QCA

Review of QR's Estimates for

Gindie Minerva

August 2008

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1. Executive Summary

We have undertaken a review of QR's submission in relation to the Blackwater Western Cluster made up of the Burngrove to Minerva infrastructure.

The submission proposes DORC values for the infrastructure, incremental maintenance costs for the mainline, maintenance costs for the Burngrove to Minerva infrastructure and incremental rail management costs.

QR have correctly emphasised the fact that the railway is a low capital cost high maintenance cost railway because of the history of railway operations and the limited extent of railway upgrading works.

In undertaking the review we have examined two sets of reports dealing with estimates of QR's proposed capital and maintenance costs for the "Gindie Minerva" railway infrastructure, namely the WorleyParsons' report and the Connell Hatch report and reconciled those reports with QR's latest submission.

We note that QR's DORC valuation is lower than the WorleyParsons' valuation primarily because of the treatment of land costs. This gap would have been larger but for the fact that some aspects of QR's valuation have been double counted and over-estimated due to mathematical error.

On this, it is noted that QR's estimate of DORC of $75,958,416 is over stated by $8,895,369 primarily because:

- The DORC value of the Comet River Bridge has been overstated by the counting of both a DORC and an upgrade, producing a double counting.
- The unit rail cost applied by QR is one applicable to track, that is two rails, and not one rail, thereby effectively doubling the ORC.

In relation to the incremental maintenance cost of the mainline, the rationale for using the Blackwater system rate is sound and the estimate is reasonable.

In relation to the maintenance cost of the Burngrove to Minerva infrastructure, these estimates are much higher than the Blackwater system but are within the expected range for the quality of the infrastructure and are considered reasonable.

In relation to the incremental railway management costs, these are within the expected range and confirm earlier benchmarks and are therefore considered reasonable.

2. Background

Queensland Competition Authority

The Queensland Competition Authority (the Authority) is an independent statutory body responsible for the economic regulation of key rail, port, water and energy monopoly infrastructure services in Queensland.

On 30 June 2006, the Authority approved Queensland Rail's (QR) 2006 access undertaking which, amongst other things, sets out the terms and conditions under which QR provides access to QR's declared service (below-rail infrastructure), including reference tariffs for coal-carrying train services for central Queensland and processes to establish access charges for new train services.

The central Queensland Coal Region (CQCR) comprises four systems, namely, Moura, Blackwater, Goonyella and Newlands. Further detail on these systems is available at www.networkaccess.qr.com.au.

Reference train services for new Minerva coal mine

QR commenced railing coal from Minerva mine during the second quarter of 2005-06. The Minerva mine is located approximately 45 kilometres south of Emerald and is an unincorporated joint venture between Felix Resources (Felix 70%) and Sojitz Corporation of Japan (Sojitz, 30%). Felix manages the project.

The Minerva mine is located outside the existing boundary of the CQCR and is connected to it at Burngrove (ie the Gindie-Minerva line). The Gindie-Minerva line consists of existing rail infrastructure (Burngrove – Emerald – Wurba Junction) plus a new spur line and loading loop. The existing rail infrastructure has not previously been used for transporting coal.

QR's Network Access Group (QRNA) has foreshadowed developing a new reference tariff for coal-carrying train services operating from the Minerva mine to the Port of Gladstone.

As part of its consideration of QR's proposed reference tariff for coal-carrying train services on the Gindie-Minerva line, the Authority commissioned WorleyParsons Services Pty Ltd to prepare:

- an independent depreciated optimised replacement cost (DORC) valuation of existing below-rail assets to compare with QR's proposed values;

- an assessment of the capital expenditure associated with new below-rail infrastructure (spur line and loading loop); and

- an assessment of related expenditure necessary for maintaining these assets.

QR has also provided reports consisting of a Connell Hatch Report[1], a QR Report[2], and the QR Access Undertaking Submission to QCA[3].

The purpose of this review is to compare the results of these reports, essentially the QR view of the capital and maintenance estimates and the WorleyParson's view, and determine where the difference lie and why they occur.

[1] Final Draft Valuation Report, Wurba Junction to Burngrove – Depreciated Optimised Replacement Cost (DORC) Assessment, 1 May 2007, Reference HN82, Revision 2

[2] Project Completion Report, Minerva Coal Project, Project Number A01432, Network Access Group

[3] QR Network Access undertaking (2008), Preliminary Submission to the Queensland Competition Authority Voluntary Draft Amending Undertaking on Proposed Reference Tariffs for the West Blackwater Cluster 31/07/2008

3. Methodology

This review has concentrated on understanding the reasonableness of QR's preliminary DAAU submission[4] and supporting information[5].

