PRICEWATERHOUSECOOPERS

In association with
Hughes Consulting Services

Economic Regulation Authority

Review of WestNet Rail's Floor and Ceiling Costs for Certain Rail Lines

Revised Report

June 2007

Disclaimer

This discussion paper has been prepared by PricewaterhouseCoopers (PwC) and Hughes Consulting Services (HCS) for the sole use of the Economic Regulation Authority (ERA). Its aim is to assist in the drafting of ERA's determination regarding WestNet Rail's (WNR) floor and ceiling costs for certain rail lines. It is prepared for no other purpose. This paper represents indicative advice only, and is not an audit. This document is not intended to be utilised or relied upon by any persons other than ERA, nor to be used for any purpose other than that articulated above. Accordingly, PricewaterhouseCoopers nor Hughes Consulting Services accept no responsibility in any way whatsoever for the use of this report by any other persons or for any other purpose.

This report has been prepared based upon data obtained from and discussions with personnel from ERA and WNR, and from other publicly available data from sources external to ERA and WNR. PwC and HCS have not sought any independent confirmation of the reliability, accuracy or completeness of this information. It should not be construed that PwC or HCS has carried out any form of audit of the financial and other information which has been relied upon, nor that the suggested methodology would be necessarily acceptable to external bodies or robust to legal challenge. Accordingly, whilst the statements made and the methodology in this report are given in good faith, PwC and HCS accept no responsibility for any errors in the information provided by WNR or other parties in submissions to the ERA nor the effect of any such errors on our analysis, suggestions or report.

Contact Details:

For further information on this report contact:

Scott Lennon
Partner – PricewaterhouseCoopers
Ph: 02 8266 2765
Email: scott.lennon@au.pwc.com

Peter Hughes
Director - Hughes Consulting Services Pty Ltd
Ph: 07 3876 1131
Email: hcs@pacific.net.au

1. Introduction

In September 2006, WestNet Rail (WNR) proposed to the Economic Regulation Authority (ERA) the floor and ceiling costs for the Mainline, Worsley line and terminal end bits. This was followed in October 2006 with the proposed costs for three grain lines, being Avon to Goomalling, Katanning to Tambellup and Kulin to Yilliminning.

PricewaterhouseCoopers (PwC) was retained by the ERA to review the proposed costs, building on the experience developed in the 2003 price determination. PwC undertook this engagement with the specialist railway engineering assistance of Hughes Consulting Services ("HCS"). An initial HCS/PwC report for this project was released in March 2007 in conjunction with the ERA Draft Determination. The March report has now been revised to take account of stakeholder submissions to the Draft Determination.

The scope of works agreed to the in the engagement letter are shown in Table 1.

Table 1: Agreed scope of works

Category	Task
Review proposed costs and access pricing model	Review WNR's proposed costs
	Review Worley Parsons report commissioned by WNR
	Phone hook-up with ERA and WNR on proposed changes
	Review new costings and calculations
	Review and test WNR's Access Pricing model
	Test and confirm compliance with revised costing principles
	Test and verify proposed rates for materials and capital items
	Assess any MEA changes from earlier determinations
	Discuss recommended adjustments with ERA and WNR
	Review implementation of draft determination's adjustments
Review stakeholder submissions	Review submissions on WNR's proposed costs
	Review submissions on ERA's draft determination
Report to the ERA	Report on the accuracy, reasonableness and recommendations
	Produce report for public release
	Report on the implementation of draft determination adjustments
Review determinations prepared by the ERA	Review draft determination
	Review final determination

This is a report which details the sample testing of the accuracy and reasonableness of the pricing model, and it provides some recommendations on changes to unit cost assumptions proposed by WNR.

Proposed costs

WNR's proposed new floor and ceiling costs for the relevant nine lines, compared to 2003 determination costs, are presented in Table 2.

Table 2: WNR's proposed charges

Line		2003/2004		2006		Change	
		Floor	Ceiling	Floor	Ceiling	Floor	Ceiling
Grain lines – Last determination applied from 1 January 2004							
1	Avon to Goomalling	$60,957	$3,621,996	$96,253	$4,385,906	58%	21%
2	Katanning to Tambellup	$30,499	$2,662,278	$43,360	$3,113,891	42%	17%
3	Kulin to Yiminning	$26,843	$5,264,827	$37,780	$6,497,751	41%	23%
Main lines – Terminal end bits last determination applied from 1 January 2004. All other mainlines 1 July 2003.							
4	Kwinana to Bunbury	$2,038,047	$21,689,693	$2,097,863	$25,723,536	3%	19%
5	Brunswick to Premier	$518,712	$6,857,280	$275,069	$7,729,445	-47%	13%
6	Forrestfield to Kalgoorlie	$4,668,724	$99,181,635	$7,425,287	$121,900,516	59%	23%
7	Kalgoorlie to Leonora	$341,741	$18,933,978	$387,605	$23,217,467	13%	23%
8	Kalgoorlie to Esperance	$1,059,677	$32,102,300	$1,957,193	$39,852,414	85%	24%
9	Terminal end bits	$645,912	$2,542,413	$118,562	$3,111,869	-82%	22%

Source: WNR.

Some of the main reasons for the magnitude of the average increase in the floor and ceiling costs are:

- commodity prices boom, impacting the cost of materials;
- the strength of the WA economy, which has driven up the cost of labour. Specifically, the ABS Wage Price Index for WA has risen 12.7% over the period from July 2003 to the June 2006.
- Australian annual inflation levels being at the higher end (or on occasions above) the 2-3% range targeted by the Reserve Bank, which is reflected in the ABS indices used by WNR to escalate some of the components of the floor and ceiling costs.
- The ABS Eight Capital Cities All Groups CPI increased by 8.9% from December 2002 to March 2006 with this being the escalation index is used in the Costing Principles for escalations. The Perth CPI over the same period rose 10.3%.

Report structure

The remainder of this report is structured in the following order:

- section 2 will set out the procedures PwC/HCS undertook to verify the accuracy of the WNR pricing model and will present the results thereof;
- section 3 will summaries the views from Public Submissions and evaluates issues around the application of the MEA assumption;
- section 4 discuss the reasonableness of the prices of materials and capital items used as inputs to the calculations of floor and ceiling costs;
- section 5 will outline the conclusions; and
- appendix A provides a breakdown of recommended floor and ceiling costs by route section.

2. Pricing model review

The assumptions made with regard to the current MEA for the grain and main lines are to be retained from the 2003/04 determinations for each of these. The WNR standard for calculation of the GRV for the grain lines is summarised in Table 3.

Table 3: WNR proposed MEA standard for the grain lines

Grain line	Avon to Goomalling (1) and Katanning to Tambellup (2)	Kulin to Yiminning (3)
Axle Load – Freight (tonnes)	19 tal	16 tal
Rail weight (min Kg/m)	41	31 (if 31 not available, then 41 to be substituted)
Sleeper type, pattern and spacing	1:4 steel/timber "B' type 2100mm x225mm x130mm – 1320/km min	1:4 steel/timber "A" type 2100mm x225mm x115mm – 1320/km min
Ballast type & min depth (mm) for Continuously Welded Rail (CWR)	Metal – 150	Gravel/Metal - 150
Ballast type & min depth (mm) for Mechanically Jointed Rail	Not Applicable	Gravel/Metal - 100
Fasteners	Plated timber sleepers, elastic fasteners throughout	Plated curves <800 radius, non-elastic fasteners in timber
Formation depth (m)	1.0 (including capping layer)	1.0 (including capping layer)
Target speed maximum (kph)	80 (subject to operating requirements)	60 (subject to operating requirements)

Source: ERA October 2003 WNR Grain lines Floor & Ceiling Cost Determination.

The WNR standard for calculation of the GRV for the five nominated lines is summarised in Table 4

.

Table 4: WNR proposed MEA standard for the main lines (excluding the terminal end bits[1])

Main line	Kwinana to Bunbury (SWM) (4)	Brunswick to Premier (5)	Forrestfield to Kalgoorlie (EGR) (6)	Kalgoorlie to Leonora (7)	Kalgoorlie to Esperance (8)
Axle Load Freight (tn) & Max. Speed Freight (kph) [loaded/empty]	At 21tn: 115/115 (NG) At 23tn: 80/80 (NG)	At 21tn: 50/70 (NG)	At 21tn: 115/115 (DG & SG) At 23tn: 80/80 (DG & SG)	At 21tn: 50/70 (SG)	At 23tn: 70/80 (SG)
Max. Speed Passenger (kph)	160 (NG)	N/A	160 (SG)/100 (DG)	N/A	N/A
Ave. Formation height (m)	1.0	1.5 (Brunswick East to Worsley) 1.0 (Worsley to Hamilton & Worsley to Premier)	1.5	1.5	1.5

[1] The WNR standard for calculating the GRV for the mainline 'Terminal end bits' shall be similar to the standard for the adjoining mainline.

Main line	Kwinana to Bunbury (SWM) (4)	Brunswick to Premier (5)	Forrestfield to Kalgoorlie (EGR) (6)	Kalgoorlie to Leonora (7)	Kalgoorlie to Esperance (8)
Rail (kg/m)	50	50	60	50	50
Ballast depth (mm)	250	250 (Concrete sleepers) [2] 150 (timber sleepers)[3]	300	200	250
Sleeper Type & number/km	Concrete/ 1,500	Concrete/1,500 Timber/1,470	Concrete/1,500	1 in 4 Steel/1,500	1 in 2 Steel/1,640

Sources: ERA September 2003 WNR Clause 9 Floor & Ceiling Cost Determination (page 18) and October 2003 Worsley Floor & Ceiling Cost Determination (page 4).

Tests to reviewing the pricing model

PwC/HCS undertook two types of tests in reviewing the pricing model: line-specific tests and general model tests.

For each of the line-specific tests that were undertaken, PwC/HCS selected a number of lines which would be covered by those tests. The guiding principle was that, although such sampling would increase the efficiency of the review, rotating the selection of the lines being tested would ensure sufficient coverage across the nine lines.

The pricing model was checked to ensure that floor and ceiling prices reported by WNR in their submission were consistent with those being calculated within the model. The model was tested to check the integrity of the workings and to ensure that the methodology used for the GRV, ceiling and floor calculations was consistent with the approved Costing Principles as well as being carried out in accordance with the approved standards. The track distances for routes and route sections were checked to ensure consistency with the previous determination. This review also assessed and discussed with WNR the variations to the calculations proposed by WNR for this determination such as the inclusion of the Communications and Signal equipment for the SWM and EGR.

The route-specific tests applied to assess consistency with prior determinations included reviewing the:

- MEA standard and the actual current standards.
- Line section operational usage (ie train number and/or GTKs by route section).
- The uniformity and consistency in pricing model calculations.

The review of operating and overhead costs focused on assessing:

- operating cost and overhead cost efficiency
- detailed reviews of any new cost items (eg self-insurance costs)
- the consistency of application of costs in relation to specialist labour, environmental, engineering support and logistics operations
- the application and consistency of escalation of costs with ABS indices
- breakdowns for train control and communication and signalling costs across the WNR network.

[2] For the section Brunswick East to Worsley.
[3] For sections East and North of Worsley.

Table 5 lists the line-specific tests that were undertaken and presents their outcomes.

Table 5: Outcomes of the line specific tests undertaken

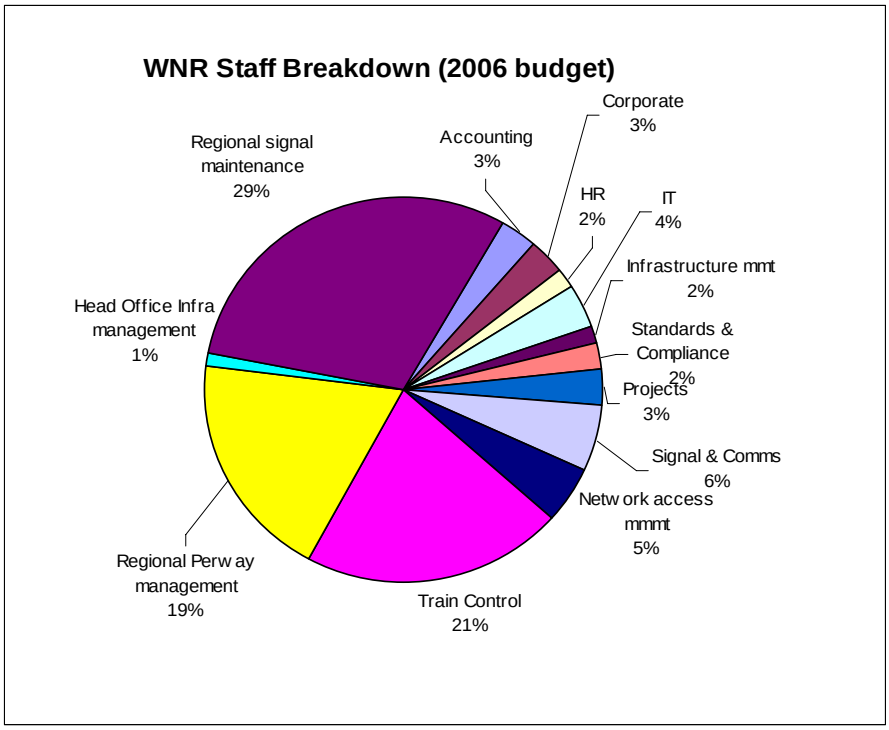
Test	Grain lines			Main lines					
	1	2	3	4	5	6	7	8	9
Agree 2006 figures in the report to pricing model	✔	✔	✔	✔	✔	✔	✔	✔	✔
Agree 2005 figures in the report to pricing model	✔	✔	✔	✔	✔	✔	✔	✔	✔
Agree 2006 line length to 2005 line length	✔	✔	✔	✔	✔	✔	✔	✔	✔
Ensure that line models have consistent calculation processes	✔	✔	✔	✔	✔	✔	✔		✔
Sample testing to confirm train number information	✔	✔		✔	✔			✔	✔
Sample testing to confirm GTK information			✔	✔	✔	✔			✔

Note: Line numbers refer to those given in Table 2

The outcomes of the general model tests are summarised in Table 6.

