

Draft Decision

Aurizon Network 2014 Draft Access Undertaking – Maximum Allowable Revenue

September 2014

We wish to acknowledge the contribution of our rail team to this report.

© Queensland Competition Authority 2014

The Queensland Competition Authority supports and encourages the dissemination and exchange of information. However, copyright protects this document.

The Queensland Competition Authority has no objection to this material being reproduced, made available online or electronically but only if it is recognised as the owner of the copyright and this material remains unaltered.

SUBMISSIONS

Closing date for submissions: 12 December 2014

This report is a draft only and is subject to revision. Public involvement is an important element of the decision-making processes of the Queensland Competition Authority (QCA). Therefore, submissions are invited from interested parties concerning its assessment of Aurizon Network's proposed Maximum Allowable Revenue. The QCA will take account of all submissions received.

Submissions, comments or inquiries regarding this paper should be directed to:

Queensland Competition Authority
GPO Box 2257
Brisbane Q 4001
Tel (07) 3222 0555
Fax (07) 3222 0599
Aurizon@qca.org.au

www.qca.org.au

Confidentiality

In the interests of transparency and to promote informed discussion, the QCA would prefer submissions to be made publicly available wherever this is reasonable. However, if a person making a submission does not want that submission to be public, that person should claim confidentiality in respect of the document (or any part of the document). Claims for confidentiality should be clearly noted on the front page of the submission and the relevant sections of the submission should be marked as confidential, so that the remainder of the document can be made publicly available. It would also be appreciated if two copies of each version of these submissions (i.e. the complete version and another excising confidential information) could be provided. Where it is unclear why a submission has been marked 'confidential', the status of the submission will be discussed with the person making the submission.

While the QCA will endeavour to identify and protect material claimed as confidential as well as exempt information and information disclosure of which would be contrary to the public interest (within the meaning of the *Right to Information Act 2009* (RTI)), it cannot guarantee that submissions will not be made publicly available. As stated in s 187 of the Queensland Competition Authority Act 1997, the QCA must take all reasonable steps to ensure the information is not disclosed without the person's consent, provided the QCA believes that disclosure of the information would be likely to damage the person's commercial activities and that the disclosure of the information would not be in the public interest. Notwithstanding this, there is a possibility that the QCA may be required to reveal confidential information as a result of a RTI request.

Public access to submissions

Subject to any confidentiality constraints, submissions will be available for public inspection at the Brisbane office, or on the website at www.qca.org.au. If you experience any difficulty gaining access to documents, please contact us on (07) 3222 0555.

Table of Contents

| | |
|---|------|
| SUBMISSIONS | I |
| Closing date for submissions: 12 December 2014 | i |
| Confidentiality | i |
| Public access to submissions | i |
| PREFACE | V |
| Our Draft Decision | vi |
| EXECUTIVE SUMMARY | VIII |
| Draft Decision | viii |
| THE ROLE OF THE QCA – TASK, TIMING AND CONTACTS | XIV |
| 1 INTRODUCTION | 19 |
| 1.1 The market context | 19 |
| 1.2 A focus on efficient costs | 20 |
| 1.3 Aurizon Network as a private company | 21 |
| 1.4 Our approach—a focus on costs and revenue | 22 |
| 2 MAXIMUM ALLOWABLE REVENUE AND INDICATIVE TARIFFS | 23 |
| 2.1 UT4 Maximum Allowable Revenue | 23 |
| 2.2 Indicative tariffs | 31 |
| 2.3 Comparison of MAR and indicative tariffs | 32 |
| 2.4 Transitional matters relating to UT4 MAR | 35 |
| 3 VOLUME FORECASTS | 38 |
| 3.1 Aurizon Network proposal | 38 |
| 3.2 Stakeholders' comments | 39 |
| 3.3 Consultant's assessment | 40 |
| 3.4 QCA analysis and Draft Decision | 41 |
| 4 OPERATING COSTS | 43 |
| 4.1 Overview | 43 |
| 4.2 System-wide and regional costs (excluding corporate overheads) | 49 |
| 4.3 Corporate overheads | 66 |
| 4.4 Risk and insurance | 79 |
| 4.5 Audit and condition-based assessment | 84 |
| 4.6 Environmental charges | 86 |
| 4.7 Operating costs - electric assets | 87 |
| 4.8 Summary | 90 |
| 5 MAINTENANCE COSTS | 92 |
| 5.1 Overview | 92 |
| 5.2 Direct maintenance costs (excluding ballast undercutting costs) | 96 |