These documents are heavily dependent on prior work completed by QR's consultant Connell Hatch[6]. QR's preliminary DAAU submission proposes to amend aspects of this prior work and, to this end, the DAAU proposal uses the updated data (highlighted in section 4.1.1.3 of QR's proposal).

We were also provided with a review of the Connell Hatch work, performed by WorleyParsons[7], which assisted the detail of the Connell Hatch work.

Reasonableness of QR's estimate was based on:

- Application of Regulatory Asset Base principles including whether the capital estimates were below rail and capital expenditure only, and applicable to the particular traffic task.
- Unit cost values within ranges usually expected and met the "sensibility test"
- The reasoning provided for the treatment and depreciation assumptions

We have applied our own adjustments that we believe should have occurred during the generation of QR's spreadsheet submission, based on their own written submission and their own spreadsheet dialogue.

[4] *QR Network Access undertaking (2008), Preliminary Submission to the Queensland Competition Authority Voluntary Draft Amending Undertaking on Proposed Reference Tariffs for the West Blackwater Cluster 31/07/2008*

[5] adjoining spreadsheet "*Aug 08 Documents_223350_1.XLS*

[6] *Final Draft Valuation Report, Wurba Junction to Burngrove – Depreciated Optimised Replacement Cost (DORC) Assessment, 1 May 2007, Reference HN82, Revision 2*", Connell Hatch, and its accompanying spreadsheet "*Wurba to Burngrove-DORC v6 CHECK Timber Sleepers 15 years.xls*

[7] *Review of QR's Gindie - Minerva Rail Infrastructure, 24th May 2007*

4. ORC Valuations

4.1 WorleyParsons

WorleyParsons identified 3 different ways that the costs could be assessed; using the upgrade path actually adopted by QR, using a brownfields replacement approach or using a greenfields MEA approach. The results of their assessment are shown in Figure 1. WorleyParsons costs were in Dec 2005 $.

Figure 1 WorleyParsons' ORC Assessments

	Option 1			Option 2	Option 3
	Upgrade Path			Actual Existing	MEA
Line Segment	As existing rail weight. Reduced loading for bridges, no turnouts, no comms for the Nogoa to Wurba section, no balloon loops costs 15.75t axle load	Upgrade costs	Total	increased loading for bridges. All timber sleepers except concrete sleepers for Nogoa angle. Added active crossing at Gregory Hway and comms (20t axle load)	Greenfield construction for all sections at 20 TAL including turnouts and balloon loop. Comms included for all sections. Concrete sleepers for Burngrove to Nogoa section
Land Costs			$7,100,000	$7,100,000	$7,100,000
Land Acquisition			$4,300,000	$4,300,000	$4,300,000
Burngrove to Nogoa	$88,204,040	$4,202,081	$92,406,121	$89,327,749	$88,750,240
Nogoa to Wurba Junctic	$44,481,106	$2,565,203	$47,046,309	$45,327,547	$47,650,192
Wurba to Minerva	$0	$4,507,370	$4,507,370	$4,868,246	$4,868,246
Total ORC	$132,685,146	$11,274,654	$155,359,800	$150,923,543	$152,668,678

WorleyParsons also provided the reasons for the differences, those being in Figure 2 below:

Figure 2 Observations of WorleyParsons

> The most apparent observation is that Option 1, which includes the upgrade costs, is more expensive than any other option. This is substantially due to the costs of upgrading the Comet River Bridge, essentially duplicating the cost of the bridge.
>
> Option 3, MEA, for Burngrove to Nogoa is marginally less expensive than Option 2 because of the use of concrete sleepers which are now less expensive to purchase and install than timber sleepers on a new cost basis. 50kg/m rail is used in all three options.For the Nogoa to Wurba section, Option 3 is more expensive because under MEA a 50kg/m rail is used. In this section timber sleepers are used in all options because of the limited economic life of the section.

4.2 Connell Wagner

Connell Wagner came to a conclusion about ORC reflected in Figure 3.

Figure 3 Connell Wagner's ORC Estimate

	Total ($M)	Total ($/km)
ORC ($ Jul 2005)	$147.4	$1,420,000
ORC ($ Nov 2005)	$167.0	$1,460,000

Although a replacement table in this format has not been produced by QR subsequent to their modifications of the Connell Report spreadsheet, similar totals exist.

