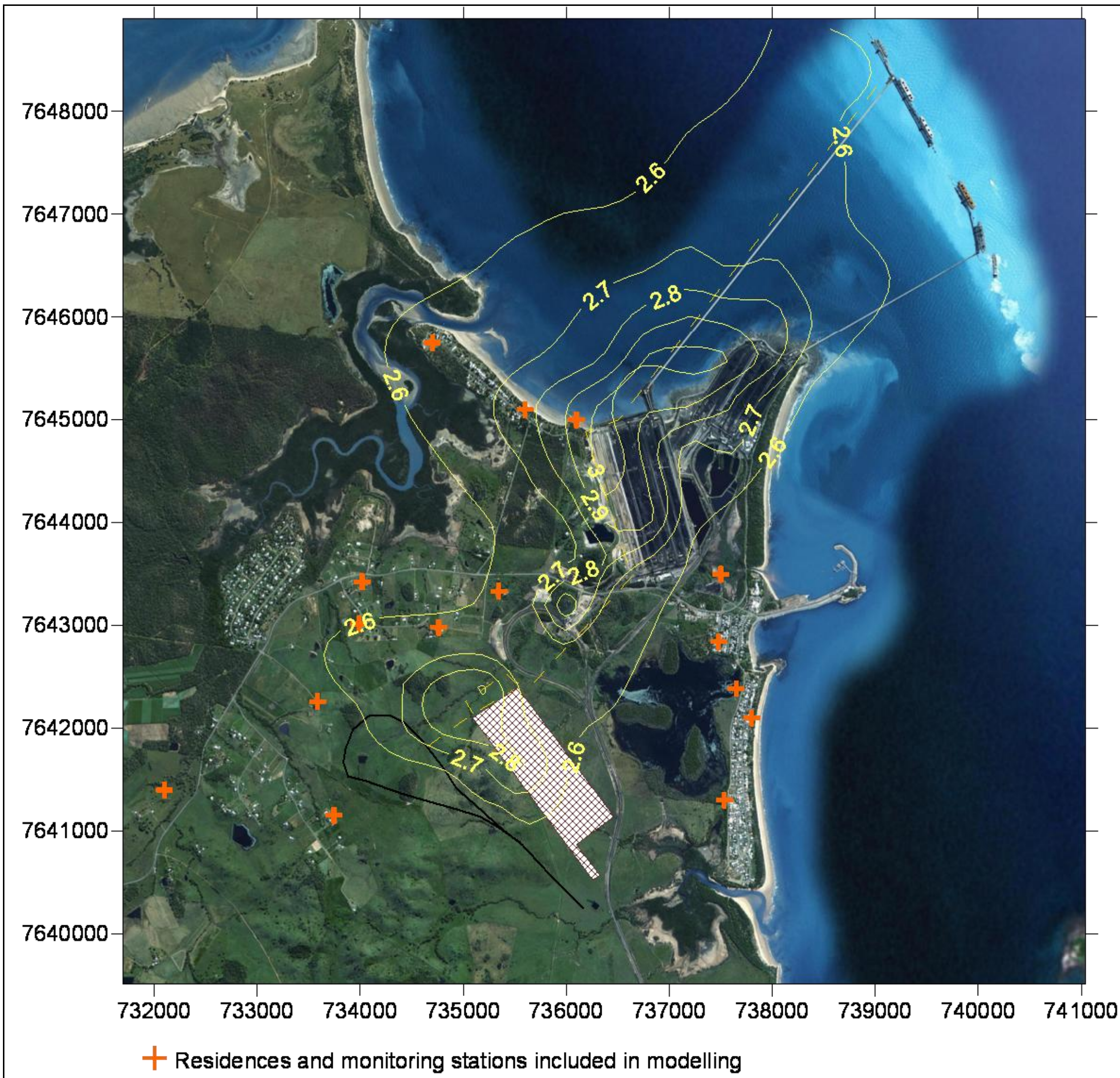


Figure 7 Predicted annual average $PM_{2.5}$ ground-level concentrations for the Southern Stockyard Option with DBCT at 90 Mtpa, HPCT approved plus background levels

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** Micrograms per cubic metre
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

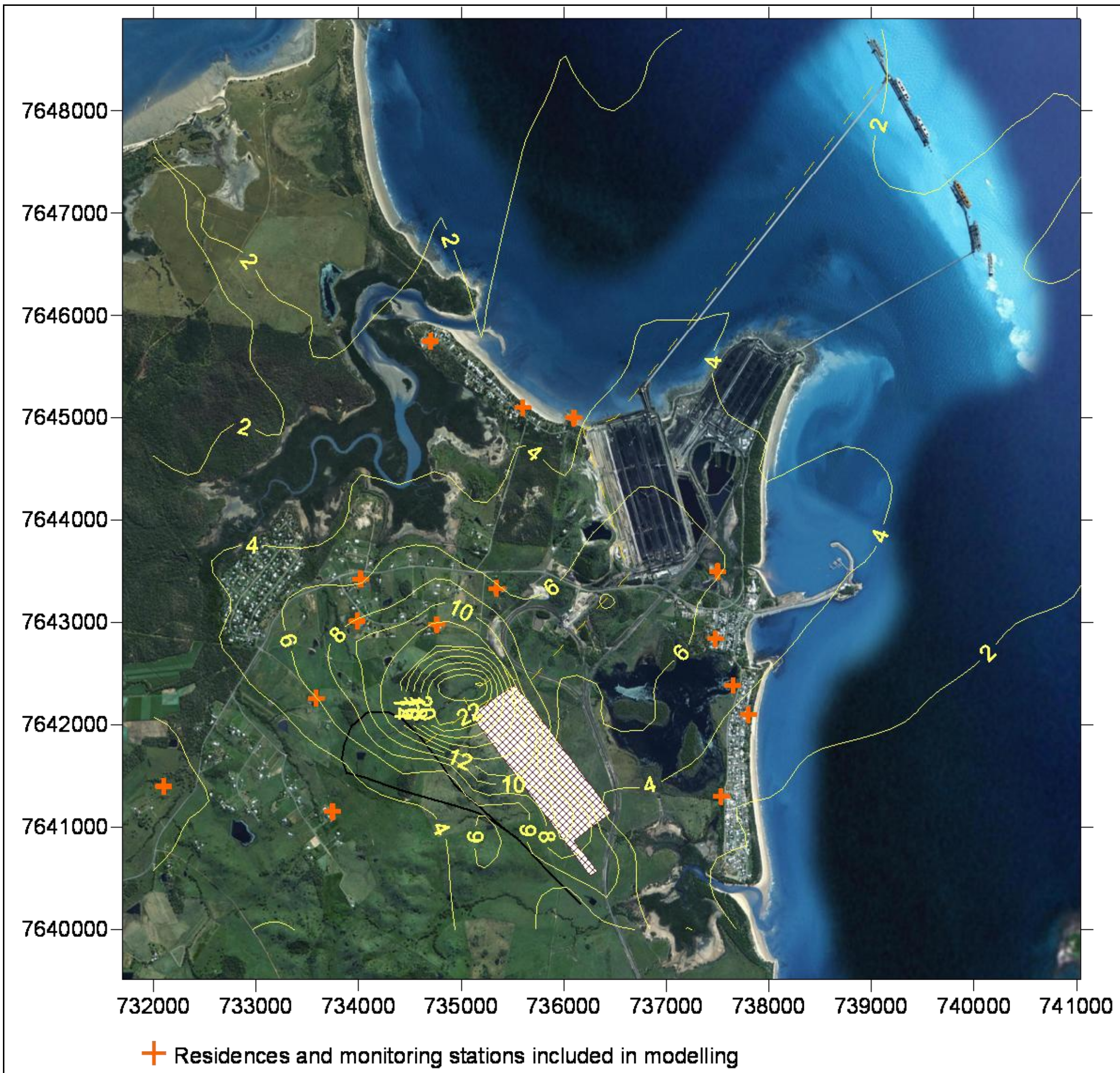


Figure 8 Predicted 24-hour average PM_{10} ground-level concentrations for the Southern Stockyard Option in isolation

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** Micrograms per cubic metre
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

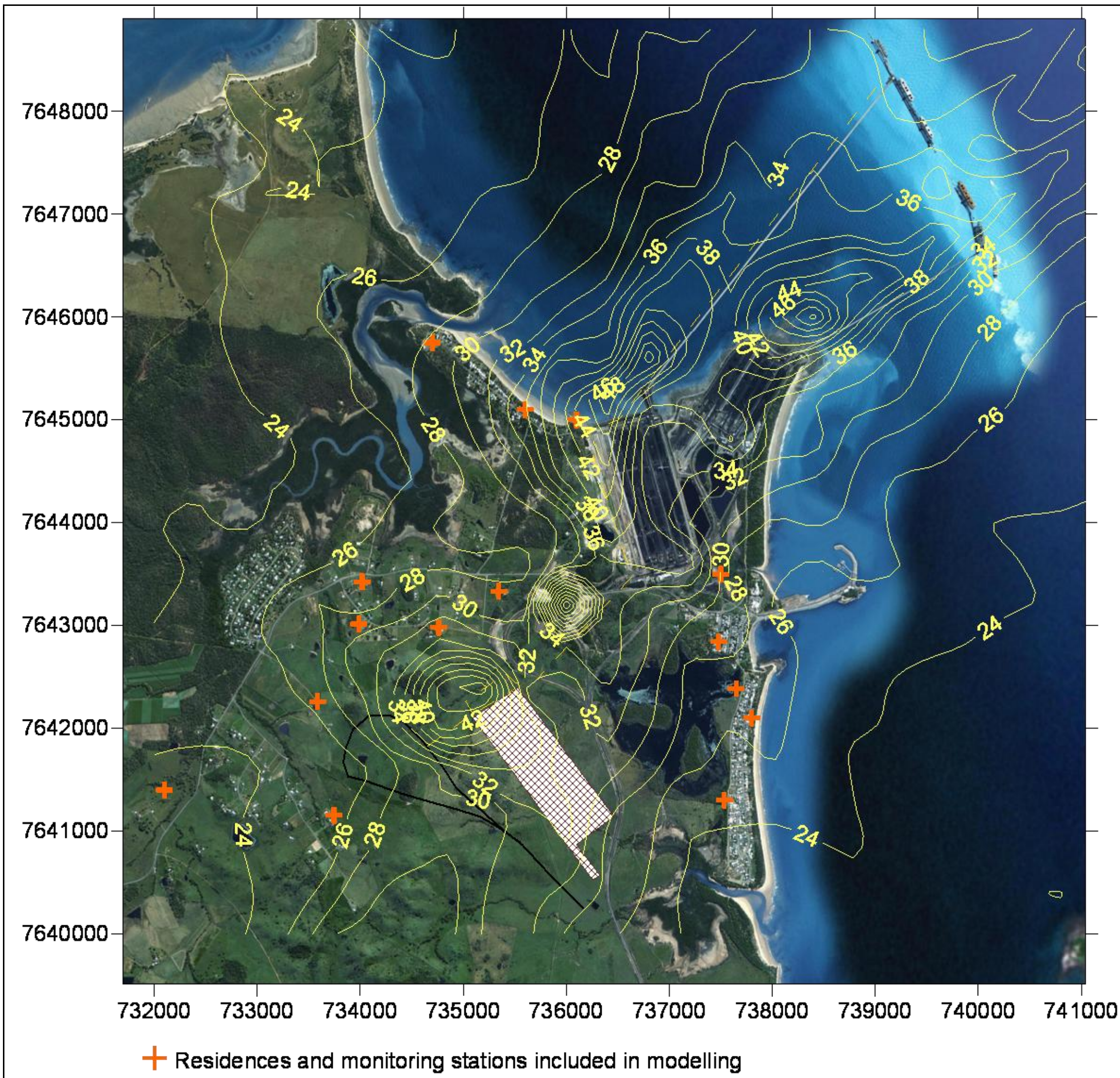


Figure 9 **Predicted 24-hour average PM_{10} ground-level concentrations for the Southern Stockyard Option with DBCT at 90 Mtpa, HPCT approved plus background levels**

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** Micrograms per cubic metre
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

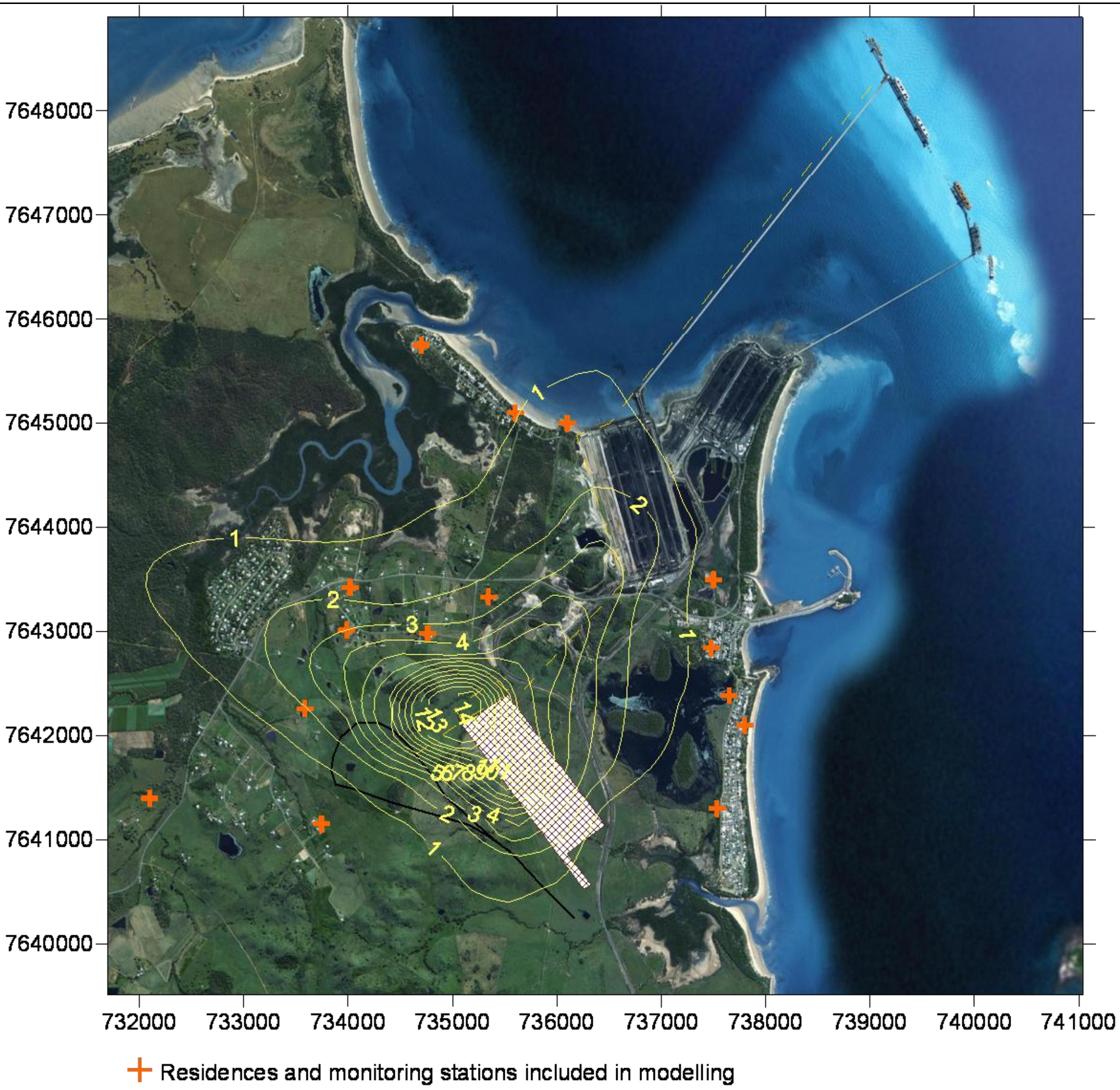


Figure 10 Predicted annual average TSP ground-level concentrations for the Southern Stockyard Option in isolation

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** Micrograms per cubic metre
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

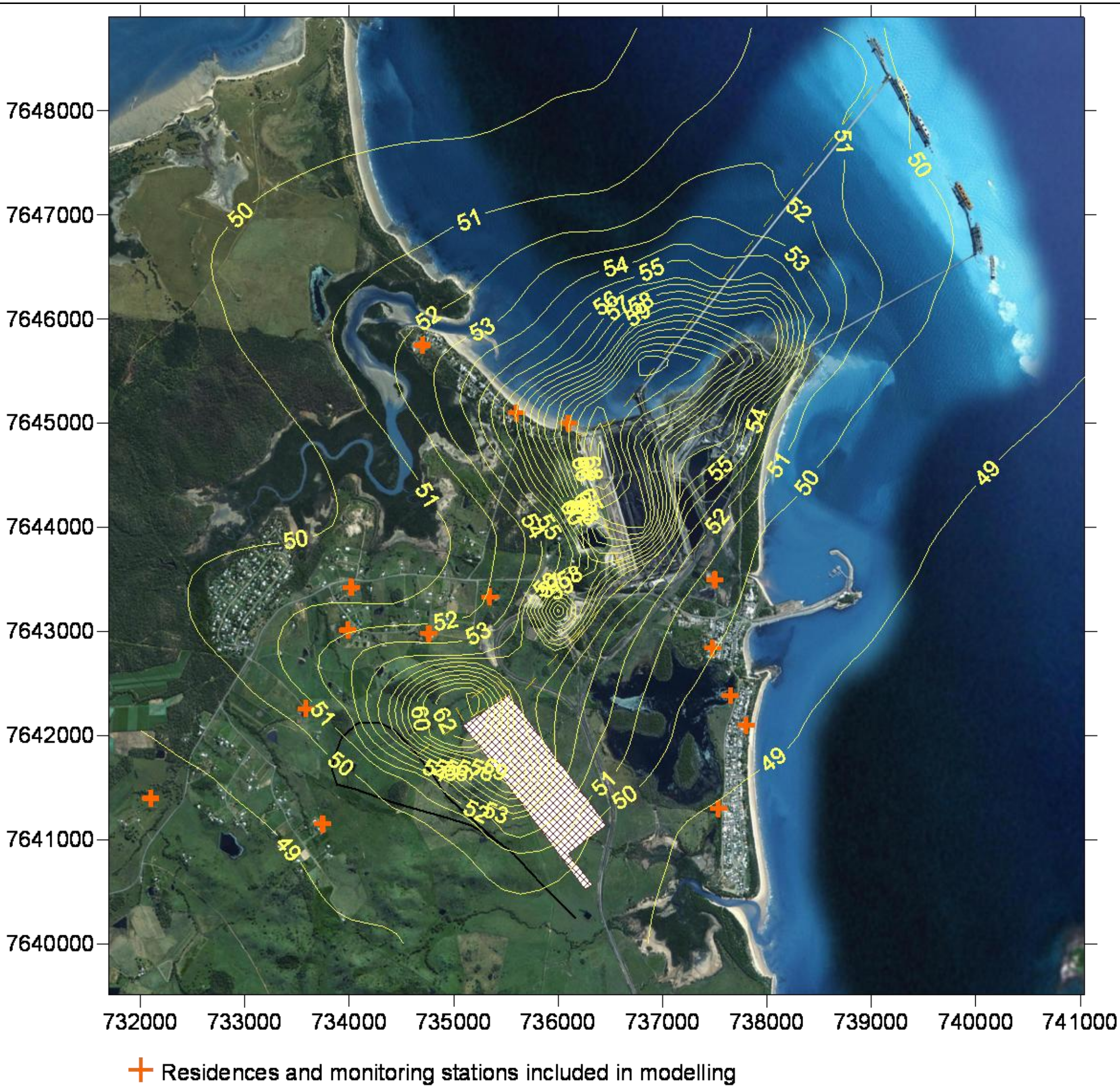


Figure 11	**Predicted annual average TSP ground-level concentrations for the Southern Stockyard Option with DBCT at 90 Mtpa, HPCT approved plus background levels**

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** Micrograms per cubic metre
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

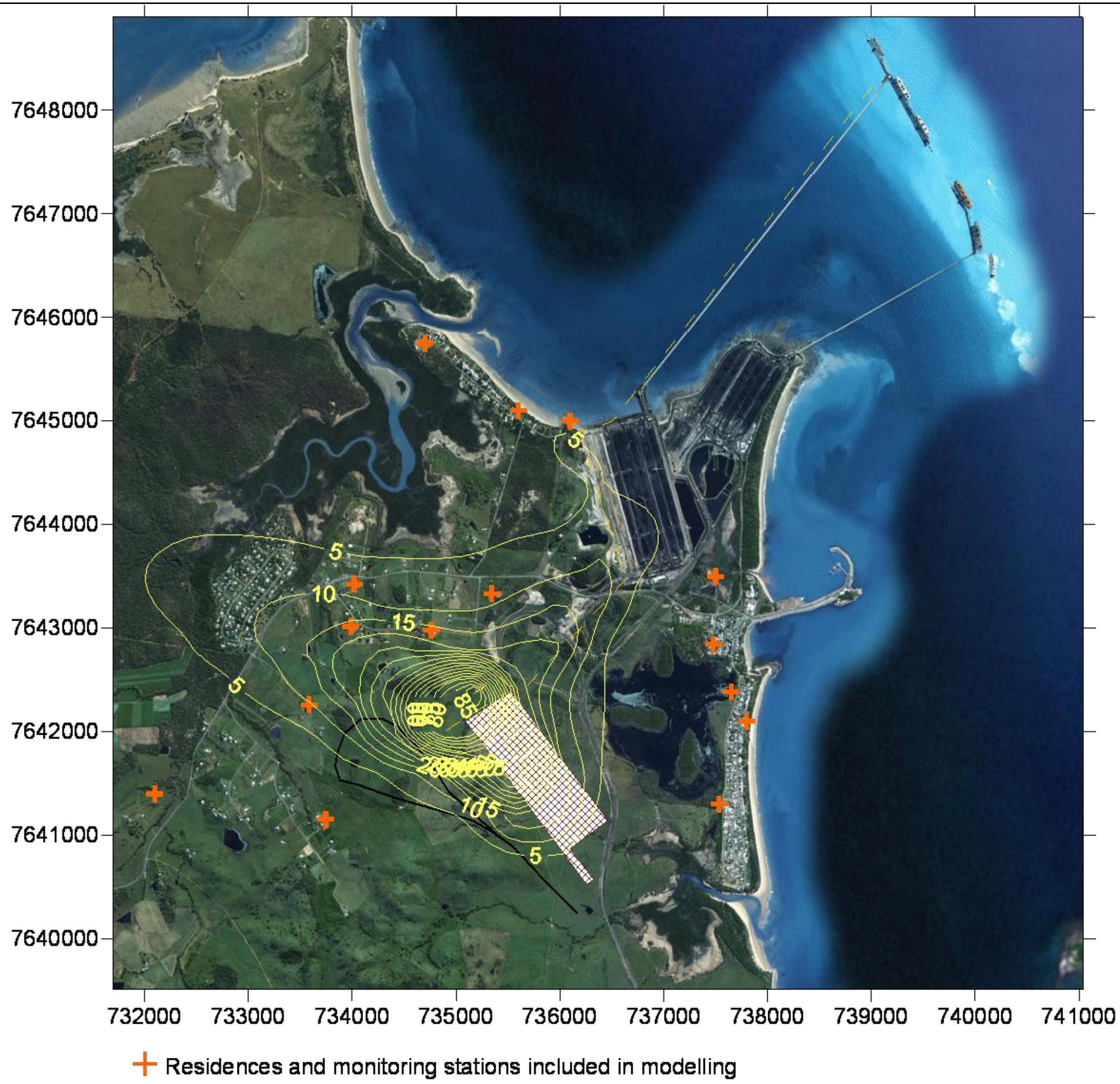


Figure 12 Predicted annual average dust deposition rate for the Southern Stockyard Option in isolation			
Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** mg/m²/day
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

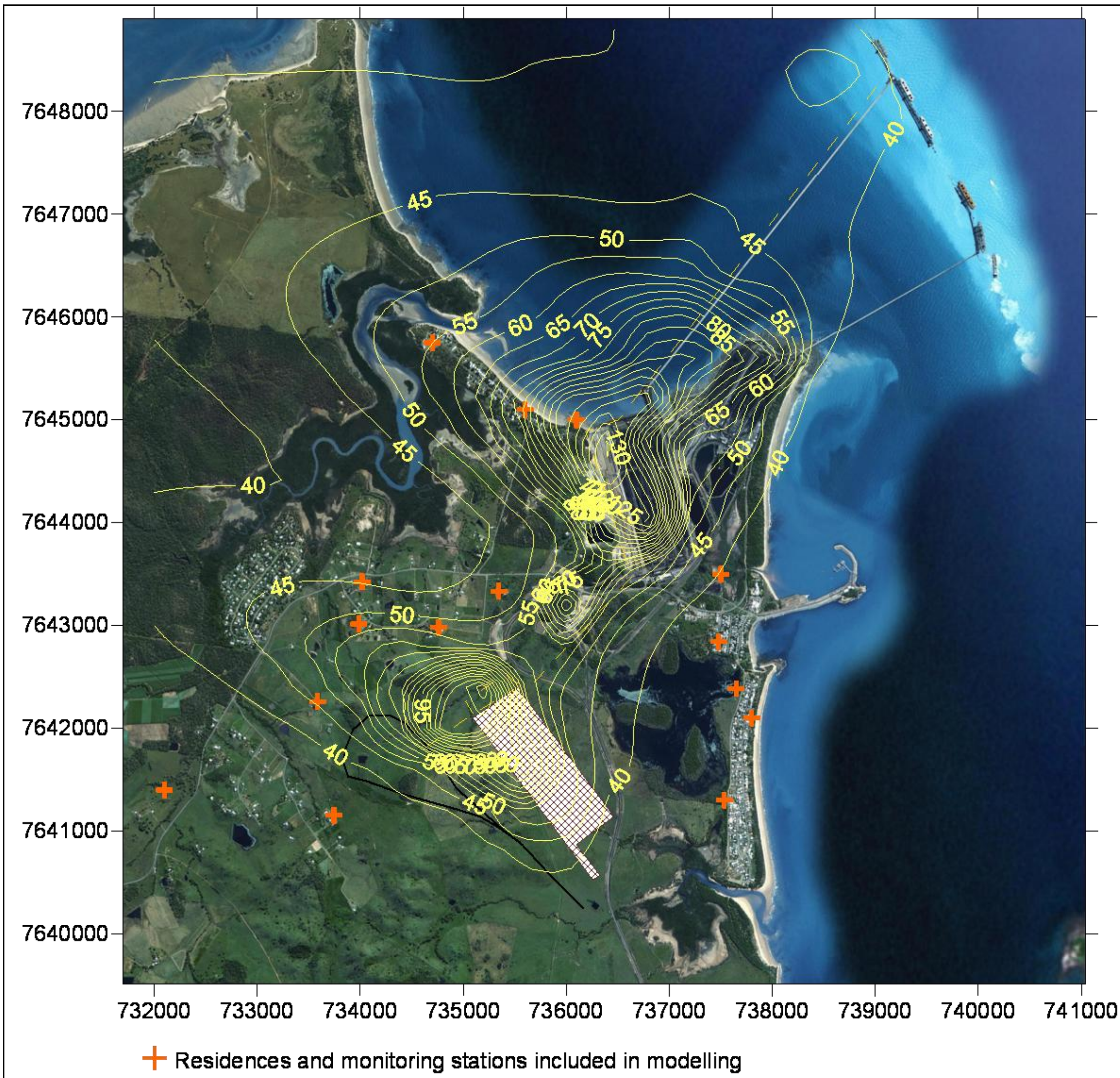


Figure 13 **Predicted annual average dust deposition rate for the Southern Stockyard Option with DBCT at 90 Mtpa, HPCT approved plus background levels**

Location: Port of Hay Point	**Period:** N/a	**Data source:** ISC	**Units:** mg/m²/day
Type: Contour		**Prepared by:** Lena Jackson	**Date:** 4/3/2009

Appendix D

HUSON & ASSOCIATES

REPORT

PRELIMINARY NOISE IMPACT ASSESSMENT

STAGE 8X EXPANSION OF DBCT

CLIENT: BBI

Job No LHA170
March 2009

L HUSON & ASSOCIATES PTY LTD

Specialist Environmental Consultants

PO Box 290
WOODEND
VIC 3442

Tel. 0416 143 716

Email: OFFICE@HUSON.COM.AU

ABN 57 094 096 992

PRELIMINARY NOISE IMPACT ASSESSMENT

STAGE 8X EXPANSION OF DBCT

EXECUTIVE SUMMARY

1 Phase 1(8X) is expected to comply with current license conditions and the new NoiseEPP in respect of controlling background creep.
2 Phase 2(8X) and Phase 3(8X) would comply with current license conditions but would likely fail the acoustic quality objectives in the new NoiseEPP if 8X were to be assessed using this legislation as a new industry. Under such circumstances noise mitigation at individual properties around Horsbrough Rd may be required to meet NoiseEPP acoustic quality objectives. However, we believe that the target noise emission levels for the combined current and 8X expansion should be the noise limits in the existing license for the DBCT and under these circumstances it will be possible to demonstrate compliance.
3 The constant noise emissions from Phase 3(8X) are approximately 3dB(A) higher than those for Phase 2(8X). Maximum noise emissions from Phase 2(8X) and Phase 3(8X) due to RRP4 and RRP5 are the same.
4 Sound levels in key residential areas are summarised below for 8X phases:

Area	**Phase 2**		**Phase 3**	
	Constant sound	**Max sound**	**Constant sound**	**Max sound**
Residential area south of Half Tide	38dB(A)	33dB(A)	41dB(A)	33dB(A)
Timberlands	32dB(A)	33dB(A)	35dB(A)	33dB(A)
Horsbrough Rd	42dB(A)	40dB(A)	45dB(A)	40dB(A)

Note: Phase 1(8X) will have no influence on the levels for Phase 2 and Phase 3.

TABLE OF CONTENTS

INTRODUCTION

L Huson & Associates Pty Ltd has been commissioned to complete a preliminary noise impact assessment of a number of expansion options at the Dalrymple Bay Coal Terminal (DBCT).

The expansion options considered are:

- Phase 1 (8X): Assess noise increase from extra 4Mtpa in rows 1 and 2 of existing stockyard
- Phase 2 (8X): Assess noise increase from 33Mtpa in row 10 and row 11 with remnants in row 9 of new stockyard using extra RRP4.
- Phase 3 (9X): Assess noise increase from 33Mtpa in rows 12 and 13 having an additional RRP4 and RRP5.

The following summarises the expected noise impact from the different cumulative expansion options (Stage 8X) post the 85 Mtpa Expansion at the DBCT.

TERMS OF REFERENCE

IMPACT ASSESSMENT

The DBCT currently holds an environmental authority for operations having a throughput up to 85 Mtpa.

An adverse impact would be if noise emissions from the DBCT exceed current license conditions, which in relation to noise emissions are as follows:

(N3) Noise from the ERA must not cause an unlawful environmental nuisance at any nuisance sensitive place and must comply with the Attachment 1 – Table 1.

(N6) For the purpose of determining compliance with the limits specified in Table 1:

- *The sound pressure level should not exceed the level specified measured over any 15 minute period that is representative of the noise being investigated;*
- *The measurement location is 4.0m (+/- 0.5m) outside the part of the place most affected by the noise under investigation.*

Attachment 1 – Table 1- Noise Limits

Period	*Noise Level at a Noise Sensitive Place Measured as the LA90,15 min*
7am-7pm	*55dB(A)*
7pm-7am	*53dB(A)*

In the event that stage 8X was to proceed the full three phases of the expansion would be considered significant and a full impact assessment would be required as described in the Environmental Protection Act 1994 (EPAct), Section 73A, as follows:

73A Assessing development applications

(1) In assessing the application, the administering authority—
(a) must comply with any relevant regulatory requirement; and
(b) subject to paragraph (a), must consider the following—
(i) the standard criteria;
(ii) any additional information given in relation to the application.
(2) This section does not limit the Integrated Planning Act, section 3.3.15 or chapter 3, part 5, division 2 of that Act.
(3) If the application is an application for an increase in the scale or intensity of a chapter 4 activity, the administering authority must assess the application having regard to—
(a) the proposed activity; and
(b) the existing activity; and
(c) the total likely or potential environmental harm the proposed activity and the existing activity, may cause.
Example of how application is assessed—
If a chapter 4 activity is carried out on premises and a development application is made because of a proposed intensification of the activity, the application is assessed on the basis of the activity, including the intensification.

A Terms of Reference for the impact assessment would be issued and this would require an assessment of noise emissions from the existing operations and the proposed 8X expansion.

