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Mr Graeme Hunt
President – Iron Ore,
Carbon Steel Materials
BHP Billiton Limited
GPO Box 86A
MELBOURNE VICTORIA 3001

Dear Mr Hunt,

Port of Port Hedland – Port Capacity

This letter is in response to your request for information for the purpose of submission to the National Competition Council in connection with its recent draft recommendation relating to access declaration of the Mt Newman rail line.

Over many years, TSG Consulting (TSG) has provided simulation modelling based consulting services to BHPBIO in relation to BHPBIO's mine, rail and port operations in the Pilbara region of Western Australia. As a result of providing these services, TSG has considerable knowledge of, and experience relating to, the capability modelling and system dynamics of the whole of BHPBIO's mine, rail and port operations.

The integrated nature of BHPBIO's mine, rail and port operations, results in BHPBIO's annual total system production being constrained to the capacity of that sub-system that is performing the weakest. For example, if the port was the constraint, then the production achievable from mine operations and rail operations will be limited to that which the port can sustain.

This production constraint imposed on other components in the supply chain, is especially relevant when considering the capacity of the rail system in isolation of the mine and port capabilities. To quote rail capacity numbers in excess of port capacity numbers can be very misleading to anyone who is not familiar with Iron Ore operations in the Pilbara.

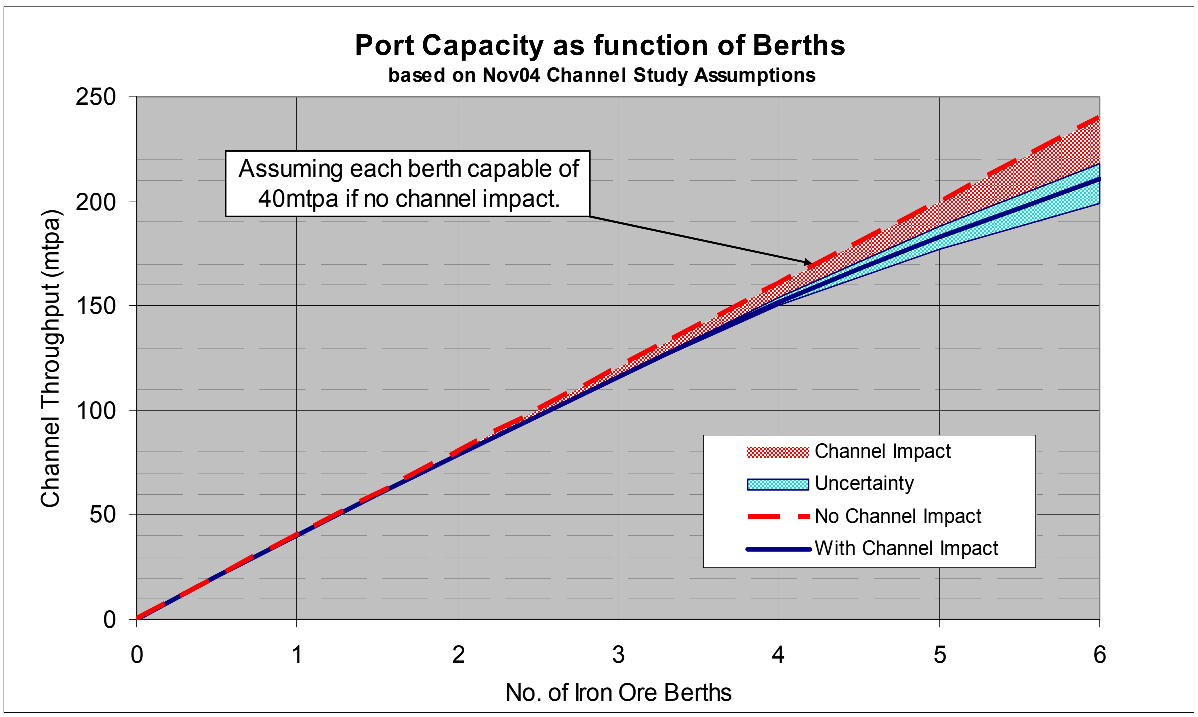
The capacity of a port is not a simple calculation, especially in a tidal constrained harbour like the Port of Port Hedland. There are a large number of factors that influence this calculation, some of which include:-

1. The acceptable level of demurrage (or turnaround time) incurred by vessels.
2. The number of iron ore berths and lay-by berths by Company in the harbour.
3. The loading rates and equipment reliability that can be achieved over these berths.
4. Shippable product availability at each berth to fulfil vessel requirements.
5. Product restrictions at berths and separated vessel queuing for specific berths.
6. The time taken between the last lines of the loaded vessel and the first lines of the next empty vessel.
7. Forecast sales by Company, by destination, by product, including arrival variability.
8. Vessel size distributions and their unloading port draft constraints.

9. Entry ballast requirements and the vessel de-ballasting rates.
10. Geographical position in the harbour of the berths and transit times per berth.
11. Numbers of available tugs and pilots including operational constraints.
12. Operating protocols for departing and entering vessels including headway and tug requirements.
13. Scheduling rules of multiple departures on a tide.
14. Underkeel clearance allowances.
15. Channel profile and siltation allowances.
16. Tidal patterns, tidal estimation error and swell dynamics.
17. Other harbour movements, etc.

Over the years, there have been many port studies undertaken for BHPBIO and also for the Port Hedland Port Authority (PHPA) looking at this port capacity question for the Port of Port Hedland. Each study involves many input and operating assumptions, and the outputs of these studies are only as accurate as the inputs and assumptions agreed.

In November 2004, a channel study was undertaken to determine the port capacity with an increased number of iron ore berths in the harbour. The following chart, from the results of this study, shows the relationship between channel throughput and the number of iron ore berths.



The red shaded area indicates the loss in capacity due to the channel impact, with the blue shaded area showing the possible further loss in capacity due to uncertainty in the inputs. What is very evident from this chart, is that the marginal gain in overall port capacity is significantly reduced as additional berths are added into the harbour. In other words, the same capital spent on building a new berth in the harbour will deliver less production than the last berth, as the total number of berths increases. In the above chart, the 6th berth delivers only approximately 70% of an unconstrained berth to the total port capacity.

However, the actual drop in production is not all felt at the last berth to be built. If the port departure rules treat all berths equally, then the new total port capacity will be proportionally allocated across all the berths, resulting in a drop in production capability over the existing berths even if the new berth is added by a third party.

Therefore to answer the question of what is the port capacity becomes one of economics and risk. If the marginal return is less than that required to justify the investment, then the port may be constrained to 5 or 6 berths. Six berths would result in a port capacity of between 200 and 220 mtpa. (Based on the November 04 Channel Study assumptions)

More than 6 berths in the harbour would result in further drop in the marginal gain in total production resulting in less economic return for the same capital required to build an additional berth.

Ultimately capacity can be expanded, but the cost of expansion can be very large if significant dredging of the channel and/or inner harbour is required. It also needs to be borne in minding that any dredging will be required to be undertaken in an operating port. Accordingly capacity as defined in this work was defined as that capacity that did not require dredging work other than that required for the installation of new berths.

Yours sincerely

Rodney Hoare
General Manager – TSG Consulting