| | | |
|-------|--|-----|
| 5.3 | Indirect maintenance costs | 113 |
| 5.4 | Maintenance Cost Index (MCI) | 119 |
| 5.5 | Summary | 125 |
| 6 | BALLAST UNDERCUTTING COSTS | 127 |
| 6.1 | Overview | 127 |
| 6.2 | 2014 DAU ballast undercutting costs | 132 |
| 6.3 | Treatment of UT3 RAB impairment – ballast undercutting | 144 |
| 6.4 | Is ballast undercutting renewals or maintenance expenditure? | 150 |
| 6.5 | Summary | 151 |
| 7 | OPENING ASSET VALUE | 153 |
| 7.1 | Opening asset base (RAB roll-forward) | 153 |
| 7.2 | Equity raising costs | 156 |
| 8 | REGULATORY ASSET BASE (INCLUDING CAPITAL EXPENDITURE) | 158 |
| 8.1 | Proposed forecast capital expenditure (the capital indicator) | 158 |
| 8.2 | Capital expenditure carryover account | 169 |
| 9 | RETURN OF CAPITAL (NET DEPRECIATION) | 171 |
| 9.1 | 2014 DAU depreciation allowance – overview | 171 |
| 9.2 | Legal Framework | 172 |
| 9.3 | Previous consideration of depreciation by the QCA | 174 |
| 9.4 | Asset lives — weighted average mine life | 174 |
| 9.5 | Accelerated depreciation – continuation of 20-year rolling asset lives | 180 |
| 9.6 | Timing and asset lives | 182 |
| 9.7 | Summary | 183 |
| 10 | RETURN ON INVESTMENT | 184 |
| 10.1 | Aurizon Network proposal | 184 |
| 10.2 | Legislative requirements | 185 |
| 10.3 | Framework issues | 187 |
| 10.4 | Risk-free rate | 201 |
| 10.5 | Capital Structure and Credit Rating | 211 |
| 10.6 | Cost of Debt | 213 |
| 10.7 | Market risk premium | 224 |
| 10.8 | Beta | 239 |
| 10.9 | Gamma | 254 |
| 10.10 | Conclusion – WACC | 261 |
| | GLOSSARY | 263 |
| | APPENDIX A : STAKEHOLDER CONSULTATION | 267 |
| | 2014 DAU Process | 267 |
| | 2013 DAU Process | 267 |
| | Submissions Listing | 269 |

| | |
|--|-----|
| APPENDIX B : QUEENSLAND TREASURY AND TRADE | 277 |
| APPENDIX C : POST TAX REVENUE MODEL (PTRM) | 280 |
| Model Framework | 280 |
| APPENDIX D : MAXIMUM ALLOWABLE REVENUE | 285 |
| APPENDIX E : CALCULATION OF BALLAST CLEANING COSTS | 290 |
| APPENDIX F : OPENING ASSET BASE SUPPORTING TABLES | 291 |
| APPENDIX G : CAPITAL EXPENDITURE - SUPPORTING TABLES | 294 |
| REFERENCES | 295 |

PREFACE

Aurizon Network Pty Ltd (Aurizon Network) owns and operates the below-rail network in the central Queensland coal region (CQCR) and is responsible for negotiating access with parties seeking to use its rail network.

The use of a coal system for providing transportation by rail is a service under Part 5 of the *Queensland Competition Authority Act 1997* (QCA Act) by operation of section 250 of the QCA Act and is referred to in this Draft Decision as the 'declared service'.

A 'coal system' means rail transport infrastructure (a 'facility' under section 70 of the QCA Act) that is part of the Blackwater system, Goonyella system, Moura system or Newlands system, plus direct or indirectly connected rail transport infrastructure owned or operated by Aurizon Network, plus extensions built on or after 30 July 2010 owned or operated by Aurizon Network, as defined in section 250 of the QCA Act. The declared rail transport infrastructure is collectively referred to in this Draft Decision as the 'central Queensland coal network' (CQCN).

As a result of the declaration of the CQCN, Aurizon Network (as access provider) and access seekers are subject to various rights and obligations under the access regime in Part 5 of the QCA Act.

Section 136 of the QCA Act permits Aurizon Network, as the owner or operator of a declared service, to voluntarily submit a draft access undertaking to us. We must then consider the draft access undertaking and either approve, or refuse to approve, the draft access undertaking. If we refuse to approve the draft access undertaking, we must give Aurizon Network a written notice stating the reasons for the refusal and the way in which we consider it is appropriate to amend the draft access undertaking.