Table 6: Outcomes of the general tests undertaken

Test	Outcome
Analyse the efficiency of the activities driving the overhead costs	▪ The overall proposed $16.2 million overhead cost reflects a reduction in the cost of insurance. ▪ WNR has a labour budget for FY 2006 based on194 WNR full-time equivalent (FTE) employees. Of this total 35 are included in the calculation of overhead costs, 41 are in train control, 39 are in perway management, 59 are in regional signal maintenance (with these costs being covered in the maintenance unit rates), 11 are in Signal and Communications management and 9 staff being in network access management. Of the staff in the overhead category 22 are in accounting, HR, IT & corporate. In the period since the separation of WNR into a standalone entity, WNR has had associated headcount growth in HR, IT and the Commercial groups. The pie chart below show the relative functional mix of the WNR employees.

Test	Outcome
	 In relation to specific tests of overhead efficiency PwC/HCS observed: ▪ One FTE employee is tasked with accounts payable. The unit cost of this function (before overhead and IT allocation) is viewed as reasonable at less than $5 per account payable. ▪ The payroll function is outsourced. PwC/HCS assessed the cost per pay run and this was below $10 per pay which is an efficient outcome for a relatively small entity. ▪ Sundry Contract Costs account for 55% of the IT budget. PwC/HCS sighted the breakdown of that amount into its 22 constituent items, of which only one accounted for more than 10% of the total being Transitional Services. While the amount was somewhat uncharacteristically large compared to the other components of that section of the IT budget, it is related to relatively resource-intensive projects such as the maintenance and support of HR and timekeeping systems and the maintenance of email and Blackberry services. ▪ In sample testing, PwC/HCS also assessed the costs of the WNR IT helpdesk. The labour allocation (2.5 FTEs) and the subsequent cost appears a reasonable cost given the salary range for adequately-skilled IT workers and the supporting infrastructure required. ▪ Of WNR's motor vehicle fleet, 62% is comprised of 4X4s and inspection vehicles, indicating that most of the cost is incurred directly in relation to the core activities. Fleet management costs were outsourced and confirmed as efficient. The actual WNR cost for fleet in 2006 was 10% above that requested by WNR within the access pricing model with WNR making a minor adjustment to reflect their view on efficient costs.
Review the proposed $6m civil and control & signalling (C&S) costs	An amount of $6.0 million has been allowed by WNR to cover overall contract administration, project management and overheads in relation to the major maintenance contract with John Holland Constructions and with other maintenance related contracts as required. PwC/HCS has reviewed the breakdown of this cost category. The largest item, accounting for around 26% of the total cost is the John Holland contract. PwC/HCS sighted copies of John Holland invoices to confirm this expenditure. ▪ This allowance, as reviewed by PwC/HCS, is separate to other WNR office overheads and shall be allocated to each line proportionally to the maintenance expenditure for that line as appropriate. This allowance does not include the cost of WNR maintenance inspectorial or other direct project cost, but will include; ▪ Head Office maintenance contract administration and support staff, ▪ Head Office maintenance management, accounting, etc and support staff, ▪ Professional support services including legal, accounting, engineering, surveying, etc, ▪ Management and inventory of materials and personnel including rail safe working practices of maintenance staff, ▪ Regional maintenance contract administration, management and support staff, and

Test	Outcome
	▪ Other resources and equipment as required to meet the maintenance activities of WNR. PwC/HCS also tested whether John Holland costs would be lower for a new MEA network. WNR stated that it had not adjusted for a new MEA network as the nature of these costs are not influenced by the age or MEA standard of the network with these costs being incurred regardless of the status of the network. The materials management, storage and handling represent the cost of holding sufficient inventory for emergency and scheduled maintenance activities. The environmental and engineering services are part of the infrastructure management overhead to provide technical and regulatory advice on an "as required" basis. PwC/HCS considers that this allowance is fair and reasonable to meet WNR responsibilities regarding the management and operation of the maintenance contract(s) undertaken to maintain a safe railway network.
Agree the escalation of costs to ABS indices	For unit costs where WNR did not have recent market price information for a large scale order, WNR generally proposed escalation by an ABS Index (the Producer Price Index: Road and Bridge Construction Costs for WA.[4] WNR proposed to use the percentage increase from December 2002 (the time costs were collected for the July 2003 review) to March 2006) which was a rise of 17.4%. PwC/HCS contacted ABS and confirmed that this index was their most appropriate for measuring the change in rail network costs (as no rail costs specific index is available) and confirmed the WNR calculations. As a cross check using the same index with more recent data (June 2003-June 2006) the cost rise was 18.1%. Whilst the main original Costing Determinations were released in September –October 2003 and a further Determination in July 2004 (terminal end bits), the later Determination was based on the same original unit cost data. As the date of the source data is more relevant for accurate escalation than the date of the Determinations, PwC/HCS recommends applying the same escalation methodologies and levels across all routes. There is a range of support for the WNR view that rail network cost growth has been greater than CPI: ▪ The escalation outcomes from indices used by WNR appear conservative when compared to benchmarks such as the WA Department of Housing and Works Building Cost Index (BCI). The BCI for Perth accounts for the costs of non-residential construction and it increased by 40% between December 2002 and March 2006. ▪ In a Victorian regulatory decision on the PN intra-state rail network (May 2006), the Essential Services Commission escalated some cost items by an index from the same Table and Series (ABS Non-building Construction Index), indicating that this series is the most appropriate for measuring cost movements in rail network operations and maintenance.[5] ▪ The WA Minister for Planning and Infrastructure said that 'in Western Australia, construction costs had increased by 30% over the past two years'[6]. ▪ The NSW Minister for Roads stated last year that 'bitumen and steel costs had increased about 20% since last year'[7], ▪ WNR indicated that the company experience wages growth of 13% between June 2003 and June 2006. This is in line with the ABS WA all industries wage index growth of 12.7% over the same period, as well as the Australia-wide comparable index increase of 12.8% . Overall, the WNR proposed escalation of 17.4% appears reasonable.
Validate the inclusion of the amount for self-insurance	WNR advised that the self-insurance amount equates to 41% of total WNR insurance and 12% of total overheads. The self-insurance component is based on the cost of attending to minor incidents considered "non recoverable" and represents only the variable ("out of pocket") cost component to each response ie it does not include an allocation of labour costs already funded elsewhere in the WNR cost structure. WNR provided a detail breakdown of this calculated by incident to PwC/HCS. This cost has not been adjusted for the potentially lower incident rate which may occur on a new MEA network however, WNR stated that most incidents are caused by Acts of God or Operator equipment failure which cause loss and the age of a well maintained network is not a key driver behind incident levels.
Validate the breakdown of communications and signalling costs	Signals and communications systems appear to be appropriate and detailed specifications have been provided. However, it is difficult to compare the WNR specification to other benchmark rail communications and signalling costs or to the confidential quotation provided by Alcoa/Worsley as the network consists of a number of base components tailored to the track configuration (including loops), the topography and the freight/passenger traffic mix. Further discussion on communications GRV issues is provided in Table 7.

[4] See ABS Producer Price Index, Series: 6427.0 Table 15: 4121, accessed at: http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6427.0Mar%202007?OpenDocument
[5] See p 86: http://www.esc.vic.gov.au/NR/rdonlyres/95B1F977-DEFC-40FE-829D-9F1C96CE3C02/0/DTR_FinalDecision_PacificNationalProposedAccessArrangement31052006.pdf
[6] Australian Financial Review, 13 June 2006.
[7] Ibid.

<table>
<tr><th>Test</th><th>Outcome</th></tr>
<tr><td>Validate the WNR proposed 16.7% rise in comms & signalling component unit costs</td><td>
It is noted that the WNR submission proposed an escalation rounded up to 17% but that the actual WNR calculations remain based on a 16.7% escalation factor. WNR proposed calculating a comms and signals escalation factor by splitting the cost into its four major components, identifying separate escalation factors for the four components and then weighting these outcomes relative to their proportional cost mix. The approach (as per p 23 of the WNR/Worley Parsons September 2006 Submission) is summarised below. Worley Parsons did not provide sources or reference to support the various escalation factors.

WNR proposed comms & signalling cost rises
<table>
<tr><th>Comms & Sigs Cost Component</th><th>2003 to 2004</th><th>2004 to 2005</th><th>2005 to 2006</th><th>Compound Change</th><th>Weight</th><th>Weight rise</th></tr>
<tr><td>Engineering</td><td>3%</td><td>3%</td><td>5%</td><td>11.4%</td><td>20%</td><td>2.3%</td></tr>
<tr><td>Materials</td><td>5%</td><td>10%</td><td>5%</td><td>21.3%</td><td>40%</td><td>8.5%</td></tr>
<tr><td>Installation</td><td>5%</td><td>5%</td><td>5%</td><td>15.8%</td><td>30%</td><td>4.7%</td></tr>
<tr><td>Management</td><td>3%</td><td>3%</td><td>5%</td><td>11.4%</td><td>10%</td><td>1.1%</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>Total</td><td>16.7%</td></tr>
</table>
The Alcoa/Worsley submission also recommended that rather than above 16.7% escalation to the comms GRV proposed by WNR, that the most relevant escalation approach is ABS index is the Producer Price Index for telecommunications and broadcasting equipment which rose only 0.46% in the past 3 years (June 2003 to March 2006). Furthermore Alcoa/Worsley viewed comms equipment prices as either static or reducing over time (as data volumes rise).

Overall, HCS is of the view that the cost growth since 2003 for materials component of communications and signalling costs should be linked to the relevant ABS index which appears to be the Producer Price Index for telecommunications and broadcasting equipment. This index has risen 0.5% over 3 years. The remaining 60% of the comms and signals GRV escalation factor should be based on the change in the ABS WA Wage Cost Index which rose 12.7% between July 2003 to the June 2006. Consequently, PwC/HCS recommends that the total comms and signals GRV be adjusted by 7.8% from 2003 levels.
</td></tr>
<tr><td>Ensure no redundant assets are included in the MEA</td><td>The WNR register of assets has been reviewed, on a sample basis, in both 2003 and 2006/07 by PwC/HCS and from that review followed by further discussions with WNR, PwC/HCS is not aware of any redundant asset at this time which may form a part of the MEA as the basis for the GRV calculations. This review was supplemented by separate assessments by Indec on behalf Alcoa and Worsley which in part focus on ensuring there were no redundant assets are included in the MEA.</td></tr>
</table>

3. Public submissions

As part of the public consultation process, ERA received two submissions: one from ARTC and a joint submission from Alcoa World Alumina and Worsley Alumina. In response to those submissions, PwC/HCS performed a number of tests in addition to those discussed above.

Regarding the issue of the allocation of Centralised Train Control costs raised by ARTC, it is the PwC/HCS understanding that those costs are allocated directly to the main routes based on effort exerted by the train controllers for each route. This is a more appropriate method than allocating costs based on train numbers or GTK. PwC reviewed the full cost per FTE employee (including on-costs, payroll tax, super, workers comp etc) of approximately $128,000 and verified this against the financial system data. The documentation outlining the cost allocation across the lines was also sighted. WNR has increased the number of staff in train control from 29 in the 2003 Determination to 37 in the 2006 Determination. This has arisen due to placing an additional control desk in the MidWest region to deal with projected demand for all Stage 1 projects in the region (4 controllers) and an additional desk in the Eastern Goldfields for projected increase in traffic for Portman expansion and new business growth in Iron Ore - Golden West Resources and others (4 controllers).

Furthermore, in relation to the abovementioned submission, PwC made two sets of enquiries. The first related to the prices of inputs quoted by the submitters. The resolutions to those recommendations are summarised in Table 7.