The current noise emissions from the DBCT are in terms of LA90 sound levels (A-weighted sound pressure level exceeded for more than 90% of a measurement period, defined to be 15 minutes in this case). This acoustic parameter is also used to assess Background noise and it is an appropriate noise parameter for constant type noise emissions from drive motors and conveyors, for example.

NEW ENVIRONMENTAL PROTECTION (NOISE) POLICY 2008 AND ENVIRONMENTAL PROTECTION REGULATION 2008

Any new industrial project would be considered in light of the latest Environmental Protection (Noise) Policy (NoiseEPP) that came into force on 1 January 2009. The noise impact targets under this new legislation is that a development must not exceed the Background (LA90) by more than 0dB for constant noise (to prevent background creep) and there are acoustic quality objective targets stated for day and evening outdoors (for night time it is stated as an indoor level), as follows:

Sensitive Receptor	Time of day	Acoustic quality objectives (measured at the receptor) *dB(A)*			Environmental value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
Dwelling (for outdoors)	daytime and evening	50	55	65	health and wellbeing
Dwelling (for indoors)	daytime and evening	35	40	45	health and wellbeing
Dwelling (for indoors)	night-time	30	35	40	health and wellbeing, in relation to the ability to sleep

Under the new legislation an indoor target noise level at night is the most stringent criteria because the attenuation from outside a dwelling to inside a dwelling with windows open could be as low as 5dB. This would then equate to an outdoor noise level target of only 35dB(A) at night.

The new NoiseEPP repeals the earlier policy and the acoustic quality objective of achieving an outdoor sound level of 55dB(A), Leq for 24 hours for most of Queensland's residents of the old policy has been replaced with the above.

The acoustic quality objectives of the new NoiseEPP are softened with the statement in Part 3, section 8(3) that: "It is the intended that the acoustic quality objectives be progressively achieved as part of achieving the purpose of this policy over the long term." Also, in Part 4 of the new NoiseEPP the management intent to control background creep is softened with: "To the extent that it is reasonable to do so …" and refers to Section 51 of the revised Environmental Protection Regulation 2008 (EPRegs) for managing an activity involving noise. (See Appendix A).

EFFECT OF NEW NOISE EPP AND EPREGS

It would be difficult to meet the new indoor night time criteria with the night time noise levels currently allowed under the current licence for the DBCT. Furthermore, the daytime and evening criteria in the new Environmental Protection (Noise) Policy (NoiseEPP) are more stringent than that allowed outdoors in the current license.

Given that section section 73A, (3) of the EPAct states when assessing development applications that an increase in scale or intensity of an authorised activity must consider the original activity **and** the increased activity, it could logically be argued that the target noise limit for the combined activities would be that already authorised, before any expansion.

PREDICTED NOISE EMISSIONS

The following outlines a brief description of the proposed expansion phase and impact of each. Figure 1, drawing number SK-S-08-0101, shows the layout of the rows on the southern stock yard.

Proposed Expansion Phase 1(8X)
Increase throughput in rows 1 and 2 of existing stockyard by increasing conveyor belt speed and change in drive motors.

Noise Impact of Phase 1
Negligible increase in noise levels will only be measurable locally. No change in overall noise levels for any noise sensitive location surrounding the DBCT. It could reasonably be expected that compliance with the current license conditions and the new NoiseEPP will be achieved.

Proposed Expansion Phase 2(8X)
Provide additional throughput of 33 Mtpa using rows 10 and 11 and part of row 9 at the new southern stockyard. This will require an unloading station (RRP4) as part of the new rail loop.

Proposed Expansion Phase 3(8X)
Provide additional 33 Mtpa throughput using rows 12 and 13. This requires an additional rail unloading station (RRP5) on the new rail loop.

Impact of Phase 2 and Phase 3
The noise impact from stage 2 and stage 3 is grouped together because the new sound sources and their locations are similar. In general, it is expected that the noise emissions from phase 3 will increase by 3dB over those for phase 2 for constant type noise (conveyors, for example). The operations of RRP5 in phase 3 will not double the noise emission from RRP4 in terms of maximum noise emission during train unloading using a vibrator. The maximum observed sound level from such activities (vibrator operation) will not change but the number of such events will double.

Noise Impact Assessment (Phase 2 and Phase 3)
These two phases require the construction of infrastructure south of the existing DBCT stockpiles.

To move coal to the ships requires construction of conveyors generally in parallel and just south of the Stage 7 inloading conveyor from RRP3 for both phase 2 and phase 3.

DO NOT SCALE – IF IN DOUBT ASK.

PRELIMINARY
NOT FOR CONSTRUCTION

NOT YET ISSUED WITH THIS REVISION

DRAWN	DESIGNED		REV.	DATE
RGF 5-02-09	JDL	5-02-09	01	??
VERIFIED	APPROVED			

SK-S-08-0101

DALRYMPLE BAY COAL TERMINAL
SOUTHERN STOCKYARD OPTION
ARRANGEMENT 1/2

DALRYMPLE BAY COAL
TERMINAL
POST 85 MTPa STUDY

DBCT MANAGEMENT PTY LTD

Connell HATCH
CH PROJECT NO.
H329544

ID.	DESCRIPTION	DRAWN	VERIFIED	APPR.
01	PRELIMINARY ISSUE	RGF		

REVISIONS

REFERENCE DRAWING TITLES | DRG No.

B1

ACAD/PRIME.B1/REV-A.

CAD FILE SKS080101.dwg

The existing stockpiles have inloading to the south and outloading to the northern end, in contrast to the proposed southern stock yard that has inloading and outloading equipment both on the northern end of the new stock yard, farthest away from the most populous noise sensitive areas. The most significant noise emissions are from elevated conveyors such as S4 and various drive towers. The arrangement for the southern stock yard concentrates the higher noise emitting equipment in one area at the northern end of the southern stock yard.

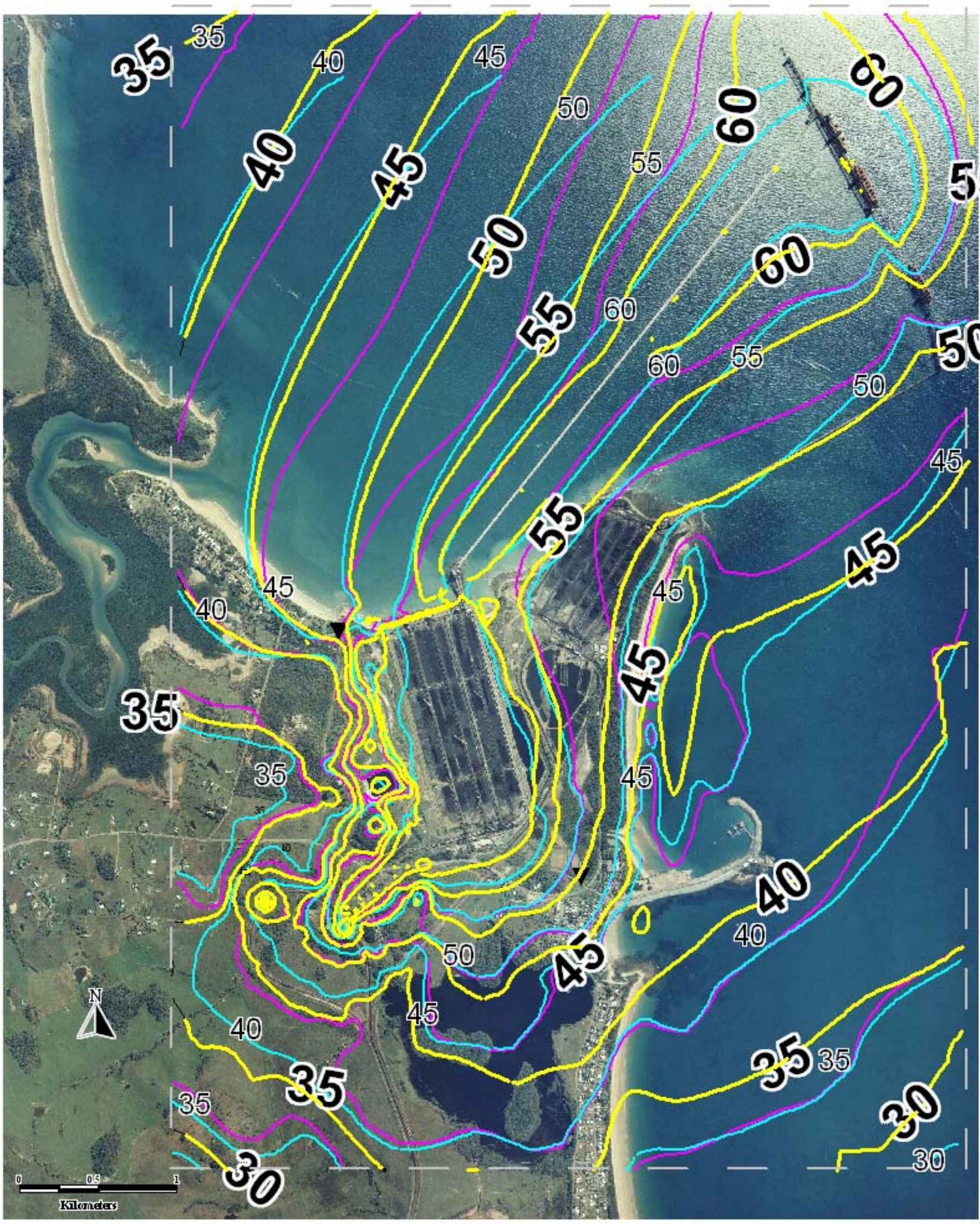
This design approach would assist in minimising noise emissions as per the requirement of Part 4, section 9 (2)(b)(i) in the new NoiseEPP. Furthermore, noise emissions would be further minimised through the use of low noise idlers and choice of quiet drives and transfer tower enclosure design in compliance with Part 4, section 9 (2)(b)(ii).

Estimates of noise levels from the Phase 2(8X) works indicate that sound levels of approximately 38dB(A) would occur in the residential strip to the east of the southern stock yard (south of Half Tide). For Phase 3 the sound levels would be approximately 41dB(A) in this area.

Sound levels at Timberlands and for some dwellings to the west and NW of the Phase 2 and Phase 3 inloading and outloading equipment have the advantage of hills blocking line of sight to the equipment (this provides noise attenuation). Unfortunately, a recent complainant in Horsbrough Rd would have an unimpeded view of the new equipment and some dwellings in this area would experience continuous type sound levels of approximately 45dB(A) for Phase 3 and 42dB(A) for Phase 2. The same dwellings in Horsbrough Rd have recently been surveyed after completion of RRP3 and maximum sound levels of 40dB(A) were found for individual vibrator operations within RRP3. The proposed RRP4 and RRP5 are the same distance away from these dwellings as RRP3 (also having direct line of sight) so it is expected that similar maximum sound levels at this location would be observed for RRP4 and RRP5.

Detailed modelling has not been completed for the Timberland residential area but we would expect sound levels from Stage 2(8X) to be approximately 32dB(A) for Phase 2(8X) and 35dB(A) for Phase 3(8X) formed by constant sound from conveyors, transfer towers, drive towers and stacker/reclaimers. Maximum sound levels from vibrator operations would be less than 33dB(A) in the Timberland area.

The overall impact from the current and proposed expansion (8X) is the predicted sound pressure levels for the 8X works plus those from existing operations at the DBCT. Figure 2 shows a noise contour map of the area for existing operations and the 8X noise emission estimates described above should be added to these to get a cumulative noise impact. There are no locations where noise sensitive receptors would experience night time noise limits of more than the current license condition of 53dB(A), LA90 from the cumulative noise emissions of the current and proposed 8X expansion.



Key: Predicted sound pressure levels in dB(A)

- Existing situation, May 2000 (contour levels in small font)
- Stages 5, 6 and 7 expansion with mitigation measures as shown in Stage 6/7 EIS. (contour levels in small font)
- Stages 5, 6 and 7 expansion with mitigation measures and Stage 7X improvements to 85Mtpa (contour levels in large font)

FIGURE 2

CONCLUSIONS

1 Phase 1(8X) is expected to comply with current license conditions and the new NoiseEPP in respect of controlling background creep.
2 Phase 2(8X) and Phase 3(8X) would comply with current license conditions but would likely fail the acoustic quality objectives in the new NoiseEPP if 8X were to be assessed using this legislation as a new industry. Under such circumstances noise mitigation at individual properties around Horsbrough Rd may be required to meet NoiseEPP acoustic quality objectives. However, we believe that the target noise emission levels for the combined current and 8X expansion should be the noise limits in the existing license for the DBCT and under these circumstances it will be possible to demonstrate compliance.
3 The constant noise emissions from Phase 3(8X) are approximately 3dB(A) higher than those for Phase 2(8X). Maximum noise emissions from Phase 2(8X) and Phase 3(8X) due to RRP4 and RRP5 are the same.
4 Sound levels in key residential areas are summarised below for 8X phases:

Area	**Phase 2**		**Phase 3**	
	Constant sound	**Max sound**	**Constant sound**	**Max sound**
Residential area south of Half Tide	38dB(A)	33dB(A)	41dB(A)	33dB(A)
Timberlands	32dB(A)	33dB(A)	35dB(A)	33dB(A)
Horsbrough Rd	42dB(A)	40dB(A)	45dB(A)	40dB(A)

Note: Phase 1(8X) will have no influence on the levels for Phase 2 and Phase 3.

APPENDIX A

Extract from EPRegs 2008

Part 2 Regulatory requirements for all environmental management decisions

50 Application of pt 2

This part applies to the administering authority for making any environmental management decision.

51 Matters to be considered for environmental management decisions

(1) The administering authority must, for making an environmental management decision relating to an activity, consider the following matters—

(a) each of the following under any relevant environmental protection policies—

(i) the management hierarchy;

(ii) environmental values;

(iii) quality objectives;

(iv) the management intent;

(b) the characteristics of the contaminants or materials released from carrying out the activity;

(c) the nature and management of, including the use and availability of technology relating to, the processes being, or to be, used in carrying out the activity;

(d) the impact of the release of contaminants or materials from carrying out the activity on the receiving environment, including the cumulative impact of the release with other known releases of contaminants, materials or wastes;

(e) the characteristics of the receiving environment and the potential impact on it from carrying out the activity;

(f) for each affected person for the activity—the order of occupancy or use between the person carrying out the activity and the affected person;

(g) the remaining capacity of the receiving environment to accept contaminants or wastes released from future activities while protecting the environmental values;

(h) the quantity and type of greenhouse gases released, and the measures proposed to demonstrate the release is minimised using best practice methods that include strategies for continuous improvement.

(2) In this section—

affected person, for an activity, means a person affected, or who may be affected, by the release of a contaminant or waste from carrying out the activity.

52 Conditions to be considered for environmental management decisions

(1) The administering authority must, for making an environmental management decision relating to an activity, consider whether to impose conditions about the following matters—

(a) implementing a system for managing risks to the environment;

(b) implementing measures for avoiding or minimising the release of contaminants or waste;

(c) ensuring an adequate distance between any sensitive receptors and the relevant site for the activity to which the decision relates;

Examples of a condition for paragraph (c)—

a condition requiring riparian buffers, noise buffers or buffers for protecting endangered regional ecosystems

(d) limiting or reducing the size of the initial mixing zone or attenuation zone, if any, that may be affected by the release of contaminants;

(e) treating contaminants before they are released;

(f) restricting the type, quality, quantity, concentration or characteristics of contaminants that can be released;

(g) the way in which contaminants may be released;

Examples of a condition for paragraph (g)—

• a condition restricting the release of a contaminant at a particular temperature, velocity or rate or during particular meteorological conditions or water flows

• a condition restricting the release of contaminant to a depth below the level of surface waters

(h) ensuring a minimum degree of dispersion happens when a contaminant is released;

Example of a condition for paragraph (h)—

a condition requiring the use of a diffuser for releasing a contaminant

(i) protecting environmental values, and meeting quality objectives, under relevant environmental protection policies;

(j) recycling, storing, transferring or disposing of waste in a particular way;

(k) rehabilitating land to achieve particular outcomes;

(l) measures for the ongoing protection of environmental values that are, or may be, adversely affected by the activity.

(2) In this section—

attenuation zone means the area around a release of contaminants to groundwater in which the concentration of the contaminants in the release is reduced to ambient levels through physico-chemical and microbiological processes.

sensitive receptor means a sensitive receptor under any relevant environmental protection policies.

Appendix E

Connell Hatch
ABN 21 646 421 651
433 Boundary Street
(Locked Bag 2700)
Spring Hill
Queensland 4004 Australia

Telephone: +61 7 3135 8444
Facsimile: +61 7 3135 8445
Email: chbne@connellhatch.com
www.connellhatch.com

Project: DBCT Post 85 Mtpa options study	Reference: H329544

To:	Copy:	Circulate:	Name:	Organisation:	Location/Facsimile:
✔			Peter Wotherspoon	BBI(DBCT)	
	✔		Greg Smith	BBI(DBCT)	
	✔		Andrew Mecoles	BBI(DBCT)	
	✔		John Leech	CH	
	✔		Arne Nilsen	CH	

From: Rosemary Johnson	Date: 14 July 2008	Total Pages: 5

Subject: Hay Point Departure Channel Capacity

Dear Peter,

1. Summary

One of the questions raised with the proposal of expanding to four outloading strings and four berths at DBCT is how often will multiple capes need to sail on the same high tide, and does the departure channel have the capacity for this scenario. This work reported in this memo addresses this question.

A simple spreadsheet model has been developed to address this issue. This model indicates that departure channel capacity should not be a constraint on outloading capacity for the scenario of 105 Mtpa being exported through DBCT and 55 Mtpa being exported through HPCT. The capacity of the existing towage capacity has not yet been assessed.

2. Departure Channel and Sailing Rules

Vessels depart the terminal either via the departure channel or via a paddock crossing, depending on the draft of the vessel, and the tidal window they need. The Dynamic Under Keel Clearance (DUKC) is used to set the UKC for the vessel depending on the sea conditions, or alternatively a Static Under Keel Clearance (SUKC) can be calculated according to the formula described in the sailing rules. A tidal window is then calculated for the tide of the day, or alternatively a draft limit is set for the vessel in order to sail on the top of the tide. Since the departure path has been in operation, the majority of vessels sail on a tidal window, and it is rare for draft limits to be set.

The Regional Harbour Master's port and scheduling rules for the Hay Point Departure Channel contains the following relevant information:

- Ships must have last cargo on board not less than 1 hour prior to last lines (LL).
- Ships to be scheduled to pass the channel beacons with separation no closer than 30 minutes.

- The following times are to be used when scheduling ships to reach the beacons departing from BMA and DBCT terminals:

Berth	Departure	
	Starboard Side to (SST)	Port Side to (PST)
BMA 1	30 min	50 min
BMA 2	35 min	55 min
DBCT 1	40 min	60 min
DBCT 2	40 min	60 min
DBCT 3	45 min	65 min

- Time from beacons to end of channel (4.4nm) @ 8 knots = 35 minutes
- Generally, departing ships have preference over berthing ships when allocating use of available manoeuvring space. To be addressed case by case.

The RHM's General Guidelines – Hay Point and Dalrymple Bay contains the following relevant information:

- Load planning can be undertaken utilising the information derived from the 23 hour DUKC advice provided the ship's 100% loaded BWS prediction forecast remains in the normal zone for the period the vessel is scheduled to remain alongside the jetty.
- Slack water sailing rule – Applies to all ships with sailing displacements of 110 000 tonnes and above. At all berths when PST and HPT No 1 when SST, vessels are able to sail at all times (providing drafts permit) where the tidal stream rate is not greater than 0.3 knots on the ebb current.
- Static Under Keel Clearance (SUKC) – Stage 2 maximum draft = UKC of 1m + 5% draft, calculated as below:

  (Port depth -1.00m + tide) / 1.05 = Maximum draft
- Static UKC sailings must maintain the minimum clearance for 90 minutes after LL when using the non-paddock departure.
- Static UKC sailings must maintain the minimum clearance from LL to clearing the dredged channel when using this departure path.

3. Assessment Approach

It was decided to do a first pass assessment adopting several simplifying assumptions in order to determine whether or not channel capacity will be a constraint when the port is operating at 160 Mtpa (105 Mtpa at DBCT and 55 Mtpa at HPCT). The approach of this assessment is as follows:

- Instead of considering the real time tide, which varies on a daily basis, just consider a "standard" spring tide from MLWS to MHWS, and a "standard" neap tide from MLWN to MHWN and average the results.
- Using the SUKC formula calculate the limiting drafts for each of the following types of shipping movements for each of the spring and neap tide cases:

  Ships can depart at any stage of the tide (d < d1)

  "Long tidal window" (from MSL to MSL – i.e. approx. 6 hours) for paddock crossing (d1 < d < d2)

  "Short tidal window" (1.5 hours either side of high tide) for paddock crossing (d2 < d < d3)

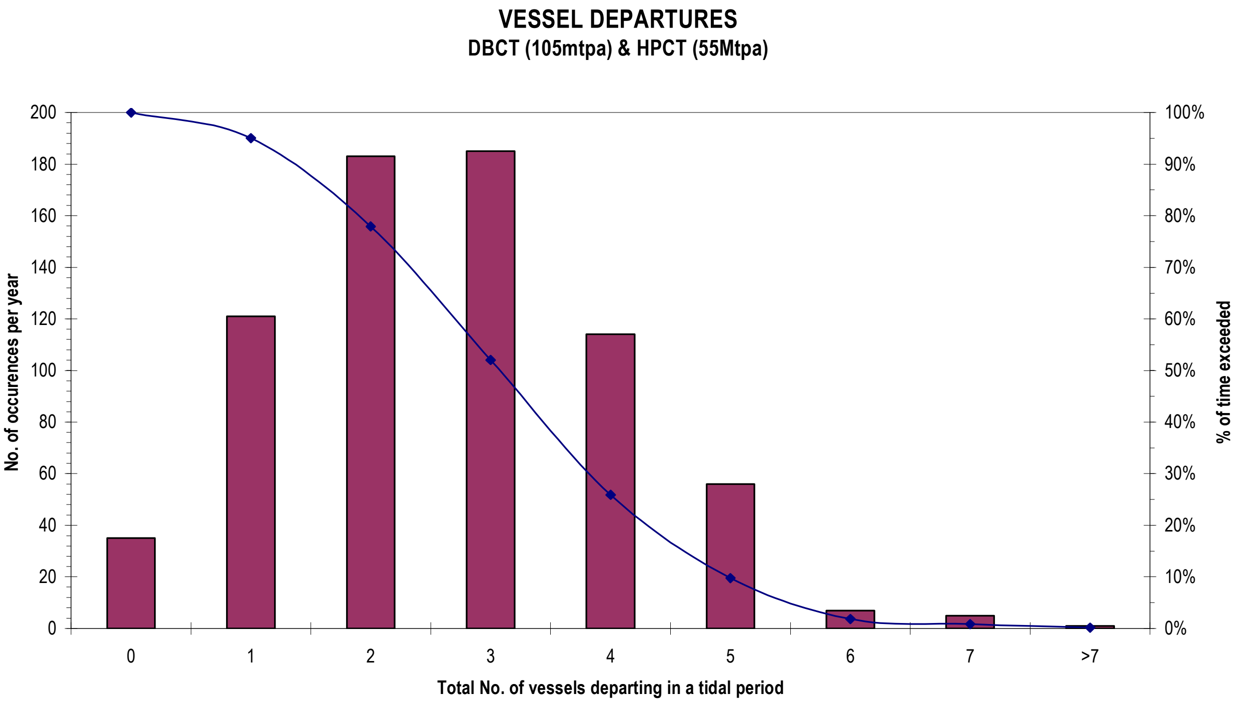
  "Long tidal window" (from MSL to MSL – i.e. approx. 6 hours) for departure channel (d3 < d < d4)

"Short tidal window" (1.5 hours either side of high tide) for departure channel (d4 < d < d5)

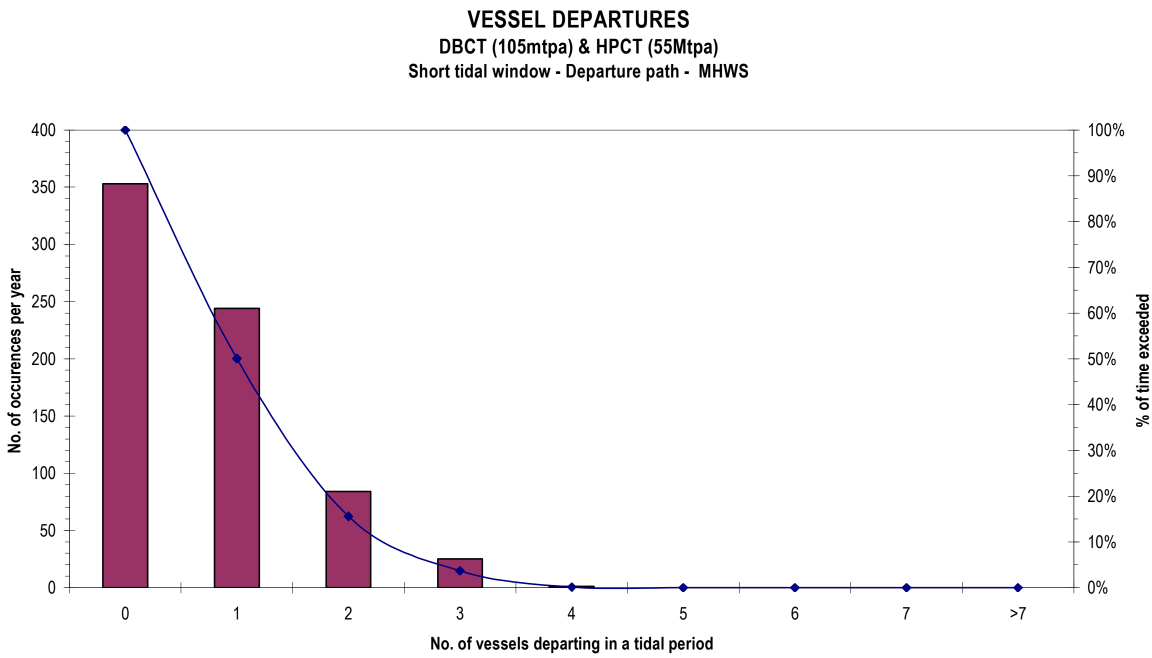
- Take historical shipping data from DBCT and HPCT that contains sailing draft and sailing time, and duplicate this data to generate a data set that exports 105Mtpa for DBCT and 55Mtpa for HPCT. The shipping data that was available was 5 months of 2002 and the full year of 2003 for DBCT, and the full year for 2003 and 2003 for HPCT. This approach matches the right intensity of shipping, but may be conservative with the number of vessels leaving the port at any given time, because the constraint of the number of berths at the port cannot be maintained in the generated data set.
- Calculate the number of vessels that need to depart the port for each 12.25 hour standard tidal period for the year. (The actual tidal period varies). Calculate the number of vessels that need to depart the port for each standard tidal period, for each of the categories listed above. Generate graphs and statistics on this data.

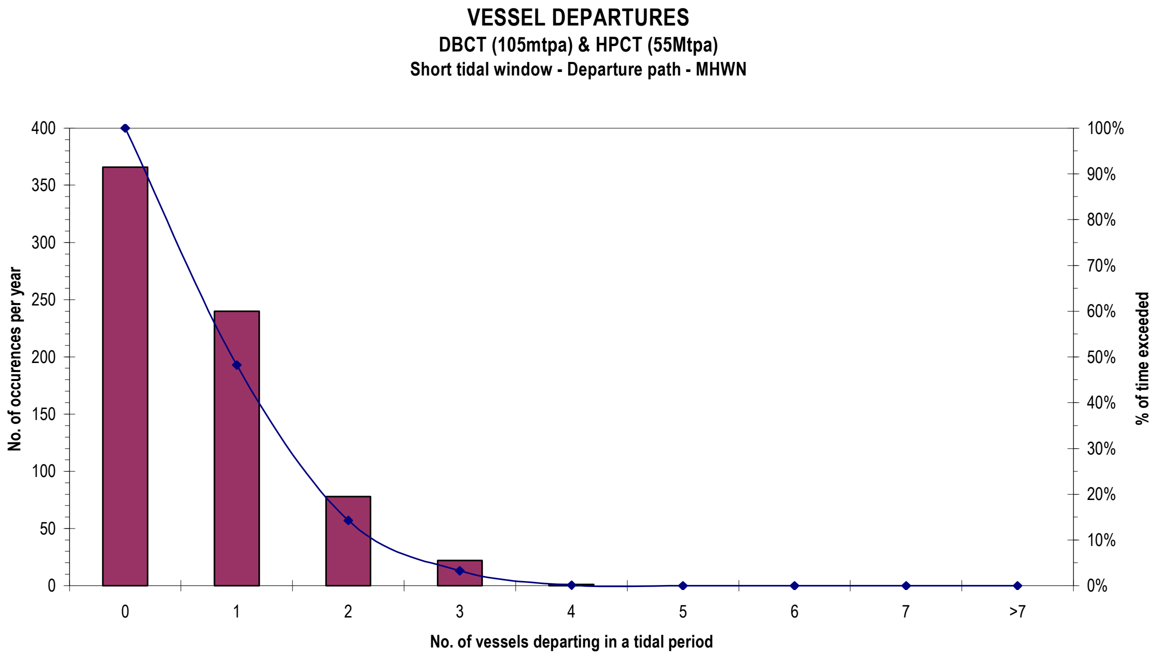
A "short tidal window" of 3 hours (1.5 hours either side of high tide) was chosen because the tide is relatively high throughout this period. From the information in the departure channel rules, and assuming no constraints from tugs or pilotage the maximum number of vessels that can use the channel in this period is four. Assuming two vessels from HPCT and two vessels from DBCT, and that the HPCT vessel is scheduled to depart first because it has the shorter journey to the channel beacons, it takes 2hours 35 minutes for four vessels berthed SST to depart the terminal and 3 hours 5 minutes for four vessels berthed PST to depart the terminal.

4. Results



This chart shows the total number of vessels departing the port in a tidal period. It can be seen that 98% of the time 5 or less vessels need to depart in one tidal period. Note that there is one occurrence where >7 vessels depart in one tidal period which is a data anomaly, because there would be 7 berths (3 at HPCT and 4 at DBCT) in the 160 Mtpa scenario.





These charts show that on both spring and neap tides, 99% of the time 3 or less vessels need to depart through the departure path in the 3 hour window around high tide. As up to four vessels are able to depart in this timeframe, it can be concluded that the channel is not a bottleneck for a port capacity of 160 Mtpa.

Graphs have also been generated for the DBCT only case, and these will be useful to determine whether there is sufficient towage capacity for the terminal. However, data on the time tugs are required for various vessels movements (arrivals - PST and SST, departures - PST and SST, paddock crossing and departure path) needs to be sourced in order to assess whether additional towage capacity is required.

5. Further Work

The following further work is envisaged:

- Running this model for larger throughput tonnages for DBCT to determine when the departure path starts becoming a bottleneck. This bottleneck can be dealt with by downrating the capacity of the berth infrastructure due to the short loading of some vessels and/or forcing them to use a paddock crossing departure. As the first departure path was a very cost-effective way of providing additional capacity for the port, it is assumed that a second departure path will also be an attractive option when enough ships are affected.
- For larger tonnages the issue of interaction between arriving and departing vessels needs to be addressed, and how much manoeuvring space/time is required.
- Determining at what tonnage throughputs additional towage capacity is required.
- It is assumed that pilotage services will grow organically with increasing tonnage so that pilotage will never be a constraint. However, there is the capital investment of an additional helicopter that may be required as the vessel movements become too frequent. Determining at what tonnage an additional helicopter may be required.

The following work can be undertaken to improve the accuracy of the model:

- Source recent data sets of shipping data.
- Modify the model to use a real tide model instead of an idealised spring and neap tide.

Please contact me if you have any questions or queries regarding this piece of work.

Regards

Rosie Johnson

Appendix F

DBCT Management Market Report

consulting
business environment

business environment • government • monetisation • strategy • transactions •
consulting

A Wood Mackenzie Company

HILL & ASSOCIATES
A WOOD MACKENZIE COMPANY

Delivering commercial insight to the global energy industry

consulting business environment

April 2009

DBCT Management Market Report

Dalrymple Bay Coal Terminal (DBCT) is a significant coal terminal on the eastern seaboard of Australia, currently undergoing expansion works the terminal will be able to throughput 85 Mtpa of coal by the middle of 2009. The predominant types of coal that are exported through DBCT are hard coking coal (HCC) and Pulverised Coal Injection (PCI) coals, with minor amount of thermal coal and lower quality coking coals.