Aurizon Network is the responsible person for the QR Network's 2010 Access Undertaking (2010 AU) that we approved on 1 October 2010 (UT3). UT3 is an access undertaking previously given by Aurizon Network in relation to the declared service under section 136 of the QCA Act. UT3 is set to expire on 30 June 2015.¹

On 11 August 2014, Aurizon Network voluntarily submitted a further draft access undertaking under section 136 of the QCA Act (the 2014 DAU) for the declared service for our approval. The submitted 2014 DAU replaces an earlier draft access undertaking by Aurizon Network that was withdrawn on the same date (the 2013 DAU).² In submitting the 2014 DAU, Aurizon Network said it had sought to address concerns raised by stakeholders in response to its 2013 DAU and it reflects the outcomes of its ongoing engagement with industry:

*The 2014 DAU is the result of extensive consultation and negotiations with industry participants over a 15-month period in relation to positions reflected in the 2013 DAU. ... [It] reflects the position on the outcome of the negotiated changes to the 2013 DAU. In large parts, the 2014 DAU adopts the positions argued for by industry participants, whilst in other parts it reflects Aurizon Network's preferred position after consideration of the position proposed by industry.*³

¹ On 12 June 2014, we approved Aurizon Network's draft amending access undertaking to extend UT3 to 30 June 2015, with transitional reference tariffs for 2014–15 and a 'true-up' mechanism for dealing with over and under recoveries from 2013–14. QCA June 2014. Letter: Approval of May 2014 Extension DAU

² On 11 August 2014, Aurizon Network withdrew its original 2013 Draft Access Undertaking (the 2013 DAU).

³ Aurizon Network, 2014 DAU, sub. no. 1: 1

Aurizon Network has divided its 2014 DAU into three volumes:

- the access undertaking and schedules, including system allowable revenues and reference tariffs inputs (Volume 1)
- a standard user funding agreement (Volume 2)
- other standard agreements (Volume 3).

Aurizon Network also provided a submission and explanatory materials to support its 2014 DAU and to assist our consideration of the 2014 DAU under the QCA Act. Aurizon Network said that any explanatory documentation that had been provided in support of its 2013 DAU remains relevant to our consideration of the 2014 DAU—but that the 2014 DAU should prevail to the extent of any inconsistency.

Specifically, Aurizon Network stated in a letter to us dated 11 August 2014:

The explanatory material, specifically volumes 1-4 submitted as part of the 2013 DAU remain relevant and should be read in conjunction with 2014 DAU.

These volumes are summarised as:

- *Volume 1 - Overview and Summary*
- *Volume 2 - The 2013 Undertaking Proposal*
- *Volume 3 - Maximum Allowable Revenue and Reference Tariffs*
- *Volume 4 - Maintenance Submission*

To the extent of an inconsistency between the volumes and 2014 DAU, the 2014 DAU prevails.

In accordance with section 147A(2) of the QCA Act, we must use our best endeavours to decide whether to approve, or refuse to approve, the 2014 DAU within the time periods specified in that section. We gave notice of those time periods on 11 August 2014 and we also gave a notice of investigation to Aurizon Network under section 146 of the QCA Act and invited persons to make submissions with a closing date of 3 October 2014.

Our Draft Decision

In undertaking our investigation of the 2014 DAU, we must comply with Part 6 of the QCA Act. However, we have a high degree of flexibility in the manner in which we conduct an investigation. For the purposes of the current investigation, we consider it appropriate to sequence our consideration of the 2014 DAU so that we can invite submissions on two Draft Decisions.

We consider it is appropriate to release our analysis of the Maximum Allowable Revenue (MAR) now so that interested parties can direct their submissions at the methodology we have adopted and the analysis we have undertaken. An earlier Draft Decision therefore enhances the quality of the public consultation process and ultimately the quality of our final decision.

We will therefore be publishing Draft Decisions:

- first, on the MAR aspects of the 2014 DAU; and
- second, on the remainder of the 2014 DAU.

Our Final Decision will consolidate these two Draft Decisions in light of the submissions we receive.

This is the first of the two Draft Decisions and responds to the MAR aspects of the 2014 DAU submitted by Aurizon Network for the 2014 DAU period (2013–14 to 2016–17).

Our Draft Decision is to refuse to approve the 2014 DAU insofar as it relates to the MAR. This would result in an overall decision in which we similarly refused to approve the 2014 DAU.

Accordingly, we set out in this Draft Decision our proposed reasons for this refusal and the proposed way in which we consider it appropriate to amend the 2014 DAU insofar as it relates to the MAR. If we ultimately accept Aurizon Network's 2014 DAU, we understand Aurizon Network intends that this access undertaking would take effect on and from the date of expiry of UT3, and would be known as 'UT4'. References to 'UT4' in this Draft Decision are references to the 2014 DAU, if it is ultimately accepted by us.

Acknowledgements

We would like to thank the ongoing cooperation of Aurizon Network's staff in the preparation of our Draft Decision and all stakeholders for submissions made to date.

Way forward

Our Draft Decision on Aurizon Network's proposed costs and MAR is the first of a number of decisions we will be making about Aurizon Network's 2014 DAU. We have released this Draft Decision now to provide Aurizon Network, industry and others with an early indication of our views on Aurizon Network's proposed costs and MAR. We will make a Draft Decision on remaining matters (policy and pricing) by the end of 2014—with a Final Decision on the 2014 DAU in its entirety expected in May 2015.