Table 7: Outcomes of consultation with Indec, the consultants to Alcoa and Worsley Alumina

Test	Outcome
Ballast cost	WNR proposed the ex-quarry ballast price of between $20 and $25.50 per tonne. Hanson provided Indec Consulting (Alcoa consultants) with a quote of $20.70 per tonne ex-quarry for the delivery to Bunbury, which WNR estimated at $25. PwC confirmed with Hanson the validity of their quote. To assess these quotes, PwC independently sought further ballast cost information from another rail network operator and was advised that the average price per tonne across central Australia is $15 ex-quarry, while the ballast price accepted by the ESC in Victoria for PN was an average of $25/tn ex-quarry and $30/tonne delivered. To further test the ballast market, PwC obtained quotes from two ballast suppliers: i. Boral: which indicated that they do not have the capacity to deliver the quantities required for WNR, nor do they have 50mm ballast available. However, a hypothetical price for 40mm ex Perth would be $36 per tonne. ii. ReadyMix (Rinker) provided a quote for 50mm ballast on WNR's account of $31.90 ex Gosnells (18km south west of Perth). Overall, the quotes from ReadyMix and Boral are likely to be above the efficient cost for a large scale order with the two suppliers providing the 'list price' consistent with our approach being a hypothetical request for supply. It is recommended that the Hanson price of $20.70 per tonne ex-quarry at Bunbury should be adopted with pro-rata distance adjustments for locations more distant from quarries (reflecting WNR proposed mark-ups from Bunbury). Whilst rail ballast prices of $15/tonne (ex-quarry) appear available for large orders elsewhere in central Australia, on balance it appears the Hanson price represents a more realistic efficient cost benchmark for Western Australia. But the availability of ballast at $15 per tonne (ex-quarry) across central Australia provides greater confidence that the efficient / high volume price for the Bunbury region of the WNR network is closer to $20.70 per tonne (rather than $25 per tonne). A review of all ballast costs throughout the WNR network is included in Table 11 of this Report which reflects the discussions held with Indec and later submissions from Alcoa/Worsley and which reduces the cost of ballast (ex–quarry) pro-rata proposed by Indec for Alcoa/Worsley to that proposed by WNR.

Test	Outcome
Ballast transport costs	The WNR approach to the ballast cost calculation is to examine the distance of the line assume quarries are sited at central points along each line and make an adjustment for extra distance due to the fact that suitable quarry sites will not be locatable adjacent to the rail corridor. The WNR September 2006 submission stated that ballast would be transported up 250km (assumed average 150km) from the supply point to the construction worksite. WNR also stated that for the purposes of haulage; $0.08 per tonne per km is considered a reasonable and acceptable value to adopt, given that the assumed average transport distance would be 150km from the nearest quarry, this equates to an average $12/t haulage cost. The WNR March 2007 submission advised that the assumed average ballast haul distance for the SWM was 70km.[8] In subsequent consultation with WNR to understand a specific example of ballast costs for the SWM (25 May 2007), which has a length of 180km, WNR stated that they has assumed an average haulage distance of 60km and the WNR proposed unit haulage rate was $0.114/GTK (instead of $0.08 per NTK) resulting in a ballast transport rate of $6.84/tn (instead of $4.80/tn if $0.08 per NTK at 60km is utilised. The Alcoa/Worsley Submission proposed a maximum cost for ballast transport on the SWM should be $3.60 per tonne based on 45km average haul at $0.08 per net tonne kilometre, but did not provide specific supporting quotation evidence for this estimate.[9] However, the 45km assumption assumes the ballast quarries are located at exact midpoints and immediately adjacent to the rail corridor and this is arguably unrealistic. After reviewing the positions of stakeholders and referencing benchmark truck haulage costs HCS/PwC concurs with the original WNR ballast unit transport cost of $0.08 per NTK as being efficient and broadly consistent with publicly reported information on efficient bulk road freight costs and prices.[10] In relation to the assumed haulage distance, HCS believes that instead of assessing line by line transport costs based on distance to current quarries, that it is simpler and reasonable to assume a uniform average haulage length across the network and this is likely to be less than those assumed by WNR. It is also noted that for most longer hauls of ballast (eg 70-100+km) rail transport is often used where it has better cost unit outcomes than road freight. Hence for better transparency and simplicity, HCS recommends the use of a uniform average transport distance of 60km which at $0.08 per NTK results in a ballast haulage cost of $4.80/tn for all lines.
Rail costs	WNR proposed a 60kg price of $1,440/tn and 50kg of $1,500/tn (both delivered to Midland). Assessing the efficiency of rail prices is challenging as OneSteel is the predominant domestic rail manufacturer. PwC confirmed with a leading Australian rail network operator that their OneSteel large order price is $1,240 per tonne for a 60kg rail ex-works excluding flashbutt welding ($200 per weld per 110 metres) providing a price ex-works including welding of $1,270/tn. Adding to this an estimated rail transport cost of approximately 12 cents per km per tonne and applying this to a Whyalla-Midland movement (approx. 2,340km) produces a transport cost of approximately $280/tn generating a complete rail cost delivered to Midland of $1,550/tn for 60kg. The submission provided by Indec (on behalf of Alcoa/Worsley of 2 May 2007) contained a quotation for 60kg rail from China plus an estimate of shipping and freight costs delivered to Midland totalling an estimated $A1,002/tonne, for large quantities. A further confidential submission from Indec (on behalf of Alcoa/Worsley of 14 May 2007) provided a brief quote from a Chinese supplier to support this price. The same submission also provided extra supporting detail on likely freight costs and lengths of rail to be supplied. However, the transport costs assumed are also arguably low given the strength in the ship charter rates over 2006/07. In assessing the current appropriateness of relying a quote from China for rail, WNR (7 May 2007) expressed the following concerns: - Potentially shorter lengths due to shipping constraints creating a need for more welds and adding to cost; - Exposure of the rail to salt during shipping and the need to remove this salt with a chemical treatment before use (potentially also adding to cost); - Uncertainties over compliance with Australian Standards, dimensional tolerances, chemical composition and mechanical properties; - Uncertainties over the economic life of 60kg Chinese made rail. Whilst it is being installed in the Pilbara, it is currently untested rail under Australian conditions;

[8] WNR Submission March 2007 p 3.
[9] May 2 20007 p 3.
[10] For example work commissioned by the NTC and BRTE analysis available at: http://www.ntc.gov.au/filemedia/Reports/TheFutureofFreightMarch2006.pdf, http://www.btre.gov.au/docs/submissions/BTRE_submission_pc_infra_pricing.pdf

Test	Outcome
	- The reliability of supply remains unproven; and - Entering such a deal would create risk exposures to fluctuation in exchange rates (albeit these could be controlled through hedging contracts).. Discussions by HCS with QR, indicates their current reluctance to use imported rail from China for similar reasons as provided by WNR (ie Chinese rail is not a tried alternative to Australian manufactured rail as to economic life, reliability of supply is unproven, standards and dimensional tolerances under Australian conditions as these have not been confirmed). Whilst this assessment is for a large scale order, QR also considers that their current quantity requirements for 60kg rail are not sufficient to produce an adequate financial advantage to compensate for the risks of procuring Chinese rail. In summary, PwC/HCS, at this stage, could not support the assumed use of imported rail from China as it is not a tested product and, as such, may not provide public rail operators the surety of the provision of safety and service as required under the Rail Safety Code. At the next floor and ceiling cost reset, we recommend that the issue of purchasing rail from China should be re-assessed based on factors including: o new quotes from China (or other nations) & the differential vis-à-vis the latest Australian prices o the actual out-turn cost of rail imported from China for use in the Pilbara o An assessment of any installation issues and any initial performance quality data from use of Chinese rail in the Pilbara. The Indec submission also recommended that for Australian sourced rail, the appropriate price per tonne should be $A1,430/tonne and not $A1,440/tonne recommended by HCS/PwC in the March 2007 report. In relation to this request, PwC/HCS notes that the difference in the two rates is arguably insignificant (at 0.7%) and documentation supporting the $1,440/tn has been verified.
Sleeper cost	WNR has proposed a price of $95 per SG concrete sleeper and $85 for NG concrete sleepers from Humes at Welshpool. WNR sought to further support this claim by providing more recent emails from Humes (Rinker) illustrating prices being paid by WNR have been subject to a further modest price increase. Indec referred to the contract price for SG concrete sleepers of $75, as provided by Rocla (Mittagong & Grafton in NSW) to ARTC.[11] However, PwC/HCS independently confirmed that their free on train (ex Rocla works) price is $86 for 1.35 million concrete sleepers including jewellery over 2.5 years. Whilst the $86/sleeper ex-works price from Rocla appears cheaper once transport is added-in, the delivery cost from Mittagong to Midland (3,930km) is likely to be between $70 and $90 per sleeper making supply ex-Mittagong uncompetitive. Austrak at Port Hedland is manufacturing SG (40tal) concrete sleepers for BHP Billiton and more recently for FMG. We understand the cost of these Austrak Port Headland 40tal concrete sleepers is above the SG 23 tal benchmarks relating to the greater strength and density of the product as well as issues relating to higher labour cost in remote areas. The WNR Submission (17 April 2007) sought to reinforce the reasonableness of the proposed SG concrete price by providing a further quote (as a Confidential Submission) from a WA supplier (dated 20 March 2007) for 75km of SG concrete sleepers. Overall, the $95 per SG concrete sleeper price may be close to prevailing prices in WA. However, the Rocla information appears to suggest that lower prices can be achieved through a well structured, competitive tender process where higher economies of scale from large scale orders are offered to the market. The Alcoa/Worsley supplementary submission suggested that the sleeper costing exercise should assume that either Rocla or Austrak would build a new concrete sleeper production facility in WA for the quantities required for the MEA rebuild of the WestNet network.[12] As a sleeper plant already operates in Perth, a new entrant to this market would be likely to price based on market forces (rather than a cost build-up) and price at slightly below the prevailing market price. Such a new entrant would also have some cost disadvantages compared to the incumbent (Humes) particularly in relation to the costs of building a new plant (including associated land around Perth) plus the new facility would be likely to have higher capital costs associated with having an all new plant and equipment . Whilst major rail projects in remote parts of Australia have from time to time warranted new (usually temporary) sleeper manufacturing plants (eg Katherine, Tennant Creek and Tailem Bend). The set-up of temporary plants is often driven by the cost of transporting sleepers from existing plants plus the need to ensure supply availability as well as the large order scale. On project completion, the project focused sleeper plants are usually closed and where this occurs they are not an ongoing competitive market participant. Hence such project based sleeper plants can have high ex-plant unit costs higher compared to permanent plants as they need to recover set-up and capital costs over a shorter economic life.

[11] According to a Rocla press release, at www.pipe.rocla.com.au/news/200605/article401.shtml, the cost is $85 per sleeper.
[12] 2 May p 17.