- World metallurgical coal imports are forecast to reach 389 Mtpa by 2025, an increase of 148 Mtpa from 2008 levels. This will be predominately driven by demand growth in India, China, and Brazil. Seaborne trade will account for 130 Mtpa of this 148 Mtpa increase.

- Imports of thermal coal are forecast to increase from 689 Mtpa to 1,073 Mtpa in 2025. Land-based trade will be less than 70 Mtpa of this volume. Growth will be mainly in Asia, whilst Europe will be mainly flat with small decreases in demand due to fuel switching to gas.

- The supply catchment area of DBCT takes in significant reserves and resources of metallurgical coal. The production capacity within supply catchment is likely to exceed current (post 7X expansion) terminal capacity by 2012. If demand meets this supply capacity then throughput limits will be reached

- Rail infrastructure is undergoing upgrade to meet DBCT’s post 7X terminal capacity, though additional rail capacity could be limited by external factors which could hamper further port expansion. QR Network are currently investigating further Goonyella coal chain expansion scenario's to provide combined Hay Point capacity above 129 Mtpa in response to requests from both Hay Point Services (HPS) and DBCT Management.

- Construction of the rail link from the Goonyella rail system to Abbot Point (GAP) could cause some 'catchment leakage' from DBCT although this risk is somewhat offset by the recently announce indefinite delay to the GAP project, which is still subject to commercial closure between the coal producers and QR Network.

- Other coal terminal developments will be immaterial to DBCT’s due to the highly differentiated markets for coal that is shipped through the various coal terminals on the Australian eastern seaboard.

- DBCT coals are well positioned in terms of cost competitiveness. DBCT thermal coal is firmly within the lowest quartile and will remain there to 2020. DBCT metallurgical coals are well spread across the range of Australian metallurgical coals. Australian metallurgical coals dominate the lower three quartiles of production. DBCT coals due to the type and quality within the metallurgical spread would be likely to absorb any ‘price squeeze’ better than other producers globally.

Report scope and background

Background

Dalrymple Bay Coal Terminal (DBCT) is an important bulk export facility servicing both the metallurgical and thermal seaborne markets.

- DBCT Management (DBCTM) is the long-term lessee of the terminal (i.e. they are the effective owner of the DBCT facility).
- DBCTM need to understand the market demand and cost competitiveness for coal shipped through Dalrymple Bay, and the production and export capacity of suppliers within their catchment to effectively operate and manage the DBCT asset.
- Babcock and Brown Infrastructure are currently the 100% equity owners of Dalrymple Bay Coal Terminal Management. There is currently a sale process underway for the disposal of all or part of this equity stake by Babcock and Brown Infrastructure.

Currency

Wood Mackenzie notes that both the significant time has elapsed since the provision of the last market report for DBCTM and the rapid changes in the market that have occurred since September 2008, mean that an entirely new report will need to be developed.

- We note that our approach in regards to the market outlook sections of this report are based on the current versions of our research services from late 2008, and that the timing of delivery means that we were unable to allow inclusion of material from the major update of the Coal Market Service that is due by the end of May 2009.
- At this time the main review to the market forecast presented in this report relates to the short-medium term outlook with reduced near-term projections for demand (and supply) through reduced activity levels and deferment of project development for both consumers and producers. The long-term outlook, however, still shows strong growth.
- A further update of the Coal Market Service is due at the end of October 2009

Wood Mackenzie recommend that this reported be updated when in either June 2009 or November 2009 as our research services are updated.

Methodology

In producing this market report Wood Mackenzie have drawn on our extensive coal market research. Information has been drawn from our research products as listed below

- Coal Supply Series – CSS has been used to present asset-by-asset reserves and total resource base for the catchment area, as well as logistics and infrastructure
- Coal Market Series – CMS has been used to present our assessment of the metallurgical and thermal coal markets. The ICT model within CMS has been utilised to produce competitive cost positioning for DBCT shippers.

Disclaimer

This report has been prepared for Dalrymple Bay Coal Terminal Management by Wood Mackenzie (Australia) Pty Ltd. The report is intended solely for the benefit of Dalrymple Bay Coal Terminal Management and its contents and conclusions are confidential and may not be disclosed to any other persons or companies without Wood Mackenzie's prior written permission.

Reliance

Wood Mackenzie have acted as advisers to Dalrymple Bay Coal Terminal Management ("DBCTM") in preparing a report dated April 2009 (the "Report") regarding a forecast of coal throughput at Dalrymple Bay Coal Terminal ("DBCT") during the period to 2025. We are instructed that you propose to use this document for either financing for the Project to participate in the provision of financial accommodation or a financial guarantee to, or for the benefit of, DBTCM in relation to the Project, or for the purpose of determining the attractiveness of potential equity participation in DBCTM ("Relevant Involvement").

The Report has been prepared for DBCTM and may not be shown to or relied on by any other person without our prior written consent. This section sets out the basis on which we consent for Financiers or Potential Equity Participants (as defined below) being provided with a copy of the Report and the basis on which they may rely on the Report.

- Financier means any bank, financial institution or guarantor to the extent those persons provide financial accommodation or any financial guarantee to, or for the benefit of, BBI in respect of the Project, and in each case as at completion of the Project or within 12 months following completion of the Project.

- Potential Equity Participant is any party who is evaluating the potential purchase of a partial or complete equity share of DBCTM, in the 12 months from the date of the Report.

Wood Mackenzie agrees to providing a full copy of the Report to a Financier or Potential Equity Participant (as defined above) for the purpose of providing financial accommodation or any financial guarantee to, or for the benefit of, DBCTM in connection with the Project or for evaluating the potential purchase of a partial or complete equity share of DBCTM respectively.

Reliance by any of these parties on the Report is subject to the following:

- Wood Mackenzie receiving a copy of the Reliance Letter (the form of which is attached at Addendum A to this Report) signed by the relevant Financier or Potential Equity Participant; and

- on the understanding that by accepting and relying on this Report, the recipient confirms that it is aware of, and understands the scope of Wood Mackenzie's engagement as set out in Section 1 of this Report and agrees that its right to recover for any claim, action, proceeding, loss, cost, damage, expense or liability incurred by or to be made or recovered by or against Wood Mackenzie however arising, whether present, unascertained, immediate, future or contingent (Claim) is limited to the extent that any Claim is directly attributable to Wood Mackenzie's negligence in preparing this Report for BBI, but in any event Wood Mackenzie's liability will not exceed a maximum aggregate amount of A$5 million for all Claims made by any person entitled to rely on this Report (including Wood Mackenzie).

Scope

The scope of our Report was agreed by DBCTM. We have not departed from the scope except where indicated in the Report.

Qualifications

The assumptions and qualifications made in preparing our Report are set out in the Report. In addition, we draw the Financiers' or Potential Equity Participants attention to the following matters:

- we have acted solely for DBCTM in preparing the Report;

- we have prepared the Report in accordance with the instructions of DBCTM and for its benefit, and have considered only the interests of DBCTM in doing so;

- by accepting and relying on this Report, the recipient confirms that it is aware of, and understands the scope of our engagement as set out in the Report and agrees to the limitation of liability set out below.

Limitation of Liability

Financiers' or Potential Equity Participants, agree that any right to recover for any claim, action, proceeding, loss, cost, damage, expense or liability incurred by or to be made or recovered by or against Wood Mackenzie however arising, whether present, unascertained, immediate, future or contingent (Claim) is limited to the extent that any Claim is directly attributable to Wood Mackenzie's negligence in preparing this Report for DBCTM, but in any event Wood Mackenzie's liability will not exceed a maximum aggregate amount of A$5 million for all Claims made by any person entitled to rely on this Report (including Wood Mackenzie).

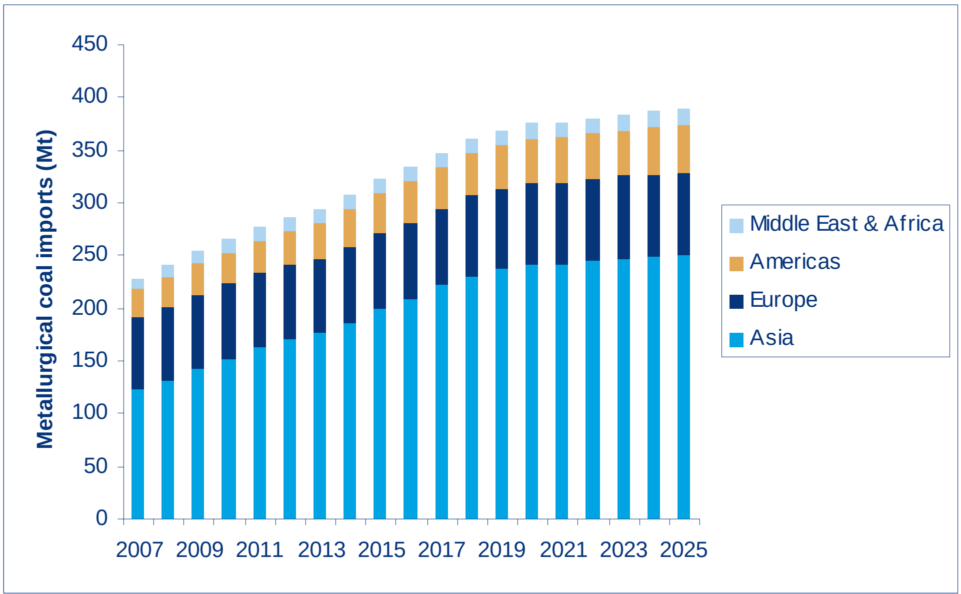
Summary

Seaborne coal markets (as at Dec 2008)

Metallurgical coal demand

World metallurgical coal imports are forecast to reach 389Mt by 2025, an increase of 148Mt from 2008 import levels (a CAGR of 2.9%), with growth concentrated primarily in three countries: India (63Mt), China (33Mt) and Brazil (18Mt). Seaborne imports increase 130Mt to 356Mt in 2025.

World metallurgical coal demand by region



- In India, imports of metallurgical coal have grown over the past five years and reached 20Mt in 2006. Metallurgical coal imports are to grow significantly to 96Mt in 2025. Australia continues to remain the major beneficiary of this metallurgical coal import demand growth, exporting mostly high quality hard coking coal

- Japan is currently the largest importer of metallurgical coal in the world, totalling 64.4Mt in 2007. Australia supplies over 70% of Japanese metallurgical coal imports.

- China is the largest steel producer in the world. China only became a net importer of metallurgical coal in 2007, importing 6.2Mt, with over half from Mongolia. We expect Mongolian imports will continue to feed Chinese metallurgical coal import demand during the forecast period. Australia supplied 2.3Mt of imported metallurgical coal in 2007

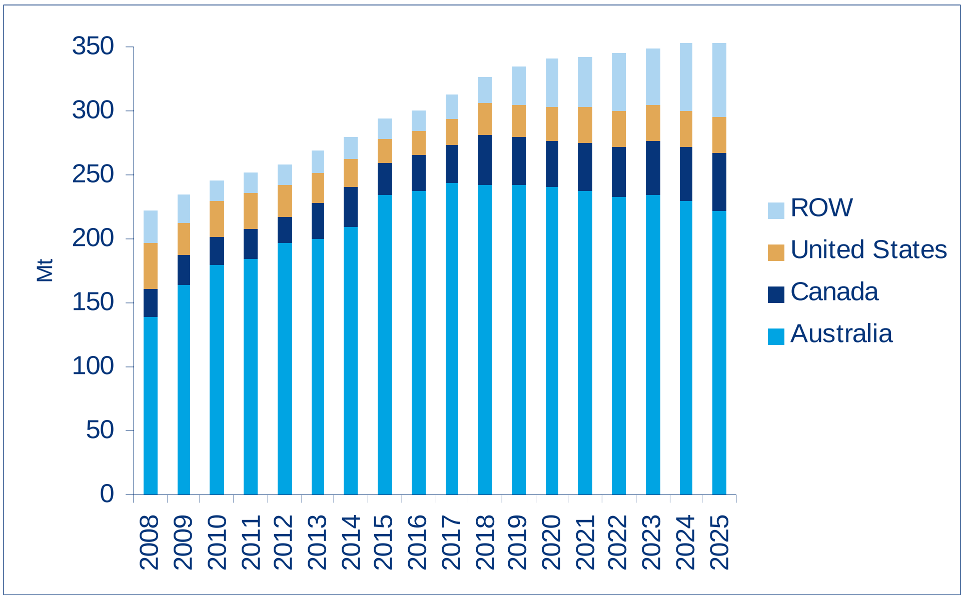
- South Korean 2007 imports totalled 17.3Mt of metallurgical coal, primarily from Australia (10.4Mt). Taiwan's crude steel production reached 20.9Mt in 2007, with metallurgical imports at 8Mt. Both countries show modest growth to 2025.

- Brazil, ranked ninth in terms of world crude steel production in 2007 imported 15.7Mt of metallurgical coal in 2007, sourced mainly from Australia (6.1Mt). Metallurgical coal imports are forecast at 35Mt by 2025, with an increasing proportion of PCI coal.

Metallurgical coal supply

World metallurgical coal seaborne supply is expected to increase by 131Mt in the forecast period, to 353Mt in 2025 from 222Mt in 2008. This increase in exports is expected to comprise of 91Mt of coking coal and 40Mt of PCI coal. Substantial new supply capacity is expected to come on stream in Australia as port and rail infrastructure constraints ease. New projects in Mozambique and Indonesia are expected to supply considerable amounts of coking coal into the market post 2010.

Projected seaborne supply by region to 2025



- Australia is forecast to continue dominating the export market of all metallurgical coal types, accounting for close to 71% of all exports during the forecast period and driven by extensive coking coal reserves in Queensland. The recent difficulties with port and rail infrastructure limitations are being addressed. A large number of projects in Australia could potentially be developed earlier if demand increases more rapidly than forecast.

- Canada will remain the world's second largest exporter, with 11% of total world metallurgical coal exports from 2008 to 2025 (reaching 45Mtpa by 2025). The western Canada coking coal mines are inherently high export cost operations with rail distance to British Columbia ports of approximately 1,000 km.

- Mozambique coking coal will play a key role in supplying the forecast growing import requirements for India in particular due to its freight cost advantage. The Moatize coalfield will be developed, and coking coal production will rise to 18.5Mt by 2025.

- Indonesian metallurgical coal exports will total 10Mt by 2025. Mongolia is forecast to increase exports over the forecast period, with all coal being consumed in China

- The USA will continue as a "swing supplier", responding to price levels in the seaborne markets. USA exports are forecast to remain steady around 26Mt.

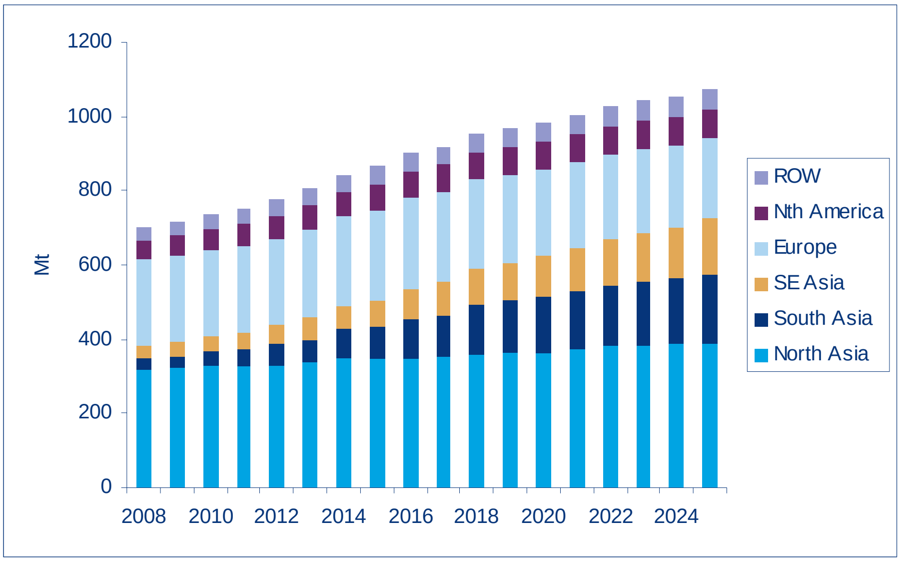
Thermal coal demand

The global market in traded thermal coal is forecast to show substantial growth with imports increasing from 689Mt in 2007 to 1,073 Mt in 2025 (a compound annual growth rate of 2.5% to 2025). Imported thermal coal demand growth is driven by burgeoning power-sector demand in Asia with increasing power generation capacity and higher utilisation rates

Supply capacity is expected to grow faster than demand growth over the next five years, with a progressive overturning of the current market supply deficit. Continued strong growth in supply from Indonesia, coupled with rail and port capacity additions in Australia, are forecast to lead to supply overcapacity developing rapidly during 2009 and 2010, with the capacity surplus peaking in 2012

Asian imports grow by 340Mtpa to 2025, with India accounting for 158Mtpa and South East Asia 117Mtpa. European seaborne imports of thermal coal are expected to fall slightly from 181Mt in 2007 to 174Mt in 2025, due to carbon emissions constraints and competition from gas.

World thermal coal demand by region



- Japan remains the single largest thermal coal importer at 122Mt in 2007 but has a generally flat growth profile. South Korean demand is expected to grow strongly to over 100Mt by 2025

- Indian import demand is expected to grow at a CAGR of 12%, which will see it overtake Japan around 2018 as the largest thermal coal importer. India's emergence as a major importer of thermal (and metallurgical) coal is expected to continue and accelerate over the period to 2025. Domestic production is forecast to be unable to keep pace with coal demand leading to a domestic supply gap

- Imports into China tend to be independent of the wider thermal coal trade. In 2007 they were around 45Mt dominated by anthracite from Vietnam. The long term production forecasts for China indicate thermal coal demand will be able to be satisfied by domestic production and increasing imports from Mongolia

- Taiwan is a significant importer of coal at around 62Mt. Coal imports are expected to increase to around 72Mt in 2025

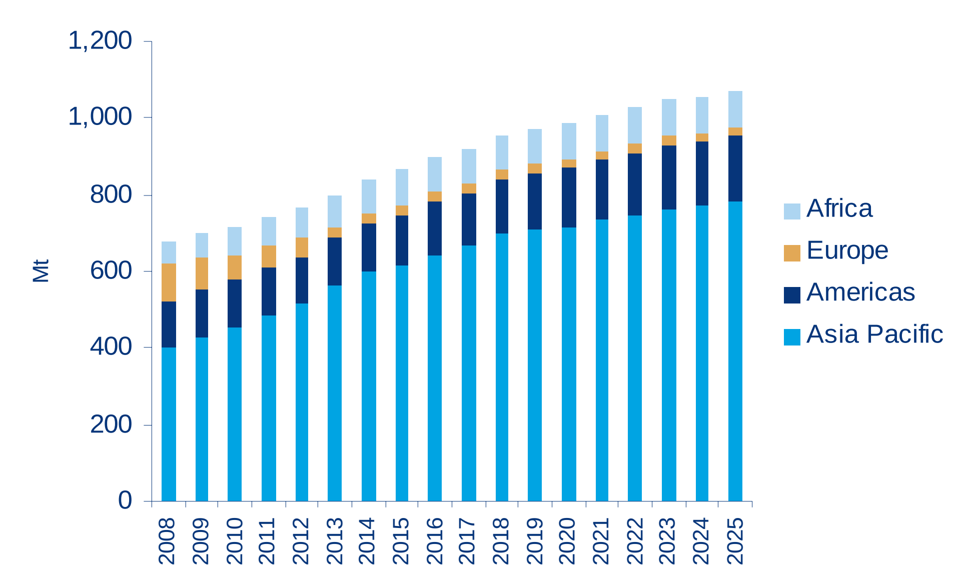
Thermal Coal Supply

Global supply of traded thermal coal (seaborne and landborne) is expected to grow from around 690Mt in 2008 to 1061Mt in 2025. The landborne component is small at around 59Mt in 2008 and increases to 71Mt by 2025. The Asia Pacific suppliers, primarily Indonesia and Australia, dominate global supply with 402Mt in 2008 rising to 782Mt in 2025. This represents a 78% increase to 2020 and 95% increase to 2025. Colombia and the USA dominate supply from the Americas, with Colombia positioned to add an additional 40Mt to its supply by 2025.

- Indonesian production growth will be sufficient to cater for increasing domestic demand growth as well as continued strong growth in exports particularly in sub-bituminous coals. This will further strengthen its position as the world's largest supplier of thermal coal over the next decade. Exports are projected to rise from 220Mt in 2008 to 403Mt in 2025. Indonesia is well placed to meet additional future demand from India in particular, with large low-cost resources of sub-bituminous coal.

- Australian thermal coal exports are forecast to increase from 120Mt in 2008 to 296Mt in 2025. The number of projects indicates that Australia also has considerable potential capacity headroom. Port and rail infrastructure problems in Australia are easing but still pose a significant risk to modelled volumes if there are delays or difficulties

Projected seaborne supply by region to 2025



DBCT supply catchment

DBCT as one of two coal terminals at the Port of Hay Point, and notably the only common-user terminal at the port, provides ship loading facilities for coal mines in the central Bowen Basin. A large proportion of the reserve/resource base in the area is controlled by BMA (BHP-Billiton Mitsubishi Alliance) who are the owners/operators of the smaller terminal at the port. In addition to shipping coal via their own terminal they also utilise DBCT for coal produced from mines they operate on behalf of BMC (BHPB-Mitsui Coal).

When Phase 2/3 of the 7X expansion project is completed DBCT will have a capacity of 85 Mtpa, this coupled with the adjoining HPCT terminal expanding to a contemplated 55 Mtpa in the next 5 years could give the port a combined capacity of 140 Mtpa, which is 20 Mtpa short of the proposed total rail capacity of the port.

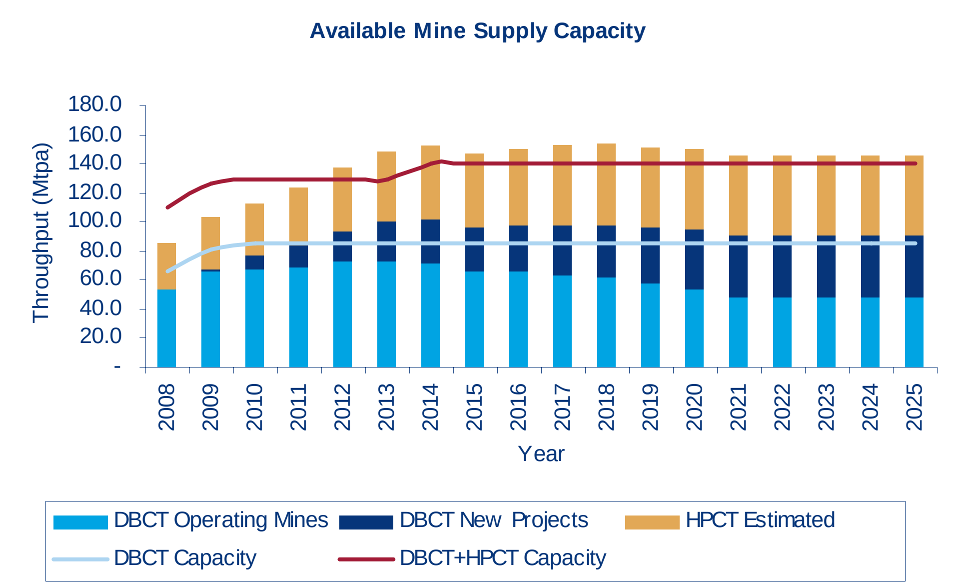
Catchment review

The catchment area takes in operations and projects owned by some of the major global metallurgical coal producers. In the next five years it is likely that coal production in the supply catchment will be lower than the available throughput capacity at the terminal, but in the mid to long-term supply capacity will exceed port capacity. From 2012 this excess in available supply may be cause to expand DBCT further. The shared rail system with HPCT and their expansion plans coupled with project rail system capacity may have an influence on plans to expand DBCT further.

Operating mines utilising the Goonyella rail system

non-BMA Operated Mines		BMA Operated Mines	
		BMA/CQCA owned	BMC owned
Blair Athol	Isaac Plains	Broadmeadow	Poitrel
Broadlea	Middlemount	Goonyella Riverside	South Walker Creek
Burton	Millennium	Gregory / Crinum	
Capcoal Complex (GMK/LL)	Moorvale	Norwich Park	
Carborough Downs	Moranbah North	Peak Downs	
Coppabella	North Goonyella / Eaglefield	Saraji	
Foxleigh	Oaky Creek		
Hail Creek			

DBCT versus HPCT supply capacity compared to terminal nominal capacity



The catchment area has significant reserves and resources of coal, more than adequate to enable port operation beyond the period of this review. The reserve base is predominately metallurgical coal, and this is mirrored in actual throughput. There is only one mine in the catchment dedicated to thermal coal production, whilst others do produce secondary thermal products. Metallurgical coal production is from a diverse range of mines and is mainly hard coking and PCI coals. Over the past decade PCI has become a more important component of DBCT throughput as steel makers in some regions have adapted to differing steel making techniques.

Marketable metallurgical and thermal coal reserves in DBCT catchment

	Operating	Project	Total
Surface	645.4	109.9	755.3
Underground	409.1	314.4	723.5
Total	**1,054.5**	**424.3**	**1,478.8**

Metallurgical

	Operating	Project	Total
Surface	84.0	241.2	325.2
Underground	-	34.5	34.5
Total	**84.0**	**275.7**	**359.7**

Thermal

The resource base (measured and indicated resources) of the combined DBCT/HPCT catchment exceeds 10.5 billion tonnes, with the amount nominally attributable to DBCT being 5.8 billion tonnes. As with reserves the resource is mainly nominated as metallurgical coal. A proportion of the coal hasn't had a type nominate by the holder, though on review of these mines they are generally in the 'Rangals Measures' and would yield mainly PCI coals with high-ash thermal by-product. The resource base within this report does exclude 'inferred resources' as whether these are reported, and in what form, varies significantly by the resource holders.

Queensland Rail is undertaking a major upgrade of the Goonyella rail system to improve system capacity inline with the expanded port facilities. This has involved upgrade to both 'above' and 'below' rail assets including additional rolling stock, power supply upgrades, signalling upgrades, bypass loops, and siding upgrades.

There are a number of proposed port developments for eastern Australia, with 'headline' capacities indicating an enormous growth in total throughput beyond demand levels. For the most part these will have minimal impact on DBCT. The majority of the other port proposals would throughput a different type of coal to that which is predominately handled at DBCT and a number of these proposals would be competing against each other rather than against DBCT. The two ports that would have a potential impact on DBCT would be Hay Point and Abbot Point, but for different reasons.

- HPCT being a single-user facility and sharing a common rail system with DBCT may have the potential to limit expansion of DBCT by utilising the current available rail capacity into the port.

- Abbot Point, following completion of the GAP project, should the project proceed and provided capacity is capable of supporting up to 100 Mtpa, would have an overlapping catchment area with DBCT. There could be 'leakage' of tonnage from DBCT to Abbot Point in the event of the project preceding.

Cost competitive positioning

Across both thermal and metallurgical seaborne markets Australian supplied coal generally sits comfortably at the lower end of the cost curves. As markets grow it will be unlikely that Australian, and in particular DBCT, mines will cede their competitive position to other producers.

- Australian metallurgical coal dominates seaborne trade, with over two-thirds of this coal being Australian sourced. DBCT coal are relatively evenly spread through the cost ranking of Australian coal, however these do generally represent a type and quality that receives a higher price in the market.

- Thermal coal represents a minor proportion of DBCT throughput, and hence a small component of global seaborne tonnage. This coal is however in the lowest quartile of cost on FOB, and CIF basis into both Atlantic and Pacific markets.

To 2020 the relative competitive position of DBCT coals is unlikely to change. They will remain a strong relative cost position and due to product type/quality premiums will be more resilient to any price squeeze than other global producing regions.

Seaborne metallurgical market (as at Dec 2008)

- World metallurgical coal imports are forecast to reach 389Mt by 2025, an increase of 148Mt from 2008 import levels (a CAGR of 2.9%), and seaborne imports increase 130Mt to 356Mt in 2025.

- The 'BIC' economies will dominate seaborne import growth: Brazil 18 Mt, India 63 Mt, and China 33 Mt.

Market overview

Asia Pacific countries are the main demand drivers during our forecast period. Seaborne demand for metallurgical coal will be driven by continued growth in world steel and hot metal production in China, India, Brazil, and South Korea. Further:

- We forecast Japanese Steel Mills will increase the proportion of semi soft coking coal in their coking coal blend during the forecast period, resulting in an increase in forecast semi soft and PCI coal imports to around 32Mt annually by 2025.

- Europe will show minor growth, primarily attributed to an increased import demand in the Ukraine, and also Germany later in the forecast period, but overall will remain reasonably stable.

Seaborne metallurgical coal export supply is expected to increase by 131Mt in the forecast period, to 353Mt in 2025 from 222Mt in 2008. This increase in exports is expected to comprise of 91Mt of coking coal and 40Mt of PCI coal. Substantial new supply capacity is expected to come on stream in Australia as port and rail infrastructure constraints ease. Additionally:

- New projects in Mozambique and Indonesia are expected to supply considerable amounts of coking coal into the market post 2010. Wood Mackenzie forecasts Mozambique metallurgical coal production to rise to 18.5Mt by 2025, or around 4.5% of total global metallurgical coal exports, with all output destined for seaborne exports.

- US exports will decline from 2009. US metallurgical coal supply will recover towards the end of the forecast period. The outlook for US exports was looking far more robust following the decline in the US dollar and increased ocean freight rates early in 2008, which reinforced its freight advantage into Europe. However, this freight advantage was removed in the later part of 2008.

- Mongolia is forecast to increase exports over the forecast period, with all coal being consumed in China. As its domestic need increases Chinese met coal exports are expected to remain at low levels.

- PCI coal exports will continue to be dominated by Australian producers.

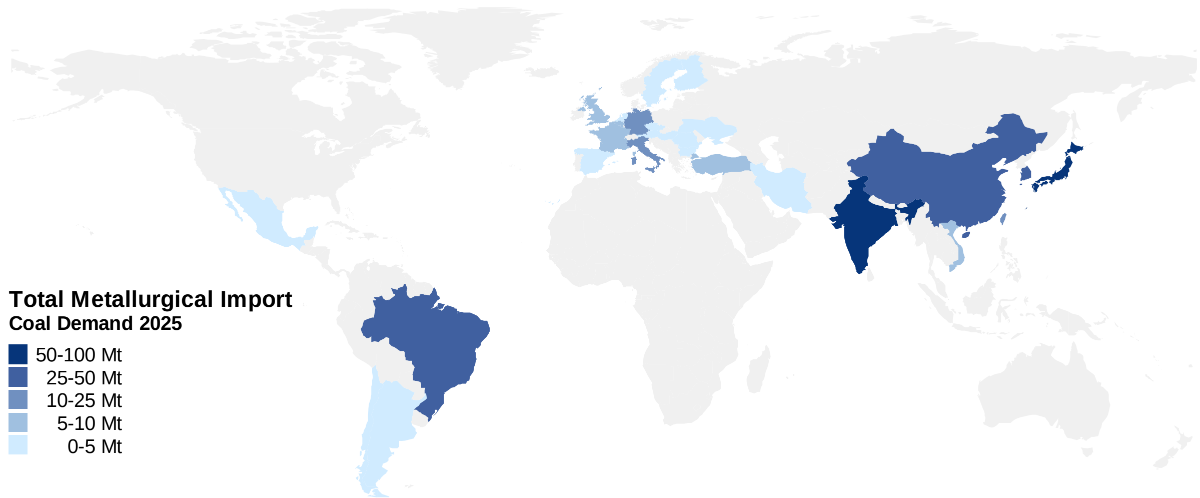
Demand for seaborne metallurgical coal

Growth in metallurgical coal imports is primarily concentrated in three countries: India (63Mt), China (33Mt) and Brazil (18Mt). These countries are not Kyoto Protocol signatories, and are therefore relatively unconstrained by carbon emission targets. India and Brazil are also low cost crude steel producing nations, while strong domestic crude steel demand is evident within our forecast period for India and China.