The difference between the July and November dollar values is mainly due to the addition of approximately $16.25m is “Minerva Project” costs, the remainder being an escalation of approximately 7% annual rate.

That is, Connell’s method was to estimate the ORC before the Minerva Project had begun, and then add on the full cost of the work undertaken for the upgrade. WorleyParsons had identified the problem of effectively double counting the cost, for example, of the Comet River Bridge using the simplified approach of adding the “Minerva Project” costs. In addition, the costs of resleepering, resurfacing, restressing and rerailing (relay) are also double counted under the simplified additive approach because those elements are already part of the ORC prior to the upgrade. Hence instead of using the costs reported in QR’s “Completion Report” of $16,191,654, WorleyParsons used a lesser amount of $11,274,674. We have instead accepted Connell’s valuation for the upgrade work and adjusted the DORC to reflect the depreciated Bridge asset as well as adjusted for the mathematical error for rail and other minor components.

4.3 Results of Comparison

Overall, there is agreement about the extent of the works in terms of the main parameters which are:

- Length of section
- Number of bridges and culverts
- Basic parameters of operation of the trains
- Signalling, electrification assets, passing loops
- Standard of infrastructure required

The main differences are:

Land – WorleyParsons uses a land value including acquisition costs of $11.4m whereas Connell uses $0.166m, an $11.2m difference.

Upgrade Costs – For WorleyParsons' option involving the upgrade, it uses the lower cost of the upgrade $11,274,674 to avoid the problem of double counting those costs that would have been included in an ORC prior to the upgrade such as the bridge cost and the track upgrade costs.

4.4 Like for Like Comparison

WorleyParsons' ORC estimate on the same basis as Connell's Land costs and assuming an upgrade path trajectory, is approximately $144m compared with Connell's $167m. The material reasons for this difference are:

- Connell have simply added the Upgrade Costs to the pre-upgrade costs and therefore double counted large elements including the Comet River Bridge and track laying.
- Connell have included a mainline turnout at Nogoa which is unnecessary.
- It appears that Connell have used the unit rate for occupation crossings [redacted] for the unit rate for fencing and may be a typographical error, especially as Connell have suggested the reference be the "2001 Undertaking" and as the figure lies adjacent to "Occupation Crossings" in their unit cost spreadsheet. An escalated 2001 Undertaking unit rate is approximately [redacted] per km. Also whether there needs to be fencing on both sides for the entire length is also questioned given the line runs parallel with the road for much of its length.
- Connell have applied an indirect cost of 31% to all cost components. While this may be appropriate for construction supervision and other "field" related activities it is not reasonable to apply this rate to material purchases, most of which require no design or limited specification since there are Australian Standards for this material.
- Connell have applied a "Top 600" to the entire length of the railway. In cuttings a Top 600 is not required8. We have ignored this minor item.
- The Connell ballast volume calculation that assumes a ballast depth of 450mm and ballast width of 5m results in a grossly inflated quantity of ballast. The use of this ballast width and depth as a plain rectangle ignores the shape of the ballast profile and the volume of the sleepers within that profile. The requirements for ballast are shown in QR drawing 10435 in QR standard CETS7.

[8] "Standard Track Formation", QR drawing number 2567

- the rate of [redacted] per metre[9] of rail ([redacted] per tonne) for rail is very high. The current cost of rail is approximately [redacted] per tonne in 2008 and estimated at [redacted] in 2005. It is possible QR has applied a track cost per metre to the number of rail kilometres (which is twice). Alternatively the cost of laying is included in the cost in which case double counting may have occurred. In addition QR claim in their spreadsheet that the unit cost is "consistent with GHD unit rate incl inflation". This refers to the unit cost in Working Paper 5, Dec 2000, wherein a unit rate of [redacted] per track metre for rail was determined.
- we note that the Land cost provides for a corridor width of 16m which we regard as being too narrow

Some items of WorleyParsons used higher and lower unit rates than Connell but were not material to the difference.

It is most probable, the appropriate ORC is in the range $153m to $158m. This estimate range represents a "construction cost quality" estimate of approximately 3% to 4% with the mid-range being $155.5m.