Test	Outcome
Premium paid for 50kg rail vis-à-vis 60kg rail	50kg rail is currently a higher cost per tonne option and Indec (on behalf of Alcoa/Worsley) believe this is mainly because it is produced by OneSteel in relatively lower volumes than 60kg rail. Indec argued that the rates used across the different rail weights should be reset to the lowest price per tonne, with this being the 60kg rail price as the Costing Principles assume a large-scale (100km minimum) network construction, which would lead to material production volumes for 50kg rail so that, by economies of scale, costs, (thus prices per tonne), across the weights should progressively move to broadly equal levels. However, it is noted that under this assumption, when the price of rail is assessed on a per metre basis that 50kg will remain 17% cheaper per metre than 60kg rail. Overall, the PwC/HCS view is that the Indec argument is valid and that if both sizes had large scale production volumes, the price of 50kg and 60kg should be broadly the same per tonne (ie efficient rail unit prices for large scale orders should be assumed to equal to lowest price per tonne for a given size across all sizes). Similarly, the 41 Kg rail price, under a large scale re-railing of the grain network, would be likely to fall to the 60kg price. This issue is further discussed in section 4 of this report.
Earthworks	The calculation of earthworks costs for the GRV has been the subject of extensive debate in submissions from Alcoa/Worsley and WNR.. , In this report PwC/HCS has confined analysis on efficient costs for earthworks rates on per linear kilometre basis. In relation to proposed efficient unit rates per kilometre: o WNR's revised submission (7 May 2007) proposed a revised rate for the SWM of $140,000 per linear km (based on being all borrow to fill for the SWM) or 12.5% below the earlier submission from WNR which proposed $159,925 per linear km for the SWM. o Indec on behalf of Alcoa/Worsley have proposed $131,000 per linear km for the SWM and $169,500 for the Brunswick to Worsley line. Alcoa/Worsley also provided a confidential submission with further detail The submission from Alcoa/Worsley provided a quotation from a WA based earthwork contractor nominating a rate of $131,000 per linear km as a 'Budget Only' (indicative cost) for establishing earthworks for a rail line such as the SWM. This rate of $131,000 per linear km is more relevant that the earlier Alcoa/Worsley suggested earthworks rates which in part used Rawlinson rates which do not fully consider the extra costs of railway earthworks over an elongated site with considerably more terrain variation (cuts, fills, batters and depressions) laterally than a building site (of the same area).[13] WNR responded that the indicative rate of $131,000 per linear km should not be relied upon as it is not the outcome of a formal competitive tender process and that their recent actual costs (albeit a small project to establish a new passing loop) had been approximately $200,000 per linear km. HCS has reviewed the Alcoa/Worsley indicative quote for $131,000 per linear km and had some concerns in relation to the detail outlined in the confidential appendix. Consequently, HCS support the $140,000 per linear km proposed by WNR as reasonable and efficient based on general consistency with costs for major new earthworks project on other leading Australian rail networks. Drawing upon the latest revised rate proposed by WNR for the SWM, HCS believes the same rate should apply for the grain lines and the Worsley-Premier (or Collie East) line due to the similar generally flat terrain and similar earthworks profiles. The revised lower rate for the SWM proposed by WNR indicates that efficiencies may be available which could be assumed to be extracted for other lines in similar terrain. Consequently, HCS recommends reducing the WNR proposed rates from September 2006 for the Esperance, Leonora and the EGR (Avon to Kalgoorlie) also by 12.5%. More specifically, HCS is of the view that the assumed profiles for the grain lines and the Worsley-Premier line are similar warranting the same assumed cost. However, HCS recommends using the original WNR proposed rate for the dual gauge/double track component of the EGR (Forrestfield to Avon) of $182,692/km as this rate reflects the efficient cost for this larger formation in steeper terrain assuming 85% cut to fill. For the Bunswick-Worsley line, the greater grades on this line means there is assumed use (85%) of the cut to fill approach which makes its costing basis different to the flat terrain routes. To assess a reasonable earthworks rate for Bunswick-Worsley line, HCS in collaboration with the ERA, utilised the 2003 WNR rate for cut to fill of $9.16 per m^3 (and then escalated this rate by 13% to 2006 cost levels), the WNR proposed borrow to fill unit rate for 2006 ($19.23/$m^3$) and $9.62 per m^2 for the for capping layer. The subsequent estimated recommended unit cost of earthworks for the Bunswick-Worsley line is $174,500/km. This rate is 3% above the rate proposed by Alcoa/Worsley and 19% below the rate proposed by WNR. Route specific earthworks costs recommendations are provided in Table 11.

[13] This elongated nature of rail sites and other aspects required for rail earthworks increases unit costs due to the need for site and construction management, limited site construction width for equipment movement, the need for toe-in of batters to reduce sideways movement (especially on curves), greater costs for topsoil stripping, stockpiling and relaying on batters, higher costs for provision of environmental protection/silt barriers to watercourses, greater costs for access points and pads for maintenance, including removal and revegetation of construction roads at completion and greater security costs.

Test	Outcome
Bridges & culvert costs unit prices should be based on efficient costs today (& not 2003 costs indexed)	WNR submissions stated that an escalation approach was used as WNR did not have enough recent construction volumes for new bridges to provide documentary evidence on the most recent unit price outcomes. WNR additionally held the view that the rise in unit costs for bridges & culverts between 2003 and 2006 would be likely to be in excess of their escalation claim based on the ABS index rise of 17.3%. Whilst, ideally, this PwC/HCS review would have appreciated more evidence to assess the change in bridge and culvert costs, after assessing a range of cost index movements (see Table 6) these provide support that construction costs have risen by more than the proposed escalation (generalised range 20%-40%).
Inclusion of communications backbone costs omitted from the 2003 review	WNR has requested that the ERA include $4.99m of communications backbone assets for the Kwinana to Bunbury line into the GRV which were inadvertently overlooked in 2003 review. Some communications backbone components were also omitted for the Forrestfield to Kalgoorlie routes. The reason for the omission of some communications backbone components in 2003 was due to oversight by WNR staff. PwC/HCS has discussed this issue in detail with WNR and has also reviewed a breakdown of the omitted components and confirms they are prudent and necessary inputs for an effective communications system.
Efficiency of WNR proposed communications backbone costs	The communications GRV nominated by WNR for the SWM is $10.67m (excluding design and project management) from July 2006. This amount includes the $4.1m (that only refers to the SWM) that was omitted at the last determination. The model then adjusts the base GRV by 20% (to $12.81m) for design & project management (consistent with the costing principles approved 20% allowance). The amount nominated by WNR is largely based on the outcome of a competitive tender to install the actual optic fibre backbone system used by WNR. As discussed in Table 6, the WNR proposed comms GRV is a 16.7% escalation from the 2003 cost level (after adjustment for omissions) to adjust for cost movements to July 2006.[14]. However, as noted by PwC/HCS in Table 6, a lower escalation of 7.8% is appropriate to recognise the relative flatness in the prices of comms and broadcasting materials and components. This change in the escalation factor would reduce the comms GRV for the SMW to $11.51m. Indec (on behalf of Alcoa/Worsley) provided a confidential submission from an ICT consultant which contained a specification and indicative quote for a comms backbone for the SWM which came to a total cost of $8.75m which is $4.05m less than the proposed WNR GRV. As the consultant specification was confidential, a full evaluation of its feasibility and safeworking compliance, particularly by WNR, was not possible. Unlike other parts of a rail network, the quantities and types of components used to form a comms backbone can have significant variation The WNR submission (7 May 2007) stated that the Indec proposed $8.7million comms GRV for the SWM was "a hypothetical cost (based on an unknown specification) compared to a WNR valuation that is based upon a real contract price." In relation to explanatory factors for the difference between the WNR comms GRV and the Indec confidential comms GRV from the consultant, some of the key differences are: - WNR includes copper backbone Coolup-Picton as well as each siding (the consultant has only 10km in sidings) - The consultant generally includes 10% for project management (WNR includes the approved 20% project design, construction management and project management margin) - HCS is unclear that adequate allowances are made for installation. The general consultant's approach is to allow 40% of equipment costs (which is usable for ballpark quotes) whereas WNR has actual install costs from its contractor post a competitive tender. - HCS is unclear that the consultant had sufficient provision for buildings/sheds (as compared to actual required for the safe working of the SWM) - Different types/brands of components & quantities (eg radio towers) HCS also has an overarching concern, that the consultant's quote contains the comment that equipment specification is "best guess" & "may not represent a functioning system solution". Whilst this quote is arguably a standard disclaimer, it also to an extent typifies the complexities involved in developing an MEA specification for a rail network comms backbone. As indicated in the 2003 Determination, communication and signalling network backbone provides the "Safe Working" validation for the rail network. The WNR submission correctly states that the comms network must have a level of redundancy required to satisfy operational capability for freight and passenger services for the entire SWM. The method of developing the WNR actual communications network had been reviewed by PwC/HCS previously as a "design and construct" contract provided by competitive tendering and accordingly, value for money and efficiency have been achieved as well as compliance requirements of safe working. Overall, the WNR proposed 2003 unit costs for communications assets were based on a competitive tender and hence they appear reasonable, inclusive of economies achieved by large scale orders and

[14] See WNR Submission to ERA August 2006 p 18.

Test	Outcome
	capturing efficiencies via combining some trenching for signalling and communications assets. The use of a lower escalation of 7.8% recognises the stability in comms components prices and reduces the comms GRV for the SMW to approximately $11.51m.
Signalling asset list and installation	Many of the comments made for the communications backbone also largely apply for the signalling assets components and their installation. PwC/HCS has discussed the signalling asset list and installation approach in detail with WNR and views these outcomes as reasonable. PwC/HCS has also reviewed the 2003 unit costs and has confirmed them to be reasonable and inclusive of economies achieved by large scale orders. However, the same reduction to the escalation rate from 16.7% to 7.8% is also recommended for the signals GRV.

PwC addressed the remaining concerns raised in the joint submission from Alcoa and Worsley by requesting additional supporting information from WNR. Table 9 presents the results of those tests.

The Alcoa/Worsley submission also raised some issues around the application of the MEA assumption for calculating the GRV of the network which are discussed in the section below.

Modern Equivalent Asset issues

In its submission, Alcoa recommends that *'based on the failure of WestNet to provide the MEA standard claimed in December 2002 over the entire SWM, the ERA needs to monitor that MEA upgrades are delivered on a timely basis or alternatively act promptly to revise the ceiling down until the committed standard is delivered'*. However, the basis of the MEA is defined in the Costing Principles as *'an optimised network that is re-configured using current modern technology serving the current load with some allowances for reasonably projected demand growth up to five years into the future. The MEA excludes any unused or under utilised assets and allows for potential cost savings that may have resulted from technological improvement.'*

WNR during the 2003 Determination provided SWM stakeholders with summary level capital works planning documents which outlined a series of sleeper and ballast upgrades to move closer to the MEA for most components. A supplementary submission to this 2006 review by WNR stated that it has completed 55% of the SWM upgrade for concrete sleepers and that the remaining 76km of timber sleeper would be targeted for upgrading to concrete in 2008/09.

It should be noted, however, that for some components of the MEA specification, such as the earthworks height, it may be prohibitively costly (ie not economically efficient) for the rail network owner to universally adopt the MEA as the minimum actual standard. Reinforcing this interpretation of the intent and requirements of the regime were comments from the Independent Rail Access Regulator within the 2002 Costing Principles Determination which confirmed that *'there is no obligation for the railway owner to provide a network that is MEA or to adopt the specific maintenance practices assumed in the regime as its actual practices. However, Clause 13(c)(i), Schedule 4 of the Code requires the prices for access to reflect the standard of the infrastructure concerned and the operations proposed to be carried on by those using the network.*' It should be noted, however, under Schedule 4 clause 2 of the Code, the ERA has the discretionary judgement on when it is appropriate (ie efficient and reasonable) to apply the MEA standard and consequently, the ERA's September 2003 Determination stated that the Regulator will monitor service levels and will revise the MEA standard if it can be demonstrated that WNR is consistently not meeting the expected level of standard and service.

Overall, it was not the intention of the ceiling price calculation within the WA Regime to require the network owner to provide a completely MEA compliant network. However, it may be commercially sensible for the network owner to progressively implement components of the MEA specification (eg replacing timber sleepers with concrete) over a nominated timeframe. The intention of the MEA was to facilitate the setting of the absolute upper limit of prices using a simplifying set of modern construction assumptions, with prices to be negotiated to appropriate levels below the ceiling to reflect the standard of the infrastructure concerned. This approach:

- reduces regulatory costs by simplifying and streamlining ceiling price calculations,
- provides some potential to pass onto to customers gains from technological innovation (eg centralised train control);
- precludes inefficient outcomes which could require the network owner to replace otherwise fit-for-purpose assets prior to their life expiry (eg timber bridges or lower height formations); whilst
- protecting access seekers from abuse of monopoly power by containing the upper limit of prices to the efficient cost levels which would prevail if the network was totally replaced.

To understand the materiality of the difference between a ceiling cost based on current configuration and the MEA, Section 5 of this report provides a sensitivity test which compares the ceiling costs of the SWM in its current state (45% timber sleepers) and under the MEA assumption (100% concrete sleepers).

4. Review of WNR input prices

Approach to assessing the reasonableness & efficiency of input prices

WNR's unit rate costs are generally consistent, whether the materials apply to grain or main lines. Those rates are provided in WNR's respective submissions to the ERA on the proposed costs for the grain and main lines.

The approach to assessing the reasonableness and efficiency of input prices has been to:

- Build upon efficiency testing completed in 2003 by HCS/PwC and Bovis Lend Lease and focus on assessing reasonable cost movements over the intervening period;
- For key costs which form a significant proportion of the ceiling cost, we have requested and reviewed the supporting third-party documentation of actual costs or cost quotations which WNR based the unit rates upon;
- Closely assess proposed alternative unit rates nominated in stakeholder submissions, particularly the submissions from Indec on behalf of Alcoa/Worsley;
- Hold discussions with major input suppliers and with other rail network operators to seek benchmark / comparative unit rate information for major cost items (eg rail, sleepers, earthworks);
- Assess and consider unit costs applied by other regulators(eg ESC, QCA) in rail access cost decisions for the major cost items.

However, PwC/HCS has not audited the WNR proposed floor and ceiling costs nor have we completed a full bottom up replication of the proposed floor and ceiling costs by calling for tenders/quotations for all network components. Table 8 summarises the outcomes of those reasonableness checks.

Mix of Rail Sizes used on WNR Network

A key item in the reasonableness checking of WNR proposed ceiling prices relates to relative prices of rail by weight category per tonne. This issue is material for ceiling prices for the WNR network due to its mix of 41kg, 50kg and 60kg rail with WNR seeking a 7% premium for 50kg and an 11% premium for 41kg rail over the nominated price for 60kg rail. The most popular size for new rail being layed in Australia is 60kg per tonne rail with its price being considered to be the more readily established efficient / high volume market benchmark price. By contrast, in the case of 50kg and 41kg rail, while market price data is available it is based on more modest volumes. The current lower demand, less frequent production and smaller production runs of 50kg relative to 60kg rail means that costs of producing 50kg rail are higher.