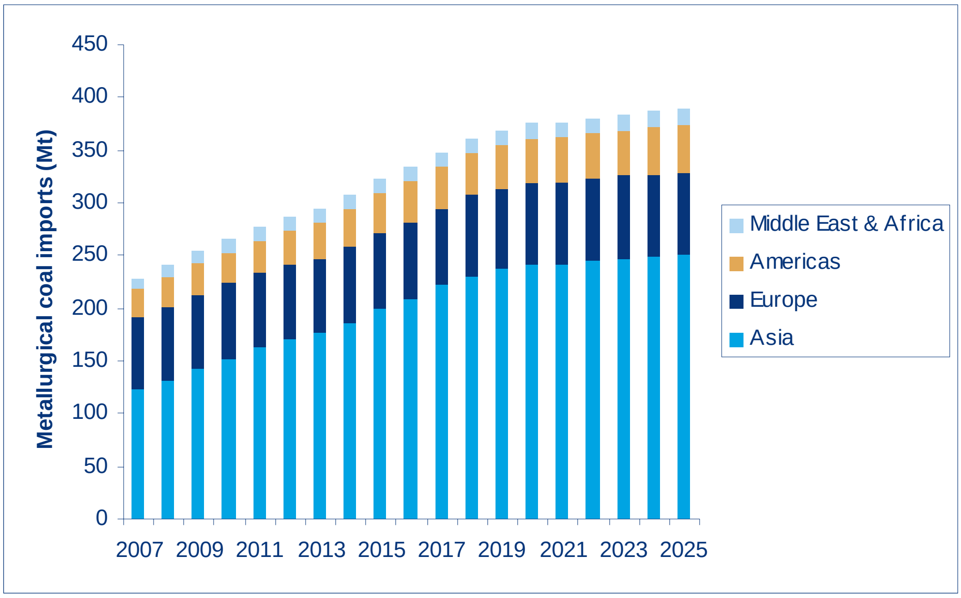
- Significant blast furnace hot metal production growth is forecast in India, China, Brazil and South Korea, while a recovery in steel production capacity will be evident in the Ukraine and Russia.

- US, European and Japanese demand is forecast to remain flat on expected low GDP growth, an aging population, mature steel industries, and increasingly regulated carbon emissions regulations.

Distribution of metallurgical coal import demand in 2025



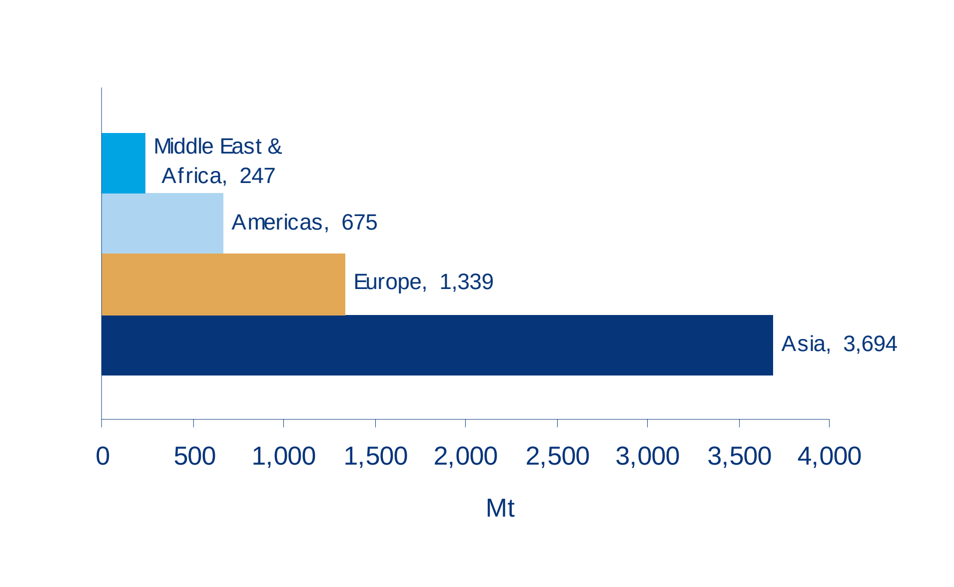
World metallurgical coal demand by region



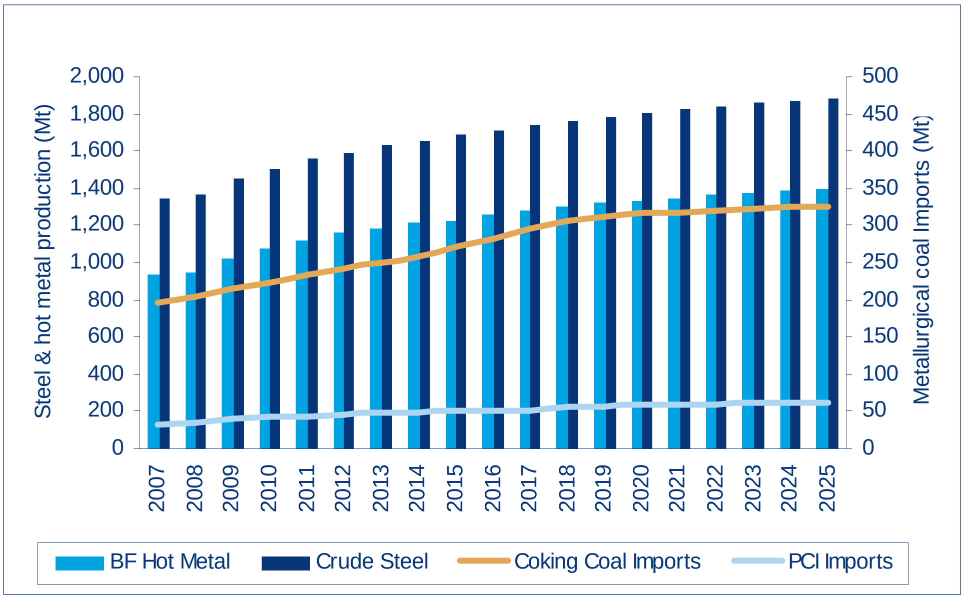
- Asian countries are the main demand drivers during our forecast period. China will increase its metallurgical coal imports, sourced primarily from Mongolia. In India, our analysis indicates domestic coking coal production will not increase significantly over the forecast period, and as such, metallurgical coal imports are to grow significantly to 96Mt in 2025. Constraints to steel mill expansions and new builds in India include lack of coal and iron ore linkages, land acquisition delays and local opposition.

- Brazilian metallurgical coal import demand is expected to be similar to Chinese imports by 2025, as new integrated steel mill projects and merchant pig iron producers increase hot metal production over the period.

Cumulative import demand by major region 2008-2025



Metallurgical coal import demand, steel production 2005-2025



Pacific market

Asia will continue to play a dominant role in the global metallurgical coal market. Of the Asian nations, India is forecast to have the greatest demand growth from 2007 to 2025, as India becomes the world's second largest hot metal producer.

- An underlying assumption in our Indian forecast is that integrated steel capacity increases will include coke oven capacity expansions. This coke capacity expansion will see India become a small net coke exporter by 2015. In the short term, delays in blast furnace projects will limit crude steel and hot metal production. Greenfield expansions will form a greater part of the growth beyond 2012.

- China will increase its metallurgical coal imports during the forecast period, despite increases in domestic metallurgical coal production. A large proportion of China's imports will be sourced from neighbouring Mongolia. There will also be scope for minor landborne imports from Vietnam, North Korea and Kazakhstan. Wood Mackenzie expects around 63% of China's total import demand will be serviced by landborne imports.

Atlantic market

Metallurgical coal import demand in the Americas is dominated by Brazil, which is forecast to increase its blast furnace hot metal production resulting in an increase in import demand.

- South American hot metal production is forecast to more than double 2007 production levels to 65.3Mt by 2025. This will see South American metallurgical coal demand increase to 40Mt by 2025.

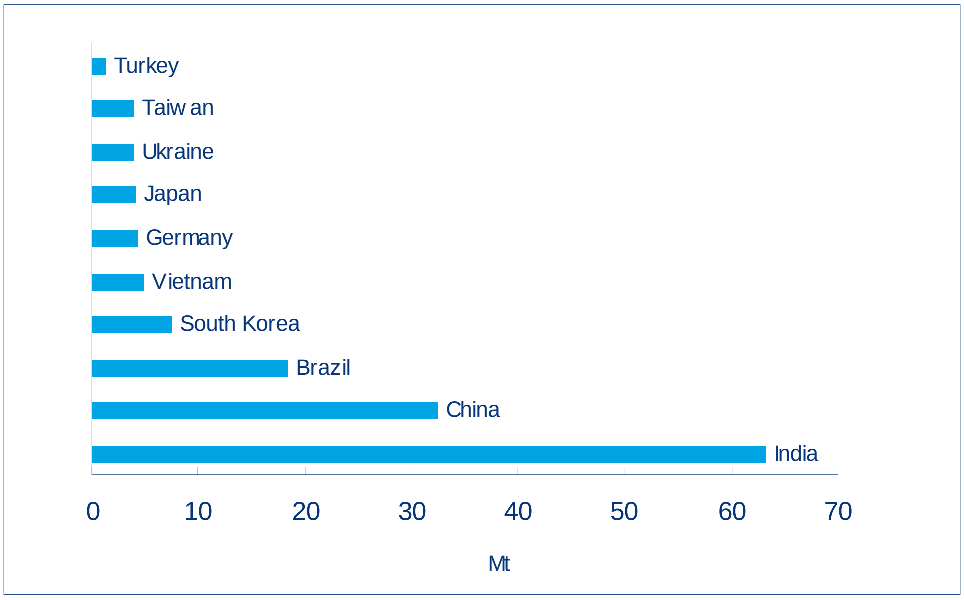
- North American hot metal production, meanwhile, is forecast to remain flat during the period, and our modelling shows a slight fall in metallurgical imports to 5Mt by 2025, as domestic coal supply increases.

Europe will show minor growth, primarily attributed to an increased import demand in the Ukraine, and also Germany later in the forecast period, but overall will remain reasonably stable.

- Capacity in the Ukrainian steel industry is currently underutilised, and as domestic demand for steel increases, we expect idled crude steel capacity will be restarted. The Ukraine government has been increasing its domestic coking coal production, reducing its reliance on imports. We expect this trend to continue, and metallurgical coal imports to remain steady around the 3Mt level through the forecast period. Coke imports are expected to continue at around 2Mtpy during the forecast period.

- We forecast a slight increase in German crude steel production, on the back of incremental electric arc furnace (EAF) steel production growth. Demand for imported metallurgical coal is expected to increase however as a result of falls in domestic production levels, with plans to close its remaining black coal mines by 2018. PCI consumption is also expected to increase in Germany as ArcelorMittal has announced plans to install PCI equipment on blast furnaces at Eisenhuttenstadt in eastern Germany and at Stahlwerke Bremen.

Coal import demand growth between 2008-2025 - top 10 countries



Key importing countries

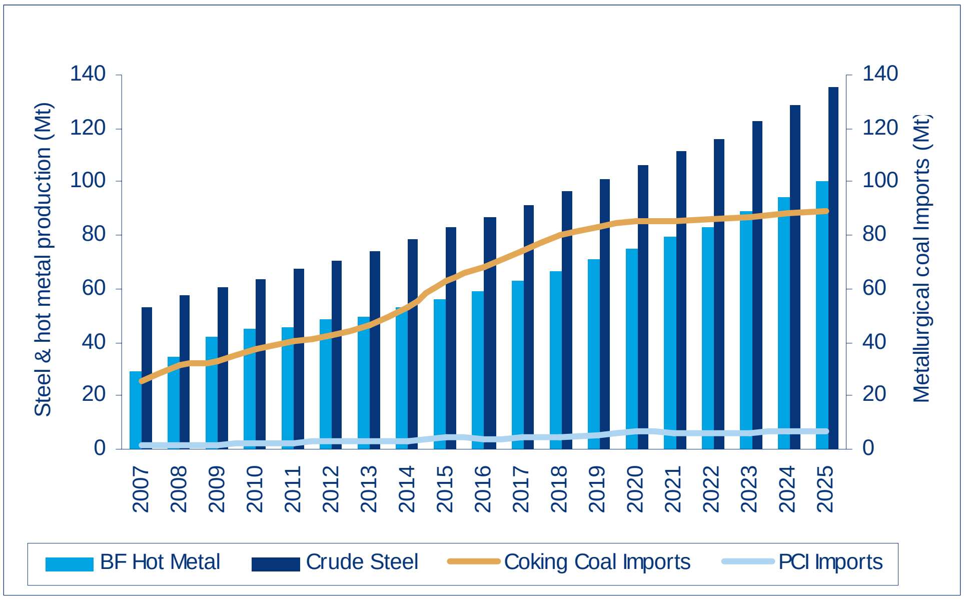
India

India's crude steel production reached 44Mt in 2006, with almost half of the steel (47%) produced by the basic oxygen furnace (BOF) process.

- Imports of metallurgical coal have grown over the past five years and reached 20Mt in 2006. Fairly consistent and rapid growth is expected over the forecast period in iron, crude steel and coke making capacity. Wood Mackenzie does not expect domestic coking coal production to increase significantly over the forecast period, and as such, metallurgical coal imports are to grow significantly to 96Mt in 2025.

- Australia continues to remain the major beneficiary of this metallurgical coal import demand growth, exporting mostly high quality hard coking coal. All other integrated steel makers rely on high quality coking coal to offset the poor quality domestic coals.

India's Iron, Steel Production and Coal Import Forecast



- An underlying assumption in the forecast is that integrated steel capacity increases will include coke oven capacity expansions. This coke capacity expansion will see India become a small net coke exporter by 2015. In the short term, delays in blast furnace projects will limit crude steel and hot metal production. Greenfield expansions will form a greater part of the growth beyond 2012.

- Wood Mackenzie does not expect POSCO's 12Mtpa Orissa project to develop, due to the long delays in land acquisition, and significant constraints may exist for other projects, including lack of coal and iron ore linkages, land acquisition delays and local opposition.

Japan

Japan is by far the largest importer of metallurgical coal in the world, totalling 64.4Mt in 2007. This represents close to 30% of total global imports in 2007. Japan is the second largest steel producer in the world after China. However, unlike China, Japan's steel makers import all their required metallurgical coal.

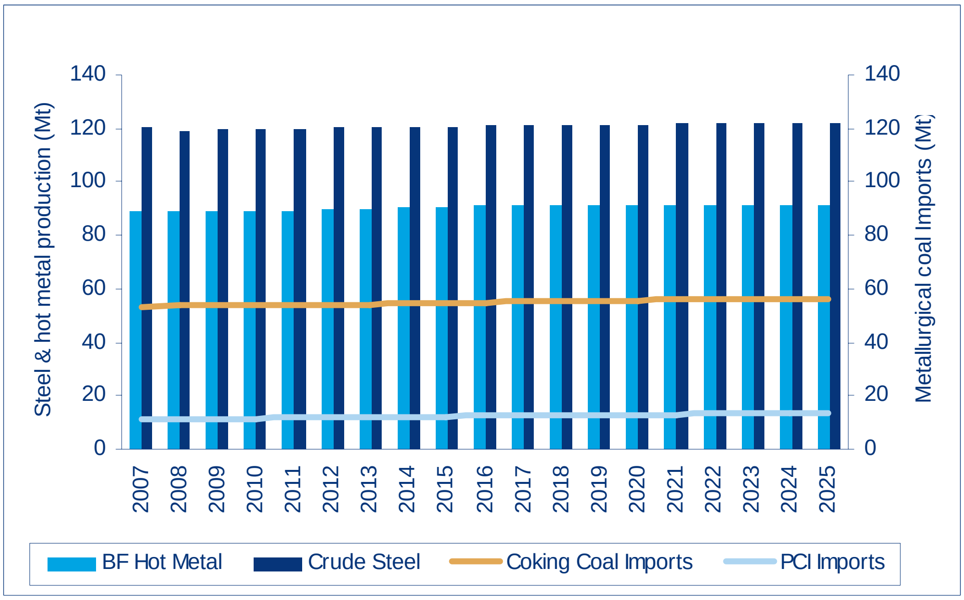
- Japan's crude steel production in 2007 was approximately 120.2Mt, the BOF process accounted for approximately 74% of this.

- Overall crude steel production is forecast to remain steady at around 120Mt in the long term with hot metal production stable at 88Mt, due to the mature nature of the Japanese steel industry.

- Australia supplied 72% of Japanese metallurgical coal imports in 2007, followed by next largest suppliers of Canada and Russia. China saw a drop year on year in exports reflecting robust domestic Chinese demand.

- Wood Mackenzie forecast an increase in PCI utilisation rates to around the 150kg/thm level, as Japanese steel mills seek better utilisation of semisoft coking coal in their blast furnaces.

Japan's Iron, Steel Production and Coal Import Forecast



China

China is the largest steel producer in the world. Crude steel production is expected to increase to 557.6Mt in 2009, from 489.1Mt in 2007, an increase of 14% on 2007 levels.

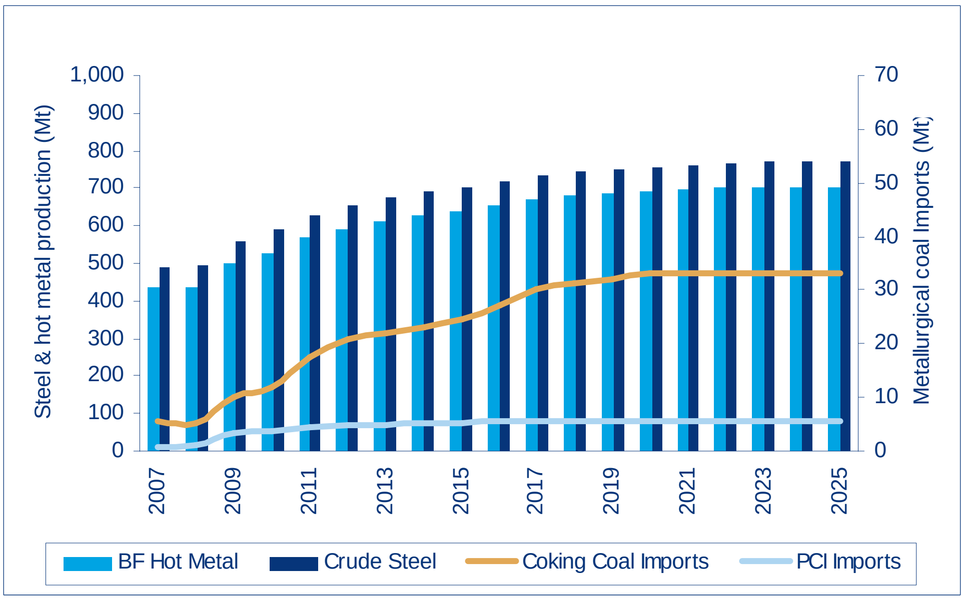
- Hot metal production is expected to increase by 68.2Mt to 537.2Mt over the same period. The BOF process dominates steel making with an 87% share of crude steel production. To meet the hot metal requirement in 2009, China is estimated to have required approximately 480Mt of coking coal and 58Mt of PCI coal.

- China's status as the largest consumer of metallurgical coal in the world is not matched by its minor role as a demand source for imported metallurgical coal. China became a net importer of metallurgical coal in 2007, importing 6.2Mt, a 33.5% year on year jump, against a 42% fall in metallurgical coal exports to 2.5Mt.

- Over half of total imports in 2007 came from Mongolia. We expect Mongolian imports will continue to feed Chinese metallurgical coal import demand during the forecast period.

- Australia supplied 2.3Mt of imported metallurgical coal in 2007.

China's Iron, Steel Production and Coal Import Forecast



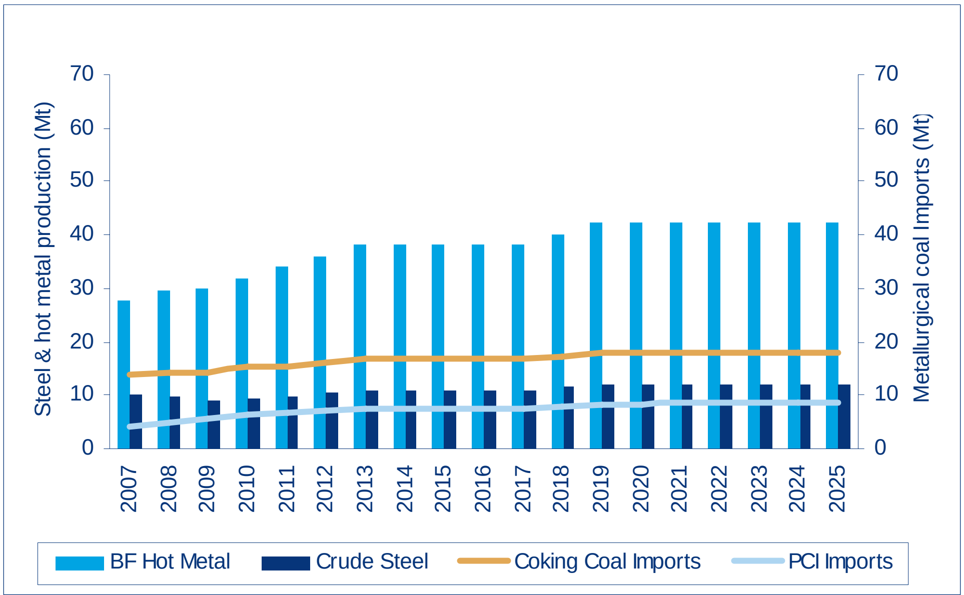
South Korea

In 2007, South Korea was the sixth largest crude steel producer in the world. South Korea does not produce any metallurgical coal, thus it is totally reliant on imports.

- 2007 imports totalled 17.3Mt of metallurgical coal, down year on year. Imports were primarily from Australia (10.4Mt), whilst other major sources included Canada (4.7Mt) and China (1.3Mt).

- The only integrated steel maker in the country is Pohang Iron and Steel (POSCO) which accounted for all hot metal production in South Korea in 2007. POSCO's Pohang Works has five coke batteries, four blast furnaces, another furnace producing foundry iron and a Corex plant. At the Gwangyang Works, POSCO operates four coke batteries and five blast furnaces.

South Korea's Iron, Steel Production and Coal Import Forecast



- Corresponding coke oven capacity expansions to meet the additional coke required for the new blast furnaces will result in increases to metallurgical coal imports. POSCO is expected to increase the PCI rates of all their blast furnaces by 2010, as well as plans to replace its blast furnaces at its Pohang works with Finex technology, and it is assumed that a PCI rate of 200kg/thm (industry best practice) is achievable for 2010 and onwards.

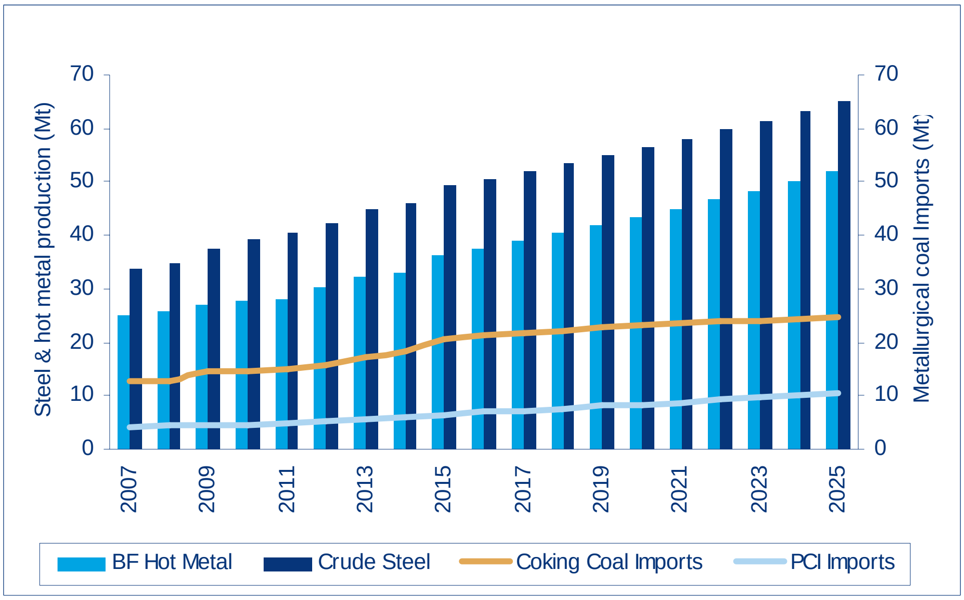
Brazil

Brazil, ranked ninth in terms of world crude steel production in 2007, is the second largest steel producer in the Americas after the USA. Hot metal production from Brazil's integrated steel mills (ISM) reached 25.5Mt in 2007 with an additional 9.5Mt attributed to independent producers and approximately 0.3 Mt of sponge iron.

- A total of 15.7Mt of metallurgical coal was imported in 2007, sourced mainly from Australia (6.1Mt), the USA (5.5Mt) and Canada (1.5Mt). Metallurgical coal imports are forecast to at 35Mt by 2025, with an increasing proportion of PCI coal.

- Brazil has four major integrated steel producers in ArcelorMittal Brasil, Usiminas Group, Companhia Siderúrgica Nacional (CSN), and Acominas. Arcelor Brazil accounted for approximately 33% of Brazil's crude steel production in 2007.

Brazil's Iron, Steel Production and Coal Import Forecast



Taiwan

Taiwan's crude steel production reached 20.9Mt in 2007, up slightly from the previous year. Just over half of the steel is produced by the BOF process and the other half by EAF. The only integrated steel maker in Taiwan is China Steel Corp which operates out of Lin Hai Industrial District in Kauhsuing. China Steel Corp's steel works include eight coke batteries (capacity of 4.56Mt) and four blast furnaces.

Vietnam

Vietnam is expected to rapidly increase its crude steel output during the forecast period. The government is targeting crude steel output of 25Mtpy by 2025, a target we consider optimistic. We are less optimistic about the scope of the projects to be developed, and have forecast steel production reaching 7.9Mt by 2015 and 16Mt by 2025.

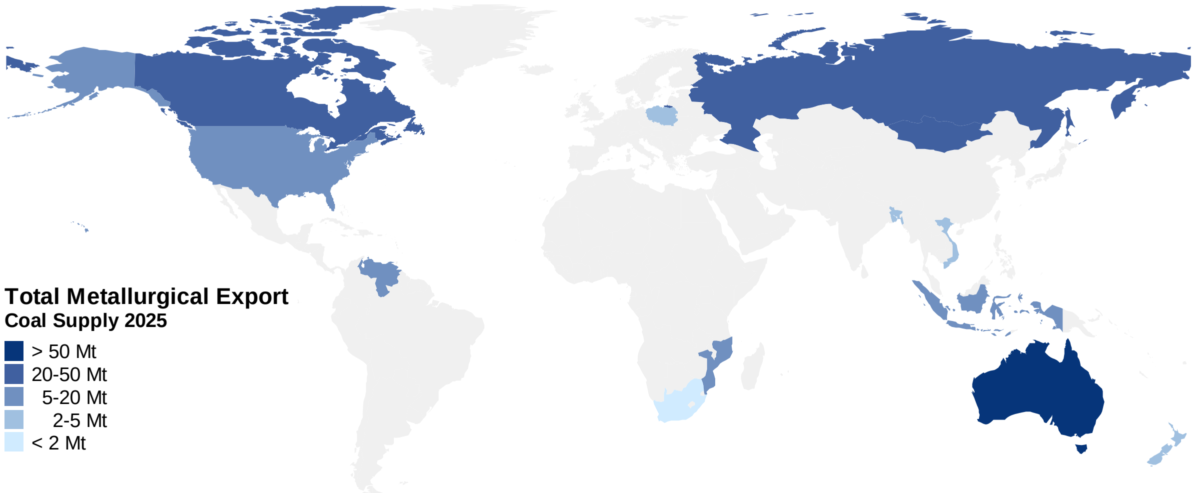
Coking coal inputs into Vietnamese steel production was approximately 0.29Mt in 2007, and will rise to 8.3Mt by 2025.

Germany

Germany remains the EU's largest steel producer, and the sixth largest steel producer in the world. Total hot metal production in 2007 is estimated to increase to around 31.1Mt, despite the closure of older blast furnaces. Germany's steel industry is mature, and increasing environmental regulations are expected to cap any major steel blast furnace expansions or new builds. A total of 8.3Mt of coking coal was imported in 2007 sourced mainly from Australia. We have forecast an increase in PCI coal imports, in part due to better PCI utilisation rates at blast furnaces. Demand for imported metallurgical coal is expected to increase as a result of falls in domestic production levels, with plans to close its remaining black coal mines by 2018.

Supply of seaborne metallurgical coal

Distribution of metallurgical coal supply in 2025



Wood Mackenzie forecasting shows world metallurgical coal seaborne supply is expected to increase by 131Mt in the forecast period, to 353Mt in 2025 from 222Mt in 2008. This increase in exports is expected to comprise of 91Mt of coking coal and 40Mt of PCI coal. Substantial new supply capacity is expected to come on stream in Australia as port and rail infrastructure constraints ease. New projects in Mozambique and Indonesia are expected to supply considerable amounts of coking coal into the market post 2010.

- The world's largest metallurgical coal exporter, Australia, faces competition from 2018 as projects in emerging supply countries enter the market.

- New projects in Mozambique and Indonesia are expected to supply considerable amounts of coking coal into the market post 2010. Wood Mackenzie forecasts Mozambique metallurgical coal production to rise to 18.5Mt by 2025, or around 4.5% of total global metallurgical coal exports, with all output destined for seaborne exports.

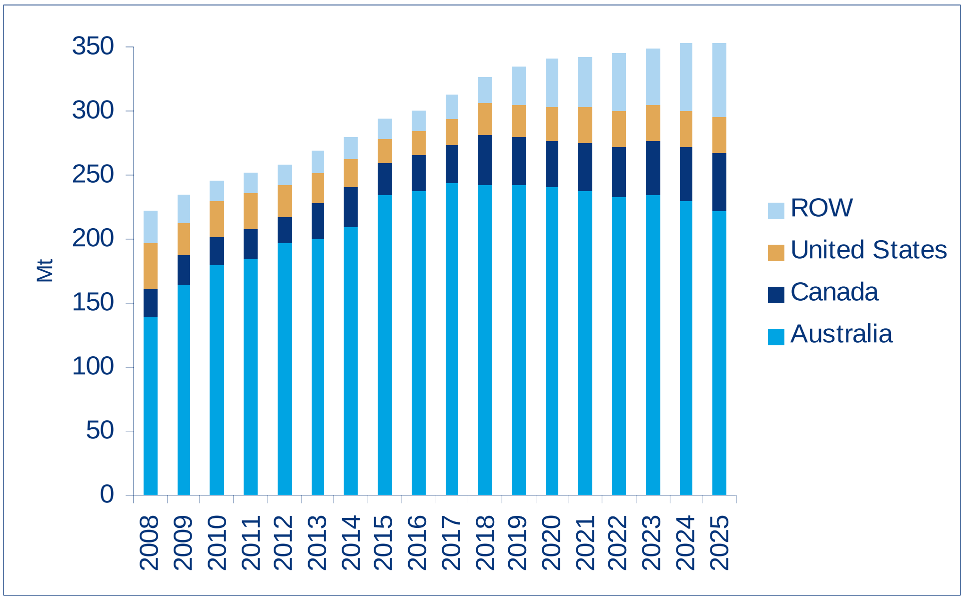
- Mongolia is forecast to increase exports over the forecast period, with all coal being consumed in China. As its domestic need increases Chinese met coal exports are expected to remain at low levels. Mongolian metallurgical coal exports during the forecast period will be landborne exports to China, with projected exports of around 6Mtpa by 2025.

- The record increases in metallurgical coal prices in 2008 had seen the re-emergence of US metallurgical coal exports into global seaborne trade. We expect US metallurgical coal exports to remain robust in the short term before declining from 2013 as prices and ocean freight rates fall, and recover to around 25Mt towards the end of our forecast period.

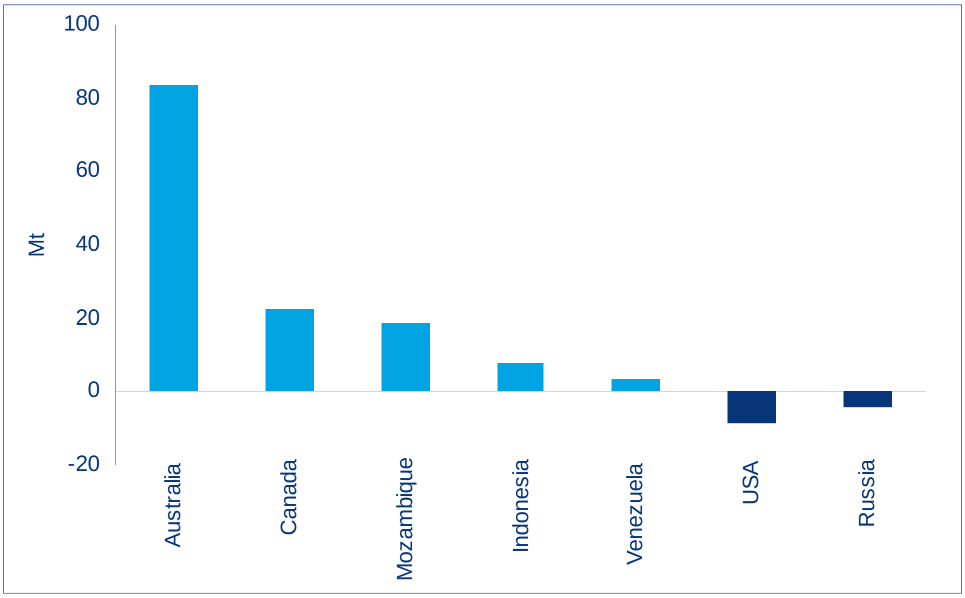
- Our modelling has also shown higher price levels have led to an increase in Canadian metallurgical coal exports to 45Mt by 2025. Higher prices have also seen Polish mine operators re-evaluating their mine closure schedule. Poland did not export seaborne metallurgical coal in the first half of 2008, with all production consumed by the domestic market.