[9] QR have used single rail kilometres as their unit and not single track kilometres which is two rails

5. DORC Valuations

In addition to those documents mentioned previously specifically for the determination of ORC, further documents we have had access are:

- QR's submission "*Aug 08 Documents_223350_1.XLS*", which is QR's most recent submission in XL format
- QR's submission "*QR Network Access undertaking (2008), Preliminary Submission to the Queensland Competition Authority Voluntary Draft Amending Undertaking on Proposed Reference Tariffs for the West Blackwater Cluster 31/07/2008*"

We note that QR has updated the source information, originally prepared by QR's consultants, in its submission.

Therefore, any of the strengths and weaknesses previously indicated in this report about the Connell report has been duplicated in QR's latest submission except that an update has been noticed since an earlier draft, in the following items – *our comments*:

- the depreciation of timber bridges (to 75% depreciated) - *appropriate*
- fully depreciated timber sleepers across all sections prior to the upgrade – *reduction to zero for all existing sleepers is unwarranted but may form a reference point for subsequent valuations*
- We note that the Top 600 costs for the Nogoa to Wurba section have been halved to reflect the asset condition - *appropriate*

Therefore the items that remain outstanding in terms of requiring updating are:

- double counting of the DORC plus recent capital costs for the Comet River Bridge, (we have adjusted the existing bridge to 25% depreciation and accept the full cost of upgrade)
- the large ballast volume calculation (we have reduced the depth to 200 mm and average width to 4m for a full rectangular shape)
- the turnout at Nogoa and its associated signalling and power (we have removed turnout)
- the fencing unit cost, although it is noted that for the purposes of the DORC this is depreciated to 5% and any difference in ORC is immaterial.
- The rail unit cost (we have used QR's escalated rail cost but applicable to the track rather than to two rails as was intended in Working Paper 5)

- Indirect cost of 31% for every cost component (we have not made any adjustment)

Based on our own estimation, if you take the abovementioned issues into account, the re-estimated DORC valuation is shown in the right hand column of Table 1 and compares with QR's submission shown in the left hand column

Table 1 QR Submitted and Adjusted DORC Values

Configuration[10]	QR SUBMISSION (including updated treatments since 2007)	ADJUSTED VALUES (including QR's updates)
Burngrove to Nogoa WDV at 1/11/2005	$36,422,380	$30,150,740
Nogoa to Wurba WDV at 1/11/2005	$16,299,341	$13,675,612
Minerva Capital Works WDV at 1/11/2005	$18,374,080	Unchanged
Minerva Capital Works WDV at 1/1/2007	$4,862,615	Unchanged

The largest differences are made up by the adjustment to the Comet River Bridge in the Burngrove to Nogoa section and to the rail in both sections. Other minor adjustments as detailed above have also been applied.

We have not applied an adjustment to indirect costs where we have indicated that the consistent application of a 31% loading is not warranted. We agree that such loadings may be applicable for work requiring design and construction management but for those elements of the upgrading and capital costs that involve rail purchase and other commonly associated railway work, that rate is too high.

Therefore our adjustments in Table 1 are conservative and we have provided QR with the benefit of the doubt.

[10] These reference QR's "Aug 08 Documents_223350_1.XLS" spreadsheet

6. The Reasonableness and Efficiency of Maintenance

6.1 Incremental Maintenance Costs for the Mainline

In their submission QR have asserted "Accordingly, QR Network proposes to set the maintenance contribution of Minerva coal carrying services to the mainline maintenance costs at a comparable level to the Central Blackwater cluster". This is because "the UT2 maintenance cost estimates for the Blackwater System were developed inclusive of the Minerva coal carrying train services and that the AT_1 tariffs for the Blackwater clusters were also established on the assumption that Minerva coal carrying services would be set at the equivalent 26 TAL".

This is a reasonable approach because the UT2 maintenance costs implied the previously established relationship between task and cost, provided in Working Paper 2[11], and for small task increases (or decreases) this relationship is sound.

6.2 Maintenance Costs Burngrove to Minerva

In section 4.2 of QR's submission, a detailed explanation of the methodology of the derivation of applicable maintenance costs is given.

A number of very good approaches are detailed:

"*The derived maintenance scope was benchmarked against like systems with data normalised against the differing traffic task and existing asset condition and structure*."

This indeed would be ground breaking work since the data available for "like systems" is rare. In addition the relationships between task, asset condition and structure and the maintenance cost has not been publicly explored except for the analysis as in Figure 4.3 of Working Paper 2. This (new) analysis by QR has not been sighted.

In addition due recognition has been made by QR of the Regulated Asset Base where

"*all maintenance costs associated with turn-outs for the optimised sidings and passing loops and all costs related to electrification assets and line signalling*" have been removed.