Whilst the general reasons behind the current price differences for 50kg and 60kg per tonne are understood to be mainly based on economies of scale, we do not have access to relevant cost data to establish the actual relativity of production costs between these weight categories when both are reduced at high volumes. However, we expect that the costs of inputs (raw materials, energy etc) would represent a large percentage within the total cost structure of rail production, and that those input costs would not vary to any significant degree on a $/tonne basis in the production of the different rail categories. This general characteristic of the production cost structure would serve to moderate the effect of any diseconomies of scale on total production costs. Consequently, under high volumes assumptions, the current prevailing premium for 50kg (due to its lower economies of scale than 60kg) is expected to dissipate and total production costs expressed $/tonne basis is unlikely to be significantly different. Hence it appears reasonable, under high volume assumptions for competitive market-based prices for both weight categories to also broadly aligned. This position is considered to be a more realistic than alternative positions ie that 50 kg/m rail production costs will be materially higher, or lower, than those for 60 kg/m rail.

It should be noted that in assuming that large volumes of 60kg and 50kg rail can be purchased for the same price in $/tonne, that 50 kg rail will remain 17% cheaper than 60 kg rail when assessed on a $ per km basis.

Earthworks

The submissions to the Draft Determination identified an issue with regard to earthworks costs and quantities in relation to the various heights, widths and unit costs for earthworks formations used for the 2003 Determination, how these were utilised in practice and then how they should be updated for 2006.

To improve clarity, the proposed earthworks approach for the 2006 Determination focussed on efficient rates per linear km by route. This should avoid the uncertainties previously identified. The assumed formations for all routes include a total formation height of 1.0m or 1.5m as applicable for the various lines including a 0.230m imported limestone capping layer

To derive these rates per linear km HCS has assessed the route as to the proportion of earthworks fill derived from cut to fill and borrow to fill. In this regard all routes on flat terrain are assumed to be 100% borrow to fill with a distance of less than 3kms. The Brunswick to Worsley line, due to its steeper gradients, is assumed to be 85% cut to fill and 15% borrow to fill (from a distance of less than 3km). HCS has then assessed efficient rates per linear km for earthworks including limestone capping layer for each route based on assumed dimensions outlined above. The recommended costs are summarised in Table 11.

HCS has assumed that the recommended costs cover all the costs which an earthworks contractor be reasonably expected to incorporate into a quotation for railway construction, including;

- construction preliminaries and service relocations
- construction approvals (where appropriate)
- environmental issues relating to the construction activities
- security during construction including fencing, lighting and access
- workplace, health and safety requirements, and
- site specific requirements eg protection of roads, etc to be converted to level crossings etc

The costs for each rail route, were then compared against earthwork costs per liner km for major recent and current road and rail projects including;

- Kwinana Freeway
- Alice Springs to Darwin Railway
- coal lines in Queensland for QR particularly the new Rolleston line

Summary of other sample tests on the reasonableness of the key unit prices

Table 8 summarises the outcomes of those reasonableness tests checks.

Table 8: Summary of Reasonableness of the key materials and capital items' prices

Item	WNR Proposed Price ($)	Reasonable?	Justification
Track			
Steel sleeper cost for DG	289	✔	Verified by reference to a May 2006 quote from OneSteel. The price is comparatively high due to low production quantity for this product.
Cost per 60 kg/m Rail per tonne (including flashbutt weld and delivery to Midland)	1,440	✔	As per Table 7, PwC/HCS has tested the WNR proposed cost by obtaining the breakdown of the price paid by a leading Australian rail network operator including transport and flashbutt welding and the WNR proposal is reasonable.

Item	WNR Proposed Price ($)	Reasonable?	Justification
Cost per 50 kg/m Rail per tonne (including flashbutt weld and delivery to Midland)	1,500	✗	Recommend assuming price is equivalent to the 60kg price. While the premium for 50kg is generally justified based on lower volumes (ie less economies of scale in production), these need to be adjusted for a significant order quantity of 50 kg/m rail, We consider price equivalence in $/tn of 50 kg/m rail with 60 kg/m rail to be obtainable in this instance.
Cost per 41 kg/m Rail per tonne (including flashbutt weld and delivery to Midland)	1,600	✗	Recommend assuming price is equivalent to the 60kg price for same reasons as per the price adjustment for 50kg rail.
Timber sleeper cost for DG	147	✓	The WNR cost is lower than PwC/HCS estimates of market costs. WNR advise that the reasons behind the sharp rise in the DG timber sleepers is unclear and that the cost of the jewellery for a DG sleeper in the original determination may have been understated. The plates and fasteners on a DG sleeper are factored by 1.5 of a SG sleeper to allow for the third rail on the DG sleeper.
Concrete sleeper cost for SG	95	✗	As per Table 7, PwC/HCS has tested the WNR proposed cost by obtaining the breakdown of the price paid by a leading Australian rail network operator including transport and jewellery. Lower prices are obtainable on the east coast compared to current WA prices driven by higher volumes and economies of scale. This analysis requires an assumption of large volume purchases providing economies of scale. Whilst WNR has provided evidence from Humes supporting sleeper costs of $85(NG) & $95(SG) including jewellery the Rocla evidence illustrates that the Humes price does not appear to represent the most cost efficient outcomes achievable from a large scale competitive tender.
Ballast cost per tonne Esperance	26	✗	A lower price is available from Hanson for rail ballast ex-quarry at Bunbury. Refer to Table 7. The average price paid for rail ballast across central Australia is $15 per tonne ex-quarry. As a comparator, albeit interstate, prices endorsed by the ESC in the Victorian Rail Access decision were $25 per tonne ex quarry and $30 per tonne delivered. Price data was obtained from the SWM ($20.70) and from the Kalgoorlie region ($15/tn ex quarry). These prices were drawn upon, with adjustments for delivery to more remote locations based on WNR unit price differentials, to inform the final recommended prices. This issue is further discussed in Table 11 of this report.
Cost per 47 kg/m turnout for DG	412,726	✓	The rates provided by the supplier are similar to that provided to other rail operators. Furthermore, the $192,872 sought by WNR for SG turnout is less that the $220,000 paid by ARTC in November 2006.[15]
Catchpoint cost per item	46,000	✓	Verified by reference to a October 2006 quote from VAE Railway Systems
Earthworks: Kalgoorlie to Leonora South West Main	 250,000 140,000	 ✗ ✓	The methodology used by WNR in 2003 Determination to implement the HCS recommended 'blended' rates per cubic metre has been clarified and updated. HCS recommends a change of methodology for earthworks as previously indicated to use rates per linear km. PwC/HCS concurs with Worley Parsons that the formation fill for most routes will be sourced locally (generally from "borrow"). For the rail lines in steep terrain (e.g. Brunswick to Worsley line) 85% cut to fill and 15% borrow to fill has been assumed. For all routes the higher-quality limestone capping layer is assumed to be fully

[15] As per the ARTC press release, at www.artc.com.au/docs/news/pdf/news_011106.pdf

Item	WNR Proposed Price ($)	Reasonable?	Justification
			imported. The recommended earthworks rates for other routes contain a number of changes from WNR proposed rates and these are summarised in Table 11.
Tracklay Brunswick to Worsley	117,510	✗	Track laying is not often tested for price, hence WNR consulted with contractors and most tracklay prices were adjusted by 17% - coincidently the same rise as the ABS based rise of 17.4% used elsewhere in this report. However, this proposed tracklay increase is 25% is higher than the other tracklay rises. After considering this issue particularly the reasonable proximity of the Worsley line and the SWM, and in the absence of more specific detail on why tracklay costs more for the Worsley line, PwC/HCS recommends assuming a uniform rise in tracklay costs.
Culvert			
2100X2100	4,554	✔	Material cost agreed to quote provided by Humes. Installation cost expressed as 80% of material cost, in accordance with the ratio approved in the 2002 determination.
2400X2400	5,202	✔	

PwC/HCS additional assessment of concerns raised in the joint submission from Alcoa and Worsley is summarised in Table 9.

Table 9: Outcomes of additional testing in response to the Alcoa/Worsley submission

Test issue	Outcome
The reasoning behind the locating of the new loop at Venn to the north of Pinjarra	WNR explained that the requirement for the new crossing loop at Venn (north of Pinjarra) is based on future pathway requirements. The Pinjarra crossing loop is constrained from further extension due to major protected level crossing infrastructure to the north and south of Pinjarra. The preferred site of Venn has been selected to accommodate a long loop consistent with other loop extensions along the SWM corridor. PwC/HCS tested whether the shorter loop at Pinjarra will still be required if a loop is added at Venn and WNR advised that the Pinjarra loop is still needed as it is the stopping place for the Australind passenger services and for passing short trains. Pinjarra is the junction point for all Alcoa traffic from Calcine to Kwinana. The Pinjarra loop will be required to hold Alcoa trains departing from Calcine when opposing trains are in the same section. However, it is noted that Alcoa claims their trains departing Calcine and heading north can be held on the branch line until the mainline is clear so it appears unlikely that another loop just 2km north of the existing branch line at Pinjarra East would be required. Overall, PwC/HCS is of the view that, based on WNR train path projections, the proposed new loop at Venn will be operationally justified. However, as the timing for the construction of the new loop is to be primarily driven by demand from existing customers, it is not clear as to when this will eventuate and therefore PwC/HCS have excluded it from the present GRV and resulting floor and ceiling calculation. However, if WNR subsequently needs to provide the Venn loop before 2009, it may be appropriate to adjust the ceiling cost to reflect this addition.
The reasoning behind the change in cost for the Burekup loop	It is also noted that WNR originally sought a capital cost of $1.35m based on an initial desk-top estimate developed by the WNR Access Group. WNR later revised this estimate based on input from the WestNet Engineering Group to a capital cost of $3.22m with the cost growth mainly driven by an understatement in the allowance for signalling costs. HCS has also confirmed that the WNR proposed cost of $3.22m was the actual cost incurred. In the instances of incremental additions to loops to accommodate growth, it appears reasonable to base the addition to the GRV on actual cost (rather than loop costs at the time of an assumed full new build) so as to give WNR incentive to expand the network capacity in response to growth in train paths.
The reason behind the locating of the new loop at Burekup	WNR explained that they had been in consultation with users of the network on the need for a passing loop at Burekup. Target commissioning date is set for Q3 2007. Overall, PwC/HCS is of the view that, based on WNR demand projections, that the proposed new loop at Burekup is operationally justified.
The justification for the three loop extensions	WNR explained that the extension of Brunswick, Benger and Yarloop to accommodate longer trains is necessary to maximise pathway utility. Network management planning has been undertaken to consider all future expansion requirements of all current WNR customers, including Alcoa, Worsley, Griffin, Cockburn Cement, Iluka and the general freighters. The Alcoa/Worsley submission endorses only needing an extra passing loop at Burekup. While Alcoa/Worsley notes in the future there is a need for extended loops between Pinjarra and Bunbury if longer trains are required to meet future increases in tonnages, at this stage Alcoa has no plans to increase train lengths. Alcoa/Worsley also note that if Worsley expands operations there will be a requirement for additional loops between Brunswick Junction and Bunbury Inner Harbour. In order to have operational flexibility the new and extended crossing loops are deemed by WNR to be necessary to accommodate the known expansions from the existing customer base. To date, Griffin has already absorbed a daily pathway between Brunswick and Kwinana. While other expansions have not yet been contractually agreed, WNR is obligated to provide for existing and reasonable projected demand. The lead time to seek all planning and statutory approvals including construction exceeds 12 months. WNR maintains that it must consider network capacity from the customers' perspective, as well as ensuring the operational integrity to maximise on-time service delivery. Overall, PwC/HCS is of the view that the proposed extension of three loops is operationally justified.
Was the 23% increase in overheads driven by underlying cost growth or the emergence of WNR as a stand-alone entity?	WNR maintains that the rise in overheads is driven by both the physical separation of the company and the underlying cost growth, with an offsetting decrease in insurance costs. In the 2003 determination, the overheads were allocated between three business entities operating under the Australian Railroad Group (ARG). Since its sale in June 2006, WNR operates as a stand-alone business and the operating budget approved by the Board of Directors is the basis of the overheads used in the Access Pricing Model.

Test issue	Outcome
	WNR provides the following to justify the increase: ▪ Perth CPI increased 13.6% since the previous determination, which has driven a genuine uplift in costs; and ▪ The overhead baseline approved in the September 2003 determination was based on a shared services model with ARG and an assessment of WNR's level of consumption of those shared services. As overheads are primarily wages and salaries, and given that these have generally risen by an average of 4% pa over the past 3 years (or 12.5% in total), it would appear that the 23% rise in overheads is comprised of 54% wages growth and 46% cost growth associated with the separation into a standalone entity. Overall, PwC/HCS is of the view that the proposed rise in overhead costs appears reasonable given intervening wages growth and the extra costs associated with separating the above and below rail businesses arising from the sale of ARG (AWR and WNR) to QLD Rail (above rail) and Babcock & Brown (network or below rail) respectively.