- PCI coal exports will continue to be dominated by Australian producers, though some growth is forecast from Canada, and also Venezuela and Bangladesh later in the forecast period.

Projected seaborne supply by region to 2025



Global seaborne metallurgical coal supply growth 2008 to 2025 (Mt)



Key exporting countries

Australia

Australia is forecast to continue dominating the export market of all metallurgical coal types, accounting for close to 71% of all exports during the forecast period and driven by extensive coking coal reserves in Queensland.

- Port and rail infrastructure problems in Australia are easing, allowing a significant increase in export volumes over the near and medium term. Potential delays to infrastructure improvements therefore pose a significant risk to forecast volumes.

- A large number of projects in Australia could potentially be developed earlier if demand increases more rapidly than forecast.

Canada

Canada is modelled to remain to be the world's second largest exporter, with 11% of total world metallurgical coal exports from 2008 to 2025.

- However, only little growth is projected in the short to medium term as market growth is met by lower cost supply from Australia. Past 2015 substantial growth is projected as new, higher cost projects become viable in British Columbia and Alberta.

- The western Canada coking coal mines are inherently high export cost operations with rail distance to British Columbia ports of approximately 1,000 km. As such the projected volumes are sensitive to the emergence of lower cost supply in other areas of the world.

Mozambique

It is anticipated that the Moatize coalfield in Mozambique will be developed on the strength of rising world demand for hard coking coal and forecast strong pricing going forward. Mozambique coking coal will play a key role in supplying the forecast growing import requirements for India in particular due to its freight cost advantage.

- Depending on the successful conclusion of the ongoing negotiations with the rail transportation service provider and the completion of the coal terminal at the Beira Port, the Moatize project is estimated to initially produce around 4Mt of export products in 2011, ramping up rapidly to 11Mtpa of export products on average for the life of the mine.

- Production costs at Mozambique projects, such as Vale's Moatize project and Riversdale/Tata's Benga project, are expected to be low.

- Wood Mackenzie models Mozambique to commence metallurgical coal exports from 2012 onwards. Coking coal production to rise to 18.5Mt by 2025, or around 4.5% of total seaborne supply, with all metallurgical coal output destined for export markets.

- The development of the Mozambique coalfields requires considerable capital and infrastructure so any alteration to the timing of development will put pressure on this forecast. In particular, port and rail infrastructure constraints could limit the number of new metallurgical coal projects in Mozambique. Negotiation of equitable rail freight agreements with rail operators would also impact mine project development.

United States

USA exports are forecast to drop significantly in 2009 and remain steady around 26Mt. The USA will continue as a "swing supplier", responding to price levels in the seaborne markets, thus the export forecast is highly price sensitive.

Indonesia

Indonesian metallurgical coal exports will total 10Mt by 2025, or have a 2.8% share of global seaborne metallurgical coal export trade. Metallurgical coal exports out of Indonesia will shift from a currently semi-soft coking coal and PCI coal dominated market to one strongly led by hard coking coal.

Seaborne thermal market (as at Dec 2008)

- The global market in traded thermal coal is forecast to show substantial growth with imports increasing from 689Mt in 2007 to 984Mt by 2020 and 1,073 Mt in 2025 (a compound annual growth rate of 2.5% to 2025).

- Asia Pacific countries including India are the main demand drivers during our forecast period.

Market overview

Imported thermal coal demand growth is driven by burgeoning power-sector demand in Asia with increasing power generation capacity and higher utilisation rates.

- Japan with 122Mt of imports remained the world's largest importer of thermal coal in 2007. This level of imports is forecast to continue but with little prospect of further growth.

- The major markets are Japan and Europe providing 50% of import demand in 2008; however these markets will represent only 32% of global trade in 2025. Demand in Japan and Europe is constrained by carbon emission limits and low population growth.

- The current financial crises, and falling oil and gas prices, are impacting thermal coal demand. We have not been able to fully incorporate the impact of these recent developments into our model, and while there is the potential for short-term downside to our demand forecasts, we consider that over the long-term our forecasts remain robust.

Supply capacity is expected to grow faster than demand growth over the next five years, with a progressive overturning of the current market supply deficit. Continued strong growth in supply from Indonesia, coupled with rail and port capacity additions in Australia, are forecast to lead to supply overcapacity developing rapidly during 2009 and 2010, with the capacity surplus peaking in 2012.

Demand for seaborne thermal coal

World seaborne traded thermal coal was 616Mt in 2007 and is expected to grow to 991Mtpa by 2025; a compound annual growth rate of 2.6%.

- Seaborne trade is either classified as the Pacific or Atlantic markets with Atlantic trade of 256Mt in 2008 and 381Mt for the Pacific. In 2025 the Atlantic trade is forecast to reach 286Mt whilst Pacific trade is expected to reach 704Mt.

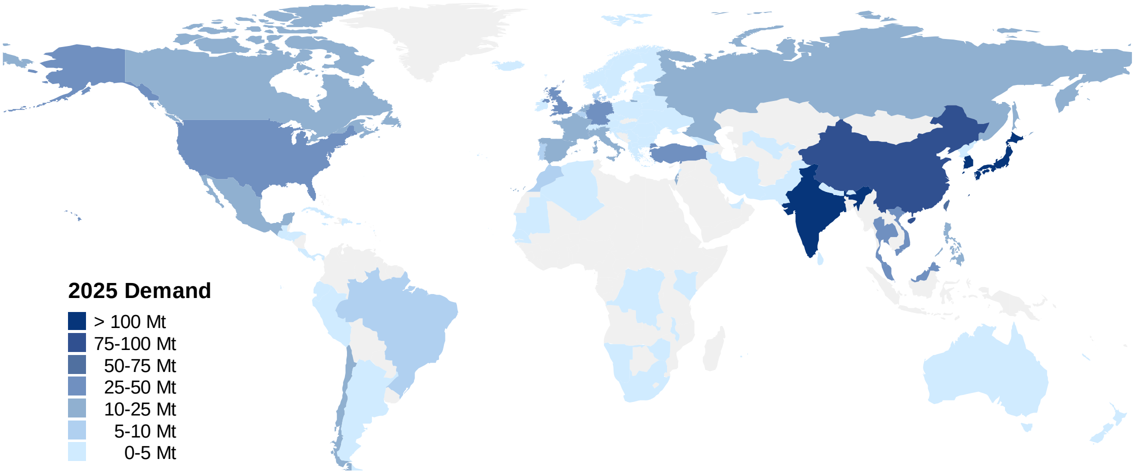
- Asia, excluding Japan, is forecast to grow imports by 339Mtpa from 2007 to 2025, with India accounting for 158Mtpa of this growth and Southeast Asia 117Mtpa.

- Europe seaborne imports of thermal coal are expected to fall slightly from 181Mt in 2007 to 174Mt in 2025, due to carbon emissions constraints, competition from oil and gas, low population growth rates and modest GDP growth. Japan's seaborne imports of thermal coal are expected to fall from 122Mt in 2007 to 120Mt in 2008, with the key drivers being the same as in Europe.

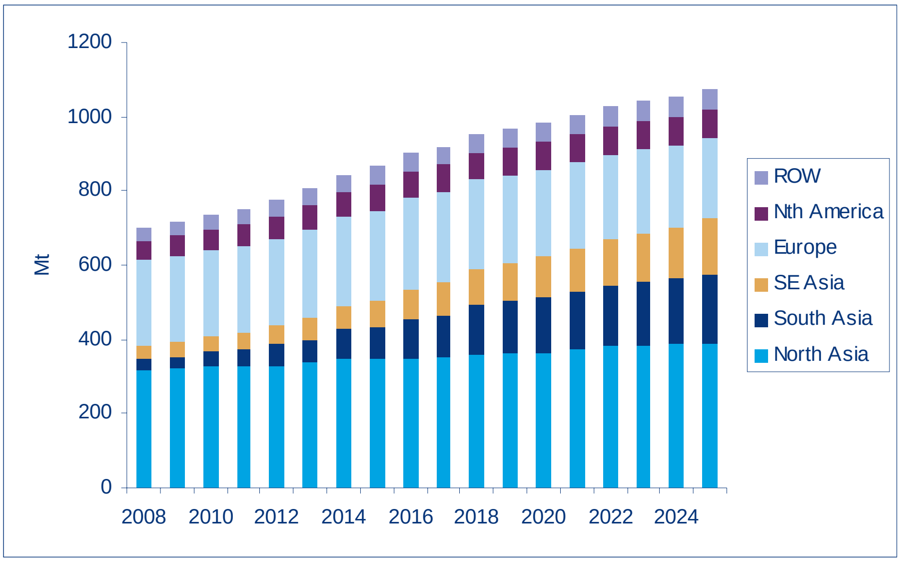
- Coal import demand in the Americas is dominated by the USA. The Americas seaborne demand is 56Mtpa in 2008 and is expected to increase to 92Mtpa by 2025. Strong growth in Chile and Mexico is forecast for power generation.

Growth in the sub-bituminous coal market is expected to continue as coal prices create a two tiered demand structure with lower rank imported coals increasingly used in the rapidly growing Asian markets, particularly in India and China.

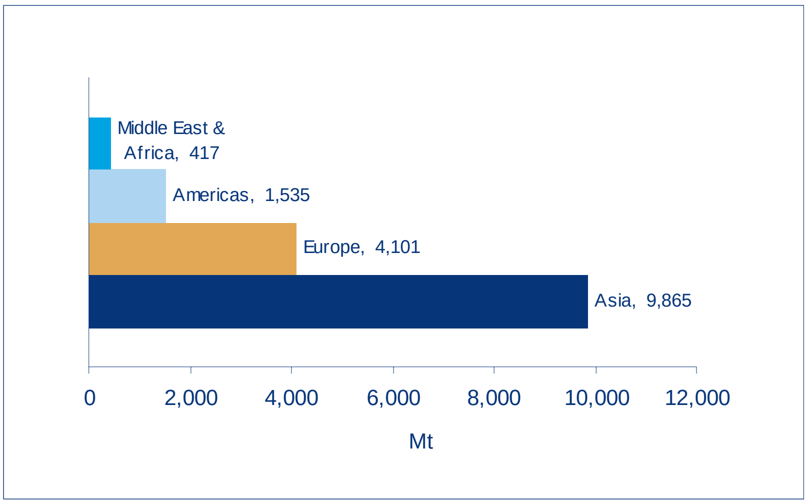
Distribution of thermal coal import demand in 2025



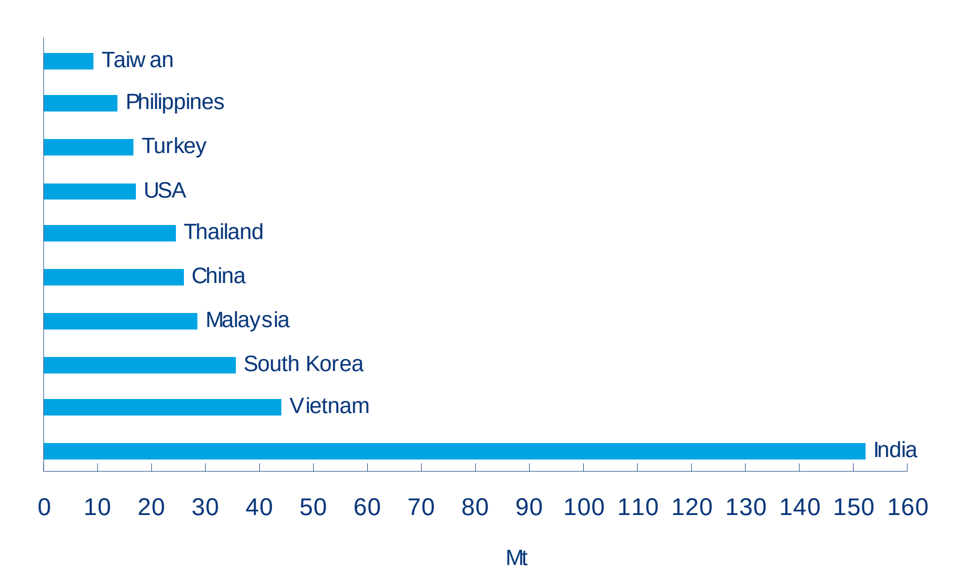
World thermal coal demand by region



Cumulative import demand by major region 2008-2025



Change in annual import coal demand between 2008-2025 – top 10 countries



Pacific market

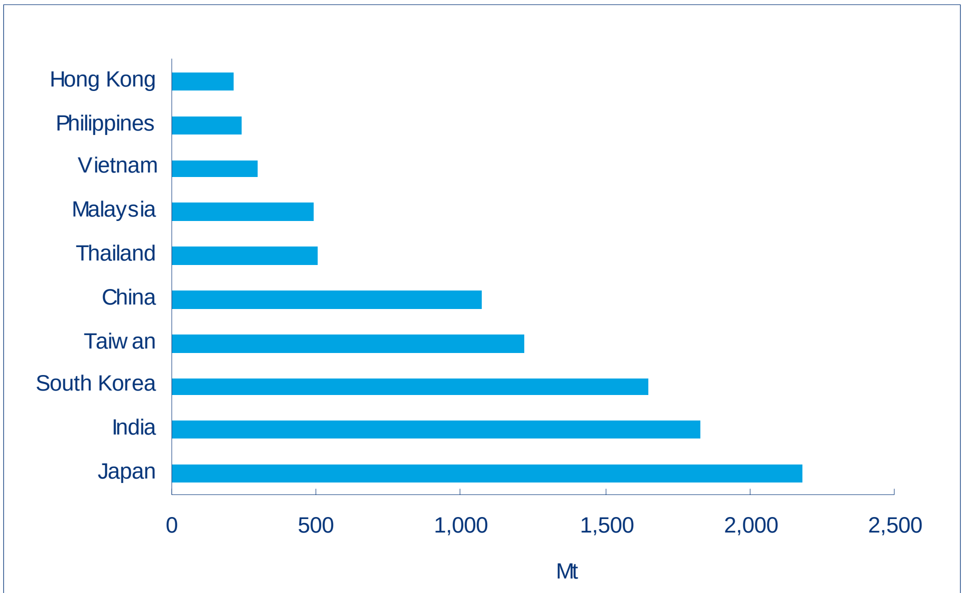
The two high volume regions are North Asia (311Mt in 2007) and South and South-East Asia (57Mt in 2007).

- Japan remains the single largest thermal coal importer at 122Mt in 2007 but has a generally flat growth profile. South Korean demand is expected to grow strongly to over 100Mt by 2025.

- The developing Asian countries, particularly India and the ASEAN countries, are expected to provide the greatest growth in demand to 2025. Indian import demand is expected to grow at a CAGR of 12%, which will see it overtake Japan around 2018 as the largest thermal coal importer.

- Imports into China tend to be independent of the wider thermal coal trade. In 2007 they were around 45Mt dominated by anthracite from Vietnam. The long term production forecasts for China indicate thermal coal demand will be able to be satisfied by domestic production and increasing imports from Mongolia, hence only moderate growth in seaborne imports mainly from Indonesia is expected.

Asia Pacific – aggregate thermal coal import demand 2008-2025 – top 10 countries

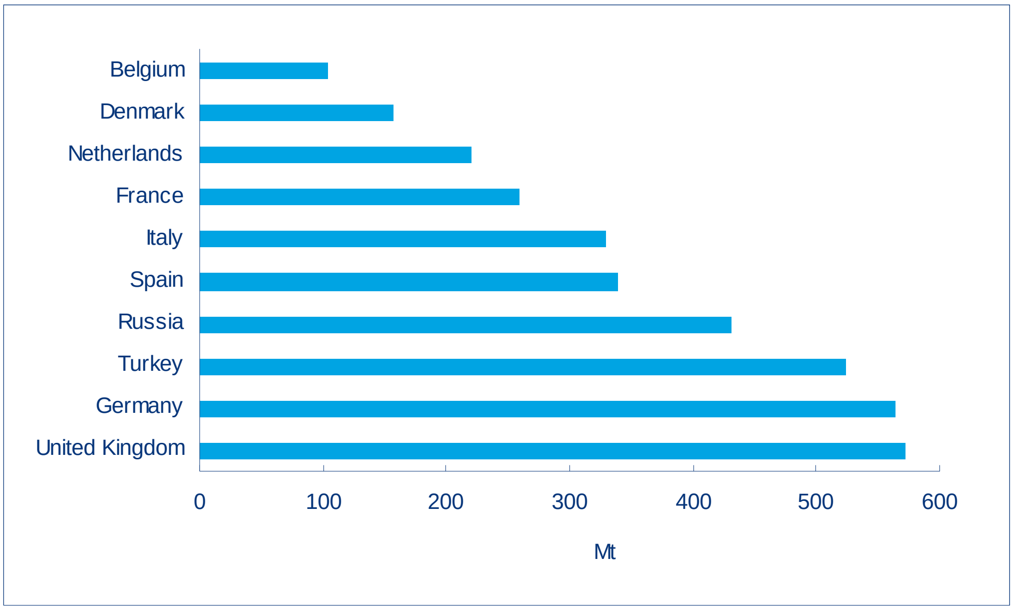


Atlantic market

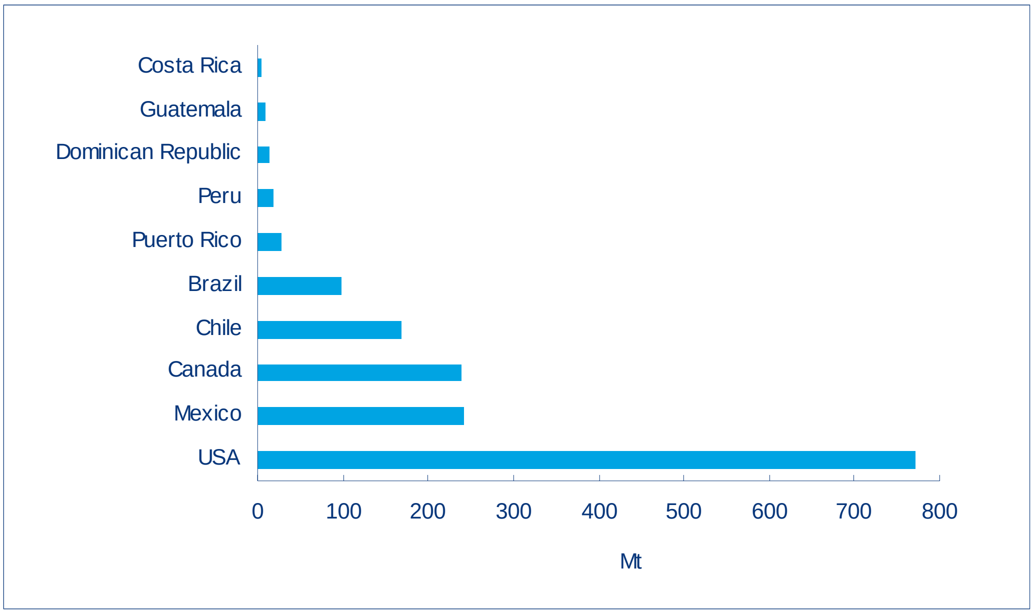
- Europe currently accounts for 34% of global import demand with volumes at 234Mt (2007), but market share is forecast to decline to 28% of world imports in 2015, then continue the decline to 20% by the end of the 2025 forecast period.

- The Americas import demand was 66Mt in 2007 and is expected to increase to 103Mtpa by 2025. Coal import demand in the Americas (North, South, Central and Caribbean) is dominated by the USA. USA imports have doubled since 2001 to around 31Mtpa in 2007 with strong growth forecast to 49Mtpa in 2025. Much of this coal comes from Colombia. Mexico and Chile are exhibiting strong growth in line with new-build coal-fired power capacity.

Europe - aggregate thermal coal import demand 2008-2025 – top 10 countries



Americas – aggregate thermal coal import demand 2008-2025 – top 10 countries



Key importing countries

Wood Mackenzie has reviewed the key import demand centres for the seaborne thermal market, and the key demand centres experiencing growth in the period from 2008 to 2025.

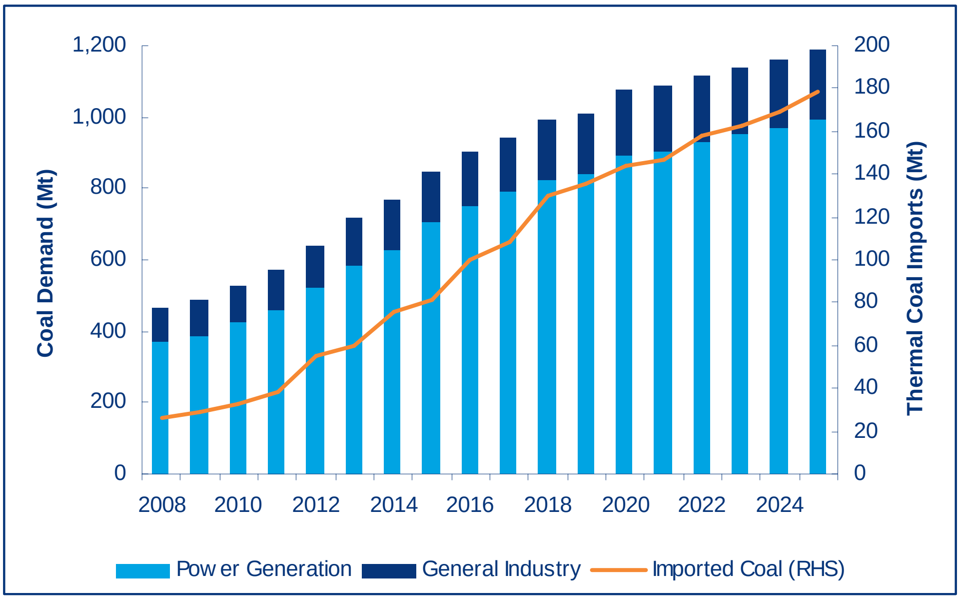
India

India's emergence as a major importer of thermal (and metallurgical) coal is expected to continue and accelerate over the period to 2025.

- Domestic production is forecast in increase substantially in future years, yet will still be unable to keep pace with coal demand leading to a domestic supply gap of 229Mt (average energy of 4100 kcal/kg gar) by 2025.
- India's demand for imported thermal coal (average energy of 5250 kcal/kg gar) is expected to grow from approximately 26Mt in 2008 to 178Mt in 2025.
- Import demand will be dominated by the power sector where imported coal is expected to grow from 15Mt in 2008 to 147Mt in 2025, representing over 82% of total forecast import demand.

Growth is projected to spike between 2012 and 2016 when a number of large generating units are expected to be commissioned. Although Government policies are conducive to growth of industry and investment, there exists a real possibility of extended delays to some projects due to financing difficulties which may result in lower than forecast coal demand.

India coal demand and coal import forecast

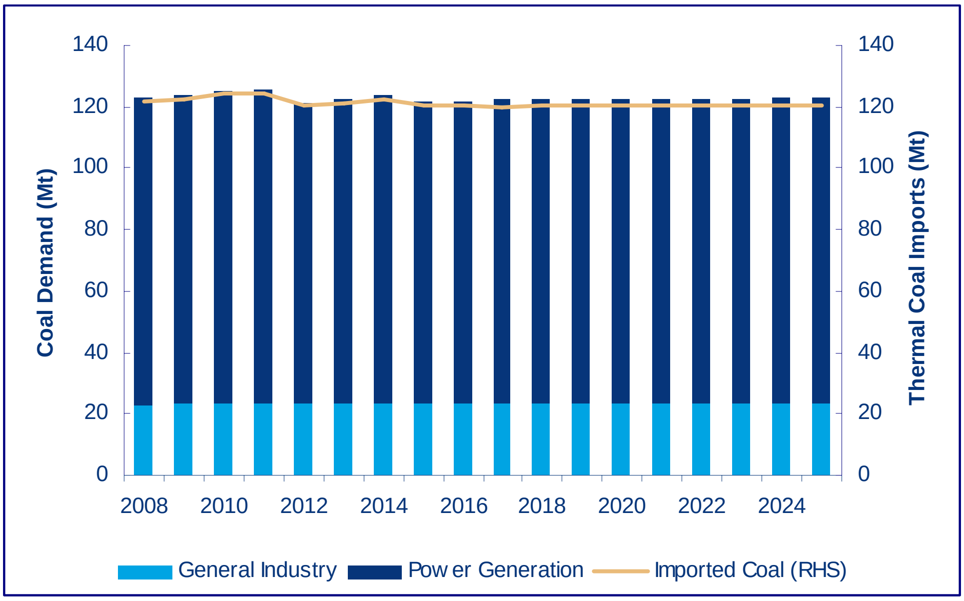


Japan

Japan remains the largest importer of thermal coal at around 120Mt, but with flat or declining imports forecast to 2025. The Japanese utilities are the thermal coal price setters, with JFY2008 prices settled at an historic high of around US$125/t for Australian sourced coal.

Currently coal accounts for around 28% of Japan's total electricity generation. This share would be expected to decrease marginally as the need for cheap electricity is reconciled with environmental commitments.

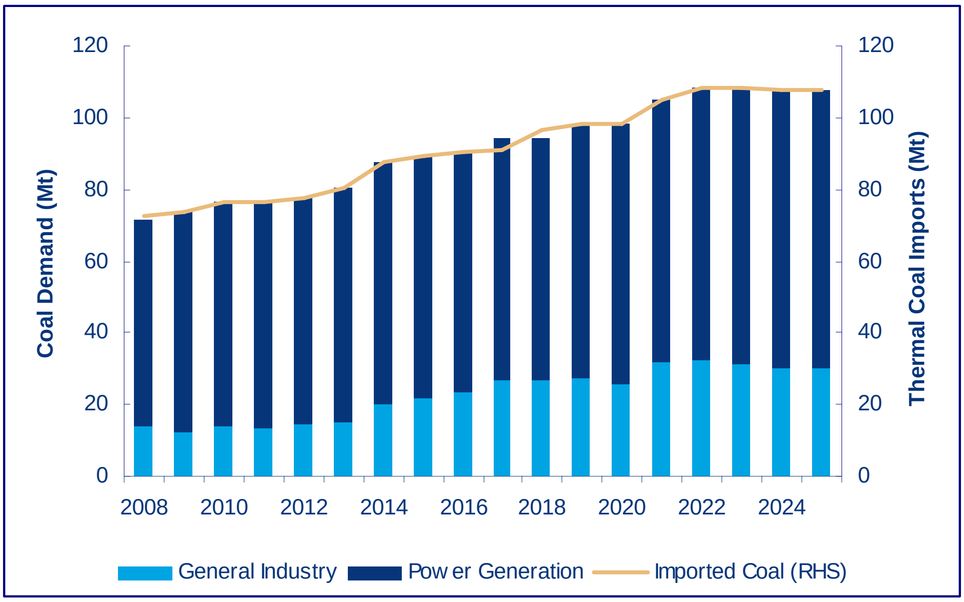
Japan coal demand and coal import forecast



South Korea

The power sector dominates coal demand in South Korea (78% of total coal demand in 2007, with industry at 20%.

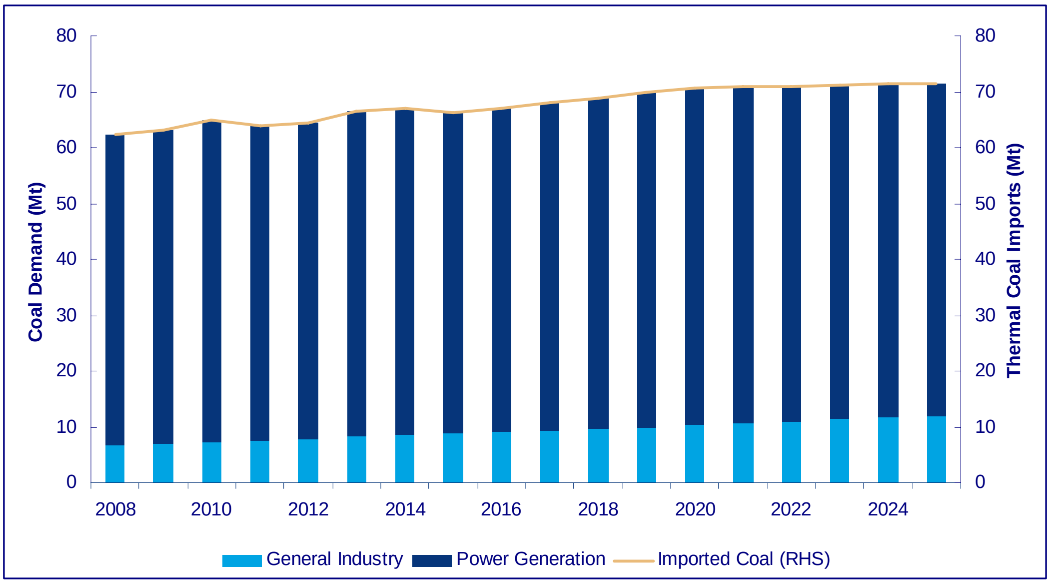
South Korea coal demand and coal import forecast



Taiwan

Taiwan is a significant importer of coal at around 62Mt or around 9% of globally traded coal in 2008. Coal imports are expected to increase to around 72Mt in 2025 with strong growth in industrial demand and continued support form the power sector. While growth in coal demand remains robust, growth in gas demand has moderated the forecast for coal demand to 2025. Further uncertainty over the expansion of nuclear generation capacity has also clouded the thermal coal demand forecast.

Taiwan coal demand and coal import forecast

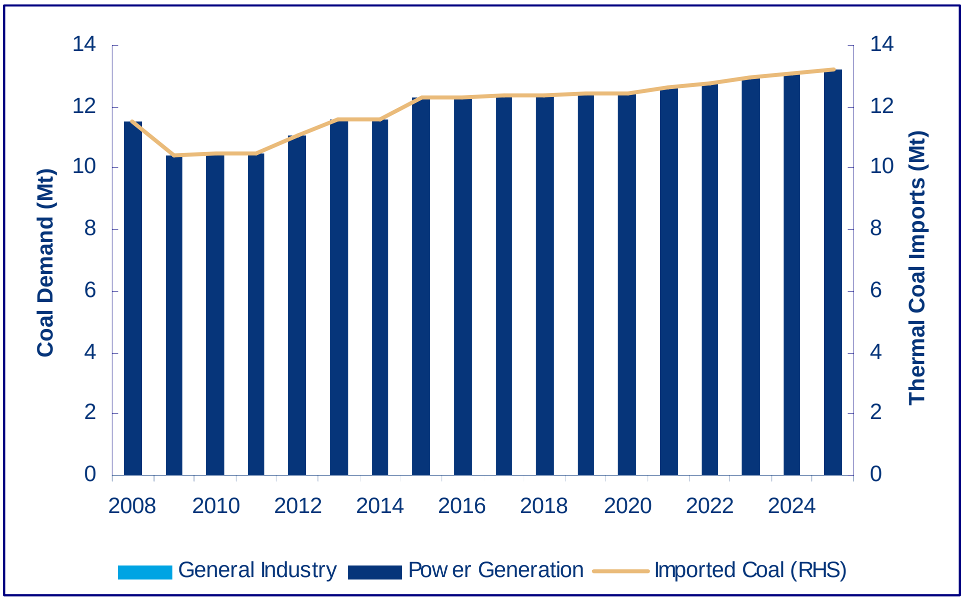


Hong Kong

Coal in Hong Kong is used only for electricity generation. All growth in coal demand will be dependent on the level of utilised capacity of the plants. Coal currently accounts for 55% of electricity production. Gas had made considerable inroads into coal usage over the last 10 years as at least 2 units of a multi-fuel fired coal plant switched to gas firing.

Coal demand by the power stations is forecast to increase from 11.5Mt in 2008 to 13.2Mt in 2025. Coal imports are dominated by lower ranked coals. Around 81% of imports in 2007 were sub-bituminous coals from Indonesia with additional bituminous coal tonnages from China, along with small amounts from the Philippines and Australia.