While we acknowledge that maintenance costs will in total be higher than a purpose built railway, the section of track between Burngrove and Nogoa, especially with its capital sleeper upgrade, concrete bridges, 50 kg/m rail and reasonable soils, would not be expected to incur significantly higher maintenance costs.

[11] Draft Decision Dec 2000, QCA

This contrasts with the section Nogoa to Wurba where the formation quality is poor, 41 kg/m rail (in some sections) and timber bridges would provide circumstances for significantly higher costs.

This contrast is borne in the relative magnitude of QR's estimates, those being $18,480 per track kilometre for Burngrove to Nogoa and $35,285 per track kilometre for Nogoa to Wurba. We also note that:

"*A breakdown of the efficient maintenance cost forecasts for the Minerva Rail Infrastructure is detailed in the Confidential submission in Attachment B*", which was sighted and confirm the activities expected.

We note that:

"*The incremental maintenance costs for the Minerva mine have been developed using a bottom up approach*" and we also note QR's caution in the application of benchmarking for this work. We presume this is a reference to the Wurba to Minerva spur because we had earlier noted QR's earlier reference to benchmarking against other systems and normalising for track condition and structure. Otherwise we are confused by QR's approach.

6.3 Conclusion

With the small matter of the slightly confusing philosophical approach to the estimates set aside, there is a sound understanding of the issues associated with the estimation of maintenance costs.

The estimates provided by QR are within the range expected and are therefore considered reasonable.

7. Reasonableness of Railway Management/Operating Costs

In section 4.3 QR's submission indicates that its method of estimating the incremental Railway Management Costs is to benchmark against comparators in the CQCR[12] and to use the Rolleston spur line as the benchmark.

This is certainly a transparent approach except that some subjective "discounting" is required for the lower frequency of train movements. It is subjective because any discounting method involves making an assumption about the relationship between task and cost unless there are sufficient benchmarks to form that relationship. Using only one benchmark is not adequate.

Given the timing of the latest QR submission, almost 3 years after completion of the capital upgrade and at least 2 years of operation, it would be more realistic to use actual data. Prior to 2005 there were no coal trains on the lines and now there is. The safeworking systems operating before and after[13] upgrading are similar except that the Burngrove to Nogoa section is assumed as DTC (Train Orders) in the new stand alone hypothetical railway in contrast to RCS (CTC) prior to the regime. All the other parameters such as CQCR telecommunications, infrastructure management, business management, corporate costs, systems development and risk premiums should all be known, at least by allocations.

The basis of the "opex" costs presented in the spreadsheet[14] is unknown to this review and therefore we are not able to comment on them.

However another benchmark which is in the public domain is that in Chapter 12 of the Draft Decision of Dec 2000 in which Train Control costs were estimated at one train controller per 200,000 train kilometres. Train control costs were shown to be approximately one half of the railway management costs. The total train kilometres over this section of railway amount to approximately 1,088 train paths[15] * 107 km or approximately 115,000 train kilometres. This task requires a little over a half a train controller at an all up cost of approximately [redacted] per annum.

If this represents one third of the railway management costs then this equates to approximately [redacted] per year which is greater than the [redacted] incremental costs estimated in the spreadsheet and could be expected to be so in comparison to a stand alone basis.

Therefore we conclude that QR's estimated costs are reasonable.

[12] Central Queensland Coal Railway

[13] After in the sense of the hypothetical stand alone railway

[14] Aug 08 Documents_223350_1.XLS

[15] Aug 08 Documents_223350_1.XLS, Pricing Inputs, C102

8. Conclusion

We have undertaken a review of the two sets of reports dealing with estimates of QR's proposed capital and maintenance costs for the "Gindie Minerva" railway infrastructure, namely the WorleyParsons' report and the Connell Hatch report and reconciled those reports with QR's latest submission.

The WorleyParsons' report indicated various elements where double counting could exist, specifically the Comet River Bridge upgrade and the associated DORC analysis. This has been borne out in QR's submission, which relies on the Connell Hatch report.

We note that QR's DORC valuation is lower than the WorleyParsons' valuation primarily because of the treatment of land costs. This gap would have been larger but for the fact that some aspects of QR's valuation have been double counted and over-estimated due to mathematical error.

In addition, other matters associated with over-specification have been reviewed and a reworked set of DORC estimates have been calculated in Table 1.

We have concluded that the estimated maintenance and network management costs are within appropriate ranges and therefore are reasonable.

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