Maintenance costs

Both submissions received, raised the issue of maintenance costs. A review of WNR's proposed maintenance costs for all lines has been undertaken.

Table 10 lists the proposed WNR price for the six main lines and the terminal end sections. Overall WNR has proposed a uniform escalation of 17.4% (based on ABS indices) to the 2003 Determination rates to provide the 2006 unit costs.

Table 10: Proposed maintenance cost per kilometre for the main lines

Route	2003 ORAR Approved Unit Costs ($ per km)	2006 WNR Proposed Units Costs ($ per km)
Kwinana to Bunbury	15,000	17,610
Brunswick to Worsley	15,000	17,610
Worsley to Premier	8,000	9,392
Terminal end sections (9)	8,000	9,392
Forrestfield to Kalgoorlie	16,000	18,784
Kalgoorlie to Esperance	10,000	11,740
Kalgoorlie to Leonora	8,000	9,392

In assessing the reasonableness of WNR's proposed maintenance costs for undertaking routine maintenance for a MEA network which commences from a new condition, PwC/HCS compared the WNR proposal to the actual maintenance unit costs being incurred in maintaining the existing network. Whilst these actual maintenance unit cost outcomes are confidential precluding release of full details, the proposed WNR maintenance costs on four of the mainlines are between 8% and 50% below the actual WNR 2006 unit cost outcomes. The WNR May supplementary public submission provided further public detail (confirming detail provided already to HCS/PwC) that the actual maintenance costs for the SWM in 2006 were $24,087/km.

However, on one of the mainlines the WNR actual 2006 cost was 32% below the proposed unit cost with this being due to how maintenance effort is deployed over the network within any one year.

It should be noted that the WNR $6.0 million contract administration, management and overhead cost of the maintenance contracts as indicated previously in this report are excluded from the Maintenance Costs per km for individual lines as indicated in Table 10 above.

The initial Alcoa/Worsley submission provided a maintenance cost specification suggesting an efficient cost of $12,700/km for the SWM. This was an update of their 2003 submission which lifted the rate by 7.5% to reflect current labour rates. The key difference between the WNR unit rate and the Alcoa/Worsley unit rate is the latter's view that at MEA there should be a lower number of trackside staff because of concrete sleepers as the current focus on inspection-related work to ensure safe working would be reduced and at MEA there is no need for extra staff to complete rail grinding to improve rail life and rideability.

After reviewing both labour specifications and assessing resources required to concurrently fulfil both the inspection requirements of the Rail Safety Act and other routine maintenance functions, PwC /HCS is of the view that the WNR staff proposal is reasonable.

WNR has proposed an approach to maintenance costs which uses the unit rate as the average across a route but within route sections WNR has proposed to use higher and lower unit rates reflecting factors such as the complexity and asset count of specific sections of track (eg turnouts, cross overs, signals, level crossings). PwC/HCS has reviewed the proposed approach and view it as reasonable particularly as it does not impact overall route costs.

After reviewing the HCS comments from our March 2007 report, the Alcoa/Worsley supplementary May 2007 submission provided information from an interstate infrastructure consultant who they engaged to independently generate a new maintenance model for the SWM based on complying with the Code of Practice for the DIRN (Defined Interstate Rail Network) Volume 4 Track, Civil and Electrical Infrastructure Part 3 Infrastructure Guidelines as the reference standard for inspections. Based on the DIRN modelling, Alcoa proposed that maintenance costs should be $15,273/km for the SWM and for the Brunswick to Worsley sections of line. This new proposed rate from Alcoa/Worsley represents a 20.2% rise from their initial 2006 submission and the gap between this new rate ($15,273) and this WNR rate ($17,610) has narrowed to 13.2%. However, the full details of the Alcoa/Worsley DIRN maintenance costing were claimed as confidential which precluded the opportunity for this to undergo a transparent critique by WNR and it also limits the extent of feedback that HCS can provide on its reasonableness and achievability. Nevertheless, in relation to the new DIRN costing, whilst the new specification is closer to a reasonable and efficient costing, HCS continues to have uncertainties on the adequacy of resources and labour allowances. In particular the new costing again appeared to understate inspection and fettling costs.

The March 2007 Version of the HCS/PwC contained a table (Table 11) which sought to provide an upper level comparison of maintenance costs in other Australian states. Table 11 recognised that some of this data included MPM which is excluded from the WA maintenance costs. The Indec submission noted that MPM can form 50% of total maintenance costs. However, the extent of MPM included in Table 11 is relatively modest as some of the jurisdictions which were assessed capitalise significant parts of their MPM costs and other networks, particularly on grain lines, have had minimal MPM.

The 2003 Clause 9 Determination reviewed the issue of estimating efficient routine maintenance unit costs in detail. The PwC/HCS recommended levels were then independently reviewed, checked and tested by rail engineers from Bovis Lend Lease with this review endorsing the PwC/HCS unit rates as reasonable and efficient. In summary, the 2003 Clause 9 Determination reported that QR's average maintenance cost (excluding MPM) is;

- just over $6,000/km on 16-19tal branch lines with annual tonnages of less than 1mgt,
- between $7,000-$9,000/km on 19tal lines where annual tonnages are in the range of 1 to 3mgt and
- between $8,000-$11,000/km on 19/21tal lines where annual tonnages are in the range of 3 to 6mgt, depending on terrain and location.

Whilst it would be reasonable to now escalate these 2003 QR rates by approximately 17% these rates continue to support retention of the proposed 2006 rates.

Overall, the proposed WNR increase in maintenance costs of 17.4% appears reasonable as it is in line with the relevant ABS indices, as established in Table 6. This increase is also consistent with the rise in the cost of the John Holland outsourcing contract.

Operating and overhead costs

In the period since the separation of WNR into a standalone entity, WNR has had associated headcount growth in HR, IT and the Commercial groups which has added to costs. This has been significantly offset by a reduction in insurance costs. PwC/HCS has completed a range of assessments of individual items in the operating cost budget (as summarised in Table 6) as well as other aggregate comparisons.

Train Control Cost Allocations

The Alcoa/Worsley submission requested that the Authority review the applicability of using current Train Controller numbers rather than benchmarking the required numbers for the MEA. Alcoa/Worsley suggested that two screens (and therefore two Train Controllers) requiring 9.2 FTEs for 24/7 coverage would not be efficient practice on a new installation with full CTC control over the SWM, the Terminal Ends and the Worsley line. Alcoa/Worsley propose, based on consultation with train controllers from other states, that only one CTC screen would be required for SWM and therefore a maximum of 5 FTE would be required to give 24/7 coverage. The WNR submission commenting on this issue noted that the two control positions also covered the Bunbury Port & the Kwinana Yard (as well as the SWM, the Terminal Ends and the Worsley line) and that halving train control resources would lead to delays in managing conflicting train priority requests and reduced service levels. Overall, HCS is of the view that two screens are required to provide adequate service quality given the relatively high number of train movements across the relevant lines (SWM, Worsley, Terminal Ends, Bunbury Port and Kwinana Yard), the growth rate in these train paths over the next 3-5 years and the rising number of passing loops across these lines (which when in use require train controller actions).

Allocation methodologies

The approved WNR Costing and Pricing Principles (2003) endorse the allocation of operating costs based on train movement number (or train paths) and the allocation of overhead costs based on 50% train movements and 50% gross tonnes kilometres (GTKs). In 2005/06 ERA established a working group of interested stakeholders to assist with the review of methodologies for allocating common costs for the purposes of calculating floor and ceiling costs under the WA Rail Access Regime. Following the review of methodologies in other jurisdictions, the working group recommended that train control costs to be directly attributed to rail lines based on time spent by train control staff monitoring specific lines. This new approach had the desirable benefit of reducing the quantum of operating costs requiring allocation and producing a more accurate/cost reflective outcome. The new cost allocation methodology is reflected in the proposed WNR costs and the recommended PwC/HCS floor and ceiling costs for rail lines.

In the submission from Alcoa and Worsley, it is stated that they still do not consider that the allocation of common costs to route sections provides a fair representation of allocated costs but they do acknowledge that the direct allocation of operating costs has been improved substantially since 2003 although the overall increase in these costs on a network wide basis is totally unacceptable and does not reflect efficient costs. Alcoa/Worsley notes that the amount of overhead allocated to the terminal end bits remained proportionally excessive. The short nature of these sections coupled with the relatively higher number of movements sees the ceiling prices in these sections made up of proportionally more overheads.

The April 2007 submission from Indec suggested placing a cap of 20% on the proportion of overheads for any particular section. Overheads in excess of this capped proportion would need to be re-allocated probably to the nearby line section(s). In assessing this issue, PwC/HCS is of the view that any cap level would be arbitrary and the reallocation would be likely to see the original parties bearing the overhead costs still bear this cost. Additionally, assessing the equity of the overhead allocation is best done on a

route basis, rather than a route section basis. Arguably the better solution to this issue, and an approach which better compliments the light handed nature of the WA rail access regime, may be to re-combine the terminal ends with the adjoining route.

Alcoa and Worsley also sought:

- a more detailed breakdown of Operating Costs including separate figures for Working Capital, Operating Costs, Overheads and Network Management Costs for the lines under review.
- identification of costs allocated to other lines on the network not the subject of the proposed review.
- key indicators, such as number of full time equivalent employees, transaction costs and IT costs to prove efficient costs are being used.

PwC/HCS has reviewed such a more detailed breakdown as part of a confidential submission lodged by WNR with summarised results provided in Table 6 of this report.

5. Conclusions

The costs that PwC recommends be changed are shown below in Table 11.

Table 11: Recommended cost changes

Item[16]	2003 Approved Price ($A)	2006 WNR Price ($A)	2006 Alcoa Price ($A)	2006 Recommended Price ($A)	Justification
Track					
Cost per 60 kg/m Rail per tonne (delivered Midland)	1,102	1,440[17]	1,440	1,440	As per Table 7 – WNR price appears reasonable.
Cost per 50 kg/m Rail per tonne (delivered Midland)	1,173	1,500[18]	as above	1,440	The price for 50kg should be reduced to the 60kg price (reasons explained in Table 8)
Cost per 41 kg/m Rail per tonne (delivered Midland)	1,138	1,600[19]	as above	1,440	As above for 50kg/m Rail
Concrete sleeper cost SG (delivered Midland)	81	95	83	90	The information from Rocla suggests that higher volumes can generate economies of scale and lower prices down to $86/sleeper (ex-works). WNR has generally assumed an order size for the GRV of 100km of track[20] which is equivalent to an order of 160,000 sleepers which is approximately a quarter of the size of the recent order placed by ARTC with Rocla (550,000pa of 1.35m over 2.5 years). The transport component of this cost (Welshpool-Midland or 20km) is not material and may well be included as part of large orders. Consequently, PwC/HCS recommends the

[16] PwC tested a sample of the items for which unit prices were provided. For those categories which yielded discrepancies between the price sought by WNR and the price deemed appropriate by PwC – such as ballast – all the items in that category were then calculated and listed in this table.
[17] Price includes delivery to Midland
[18] Price includes delivery to Midland
[19] Price includes delivery to Midland
[20] See Annexure 7.1 of WNR Proposed Costing Principles (2002) http://www.era.wa.gov.au/rail/files/determination/finalcost_prin.pdf

Item[16]	2003 Approved Price ($A)	2006 WNR Price ($A)	2006 Alcoa Price ($A)	2006 Recommended Price ($A)	Justification
					WNR price be reduced by 5% to recognise a further scale discount but result in a price slightly above that of the $86 ex-work price for Rocla and also recognising WA may have some other input costs which are higher than eastern states.
Concrete sleeper cost NG (delivered Midland)	72	85	75.50	82	The NG sleeper price is typically 8% to 10% below the SG price based on it being shorter (requiring less concrete) and being cheaper to transport. PwC/HCS recommends a 9% reduction from the recommend SG price.
Ballast cost per tonne Bunbury (ex quarry)	15	25	20.70	20.70	The March 2007 report rounded this rate to $21/tonne and this has been changed to exactly match the Hanson quote which has been confirmed as available and reasonable.
Ballast cost per tonne Esperance (ex quarry)	15	26	N/A	20.70	The estimate is based on the Hanson quote for delivery to Bunbury, adjusted based on the relationship of the WNR proposal for Esperance vis-à-vis Bunbury.
Ballast cost per tonne Kalgoorlie (ex quarry)	15	20	N/A	17.00	The estimate is based on the Hanson quote for delivery to Bunbury, adjusted based on the relationship of the WNR proposal for Kalgoorlie vis-à-vis Bunbury.
Ballast cost per tonne Kwinana (ex quarry)	15	25	N/A	20.70	Based on the Hanson quote for delivery to Bunbury with the adjustment based on the relationship of the WNR proposal for Kwinana vis-à-vis Bunbury.
Ballast transport costs	N/A	$0.08 per NTK	$0.08 per NTK ($3.60/tn for 45km for SWM)	$4.80/tn (uniform average rate per tonne to apply to all lines based on $0.08 per NTK over average haul of 60km)	WNR proposed rate (September 2006) is consistent with efficient bulk road haulage unit costs and is hence reasonable. HCS recommends for transparency & simplicity converting it to a uniform rate in $ per tn to apply across whole network.