Hong Kong SAR coal demand and coal import forecast



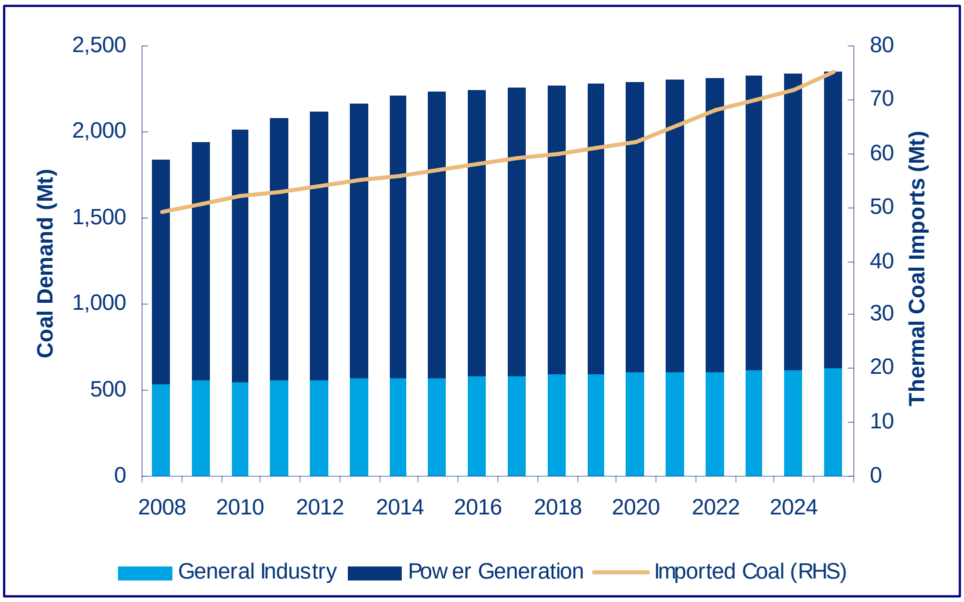
China

Coal has historically been China's most important fuel for power generation, and currently accounts for over 77% of electricity output. In 2006, China had an installed coal-fired power capacity of 472GW, with an output of 2,153TWh. The largest electricity producing areas are in the east and south east coastal provinces.

Imports have increased rapidly since 2001 to over 33Mt in 2006 and 45Mt in 2007:

- The majority of import coal is anthracite from Vietnam and North Korea has increased imports to around 4Mt each in 2007.
- Indonesian supply has surged further in 2007 to 13.6Mt.
- Mongolia entered the export market in 2005 and landborne volumes are expected to increase over the forecast period also.

China coal demand and coal import forecast

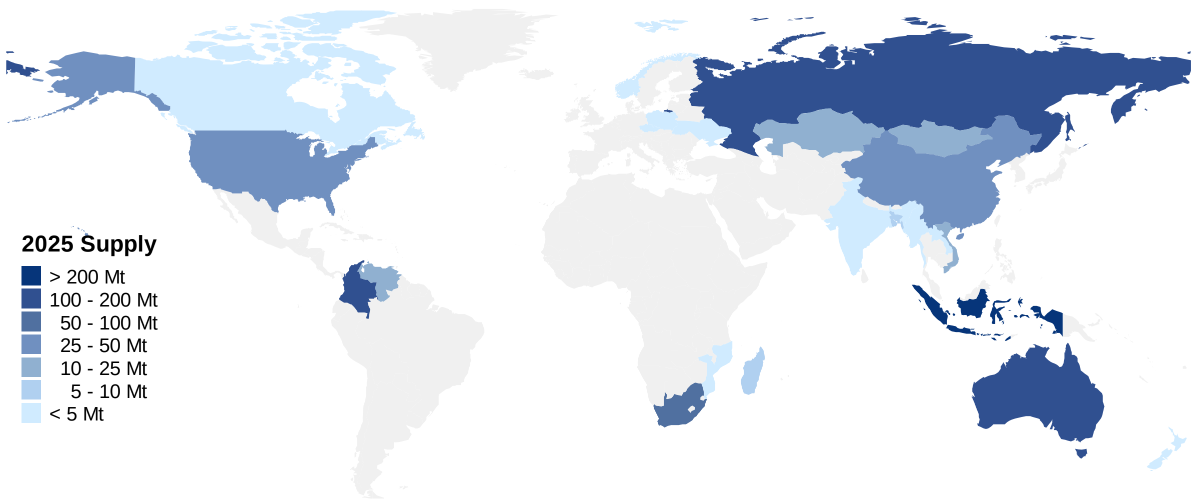


Emerging ASEAN demand

- Malaysia is rapidly expanding its coal imports to meet a significant expansion of power generation capacity. The level of imports is expected to treble to some 34Mt by 2020 and perhaps 40Mt by 2025. The construction program for new power stations is subject to delays.
- Thailand has increased demand for coal fired power generation and exhibits high industrial consumption of coal. The level of imports is expected to treble to some 39Mt by 2025. There is uncertainty as to the level of coal fired capacity pending on the split between coal and gas capacity for the proposed new build to 2020. The majority of new coal fired capacity will be fuelled by imported coal, as indigenous reserves will be unable to satisfy demand, as well as the emission problems associated with burning lignite.
- Vietnam, currently a net exporter of coal, is poised to become a significant coal importer in line with a large planned expansion of new coal-fired power capacity and expected large increases in demand by cement manufacturers. Imports will rise rapidly after 2010: thermal coal imports are expected to grow to 25 Mt out of a total thermal coal demand of 82Mt by 2020. Coal fired power in the south will use imported coal and the north will use predominately domestic coal supplemented by imports. Exports of coal, currently at around 25Mt, are expected to fall to around 2.4Mt by 2020 due to the effects of export taxes and increasing domestic demand.

Supply of seaborne thermal coal

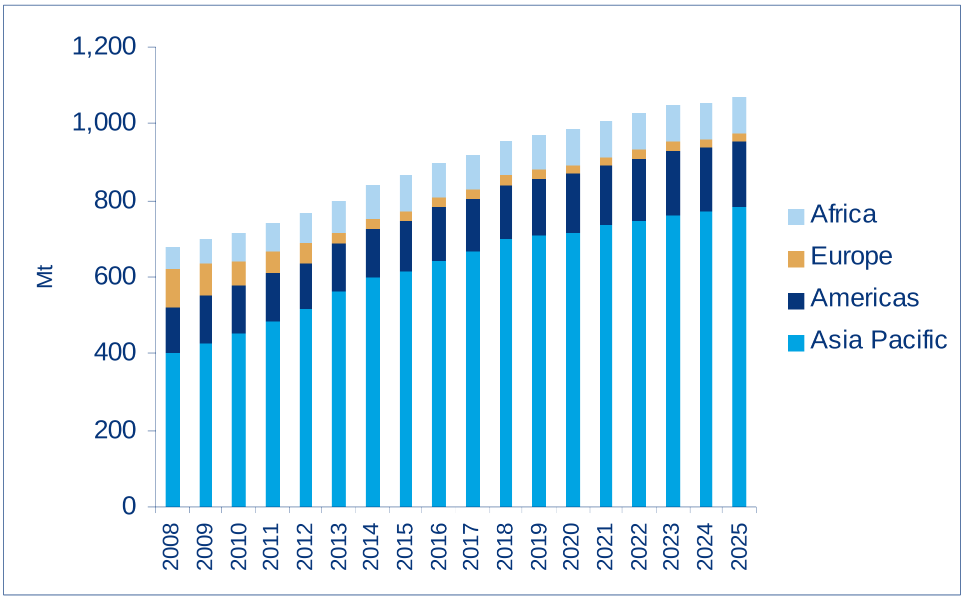
Distribution of thermal coal supply in 2025



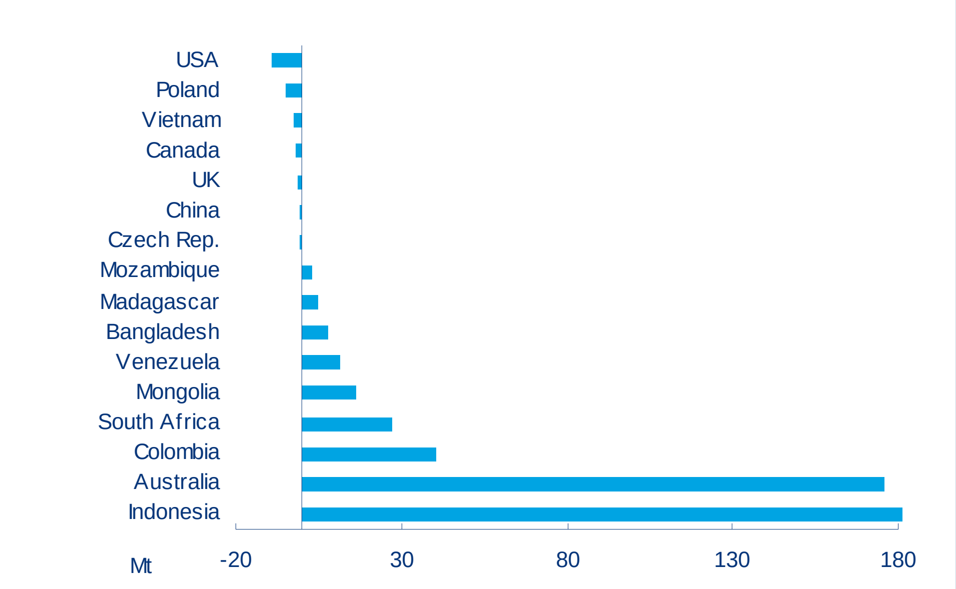
Global supply of traded thermal coal (seaborne and landborne) is expected to grow from around 690Mt in 2008 to 720Mt in 2010, to 973Mt in 2020 and to 1061Mt in 2025. The landborne component is small at around 59Mt in 2008 and increases to 71Mt by 2025. The Asia Pacific suppliers, primarily Indonesia and Australia, dominate global supply with 402Mt in 2008 rising to 716Mt in 2020 and 782Mt in 2025. This represents a 78% increase to 2020 and 95% increase to 2025. Colombia and the USA dominate supply from the Americas, with Colombia positioned to add an additional 40Mt to its supply by 2025.

NB The minor differences in demand and supply volumes relates to calibrations of the energy content of the various supply coals and assumptions for consumption within the model.

Projected seaborne supply by region to 2025



Global seaborne thermal coal supply growth 2008-2025



Key exporting countries

Indonesia

Detailed Indonesian coal supply analysis indicates that production growth will be sufficient to cater for increasing domestic demand growth as well as continued strong growth in exports particularly in sub-bituminous coals. This will further strengthen its position as the world's largest supplier of thermal coal over the next decade.

- Exports are projected to rise from 220Mt in 2008, 231Mt in 2010 and 403Mt in 2025. Indonesia has considerable potential additional capacity and is well placed to meet additional future demand from India in particular.

- Growth in the sub-bituminous coal market is set to continue as a large low-cost resource base allows the coal to be offered at a discount to bituminous coals.

- For the larger developing economies – i.e. India, and to a lesser extent China – with large new or planned power plant builds, it has become an imperative to secure long term supply and this is driving direct investment in mines and projects in Indonesia.

Australia

Australian thermal coal exports are forecast to increase from 120Mt in 2008 to 296Mt in 2025.

- The number of projects indicates that Australia also has considerable potential capacity headroom.

- Port and rail infrastructure problems in Australia are easing but still pose a significant risk to modelled volumes if there are delays or difficulties with financing the considerable capital investment required.

Colombia and Venezuela

Of the major Atlantic suppliers, Colombia is likely to increase exports significantly over the next 10 to 15 years with expansion of port and rail infrastructure capacity. Coal exports are forecast to rise from 71Mt in 2008 to 74Mt in 2010 and 112Mt in 2025. Most supply should be directed to the United States and Europe.

- Colombia has large, relatively low cost mines with the potential to greatly increase supply with adequate infrastructure. Delays in the timing of the development of port and rail infrastructure in Colombia would put the forecast at risk.

- Venezuela is expected to nearly triple its exports to 17Mt in 2025 on the basis of the planned infrastructure capacity improvements later in the forecast period, requires a political situation conducive to investment to be maintained.

South Africa

South Africa is currently the dominant supplier from Africa, mostly exporting coal into the Atlantic basin. Small improvements in its rail and port infrastructure will see exports increase from 57Mt in 2008 to 70Mt in 2010 and 85Mt by 2025.

- South African domestic power demand has outstripped supply putting pressure on coal suppliers to provide coal into the domestic market. South Africa's plan to lift Richards Bay Coal Terminal (RBCT) capacity to 90Mt provides significant upside if the rail system can be improved to match port capacity.

- The development of Botswana's coal resources and coal fired power capacity may, through exports, relieve some of the pressure on South African domestic coal and power supply and possibly allow an increase in coal supply into the Atlantic market.

Russia

Russia is the key supply country from Europe with exports into both the Atlantic and Pacific basins. Total exports are expected to decrease to 14Mt by 2020 and 13Mt by 2025.

- The growth in Russian domestic coal demand due to the expansion of coal fired electricity generation capacity is modelled to place pressure on exports. The planned replacement of gas with coal fired generation capacity is behind schedule with Russian utilities showing a preference for retaining significant gas fired capacity. This slowing of the increase in domestic coal demand may allow greater future export volumes than currently modelled.

Declining supply sources

- China will continue exporting coal to its more traditional buyers but at a slightly declining rate. In 2009 it is forecast to export 38.9Mt, (down from 40.7Mt in 2008) and further slow to 34.7Mt in 2010 and then recover slightly to 36.8Mt by 2020.

- Vietnam's export supply should wind down over time in line with Government policy to increase domestic consumption. Exports of coal, currently at around 25Mt of anthracite, are expected to fall to around 2.4Mt by 2020 due to the effects of export taxes and increasing domestic demand. We expect Vietnam to become a net importer of thermal coal by 2017, despite the significant planned increase in domestic coal production.

- USA thermal coal exports are modelled to fall in 2009 from the 28Mt in 2008 as high cost seaborne exports are not required to balance the market and the delivered cost advantage conferred by high freight rates disappears.

- Poland exported around 9.5Mt in 2008 with further reductions expected in the future as the industry retires old mines and undergoes continuing restructuring.

DBCT supply catchment review

- The supply catchment area of DBCT takes in significant reserves and resources of metallurgical coal. The production supply capacity with the supply catchment is likely to exceed current (post 7X expansion) terminal capacity by 2012. If demand meets this supply capacity then throughput limits will be reached.

- Rail infrastructure is undergoing upgrade to meet DBCT's post 7X terminal capacity, though additional rail capacity could be limited by external factors which could hamper further port expansion. QR Network are currently investigating further Goonyella coal chain expansion scenario's to provide combined Hay Point capacity above 129 Mtpa in response to requests from both Hay Point Services (HPS) and DBCT Management.

- Construction of the rail link from the Goonyella rail system to Abbot Point (GAP) could cause some 'catchment leakage' from DBCT although this risk is somewhat offset by the recently announce indefinite delay to the GAP project, which is still subject to commercial closure between the coal producers and QR Network.

- Most other coal terminal developments will be immaterial to DBCT due to different market segments for coal that is throughput. Only Abbot Point and Hay Point have the potential to cause a major impact to DBCT.

Supply availability and capacity

Dalrymple Bay Coal Terminal (DBCT) is one of two coal terminals at the Port of Hay Point. The two coal terminals are run under differing operational methodologies:

- DBCT operates as a common-user facility

- Hay Point Coal Terminal (HPCT) is owned by BHP Mitsubishi Alliance (BMA) and operated as an integrated part of their production process for the BMA-owned mines.

DBCT has experienced a significant growth in demand for throughput capacity, and expansion of the available capacity to meet this demand:

- Completion of phase 1 of the 7X expansion project in March 2008 increased terminal capacity to receive and ship 68 Mtpa of coal.

- Phase 2/3 of the 7X expansion project, to be complete in June 2009, will increase nominal capacity to 85Mtpa.

- In combination with a contemplated expansion of the adjoining HPCT from 44 to 55 Mtpa, the 'Port of Hay Point' nominal capacity will reach 140 Mtpa of coal from 2014 onwards

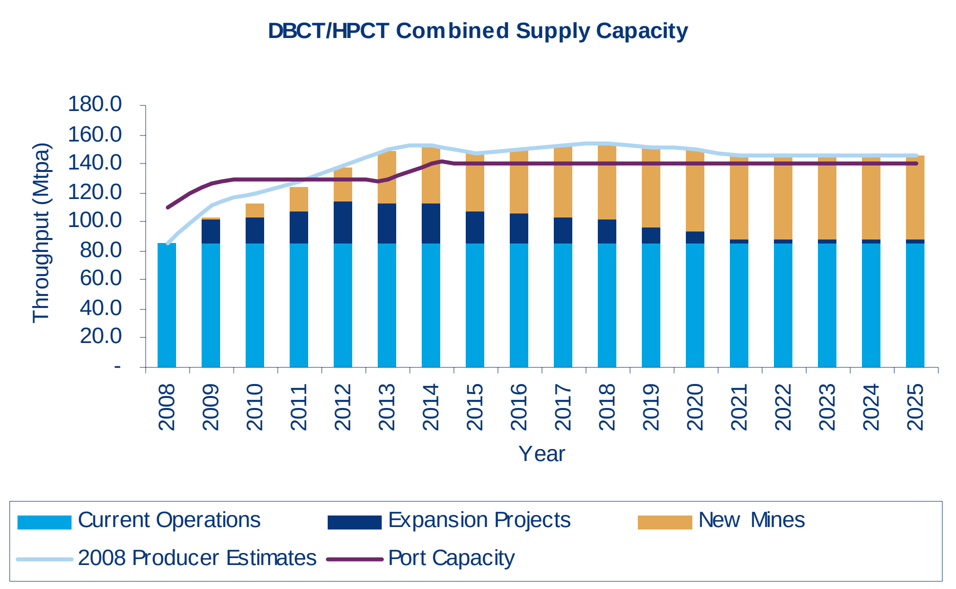
The changes in coal trade markets in Q1 2008 led to a number of mining companies accelerating expansion and new mine projects within their pipelines, or rapidly 'throw together' new ones to take advantage of the strong market conditions.

The reduction in coal price back to a level towards market fundamentals in Q4 2008 caused many companies to rethink their expansion plans. Most companies have reverted to their 2007 project timelines to reflect the current demand for both thermal and metallurgical coal, which together with commercial disagreement, has led to the delay of the GAP project.

Supply capacity

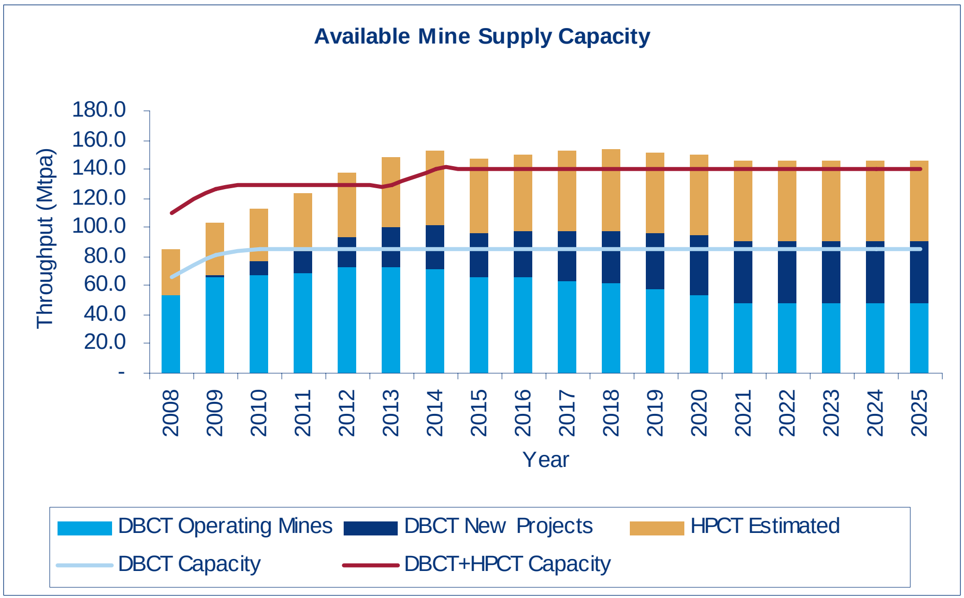
Looking at DBCT/HPCT as a combined entity, there is sufficient available supply capacity to meet the port capacity. This supply will be through the proposed expansion of current mines and new projects, with valid reserves. Whilst in the short term supply capacity will lag port capacity, this would be rectified around 2012. Post 2012 there will be excess supply in the catchment, which if met by sufficient seaborne market demand, could justify a further expansion to match an 'ultimate capacity' proposed for the Port of Hay Point according to the Access Applications.

Port of Hay Point DBCT/HPCT Combined Catchment Supply Capacity



Splitting the supply capacity by coal terminal it can be seen that most of the excess capacity is in 'non-BMA' mines which would utilise DBCT. It should be noted that BMA HPCT throughput has been assumed to be capped at 55 Mtpa inline with the currently proposed HPCT port capacity.

DBCT versus HPCT supply capacity compared to terminal nominal capacity



Supply availability

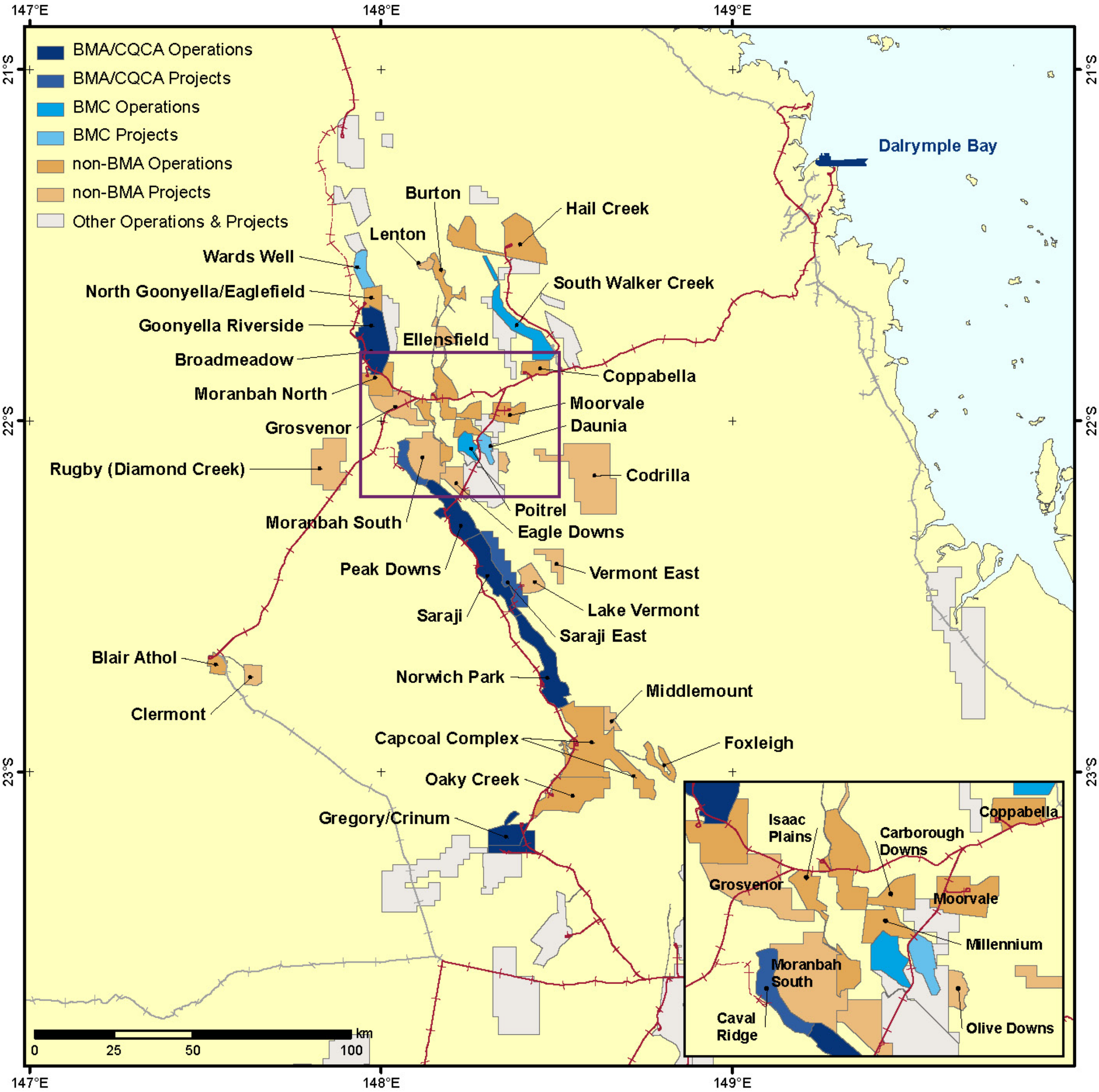
DBCT is operated by DBCT Management. Throughput of coal comes from a variety of mine owners/operators including Anglo Coal, BMA, Macarthur, Peabody, and Xstrata amongst others. HPCT, operated by BM Alliance Coal Operations Pty Ltd (BMA) (50% owned by BHP-Billiton, 50% owned by Mitsubishi Development), is dedicated to the throughput of coal from BMA owned and operated mines. Some coal from BMA-operated but not owned mines is exported from HPCT, however the ongoing strategy by BMA is for this coal to be distributed through DBCT. These BMA operated, but not owned mines, are owned by BHPB-Mitsui Coal (BMC) (80% BHP-Billiton, 20% Mitsui).

The Goonyella rail system covers a large portion of the central Bowen Basin. The northern extents of the system are North Goonyella, and the southern extent joins to the Blackwater Rail system at Oaky Creek. Some of the southern mines have the ability to rail on both the Goonyella and Blackwater systems, though due to rail capacity and operational limitations, this generally occurs on an opportunitistic basis and for a small proportion of total production. Current examples are Capcoal and Oaky Creek mines railing to Gladstone to blend coals with other mines at the port facilities there.

Operating mines utilising the Goonyella rail system

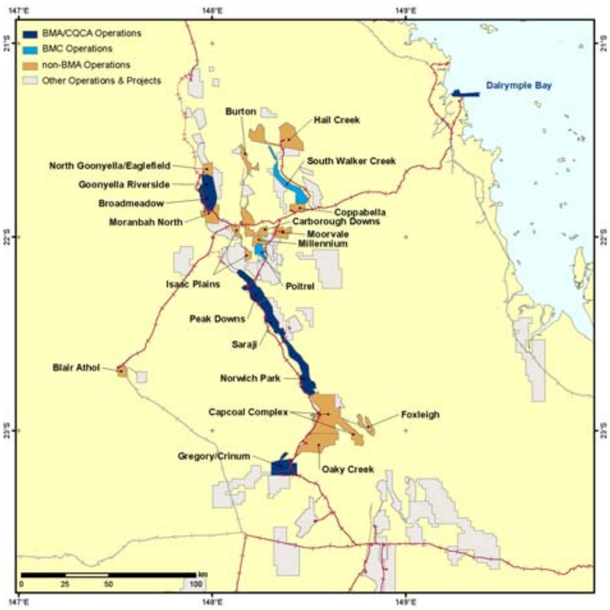
non-BMA Operated Mines		BMA Operated Mines: BMA/CQCA owned	BMA Operated Mines: BMC owned
Blair Athol	Isaac Plains	Broadmeadow	Poitrel
Broadlea	Middlemount	Goonyella Riverside	South Walker Creek
Burton	Millennium	Gregory / Crinum	
Capcoal Complex (GMK/LL)	Moorvale	Norwich Park	
Carborough Downs	Moranbah North	Peak Downs	
Coppabella	North Goonyella / Eaglefield	Saraji	
Foxleigh	Oaky Creek		
Hail Creek			

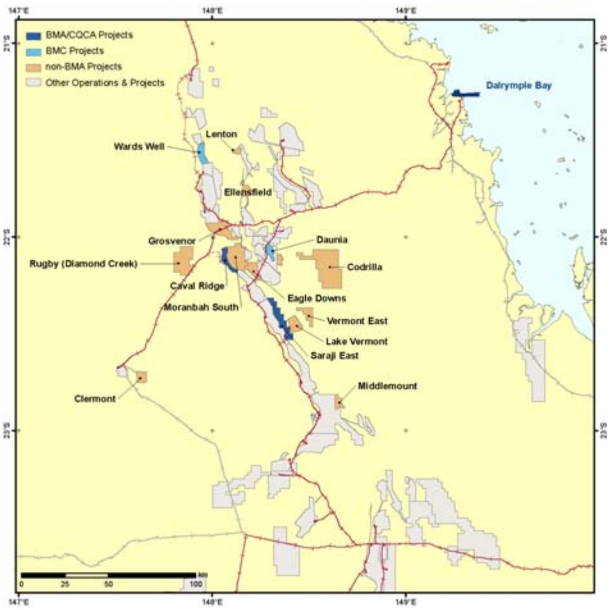
DBCT/HPCT supply catchment



Within the catchment area there are a number of projects which could be reasonably viewed as likely to progress to an operational mine in the next five years. This, coupled with relatively few of the currently operational mines reaching the end of their economic life in the next ten to fifteen years, indicates the level of expected (or possible) supply expansion from the central Bowen Basin.

Operations and Projects in the DBCT/HPCT supply catchment





Advanced projects within the Goonyella rail system area

non-BMA Projects		BMA Projects	
		BMA/CQCA owned	BMC owned
Clermont **	Lenton	Caval Ridge	Daunia
Codrilla	Middlemount **	Saraji East	Wards Well
Eagle Downs	Moranbah South		
Ellensfield	Olive Downs		
Grosvenor	Rugby (Diamond Creek)		
Lake Vermont **	Vermont East		

***Construction/development commenced*

Marketable Reserves DBCT/HPCT combined catchment

	Marketable Reserve			
	Non-BMA	BMC-owned	BMA-Owned	TOTAL
Surface - Operating	628.4	101.0	1,015.0	1,744.4
Underground - Operating	409.1	-	122.0	531.1
Surface - Project	306.1	45.0	176.0	527.1
Underground - Project	348.9	-	256.0	604.9
TOTAL	**1,692.5**	**146.0**	**1,569.0**	**3,407.5**

Looking beyond 2025, definition of additional marketable reserves in the future by coal producers would extend this reserve base and hence available supply.

Metallurgical coal availability

Metallurgical coal (coking and PCI) is the largest throughput component of DBCT, and makes up a sizeable proportion of declared marketable reserves and total resource base of current shippers.

Marketable reserve base

The DBCT catchment area is often quoted by producers to be the 'premier global coking coal basin', with historical demand and shipping for the most part confirming this claim. Current 'marketable reserves' for operating mines in this area are approximately 1,200 Mt, with projects adding another 400 Mt.

Provided demand for Bowen Basin coking coal remains strong, there are the reserves and ability from operators to produce and market this coal. Over the next 15 years to 2025, the supply capacity of metallurgical coal from the catchment area forecast to be at levels that will meet demand, in line with rail/port capacity. The past decade has seen a diversification of the metallurgical products from the DBCT/HPCT catchment area, and this is expected to continue.

Marketable metallurgical coal reserves in DBCT catchment

	Operating	Project	Total
Surface	645.4	109.9	755.3
Underground	409.1	314.4	723.5
Total	**1,054.5**	**424.3**	**1,478.8**

PCI coal, particularly from Rangals Measures mines, has become a more important part of the seaborne coal market with Korean and European steel makers adapting to differing steel making techniques.

Premium hard coking coals (HCC) from the catchment area have remained as the global benchmark for quality over a number of decades. These have been joined by lower quality coking coals as more mines have opened and some older mines have increased in depth and moved into areas with lower coke strength coals.

Thermal coal availability

Thermal coal currently contributes approximately 20% of DBCT's throughput. The proportion of new projects under development with a thermal coal focus will be higher than current levels, but not enough to change the predominance of metallurgical coal as the primary export commodity in the short to mid-term.

Marketable reserve base

The central Bowen Basin is primarily a source of Hard Coking Coal (HCC) and Pulverised Coal Injection (PCI) metallurgical coals and the current thermal supply from this area is limited. This is in contrast to other eastern Australian ports which have a high proportion and dependence on thermal coal.

- There is only one operating mine in the catchment that is solely dedicated to the production of thermal coal.
- Some mines produce a thermal 'secondary product' in tonnages well below their metallurgical coal outputs.