Item[16]	2003 Approved Price ($A)	2006 WNR Price ($A)	2006 Alcoa Price ($A)	2006 Recommended Price ($A)	Justification
Ballast cost per tonne Midland (ex quarry)	14.60	25	N/A	20.70	The estimate is based on the Hanson quote for delivery to Bunbury, adjusted based on the relationship of the WNR proposal for Midland vis-à-vis Bunbury.
Earthworks South West Main	126,650/Km	140,000/Km[21]	131,000/km	140,000/Km	Recommended rate based on WNR revised rate which WNR reduced by 12.5% from 159,925/Km (September 2006) to 140,000/km (May 2007).
Earthworks Worsley to Premier	112,200/Km	142,094/Km	N/A	140,000/Km	Recommended rate based on WNR May 2007 rate for SWM as line crosses similar terrain.
Earthworks Grain Region	112,200/Km	159,925/Km	N/A	140,000/Km	Recommended rate based on WNR May 2007 rate for SWM (see above for SWM).
Earthworks Brunswick to Worsley	161,000/Km	216,333/km	N/A	174,500/km	Recommended rate based on a mix of 85% cut to fill at the rate proposed by WNR (in 2003 report from GHD escalated by 13%) and 15% borrow to fill using rates proposed by WNR in 2006 ($19.23/$m^3$) and $9.62/$m^2$ for capping layer). The subsequent estimated recommended unit cost of earthworks for the Bunswick-Worsley line is $174,500/km.
Earthworks EGR Avon to Kalgoorlie	219,300/Km	250,000/Km	N/A	218,750/Km	Recommended rate based on WNR September 2006 rate reduced by 12.5% as per WNR proposed rate for SWM.
Earthworks Leonora Line	219,300/Km	250,000/Km	N/A	218,750/Km	Recommended rate based on WNR September 2006 rate reduced by 12.5% as per WNR proposed rate for SWM.
Earthworks Esperance Line	219,300/Km	250,000/Km	N/A	218,750/Km	Recommended rate based on WNR September 2006 rate reduced by 12.5% as per WNR proposed rate for SWM.
Earthworks EGR Forrestfield	173,910/Km	182,692/Km	N/A	182,692/Km	WNR proposed rate is recommended as reasonable.

[21] The Original WNR submission proposed a 2006 cost for earthworks on the SWM of $159,925/km.

Item[16]	2003 Approved Price ($A)	2006 WNR Price ($A)	2006 Alcoa Price ($A)	2006 Recommended Price ($A)	Justification
to Avon					
Tracklay Collie East	94,000	117,510	N/A	110,356	Track laying is not often tested for price. WNR and WorleyParsons used a GHD hypothetical estimate, but an applicable increase should be based on the relevant ABS index. The proposed increase of 25% is higher than the 17.4% rise in the relevant index. PwC recommends that the new price be the 2003 price, increased by 17.4%.
Tracklay South West Main	94,000	117,510	N/A	110,356	The proposed increase of 25% is higher than the 17.4% rise in the relevant index. PwC recommends that the new price be the 2003 price, increased by 17.4%.
Tracklay Grain Region	93,000	116,260	N/A	109,182	The proposed increase of 25% is higher than the 17.4% rise in the relevant index. PwC recommends that the new price be the 2003 price, increased by 17.4%.
Tracklay EGR dual gauge track	126,000	144,300	N/A	144,300	The proposed increase of 15% is lower than the 17.4% rise in the relevant index.
Tracklay Brunswick to Worsley	94,000	117,510	N/A	110,356	The proposed increase of 25% is higher than the 17.4% rise in the relevant index. PwC recommends that the new price be the 2003 price, increased by 17.4%.
Comms & signals escalation factor: 2003-06 (all routes)	N/A	16.7%	0.5%	7.8%	See discussion of this issue in Table 6.
Comms GRV SWM 2006 (including Design & project management)	$10.66m	$12.81m	$8.75m	$11.51m	See discussion of this issue in Table 6.
Comms GRV EGR 2006 (including Design & project management)	$36.7m	$44.17m	N/A	$39.68m	See discussion of this issue in Table 6.

Item[16]	2003 Approved Price ($A)	2006 WNR Price ($A)	2006 Alcoa Price ($A)	2006 Recommended Price ($A)	Justification
Signals GRV SWM 2006 (including Design & project management)	$31.6m	$37.81m	N/A	$34.23m	See discussion of this issue in Table 6.
Signals GRV EGR 2006 (including Design & project management)	$79.8m	$95.93m	N/A	$86.39m	See discussion of this issue in Table 6.

For other key input prices such as culverts, bridges etc the WNR prices have been sample tested for efficiency and economies of scale. Following this sample testing, PwC/HCS did not identify any instances where WNR's proposed costs were significantly above efficient cost benchmarks.

Table 12 lists the floor and ceiling costs as recommended by PwC.

The March 2007 version of the HCS/PwC Report contained incorrect ceiling price levels for the three grain lines and these have been adjusted in the tables below.

Table 12: Proposed and recommended floor and ceiling costs

	Line	WNR Proposal			Recommendation		
		Floor	Ceiling	GRV	Floor	Ceiling	GRV
Grain Lines							
1	Avon to Goomalling	96,253	4,385,906	51,500,188	96,253	4,114,528	47,590,933
2	Katanning to Tambellup	43,360	3,113,897	37,214,363	43,360	2,890,194	34,091,978
3	Kulin to Yimmining	37,780	6,497,751	80,323,583	37,780	5,938,728	72,810,475
	Total	177,393	13,997,554	169,038,135	177,393	12,943,450	154,493,385
Main lines							
4	**Kwinana to Bunbury**						
	Route Section						
	Kwinana to Mundijong Jn	306,908	4,122,772	36,951,012	302,430	3,894,025	34,097,181
	Mundijong Jn to Pinjarra	466,409	6,073,151	56,715,426	444,925	5,484,705	49,629,643
	Pinjarrato Pinjarra East	109,174	689,231	2,310,330	108,651	675,837	2,147,992
	Pinjarra East to Alumina Jn	136,962	788,122	1,311,123	136,917	780,082	1,217,619
	Pinjarra East to Pinjarra South	42,700	311,767	1,211,948	42,644	303,848	1,112,024
	Pinjarra to Wagerup	155,911	3,420,218	35,197,956	154,156	3,221,572	32,578,290
	Wagerup to Brunswick Jn	345,837	5,302,980	51,219,656	341,325	4,993,730	47,287,076
	Brunswick Jn to Picton Jn	344,031	3,503,197	28,706,611	404,264	3,563,420	29,249,898
	Picton Jn to Bunbury Inner Harb	189,931	1,512,097	8,703,167	188,953	1,468,514	8,185,733
	Total	2,097,863	25,723,536	222,327,228	2,124,264	24,385,733	205,505,455
5	**Brunswick to Premier**						
	Route Section						
	Brunswick North - East	5,359	168,677	1,160,381	5,311	154,138	1,043,700
	Brunswick - Brunswick East	13,922	495,309	3,058,037	13,868	431,679	2,869,353
	Brunswick East - Worsley	90,181	2,745,889	26,688,059	88,949	2,559,966	24,149,438
	Worsley - Worsley North	30,126	493,988	2,811,617	29,786	457,424	2,660,282
	Worsley North - Hamilton	50,745	963,112	7,539,517	49,736	889,620	6,709,177
	Worsley East - Worsley North	8,645	133,628	931,376	8,446	122,286	831,199
	Worsely - Worsely East	9,324	253,792	1,447,545	9,297	244,876	1,362,460
	Worsley East - Ewington Jn	62,438	2,156,284	23,458,746	62,022	2,119,310	22,370,746
	Ewington Jn - Premier	4,330	318,765	3,300,240	4,326	301,194	3,031,082
	Total	275,069	7,729,445	70,395,518	271,742	7,280,493	65,027,437
6	**Forrestfield to Kalgoorlie**						
	Route Section						
	F'Field Sth to Midland	537,775	5,858,387	49,811,584	534,169	5,769,252	48,794,554
	Midland to Millendon Jn	607,631	5,960,546	48,544,289	602,288	5,841,116	47,210,935
	Millendon Jn to Toodyay West	1,569,129	17,908,433	173,832,446	1,538,696	17,466,000	169,204,852
	Toodyay West to Avon Yard	767,561	8,499,722	77,612,338	751,671	8,271,006	75,136,611
	Avon Yard to West Merredin	1,324,139	27,746,154	284,831,163	1,263,583	26,031,679	263,566,463
	West Merredin to Koolyanobbing	1,059,754	25,270,734	264,058,081	995,234	23,428,565	241,215,314
	Koolyanobbing to West Kalgoorlie	1,431,828	26,136,888	256,070,979	1,376,209	24,675,997	237,915,576
	West Kalgoorlie to Border	109,055	1,713,078	13,972,929	108,495	1,635,016	13,012,131
	Avon to West Merredin Sidings	10,410	1,560,569	18,181,379	10,410	1,424,316	16,390,211
	West Merredin to Koolyanobbing Sidings	5,496	856,665	10,009,773	5,496	776,923	8,964,627
	Koolyanobbing to W Kal Sidings	2,509	389,339	4,517,230	2,509	360,443	4,134,411
	Total	7,425,287	121,900,515	1,201,442,191	7,188,762	115,680,313	1,125,545,686
7	**Kalgoorlie to Leonora**						
	Route Section						
	Kalgoorlie to Malcolm	287,966	20,533,476	242,226,407	284,628	19,360,560	226,113,645
	Malcolm to Leonora	99,512	2,660,233	28,593,082	98,952	2,509,840	26,564,674
	Menzies sidings	126	23,759	292,864	126	22,078	269,107
	Total	387,604	23,217,468	271,112,353	383,705	21,892,478	252,947,427
8	**Kalgoorlie to Esperance**						
	Route Section						
	West Kalgoorlie to Hampton	219,260	2,500,679	22,340,303	217,681	2,391,060	20,895,126
	Hampton to Kambalda	278,489	4,094,623	39,882,479	274,732	3,915,694	37,422,528
	Kambalda to Salmon Gums	912,974	22,071,889	240,668,582	862,410	20,699,621	222,535,954
	Salmon Gums to Esperance	545,575	11,005,869	117,268,011	526,009	10,409,755	109,289,591
	Kambalda siding	226	43,804	539,171	226	40,900	498,032
	Norseman Siding	195	39,959	492,797	195	36,833	449,418
	Salmon Gums Siding	473	95,592	1,175,055	473	88,742	1,079,147
	Total	1,957,192	39,852,415	422,366,398	1,881,727	37,582,605	392,169,796
9	**Terminal end bits**						
	Route Section						
	Inner Harbour 485 Pt to Alcoa (Inbound)	20,344	515,754	864,067	20,304	512,536	821,388
	Inner Harbour 486 Pt to ALCOA (Outbound)	12,132	334,228	754,239	12,129	332,664	731,641
	Inner Harbour 487 Pt to Worsley (Outbound)	7,531	219,120	631,563	7,531	217,771	612,058
	Inner Harbour 485 Pt to 486 pts	18,694	471,925	408,448	18,694	471,591	403,631
	Inner Harbour 486 Pt to 487 pts	7,145	180,928	173,927	7,145	180,701	170,656
	Inner Harbour 487 Pt to Woodchips	5,596	308,268	4,097,735	5,596	294,159	3,901,171
	Kwinana no3 points to bauxite junction	27,006	477,046	1,877,640	26,772	469,298	1,767,804
	Alcoa Bauxite Jn - Alcoa Bauxite Sdg	12,723	317,211	1,145,613	12,623	311,833	1,068,734
	Alcoa Bauxite Jn - Alcoa Caustic Sdg Pts	5,240	198,203	1,492,691	5,228	190,432	1,380,484
	Alcoa Caustic Sdg Pts -Alcoa Alumina Sdg Pts	2,150	89,188	734,898	2,149	85,331	679,180

Appendix A provides a more detailed breakdown of the above route costs into floor and ceilings by route section including the capital and operating cost components.

Ceiling price sensitivity tests

To understand the relative impact on ceiling costs of specific issues raised in submissions we have completed a sensitivity test, on using the current SWM sleeper mix ie basing the calculations on 76km of the SWM being timber sleepers (rather than concrete). The unit cost used for NG timber sleepers was $103/unit. This is 25% higher than the concrete NG at a PwC/HCS recommended cost of $82/unit as used in the base case. Under this scenario there is an increase in the ceiling cost on the SWM by 1.3%. The route section results of this sensitivity test are provided in the Table 13 below.