Within the DBCT catchment there are 'Marketable Reserves' for operating mines of 84 Mt and an additional 276 Mt from projects.

Marketable Thermal Coal Reserves in DBCT catchment

	Operating	Project	Total
Surface	84.0	241.2	325.2
Underground	-	34.5	34.5
Total	**84.0**	**275.7**	**359.7**

The primary source of thermal coal that is shipped via DBCT is from Blair Athol mine near Clermont. Blair Athol's coal reserves will be depleted over the short-term, and future thermal coal will be sourced from the Clermont mine which is currently under construction/development. Blair Athol has historically produced 8 to 10 Mtpa of product coal. The projected output of Clermont, based on currently planned mining fleet and infrastructure, will be 12 Mtpa.

A number of mines within the catchment area, while primarily operated as metallurgical coal mines; do produce a secondary thermal product. This is either as a 'secondary split' from coal washing, or as a 'high-ash' bypass product from ROM coal that has inferior coking properties. Due to the nature of this production, and sometimes limited volumes, this can often be sold on the spot market rather than contract sales. This does add an element of uncertainty to the thermal coal throughput as it often not consistent and is subject to competition in the market from other regional producers of thermal coal such as Indonesia and other eastern Australian areas.

There may be future scope for other large scale thermal coal operations in the DBCT catchment. However to date producers in the area have been focused on exploration and development of coking coal mines. Whilst the Surat and

Galilee Basins are touted as the locations for major thermal coal development, the regional geology of the DBCT/HPCT catchment area does show potential for operations in largely (to date) unexploited formations at relatively shallow depths, often within or adjoining current mining leases. However, an obstacle to development is the willingness of current operators to pursue thermal operations given the historical link to coking coal production and markets, and infrastructure to support such developments in parallel with existing operations.

Catchment resource base

The resource base of coal within the catchment area can be viewed in two distinctly varying ways. Firstly, it can be viewed on the basis of reported reserves and resources (JORC Code compliant); or secondly an optimistic view incorporating 'future exploration' and 'resource discovery'.

- Taking the first view there is a reasonably secure supply base beyond the '2025' horizon of this report.
- Taking the second view and looking beyond 'Measured' and 'Indicated' resources and adding in the less defined or in many cases un-reported categories of 'Indicated' or (non JORC Code compliant) 'estimated target' resources it is reasonable to speculated that in the future, addition reserves will be found beyond that 2025 horizon.

Measured and Indicated resources

Measured and Indicated resources for the combined DBCT-HPCT catchment total over 10.5 billion tonnes, inclusive of the Marketable reserve of 3.4 billion tonnes. These resources do not include the amount of 'Inferred' resource. Inferred resources are often not reported by the major mining companies. Inferred resources (and non-JORC Code estimates) are generally quoted by small-cap miners and explorers. Thus there is upside to the overall resource estimate.

Reserves v Resources in DBCT/ HPCT Combined Catchment

	Marketable Reserve			Resource (Measured & Indicated)			
	Metallurgical	Thermal	Total	Metallurgical	Thermal	Undefined	Total
Surface - Operating	1,658.4	86.0	1,744.4	2,839.0	186.0	882.0	3,907.0
Underground - Operating	531.1	-	531.1	2,450.0	-	320.0	2,770.0
Surface - Project	285.9	241.2	527.1	485.0	526.0	645.0	1,656.0
Underground - Project	570.4	34.5	604.9	1,290.0	-	-	1,290.0
Closed/Suspended	-	-	-	930.0	-	-	930.0
TOTAL	**3,045.8**	**361.7**	**3,407.5**	**7,994.0**	**712.0**	**1,847.0**	**10,553.0**

The resource base includes 930Mt from operations that have been closed or suspended (German Creek Central & Oaky Creek Alliance) and therefore unlikely to be mined in the medium term.

Measured and Indicated Resources by Operation Type and Owner

	Resource (Measured & Indicated)			
	Non-BMA	BMC-owned	BMA-Owned	TOTAL
Surface - Operating	1,541.0	129.0	2,237.0	3,907.0
Underground - Operating	774.0	-	1,996.0	2,770.0
Surface - Project	778.0	358.0	520.0	1,656.0
Underground - Project	1,290.0	-	-	1,290.0
Closed/Suspended	930.0	-	-	930.0
TOTAL	**5,313.0**	**487.0**	**4,753.0**	**10,553.0**

In the catchment area, metallurgical coal is the type of coal most represented among the resources, about one quarter is however reported as a tonnage only without a type nominated. On review of the mines/projects where type is not nominated these are all 'Rangals Measures' tenements, which would likely yield predominately PCI coals, plus high-ash thermal coal by-product.

Measured and Indicated Resource in nominal DBCT catchment by type

	non-BMA Resource (Measured & Indicated)			BMC Resource (Measured & Indicated)			
	Metallurgical	Thermal	Undefined	Metallurgical	Thermal	Undefined	TOTAL
Surface - Operating	593.0	186.0	762.0	9.0	-	120.0	1,670.0
Underground - Operating	774.0	-	-	-	-	-	774.0
Surface - Project	64.0	348.0	366.0	-	178.0	180.0	1,136.0
Underground - Project	1,290.0	-	-	-	-	-	1,290.0
Closed/Suspended	930.0	-	-	-	-	-	930.0
TOTAL	**3,651.0**	**534.0**	**1,128.0**	**9.0**	**178.0**	**300.0**	**5,800.0**

Metallurgical coal resources

The metallurgical coal Measured and Indicated resources in the catchment area greatly outweigh the thermal coals. Assuming that 60% of the 'undefined' coal would be metallurgical coal; a declared resource base of 4.7 Bt can be assumed. As already discussed, further exploration will result in definition of resources most likely to be of lower quality than the traditional high quality hard coking coals which have been exported through DBCT in the past.

Measure and Indicated Metallurgical Coal Resource in DBCT catchment

	Resource (Measured & Indicated)		
	Non-BMA	BMC-owned	TOTAL
Surface - Operating	1,126.4	93.0	1,219.4
Underground - Operating	774.0	-	774.0
Surface - Project	320.2	126.0	446.2
Underground - Project	1,290.0	-	1,290.0
Closed/Suspended	930.0	-	930.0
TOTAL	**4,440.6**	**219.0**	**4,659.6**

Thermal coal resources

The current measured and indicated resource base of the Bowen Basin has only a relatively small proportion of the tonnage declared as being thermal coal. This may suggest that a larger proportion of resources with quality undeclared may be thermal (or low quality metallurgical) coal. The Bowen Basin producers and explorers to some extent have been focussed on areas and seams known for being able to yield metallurgical products.

Measure and Indicated Thermal Coal Resource in DBCT catchment

	Resource (Measured & Indicated)		
	Non-BMA	BMC-owned	TOTAL
Surface - Operating	414.6	36.0	450.6
Underground - Operating	-	-	-
Surface - Project	457.8	232.0	689.8
Underground - Project	-	-	-
Closed/Suspended	-	-	-
TOTAL	**872.4**	**268.0**	**1,140.4**

There are prospective areas for large scale thermal resources within the catchment area, mainly associated with the Fort Cooper and Fairhill formations. These are sequences between the Moranbah / German Creek Measures and the Rangals Measures. As some of the current Moranbah / German Creek Measures mines increase in depth they may commence to intercept these as upper seams which could be removed as part of the mining operation as 'incremental coal'. No major Fort Cooper / Fair Hill mines have been proposed, or indeed these formations adequately evaluated. Whilst some companies do have 'inferred resources' for these coal seams within their tenements, others have excluded them from modelling either through lack of information or due to other exploration and resource modelling focuses. It would be expected that regional quality trends would dictate that thermal coals and inferior coking coals will make up a much larger proportion of future discoveries.

Rail infrastructure

The capacity of the Goonyella rail system has in recent years has been limited by a combination of availability of rolling stock, line constraints, and rolling industrial relations disputes between Queensland Rail (QR) and labour unions. For the most part these capacity restrictions are being addressed

Current rail capacity

Minor de-bottlenecking and upgrade works to the Goonyella rail system as part of the COALRAIL infrastructure program have delivered some improvements to train cycle time, and hence overall system capacity. These have been mainly around the upgrade of power feed to allow trains to run more closely spaced and upgrades to passing loops.

An upgrade to the Jilalan rail siding plus other track upgrades should de-bottleneck the lines allowing a theoretical capacity increase by 47Mtpa to 140Mtpa by early 2011. QR is bringing additional rolling stock onto the system, plus the entry of Pacific National into the Queensland coal haulage market, will improve rolling stock availability.

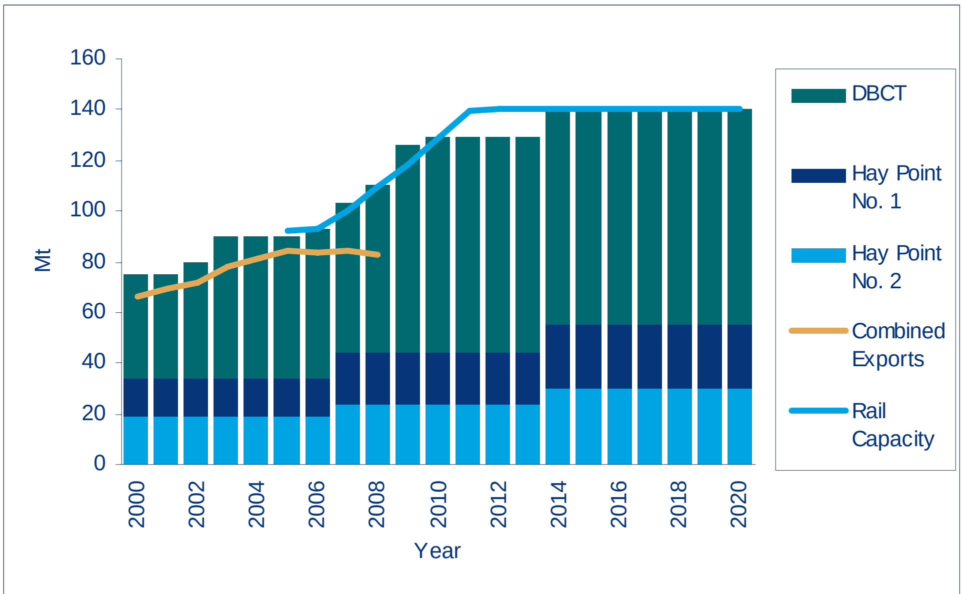
With the upgrades that have been completed the system capacity should theoretically be at 100Mt, an increase of 7Mt from the pre-upgrade condition. The completion of the Jilalan yard upgrade should provide another 29Mt to bring the system capacity to 129 Mtpa by the end of 2009. This capacity is inline with a combined DBCT-HPCT Q3/09 throughput capacity of 129Mt (85 Mtpa at DBCT and 44 Mtpa at HPCT).

COALRAIL Infrastructure Program – Goonyella System Projects

Project	Comment	Completed
DBCT 3rd Rail Loop	increase unloading capacity at DBCT	YES
Coppabella Yard Upgrade	improve	YES
Connors Range Signalling	improve sequencing through range	YES
Power Strengthening - Mindi Substation	allow tighter train spacing	YES
Power Strengthening - Bolingbroke Substation	allow tighter train spacing	YES
Broadlea-Mallawa-Wotonga Duplication	increase capacity around Moranbah	YES
Harrow Crossing Loop PeakDowns	increase capacity on sthn line	YES
Stephens Passing Loop Norwich Park	increase capacity on sthn line	YES
Jilalan Yard Upgrade	bypass track and	NO- Oct09
Rolling Stock	45 new 3800-class locomotives	NO- 20 delivered, rest by 2010
Rolling Stock	upgrade 63 locomotives	NO- 13 complete, rest by 2011
Rolling Stock	850 new wagons	NO- some delivered, complete Dec09

Source: QR Network CoalRail Progress Report 2007-2008

DBCT-HPCT Combined capacities



Forecast rail expansions

The capacity of the Goonyella rail system is currently targeted to provide a throughput of 140Mtpa, to match an assumption of DBCT having 85Mtpa of capacity and HPCT 55 Mtpa. Options have been identified to enable a further expansion to system capacity of 160 Mtpa although this may encounter significant obstacles. BMA have made a preliminary submission to the Queensland government to expand HPCT to 75Mtpa capacity, if this were to go ahead or DBCT were to expand instead then the rail expansion would be required to enable success. The expansion of DBCT would be an easier construction project, both onshore and offshore due to HPCT requiring land reclamation for further stockpile areas and significant dredging. Securing expanded rail capacity would be critical to both the market and commercial feasibility of any further port expansions.

Rail infrastructure is undergoing upgrade to meet DBCT’s post 7X terminal capacity, though additional rail capacity could be limited by external factors which could hamper further port expansion.

- QR Network are currently investigating further Goonyella coal chain expansion scenario's to provide combined Hay Point capacity above 129 Mtpa in response to requests from both Hay Point Services (HPS) and DBCT Management.

- Construction of the rail link from the Goonyella rail system to Abbot Point (GAP) could cause some 'catchment leakage' from DBCT although this risk is somewhat offset by the recently announce indefinite delay to the GAP project, which is still subject to commercial closure between the coal producers and QR Network.

Planned future expansions of rail system capacity in the central and northern Bowen Basin have been focussed on delivery of the 'Goonyella to Abbot Point' (GAP) Project, sometimes called the 'Northern Missing Link'.

- The GAP project will enable approximately 100 Mtpa of track capacity to Abbot Point, which is currently expanding to 25 Mtpa, with a plan to expand again to 50 Mtpa and then 100 Mtpa in 2014.
- From Moranbah the railing distance to either Abbot Point or DBCT would be equivalent, though indicative 'access charges' for freight carried on this rail line appear to be significantly higher than for the Goonyella system.

Other Coal Terminals

There are a number of port expansions or new ports proposed for the east coast of Australia. If all these were to proceed the total capacity would increase from 330 Mtpa in 2008 to over 830 Mtpa in 2020, in reality this is well in excess of demand and most of the proposals face barriers to successful completion.

Australian East Coast Coal Terminals – Operating & Proposed (North to South)

Name	Location	Status	Shippers	Main Cargos	Comments	DBCT Effect
Abbot Point	Bowen, QLD	Operating - Expanding	Common User	Thermal SCC	GAP rail would open access to Goonyella rail system	Major
Dudgeon Point	Hay Point, QLD	Proposed	TBA	Thermal	Proposed as facility for Galilee coal with new rail corridor. Currently a single proponent but looking for partners	Minor
Dalrymple Bay	Hay Point, QLD	Operating - Expanding	Common User	HCC		
Hay Point	Hay Point, QLD	Operating - Expanding	Single User BMA	HCC	BMA owned. Compete with DBCT for rail corridor capacity	Major
Port Clinton	Shoalwater, QLD	Federal Government Rejected	Single User Waratah	Thermal	Within Shoalwater bay military reserve. Federal Government has rejected	Nil
Fitzroy River	Rockhampton, QLD	Proposed	Unknown	Undeclared	Planned barging/transhipment operation. Early stages of feasibility/investigation	Nil
Port Alma	Gladstone, QLD	Proposed - Evaluating	Single User Xstrata	Thermal	currently evaluating for Surat projects	Nil
Wiggins Island	Gladstone, QLD	Site Pre-works	Common User	Thermal PCI / SCC / HCC	proponents include 16 companies	Minor
R.G. Tanna	Gladstone, QLD	Operating - At Capacity	Common User	Thermal PCI / SCC / HCC	At capacity, other than 'debottlenecking'	Minor
Barney Point	Gladstone, QLD	Operating - At Capacity	Common User	Thermal PCI / SCC / HCC	Original gladstone terminal, likely to be decommissioned if Wiggins Island is built	Nil
Fishermans Island	Brisbane, QLD	Operating	Common User	Thermal	Expansion opportunity limited by Brisbane urban rail network and multi-cargo facilities	Nil
NCIG	Newcastle, NSW	Under Construction	Producer Consortium	Thermal SSC	Construction commenced	Minor
Port Waratah	Newcastle, NSW	Proposed - Evaluating	Common User	Thermal SSC	Expansion underway	Minor
Port Kembla	Woolongong, NSW	Operating	Common User	SSC / HCC	Under utilised, economic reserves depleting	Nil

Ports highlighted in grey are new proposed facilities.

The ports that would reasonably compete against DBCT for capacity, both supply and demand, within Australia would be Abbot Point and Hay Point, though for different reasons:

- Abbot Point will compete as it will be a common-user facility with an overlapping catchment area hence will compete directly for share of the contracted throughput and the users will compete against each other in the market.

- Hay Point as a single-user facility will compete for capacity on potentially constrained enabling infrastructure (rail) for total throughput and the users will compete in the market, though the Hay Point user could use this factor to constrain their competitors output.

Whilst on first impressions the proposed coal terminal developments for the east coast do appear to be above demand, it is worth noting that there is only limited overlap with the coals produced in the central Bowen Basin. The real competition for DBCT will be in managing catchment and leakage from the nominal catchment area to other terminals.

Abbot Point

Abbot Point has the highest potential impact on DBCT due to the high of overlap in catchment post construction of the GAP rail line lining the Goonyella system to Abbot Point. Currently undergoing an expansion to 25 Mtpa capacity (the X25 project), and with plans to expand to 100 Mtpa in two further stages by 2014 this may have the potential to cause catchment leakage from DBCT, should the project proceed. The operations and projects that would be more easily able to change port would be those on the 'Goonyella North' line and 'Blair Athol' branch to the west of the Mallawa sidings. The Ports Corporation of Queensland stated in 2008 that they had sufficient demand to proceed, however the information supporting this has not been made public or if the same demand still exists.

During 2008 there was some catchment leakage from the Goonyella system to Abbot Point with trains travelling via the coastal railway due to congestion at DBCT, albeit in small quantities. The GAP project will enable a direct link. The construction of the GAP rail may have the effect of 'fast-tracking' development of project near or adjoining the rail line, in the short to mid-term this could have an oversupply effect and potentially displace or defer some expansion or current production from existing Goonyella system producers.

Dudgeon Point

The Ports Corporation of Queensland purchased parcels of land at Dudgeon Point, 2km north-west of DBCT and immediately north of Louisa Creek, to provide for potential expansion of the Port of Hay Point. A consortium holding significant areas of tenement in the Galilee basin is evaluating this as a location for developing a new port, part of which would include a new railway line. The other option they are evaluating is to utilise Abbot Point.

This would not have a likely impact on DBCT due to the fact that it would be a single-user facility for a new market entrant, with a different type of coal to that which is generally shipped via DBCT. This may however have some upside potential as it could offer an additional rail corridor.

Hay Point

HPCT has the potential to compete with DBCT for expansion opportunities due to rail infrastructure constraints. The current rail corridor to the Port of Hay Point is constrained to approximately 160Mtpa (20mtpa more than DBCT/HPCT 2014 capacity), an expansion beyond this would require significant rail upgrades beyond the currently planned works. If HPCT were to expand to 75Mtpa this would effectively block DBCT from expanding further with the likely result being a push of additional supply/demand from companies other than BMA via the GAP railway to Abbot Point.

Whilst HPCT is constrained in terms of available land area to expand beyond their proposed 55 Mtpa capacity, they have made a preliminary submission to the Queensland Government to expand the terminal to 75Mtpa involving land reclamation for stockpile area and dredging for an additional berth.

Gladstone Ports - Wiggins Island and Port Alma

There are two likely port proposals for the area around Gladstone; these will have minimal impact for DBCT. Both Wiggins Island and Port Alma are predicated on development of the northern Surat basin to meet an increasing demand for thermal coal and development of further mines in the Blackwater rail system.

- Wiggins Island is proposed by a consortium of 16 mining and exploration companies, these companies is either already shipping via R.G. Tanna and Barney Point Coal Terminals or are developing new projects. The new/expanded tonnes for the Wiggins Island development based on the proponents will be a combination of thermal and metallurgical coals.

- Port Alma has a single proponent in Xstrata. Port Alma would be linked to the development of the Wandoan project and would need the Surat rail link to proceed. The likely coal throughput would be almost entirely thermal coals.

Newcastle

Given the difference in predominant coal types there is little supply/demand overlap with DBCT hence would have a minor influence. Expansion of the Newcastle port has been a major political issue in NSW as producers sought to ship more coal than the facilities could handle in 2008. Work has commenced on a new terminal called NCIG and further expansion of Port Waratah has been proposed. The catchment area takes in areas that predominately produce thermal and semi-soft coking coals.

DBCT/HPCT Catchment – Reserve positions by mine

				Marketable Reserves		
Mine Name	**Status**	**Method**	**Port**	**Met**	**Therm**	**Total**
				Mt	Mt	Mt
Blair Athol	Operating	Surface	DBCT	-	35	35
Broadlea	Operating	Surface	DBCT	3	7	10
Burton	Operating	Surface	DBCT	32	4	36
Coppabella	Operating	Surface	DBCT	64	2	66
Eaglefield	Operating	Surface	DBCT	14	-	14
Foxleigh	Operating	Surface	DBCT	43	-	43
Hail Creek	Operating	Surface	DBCT	174	-	174
Isaac Plains	Operating	Surface	DBCT	23	13	36
Lake Lindsay	Operating	Surface	DBCT	76	-	76
Middlemount	Operating	Surface	DBCT	41	-	41
Millennium	Operating	Surface	DBCT	22	11	33
Moorvale	Operating	Surface	DBCT	30	8	38
Oak Park	Operating	Surface	DBCT	26	-	26
Poitrel	Operating	Surface	DBCT	50	-	50
South Walker Creek	Operating	Surface	DBCT	47	4	51
Carborough Downs	Operating	Underground	DBCT	39	-	39
German Creek Aquila	Operating	Underground	DBCT	10	-	10
German Creek Bundoora	Operating	Underground	DBCT	9	-	9
German Creek Grasstree	Operating	Underground	DBCT	39	-	39
Moranbah North	Operating	Underground	DBCT	143	-	143
North Goonyella	Operating	Underground	DBCT	50	-	50
Oaky No 1	Operating	Underground	DBCT	23	-	23
Oaky North	Operating	Underground	DBCT	96	-	96
Clermont	Project	Surface	DBCT	-	189	189
Codrilla	Project	Surface	DBCT	21	7	28
Daunia	Project	Surface	DBCT	36	9	45
Lake Vermont	Project	Surface	DBCT	29	20	49
Olive Downs	Project	Surface	DBCT	8	6	14
Vermont East	Project	Surface	DBCT	16	11	27
Eagle Downs	Project	Underground	DBCT	194	-	194
Ellensfield	Project	Underground	DBCT	64	35	99
Grosvenor	Project	Underground	DBCT	22	-	22
Moranbah South	Project	Underground	DBCT	34	-	34
Caval Ridge	Project	Surface	HPCT	176	-	176
Goonyella Riverside	Operating	Surface	HPCT	382	-	382
Norwich Park	Operating	Surface	HPCT	83	2	83
Peak Downs	Operating	Surface	HPCT	363	-	363
Saraji	Operating	Surface	HPCT	185	-	185
Broadmeadow	Operating	Underground	HPCT	122	-	122
Saraji East	Project	Underground	HPCT	256	-	256
Sub-Total - DBCT				1,479	360	1,838
Sub-Total - HPCT				1,567	2	1,567
Total				**3,045**	**361**	**3,405**

DBCT/HPCT catchment – Supply capacity forecast by mine

Mine Details Mine Name	Status	Method	Port	Supply capacity forecast 2008	2010	2015	2020	2025
				Mt	Mt	Mt	Mt	Mt
Blair Athol	Operating	Surface	DBCT	9.9	5.0	0.3	-	-
Broadlea	Operating	Surface	DBCT	0.4	1.0	1.0	-	-
Burton	Operating	Surface	DBCT	2.6	4.1	4.1	-	-
Coppabella	Operating	Surface	DBCT	3.3	3.3	5.2	5.2	*5.2*
Eaglefield	Operating	Surface	DBCT	1.3	1.0	1.0	1.0	*1.0*
Foxleigh	Operating	Surface	DBCT	2.4	3.4	3.4	3.4	*3.4*
Hail Creek	Operating	Surface	DBCT	4.7	6.0	8.0	8.0	8.0
Isaac Plains	Operating	Surface	DBCT	1.2	3.0	3.0	1.5	-
Lake Lindsay	Operating	Surface	DBCT	1.6	3.8	3.8	3.8	3.8
Middlemount	Operating	Surface	DBCT	-	1.5	3.0	3.0	*3.0*
Millennium	Operating	Surface	DBCT	1.0	1.5	3.0	3.0	*3.0*
Moorvale	Operating	Surface	DBCT	1.5	3.2	3.2	3.2	*3.2*
Oak Park	Operating	Surface	DBCT	2.1	2.1	2.1	0.8	-
Poitrel	Operating	Surface	DBCT	2.2	3.0	3.0	3.0	*3.0*
South Walker Creek	Operating	Surface	DBCT	3.0	4.0	4.0	4.0	*4.0*
Carborough Downs	Operating	Underground	DBCT	1.0	2.1	3.6	2.7	-
German Creek Aquila	Operating	Underground	DBCT	0.3	-	0.8	0.8	*0.8*
German Creek Bundoora	Operating	Underground	DBCT	0.0	1.5	-	-	-
German Creek Grasstree	Operating	Underground	DBCT	3.5	3.5	3.5	-	-
Moranbah North	Operating	Underground	DBCT	3.0	4.2	4.2	4.2	4.2
North Goonyella	Operating	Underground	DBCT	1.6	2.3	2.3	2.3	2.3
Oaky No 1	Operating	Underground	DBCT	3.5	3.5	-	-	-
Oaky North	Operating	Underground	DBCT	3.6	3.6	3.7	3.6	3.6
Clermont	Project	Surface	DBCT	-	4.5	11.7	11.7	11.7
Codrilla	Project	Surface	DBCT	-	-	2.0	2.0	2.0
Daunia	Project	Surface	DBCT	-	-	-	5.8	5.8
Lake Vermont	Project	Surface	DBCT	-	4.0	4.0	4.0	*4.0*
Olive Downs	Project	Surface	DBCT	-	1.2	1.2	0.6	-
Vermont East	Project	Surface	DBCT	-	-	2.2	2.2	2.2
Eagle Downs	Project	Underground	DBCT	-	-	4.0	3.9	3.9
Ellensfield	Project	Underground	DBCT	-	0.5	4.7	4.7	4.7
Grosvenor	Project	Underground	DBCT	-	-	-	2.3	*4.0*
Moranbah South	Project	Underground	DBCT	-	-	-	4.0	4.0
Caval Ridge	Project	Surface	HPCT	-	-	5.50	5.50	5.50
Goonyella Riverside	Operating	Surface	HPCT	10.30	10.30	12.50	12.50	12.50
Norwich Park	Operating	Surface	HPCT	4.72	5.63	5.71	4.21	4.21
Peak Downs	Operating	Surface	HPCT	8.20	9.00	11.50	11.50	11.50
Saraji	Operating	Surface	HPCT	6.04	8.00	8.00	8.00	8.00
Saraji East	Project	Underground	HPCT	-	-	5.00	10.00	10.00
Sub-Total - DBCT				**53.9**	**77.0**	**96.0**	**94.8**	**90.9**
Sub-Total - HPCT				**29.26**	**32.93**	**48.21**	**51.71**	**51.71**
Total				**83.1**	**109.9**	**144.3**	**146.5**	**142.6**

Full year-by-year data included within appendices

Comparative Cost Positioning

- Across both thermal and metallurgical seaborne markets Australian supplied coal generally sits comfortably at the lower end of the cost curves.
- As markets grow it will be unlikely that Australia, and in particular DBCT mines, will cede their competitive position to other producers.

Metallurgical Coals

Australian production dominates the cost curves, upwards of 70% of global metallurgical seaborne traded coal production is Australian sourced. This Australian production is predominately concentrated in the lower three quartiles, competing producers have minor interspersion with the Australian production but are generally concentrated in the upper quartile. DBCT coal is distributed across the entire cost spectrum of Australian metallurgical coals, however does mainly represent the higher value coals.

- In the Pacific market (CIF basis) Australian metallurgical coal has a high level of penetration in the North Asian markets and is seeing growth into the Indian sub-continent. Toward 2020 we are likely to see some southern African coal being highly competitive into India; however volumes of this low-cost coal will be constrained. Overall there is little difference between relative placing on the cost curves between 2010 and 2020, overall tonnage will increase but the relative proportions and positions of Australian and DBCT coals will remain strong.
- In the Atlantic market (CIF basis) Australian metallurgical coals hold a similar position to the Pacific market. From 2010 to 2020 the Australian, and hence DBCT, coals are concentrated at the lower end of the curve, with other producers at the high end. DBCT coal representing a proportion of the higher value coking coals will remain competitive into the Atlantic Market.

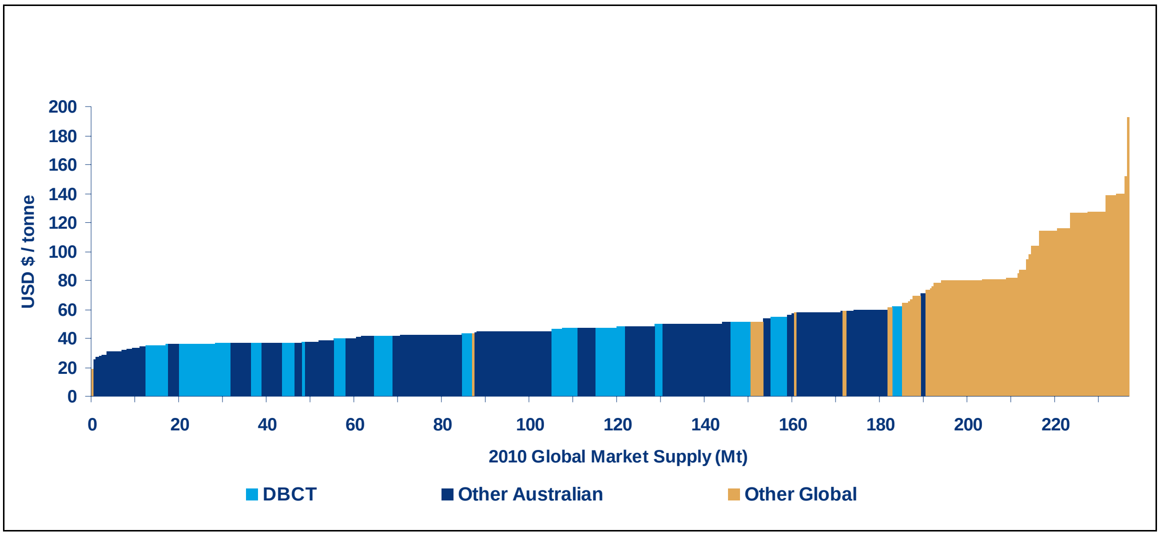
In general given the higher value achieved for central Bowen Basin coals in the market, coupled with relatively low cost, means that they will be more resilient to price squeeze than other producers. As outlined in the catchment section of this report the main competition for DBCT shippers, won't be from other global production areas but from producers in the same region/catchment. Hay Point and Abbot Point shippers will be the biggest competition for Dalrymple Bay shippers.

Thermal Coals

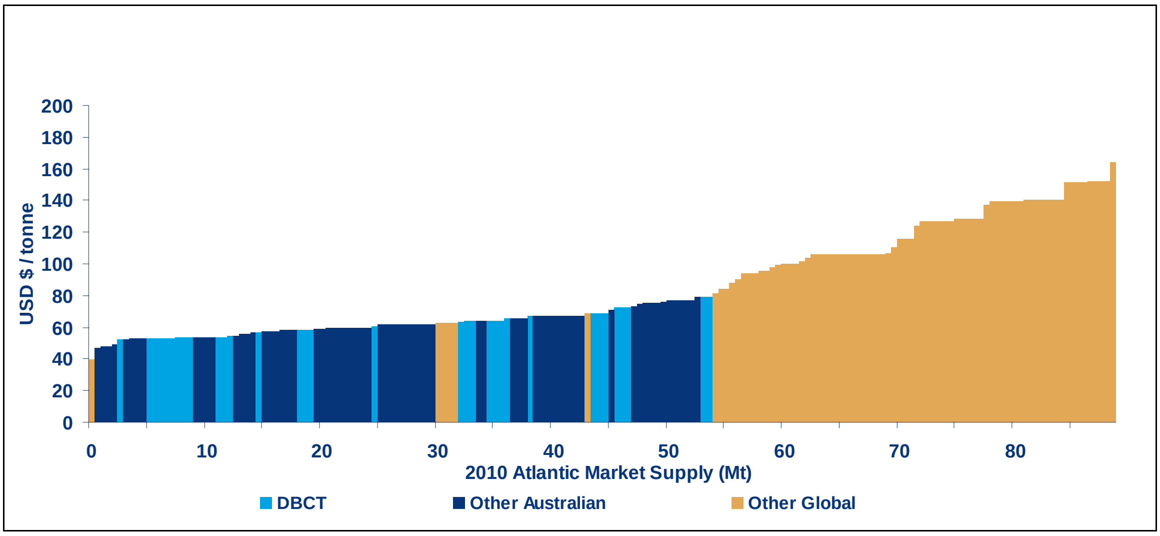
As discussed in the catchment review section of the report there is only one mine in the catchment that produces only a thermal product. This mine and its impending replacement sit in the lower quartile of global production on an FOB basis, both for 2010 and 2020, on an energy-adjusted basis. Minor amount of 'by-product' thermal coal shipped via DBCT sit toward the lower end of the second quartile.

- In the Pacific market (CIF energy adjusted basis) this mine is the lowest cost producer into the market in 2010, however as other producers enter the market it is displaced up the curve by other Australian mines and growth in Indonesia. The cost does still however remain firmly in the lowest quartile.
- In the Atlantic market (CIF energy adjusted basis) this coal is not as competitive as South American coals, though still the most competitive Australian coal, in 2010. Moving to 2020 this will slide lower on the curve as total volume increases and some South American supply becomes less competitive. Some Australian coal will be more competitive into the Atlantic market, albeit only a small proportion.

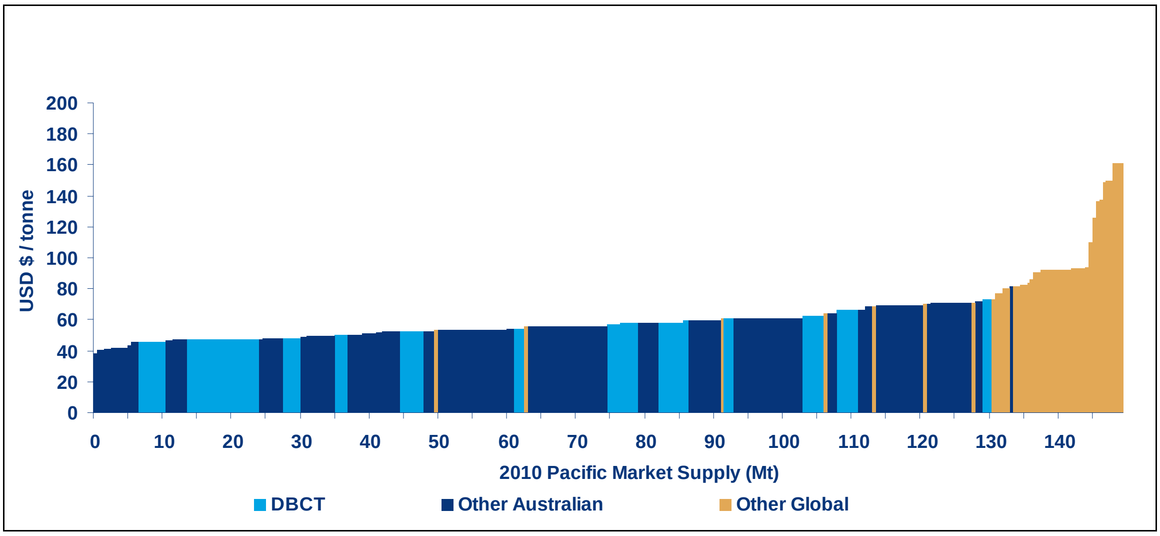
2010 Global seaborne metallurgical cost curve (FOB basis)



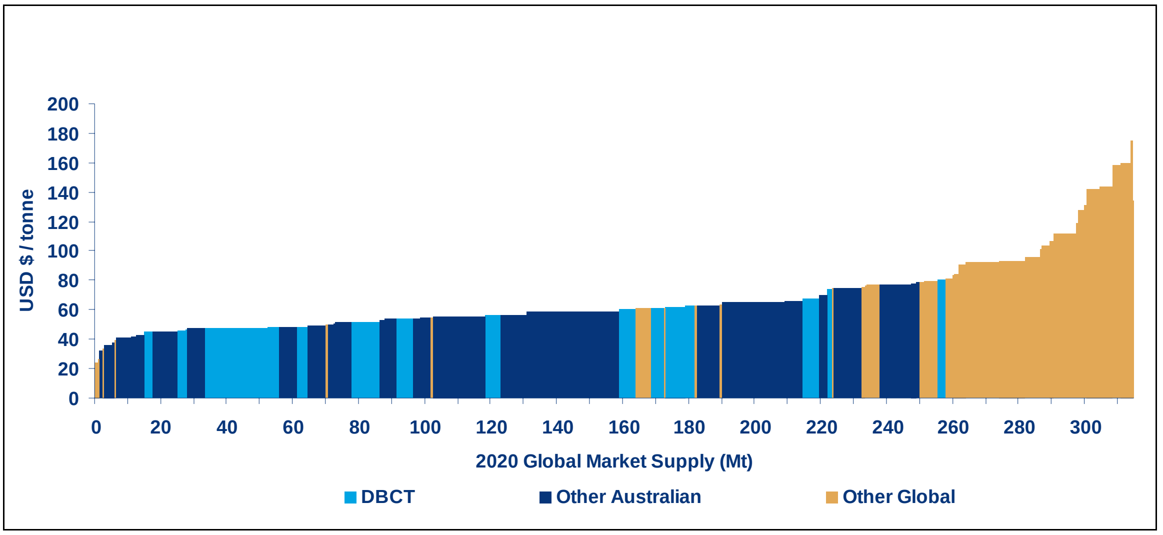
2010 Atlantic Market seaborne metallurgical cost curve (CIF basis)



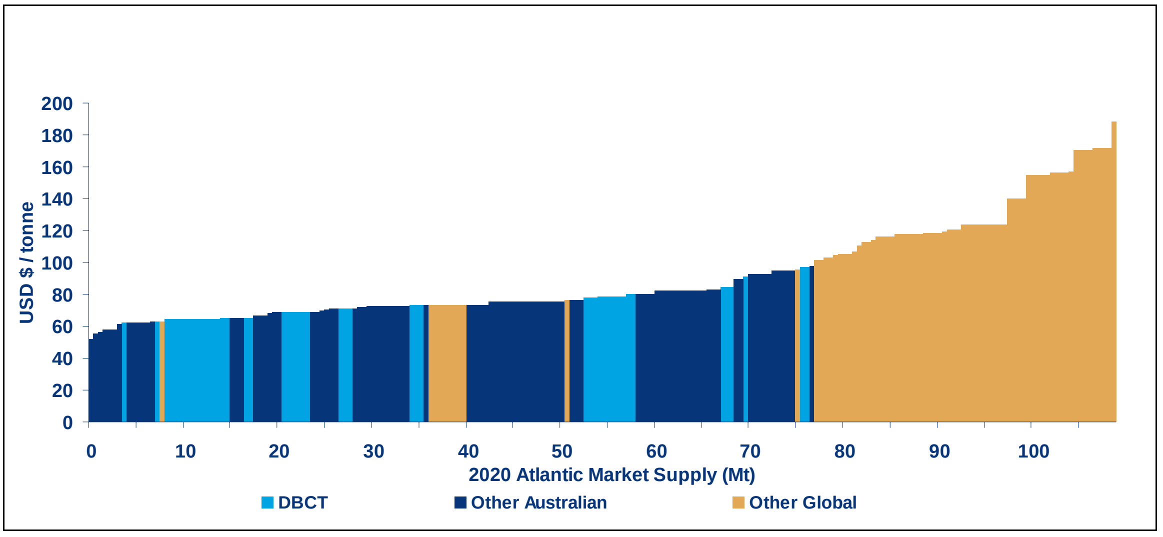
2010 Pacific Market seaborne metallurgical cost curve (CIF basis)



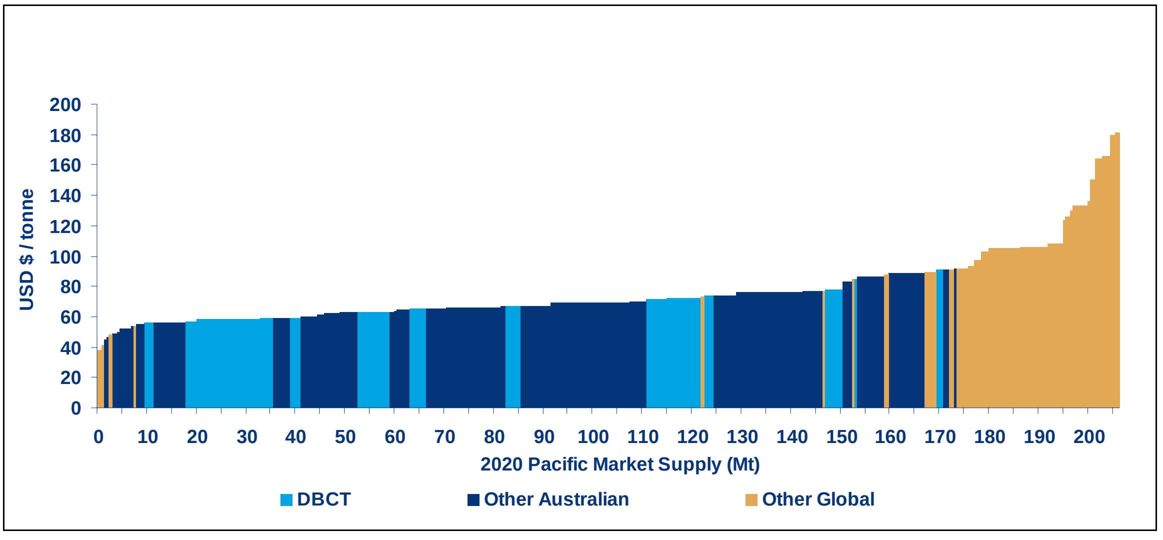
2020 Global Seaborne Metallurgical Cost Curve FOB Basis



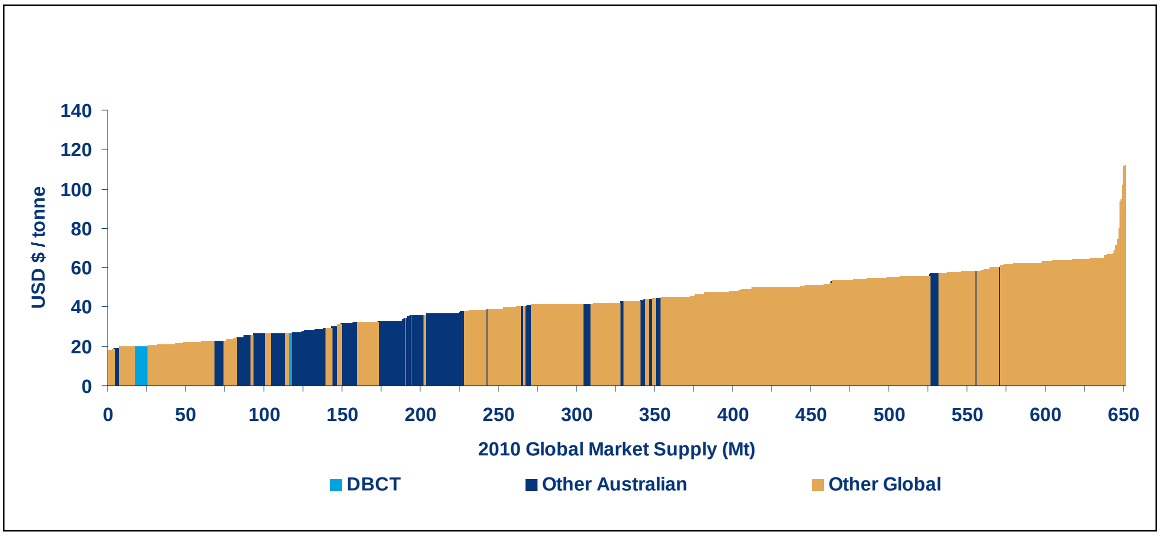
2020 Atlantic Market Seaborne Metallurgical Cost Curve CIF Basis



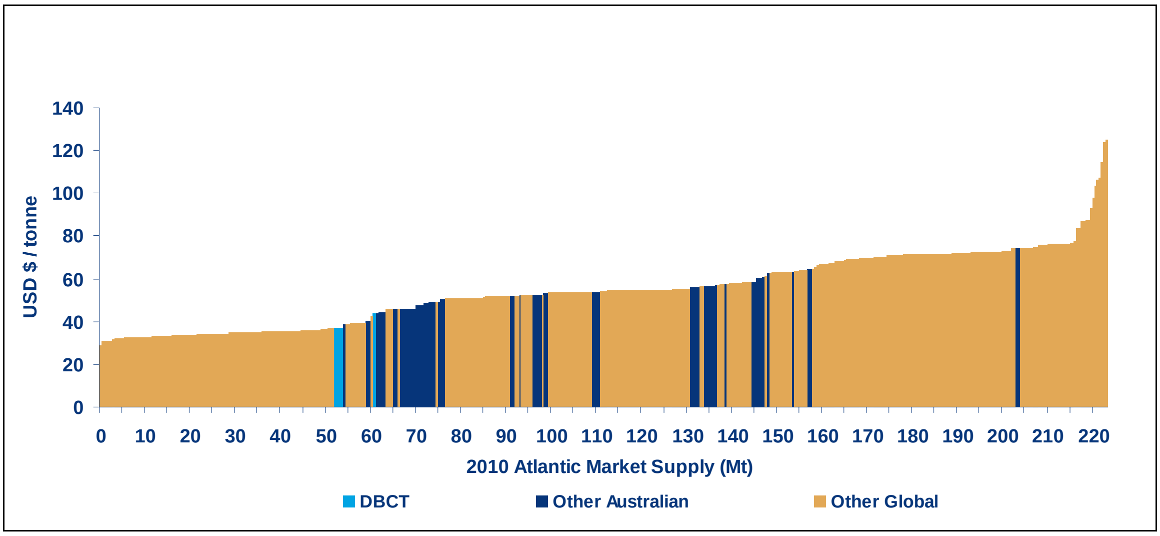
2020 Pacific Market Seaborne Metallurgical Cost Curve CIF Basis



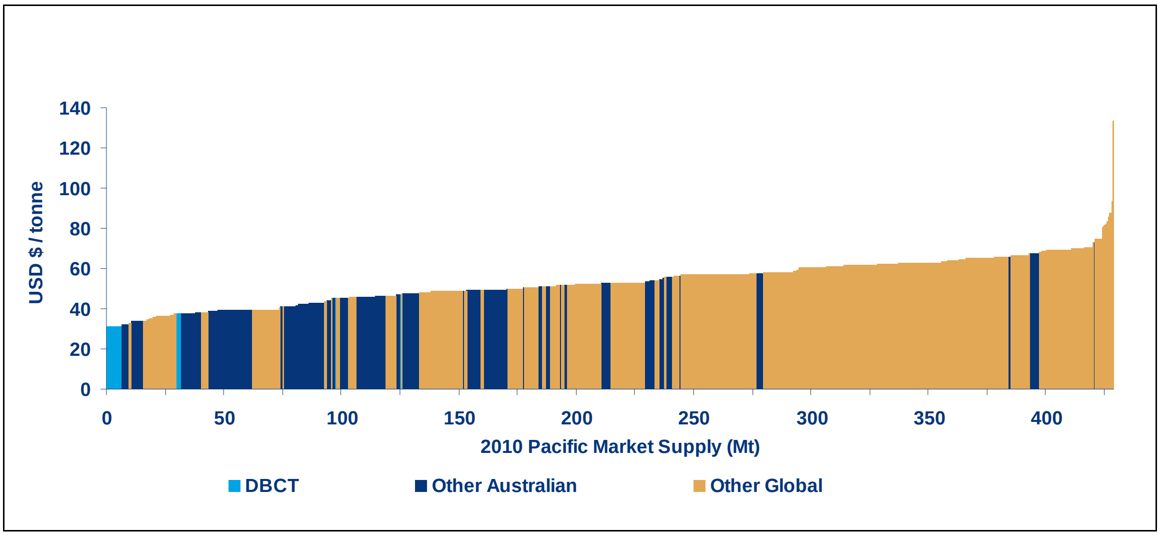
2010 global seaborne thermal cost curve (FOB basis)



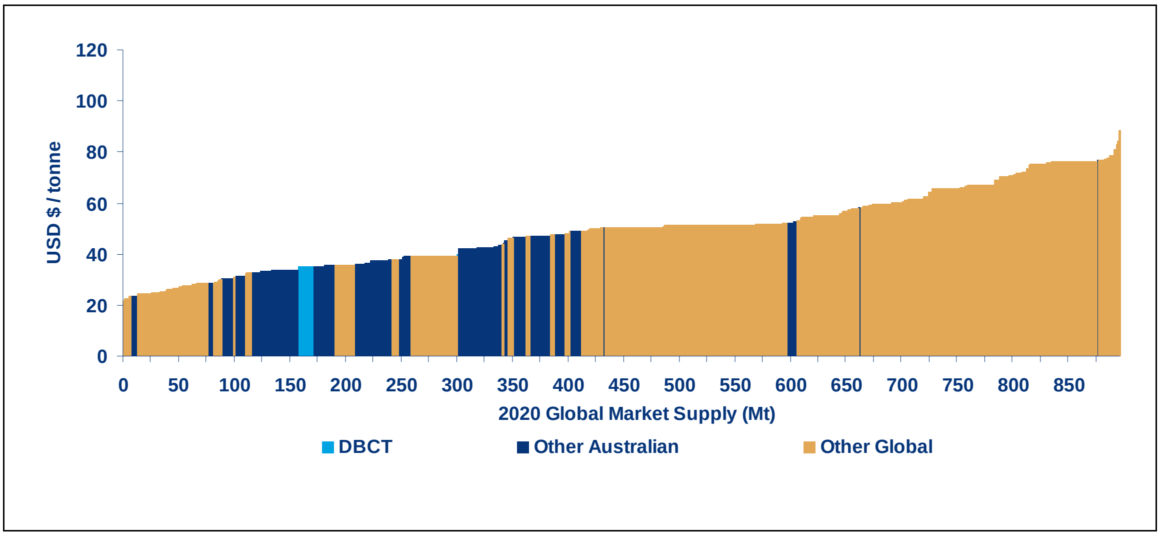
2010 Atlantic Market Seaborne Thermal Cost Curve CIF Basis



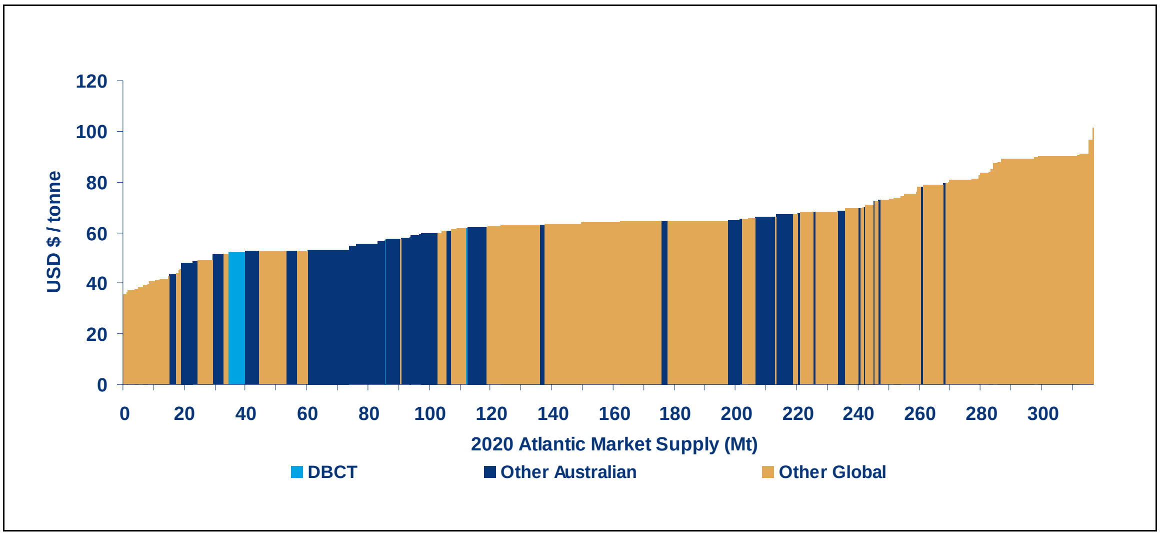
2010 Pacific Market Seaborne Thermal Cost Curve CIF Basis



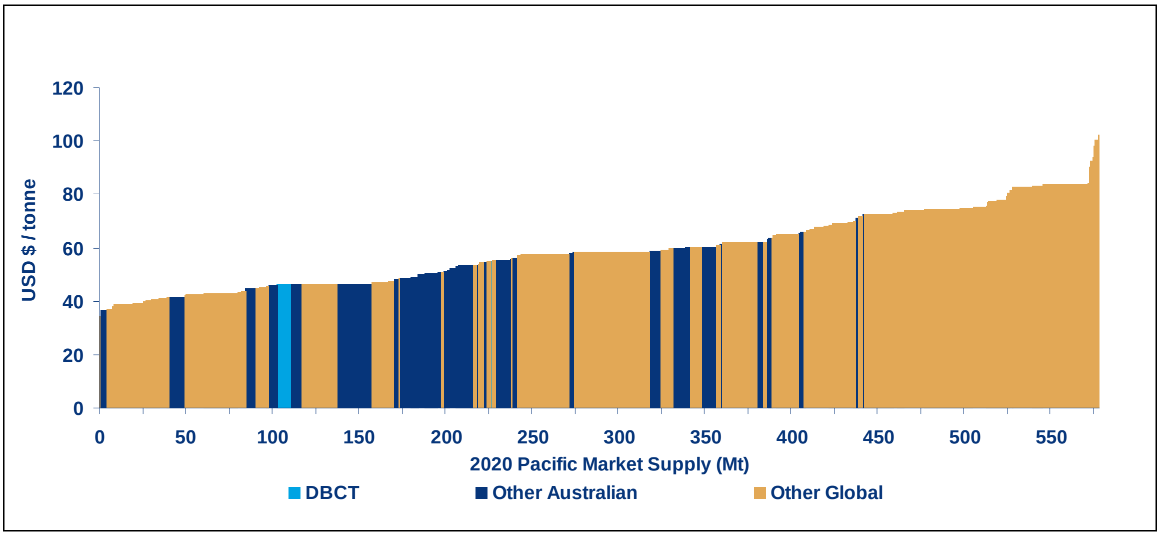
2020 Global seaborne thermal cost curve (FOB basis)



2020 Atlantic Market seaborne thermal cost curve (CIF basis)



2020 Pacific Market seaborne thermal cost curve (FOB basis)

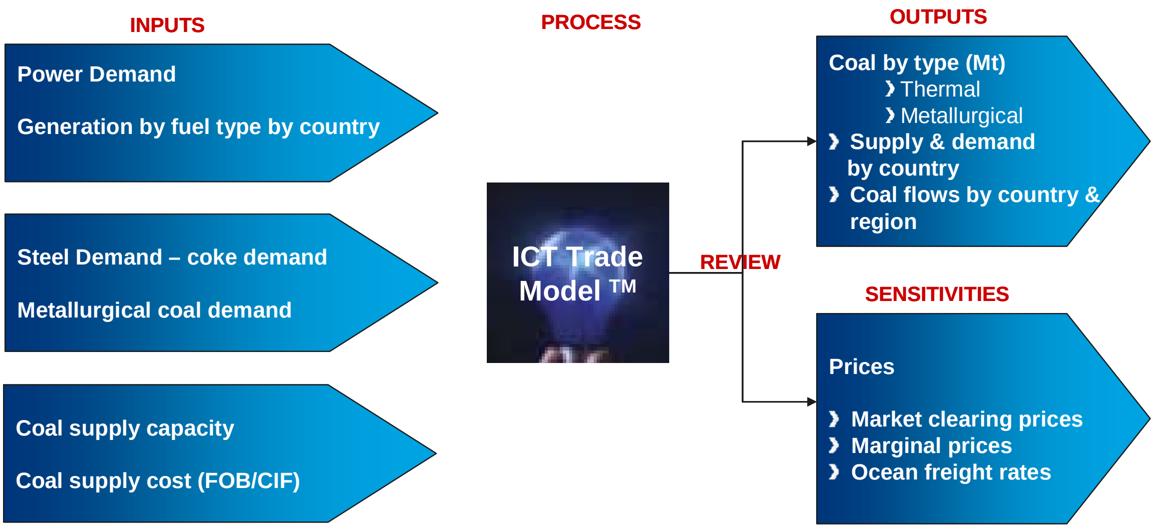


Model Inputs and Methodology

Wood Mackenzie generated the comparative cost curves utilising our ‘International Coal Trade’ (ICT) model. The ICT is a proprietary linear programming tool that takes multiple sets of inputs and derives world trade in coal. The execution of the model involves a year-by-year dynamic process, starting with the most recent historical year and projecting into the future for 15 years. The model takes demand for coal in energy units and produces *a least cost solution for trade*.

Information on trade flows is also extracted from the ICT and applied to the cost curve data, to ascertain the destination market for each tonne of coal produced. The market distribution is calculated by matching demand and supply within the model, and is summarised in the diagram below:

ICT Model Methodology



This distribution is then used to determine which markets (and countries) the coal is destined for. This is used to organise the global supply into the various market groups, in this case Pacific and Atlantic markets.

Detailed evaluation of the resulting output data to be sorted according to the desired attribute (e.g. thermal or metallurgical, country, coal type, DBCT user or other, etc) and has a freight cost applied if the value is for a delivered scenario.

- Thermal coal is cost-adjusted for energy content (energy adjusted) before the cost curves are generated. These energy adjustments are done according to coal type and country of origin (hence the range of values for some types).

- A base case freight cost matrix containing representative ports (nodes), destinations, and associated prices is used to generate freight costs. A transport cost index, independent of general inflation, is applied to all freight costs. This index has a value of 1 going forward after 2009, indicating that freight rates between the two years examined in this study (2010 and 2020) are constant.

- All cost data presented in the ICT calculations, outputs, and cost curves is in US dollars. All cost inputs to the ICT are in USD dollars except for Canada, Australia, South Africa, Russia and China, and therefore other than these exceptions do not need any exchange rate applied. The exchange rates used for the period 2010 to 2020 stay constant, and as such are the same in both sets of cost curves.

- Inflation is applied to costs on a country-by-country basis. Default inflation is 3.0% to 2012 and 2.5% beyond, each country is verified against this default and adjustments made where deemed necessary. In addition to general country inflation there are transport specific inflation rates for rail and port costs applied to producers on a node-by-node basis.

Selected ICT Freight Rates

Market & Destination Ports		Pacific	Atlantic
Freight Node	Key Port		
Australia QLD	Gladstone	11.05	17.19
Australia NSW	Newcastle	13.06	19.76
Indonesia E. Kalimantan	Mahakam	7.15	13.34
Indonesia S. Kalimantan	Taboneo	7.15	13.34
China	Qinghuangdao	2.26	22.40
South Africa	RBCT	14.52	12.82
Colombia	Puerto Bolivar	23.45	12.28
Canada West	Roberts Bank	12.66	25.63
USA	Norfolk	22.11	12.53
Poland	Gdansk	84.17	18.02
New Zealand	Greymouth	19.06	25.76
Mozambique	Maputo	14.52	12.82
Venezuela	Puerto Bolivar	40.50	16.04

Selected ports/nodes only

Exchange rate assumptions for non-USD cost base production

United States (USD)	Canada (CAD)	Australia (AUD)	South Africa (ZAR)	Russia (RUB)	China (CNY)
1.000	1.229	1.543	11.851	27.460	6.836

Selected Port Cost Inflators

Freight Nodes	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
US West Coast	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
Gladstone	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Port Kembla	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Colombia	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Indonesia	3.00%	3.00%	3.00%	2.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Russia Siberia	-25.00%	6.00%	7.00%	7.00%	7.00%	7.00%	6.00%	5.50%	4.00%	4.00%	4.00%	4.00%

29 shipping nodes are modelled in ICT to represent clusters of coal export/import terminals

Selected Rail Cost Inflator

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
USA West Coast	3.00%	3.00%	3.00%	3.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Canada West	-5.00%	-7.00%	-9.00%	-3.00%	0.00%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Queensland	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Port Kembla	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%	4.00%
Colombia	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%
South Africa	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Indonesia	7.00%	7.00%	3.00%	3.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Russia West Coast	20.00%	14.00%	14.00%	10.00%	8.00%	7.00%	6.00%	5.50%	5.50%	5.50%	5.50%	5.50%

Addendum A: Reliance Letter

Overleaf

Wood Mackenzie

Level 13
50 Pitt Street
Sydney 2000
Australia

T +61 (0) 2 8224 8888
F +61 (0) 2 8224 8899
E energy@woodmac.com
www.woodmac.com

[date]

Dalrymple Bay Coal Terminal Management
Level 15, Waterfront Place
1 Eagle Street, Brisbane
Queensland 4000

Dear Sirs,

Market Report for Dalrymple Bay Coal Terminal Management

We have acted as advisers to Dalrymple Bay Coal Terminal Management ("DBCTM") in preparing a report dated April 2009 (the "Report") regarding a forecast of coal throughput at Dalrymple Bay Coal Terminal ("DBCT") during the period to 2020 to assist in the planning of the proposed capacity expansion at DBCT (the "Project").

We are instructed that you propose to use this document for either financing for the Project to participate in the provision of financial accommodation or a financial guarantee to, or for the benefit of, DBTCM in relation to the Project, or for the purpose of determining the attractiveness of potential equity participation in DBCTM ("Relevant Involvement").

The Report has been prepared for DBCTM and may not be shown to or relied on by any other person without our prior written consent. This letter sets out the basis on which we consent to you, the Financiers or the Potential Equity Participants (as defined below) being provided with a copy of the Report, and the basis on which you may rely on the Report. Any capitalised terms used in this letter have the same meaning as set out in the Report, unless the context provides otherwise.

1.1 Definitions

In this letter, Financier means any bank, financial institution or guarantor to the extent those persons provide financial accommodation or any financial guarantee to, or for the benefit of, BBI in respect of the Project, and in each case as at completion of the Project or within 12 months following completion of the Project.

In this letter, Potential Equity Participant is any party who is evaluating the potential purchase of a partial or complete equity share of DBCTM, in the 12 months from the date of the Report.

1.2 Scope

The scope of our Report was agreed by DBCTM. The scope is set out in the Report. We have not departed from the scope except where indicated in the Report.

1.3 Qualifications

The assumptions and qualifications made in preparing our Report are set out in the Report. In addition, we draw the Financiers' or Potential Equity Participants attention to the following matters:

(a) we have acted solely for DBCTM in preparing the Report;

(b) we have not been engaged to act, and we have not acted, as advisers to any or all of the Financiers in any manner in connection with the Project or their Relevant Involvement;

(c) we have prepared the Report in accordance with the instructions of DBCTM and for its benefit, and have considered only the interests of DBCTM in doing so;

(d) by accepting and relying on this Report, the recipient confirms that it is aware of, and understands the scope of our engagement as set out in the Report and agrees to the limitation of liability set out below.

1.4 Limitation of Liability

Financiers' or Potential Equity Participants, agree that any right to recover for any claim, action, proceeding, loss, cost, damage, expense or liability incurred by or to be made or recovered by or against Wood Mackenzie however arising, whether present, unascertained, immediate, future or contingent (Claim) is limited to the extent that any Claim is directly attributable to Wood Mackenzie's negligence in preparing this Report for DBCTM, but in any event Wood Mackenzie's liability will not exceed a maximum aggregate amount of A$5 million for all Claims made by any person entitled to rely on this Report (including Wood Mackenzie).

1.5 Reliance

Subject to the matters set out in this letter, on receipt of a copy of this letter signed by you, we agree to issue a copy of the Report to you and confirm that you may rely on the Report in connection with your Relevant Involvement.

Yours faithfully,

…………………………….

Signed for Wood Mackenzie

Name:

Title:

Reliance is provided on the condition of agreement by the Financier or Potential Equity Participant to the terms on which it may rely on the Report as set out in the Report and this letter. This agreement to be provided in writing.

Yours sincerely,

…………………………….

Signed for:

Name:

Title:

Wood Mackenzie

Level 13
50 Pitt Street
Sydney NSW 2000
Australia

Global Contact Details

Europe +44 (0)131 243 4400
Americas +1 713 470 1600
Asia Pacific +65 6518 0800
Email energy@woodmac.com

Global Offices

Australia - Brazil - Canada - China - India - Japan - Malaysia - Russia - Singapore - South Africa - United Arab Emirates - United Kingdom - United States

POAPR09