Table 13 - Ceiling price sensitivity test: SWM with 76km of timber sleepers

Line		PwC recommendation			PwC recommendation using current configuration		
		Floor	Ceiling	GRV	Floor	Ceiling	GRV
Current configuration							
4	**Kwinana to Bunbury**						
	Route Section						
	Kwinana to Mundijong Jn	302,430	3,894,025	34,097,181	302,430	3,893,937	34,097,181
	Mundijong Jn to Pinjarra	444,925	5,484,705	49,629,643	444,925	5,484,623	49,629,643
	Pinjarrato Pinjarra East	108,651	675,837	2,147,992	108,651	682,629	2,178,928
	Pinjarra East to Alumina Jn	136,917	780,082	1,217,619	136,917	781,023	1,221,701
	Pinjarra East to Pinjarra South	42,644	303,848	1,112,024	42,644	308,486	1,130,084
	Pinjarra to Wagerup	154,156	3,221,572	32,578,290	154,156	3,359,863	33,010,752
	Wagerup to Brunswick Jn	341,325	4,993,730	47,287,076	340,728	5,172,951	47,867,208
	Brunswick Jn to Picton Jn	404,264	3,563,420	29,249,898	404,264	3,563,311	29,249,898
	Picton Jn to Bunbury Inner Harb	188,953	1,468,514	8,185,733	188,953	1,464,978	8,142,220
	Total	2,124,264	24,385,733	205,505,455	2,123,667	24,711,800	206,527,614

Consequently it would not appear efficient and reasonable to use the existing configuration (rather than the MEA) in the ceiling price calculation.

Appendix A Recommended Floor & Ceiling Costs by route Section

SWM

	Section Length	Total Ceiling	Capital	Maintenance	Working Capital	Operating	Overhead	Floor	Total GRV
Total Route	**181.69**	**$ 24,385,733**	**$ 15,595,470**	**$ 3,199,614**	**$ 522,448**	**$ 1,404,938**	**$ 3,663,264**	**$ 2,124,264**	**$ 205,505,455**
Route Section									
Kwinana to Mundijong Jn	29.11	$3,894,025	$2,632,542	$509,567	$88,190	$159,048	$504,678	$302,430	$34,097,180.85
Mundijong Jn to Pinjarra	47.73	$5,484,705	$3,734,048	$745,576	$125,091	$184,921	$695,070	$444,925	$49,629,642.54
Pinjarrato Pinjarra East	1.47	$675,837	$181,136	$110,833	$6,068	$128,390	$249,410	$108,651	$2,147,992.42
Pinjarra East to Alumina Jn	0.23	$780,082	$117,092	$135,098	$3,923	$183,397	$340,573	$136,917	$1,217,619.10
Pinjarra East to Pinjarra South	1.06	$303,848	$91,581	$49,339	$3,068	$55,060	$104,800	$42,644	$1,112,024.09
Pinjarra to Wagerup	33.52	$3,221,572	$2,354,285	$366,566	$78,869	$109,074	$312,779	$154,156	$32,578,289.86
Wagerup to Brunswick Jn	42.97	$4,993,730	$3,547,903	$625,716	$118,855	$171,187	$530,069	$341,325	$47,287,075.78
Brunswick Jn to Picton Jn	22.08	$3,563,420	$2,276,673	$448,046	$76,269	$222,047	$540,386	$404,264	$29,249,897.76
Picton Jn to Bunbury Inner Harb	3.52	$1,468,514	$660,210	$208,872	$22,117	$191,814	$385,500	$188,953	$8,185,732.70

Brunswick-Premier

		Section Length	Total Ceiling	Capital	Maintenance	Working Capital	Operating	Overhead	Floor	Total GRV
Total Route		**68.41**	**$ 7,280,493**	**$ 4,960,322**	**$ 858,291**	**$ 166,171**	**$ 189,229**	**$ 1,106,479**	**$ 271,742**	**$ 65,027,437**
Route Section										
Brunswick North - East	17,610.00	0.91	$154,138	$81,527	$16,043	$2,731	$8,589	$45,248	$5,311	$1,043,700.13
Brunswick - Brunswick East	17,610.00	1.03	$431,679	$239,416	$18,050	$8,020	$27,662	$138,531	$13,868	$2,869,352.83
Brunswick East - Worsley	17,610.00	22.00	$2,559,966	$1,817,561	$387,438	$60,888	$36,042	$258,037	$88,949	$24,149,438.27
Worsley - Worsley North	17,610.00	2.32	$457,424	$226,379	$40,785	$7,584	$29,389	$153,288	$29,786	$2,660,282.44
Worsley North - Hamilton	9,392.00	8.58	$889,620	$507,883	$80,621	$17,014	$41,970	$242,132	$49,736	$6,709,176.78
Worsley East - Worsley North	9,392.00	1.07	$122,286	$65,841	$10,021	$2,206	$6,734	$37,484	$8,446	$831,198.76
Worsely - Worsely East	9,392.00	1.89	$244,876	$103,744	$17,704	$3,475	$19,994	$99,959	$9,297	$1,362,460.46
Worsley East - Ewington Jn	9,392.00	28.24	$2,119,310	$1,672,525	$265,230	$56,030	$14,725	$110,801	$62,022	$22,370,746.02
Ewington Jn - Premier	9,392.00	2.39	$301,194	$245,446	$22,400	$8,222	$4,126	$20,999	$4,326	$3,031,081.55

Forrestfield-Kalgoorlie

	Section Length	Total Ceiling	Capital	Maintenance	Working Capital	Operating	Overhead	Floor	Total GRV
Total Route	**856.78**	**$ 115,680,313**	**$ 87,851,239**	**$ 16,093,831**	**$ 2,943,016**	**$ 1,746,243**	**$ 7,045,984**	**$ 7,188,762**	**$ 1,125,545,686**
Route Section									
F'Field Sth to Midland	25.71	$5,769,252	$3,930,476	$985,672	$131,671	$295,249	$426,184	$534,169	$48,794,554.18
Midland to Millendon Jn	28.25	$5,841,116	$3,880,615	$1,068,497	$130,001	$287,422	$474,582	$602,288	$47,210,935.46
Millendon Jn to Toodyay West	125.14	$17,466,000	$13,379,766	$2,495,290	$448,222	$266,347	$876,375	$1,538,696	$169,204,852.08
Toodyay West to Avon Yard	51.83	$8,271,006	$5,973,866	$1,317,954	$200,125	$251,494	$527,567	$751,671	$75,136,610.98
Avon Yard to West Merredin	190.94	$26,031,679	$20,492,940	$3,287,735	$686,513	$206,854	$1,357,636	$1,263,583	$263,566,463.19
West Merredin to Koolyanobbing	191.98	$23,428,565	$18,515,117	$2,922,484	$620,256	$169,101	$1,201,607	$995,234	$241,215,313.84
Koolyanobbing to West Kalgoorlie	204.33	$24,675,997	$18,283,825	$3,533,303	$612,508	$189,513	$2,056,848	$1,376,209	$237,915,575.85
West Kalgoorlie to Border	6.21	$1,635,016	$1,086,823	$306,337	$36,409	$80,264	$125,185	$108,495	$13,012,130.93
Avon to West Merredin Sidings	18.05	$1,424,316	$1,282,845	$98,495	$42,975	$0	$0	$10,410	$16,390,210.62
West Merredin to Koolyanobbing Sidings	9.61	$776,923	$701,061	$52,376	$23,486	$0	$0	$5,496	$8,964,627.23
Koolyanobbing to W Kal Sidings	4.75	$360,443	$323,905	$25,688	$10,851	$0	$0	$2,509	$4,134,411.38

Kalgoorlie-Leonora

	Section Length	Total Ceiling	Capital	Maintenance	Working Capital	Operating	Overhead	Floor	Total GRV
Total Route	**262.36**	**$ 21,892,478**	**$ 18,280,868**	**$ 2,464,113**	**$ 612,409**	**$ 164,057**	**$ 371,031**	**$ 383,705**	**$ 252,947,427**
Route Section									
Kalgoorlie to Malcolm	237.50	$19,360,560	$16,325,209	$2,113,798	$546,894	$82,028	$292,630	$284,628	$226,113,645.04
Malcolm to Leonora	24.54	$2,509,840	$1,936,305	$348,240	$64,866	$82,028	$78,401	$98,952	$26,564,674.46
Menzies sidings	0.33	$22,078	$19,355	$2,075	$648	$0	$0	$126	$269,107.42

Esperance

	Section Length	Total Ceiling	Capital	Maintenance	Working Capital	Operating	Overhead	Floor	Total GRV
Total Route	**399.73**	**$ 37,582,605**	**$ 29,177,709**	**$ 4,692,865**	**$ 977,453**	**$ 515,116**	**$ 2,219,461**	**$ 1,881,727**	**$ 392,169,796**
Route Section									
West Kalgoorlie to Hampton	17.88	$2,391,060	$1,605,605	$322,730	$53,788	$171,887	$237,049	$217,681	$20,895,125.60
Hampton to Kambalda	38.25	$3,915,694	$2,784,570	$529,817	$93,283	$171,887	$336,137	$274,732	$37,422,527.84
Kambalda to Salmon Gums	229.60	$20,699,621	$16,447,742	$2,510,572	$550,999	$85,671	$1,104,636	$862,410	$222,535,954.30
Salmon Gums to Esperance	111.60	$10,409,755	$8,191,253	$1,316,787	$274,407	$85,671	$541,638	$526,009	$109,289,591.15
Kambalda siding	0.61	$40,900	$36,403	$3,277	$1,220	$0	$0	$226	$498,031.51
Norseman Siding	0.52	$36,833	$32,910	$2,820	$1,102	$0	$0	$195	$449,418.18
Salmon Gums Siding	1.28	$88,742	$79,226	$6,862	$2,654	$0	$0	$473	$1,079,146.93

Terminal End Bits

	Section Length	Total Ceiling	Capital	Maintenance	Working Capital	Operating	Overhead	Floor	Total GRV
Total Route	**10.52**	**$ 3,066,316**	**$ 894,142**	**$ 98,823**	**$ 29,954**	**$ 326,592**	**$ 1,716,805**	**$ 118,170**	**$ 11,536,746**
Route Section									
Inner Harbour 485 Pt to Alcoa (Inbound)	0.51	$512,536	$79,342	$7,851	$2,658	$68,152	$354,534	$20,304	$821,388.22
Inner Harbour 486 Pt to ALCOA (Outbound)	0.38	$332,664	$66,853	$3,040	$2,240	$42,224	$218,307	$12,129	$731,640.95
Inner Harbour 487 Pt to Worsley (Outbound)	0.33	$217,771	$53,518	$2,525	$1,793	$25,928	$134,008	$7,531	$612,057.55
Inner Harbour 485 Pt to 486 pts	0.08	$471,591	$49,375	$574	$1,654	$68,152	$351,837	$18,694	$403,630.61
Inner Harbour 486 Pt to 487 pts	0.06	$180,701	$19,917	$353	$667	$25,928	$133,836	$7,145	$170,655.74
Inner Harbour 487 Pt to Woodchips	3.18	$294,159	$258,131	$24,812	$8,647	$399	$2,169	$5,596	$3,901,170.82
Kwinana no3 points to bauxite junction	1.85	$469,298	$142,840	$26,394	$4,785	$45,401	$249,878	$26,772	$1,767,804.07
Alcoa Bauxite Jn - Alcoa Bauxite Sdg	1.30	$311,833	$81,786	$15,600	$2,740	$32,808	$178,899	$12,623	$1,068,733.93
Alcoa Bauxite Jn - Alcoa Caustic Sdg Pts	1.89	$190,432	$95,694	$12,032	$3,206	$12,593	$66,907	$5,228	$1,380,484.03
Alcoa Caustic Sdg Pts -Alcoa Alumina Sdg Pts	0.94	$85,331	$46,686	$5,642	$1,564	$5,009	$26,429	$2,149	$679,179.70

Grain lines

	Section Length	Total Ceiling	Capital	Maintenance	Working Capital	Operating	Overhead	Floor	Total GRV
Total Route	**307.30**	**$ 12,943,450**	**$ 11,190,024**	**$ 973,882**	**$ 374,866**	**$ 246,689**	**$ 157,990**	**$ 177,393**	**$ 154,493,385**
Route Section									
Avon to Goomalling	57.69	$4,114,528	$3,434,778	$311,526	$115,065	$151,655	$101,504	$96,253	$47,590,932.95
Katanning to Tambellup	46.71	$2,890,194	$2,456,227	$252,245	$82,284	$63,356	$36,082	$43,360	$34,091,977.55
Kulin to Yilminning	99.81	$5,938,728	$5,299,019	$410,111	$177,517	$31,678	$20,404	$37,780	$72,810,474.66