We note our Draft Decision is just that. In coming to a final decision on these matters, our views may change, having regard to any new issues raised by Aurizon Network and stakeholders in response to the Draft Decision. Our indicative views may also change as the wider context of the 2014 DAU is considered.

We remain committed to finalising the UT4 arrangements by June 2015. Meeting this timeframe will, in part, depend on the timeliness of Aurizon Network's and stakeholders' responses to our Draft Decisions and the scope and complexity of issues raised through the ongoing consultation and submission phases.

Submissions

We have already undertaken extensive consideration of the MAR issues in the context of the 2013 DAU.

This Draft Decision benefits from that previous work as well as submissions we have received prior to the publication of this Draft Decision. Any submissions we receive between the date of the publication of this Draft Decision and submissions on Aurizon Network's 2014 DAU due on 3 October 2014 will be considered in conjunction with submissions we receive to 12 December 2014 and will not be disadvantaged in any way. This Draft Decision is subject to amendment in light of the submissions we will receive.

We seek submissions, to be presented in writing, regarding our Draft Decision on Aurizon Network's proposed costs and MAR. Submissions must be received no later than **12 December 2014**. We will consider all submissions received by us within this timeframe.

EXECUTIVE SUMMARY

An important aspect of the 2014 DAU is the pricing of access to the declared service in the CQCR. Under section 138 of the QCA Act, we are required to have regard to certain statutory criteria in deciding whether to approve, or refuse to approve, the 2014 DAU. For pricing, we are required to have regard to the pricing principles mentioned in section 168A.

The pricing we have previously regarded as acceptable is determined subject to an overall revenue constraint, known as the Maximum Allowable Revenue (MAR). The MAR is the total revenue Aurizon Network is permitted to earn each year, determined in accordance with the 'regulatory asset base' (RAB) and 'building block methodology' (BBM). The MAR is then used as a basis for calculating reference tariffs for the CQCN.

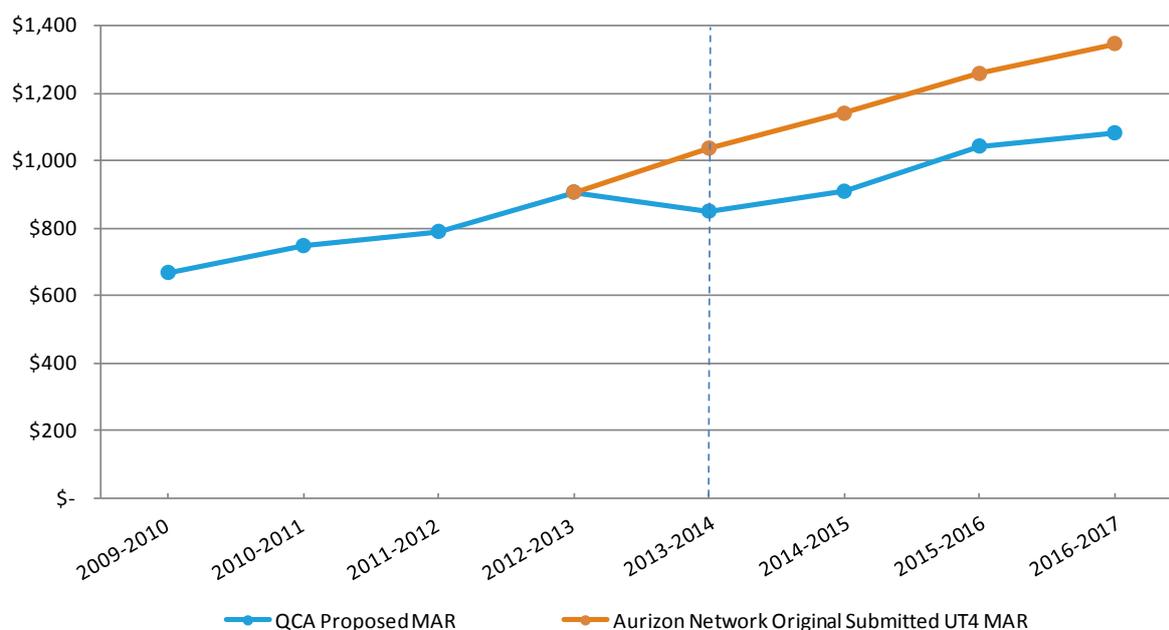
We consider our proposed MAR is consistent with section 168A(a) of the QCA Act as it leads to prices for access to the declared service that generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and that includes a return on investment commensurate with the regulatory and commercial risks involved.

Draft Decision

Our Draft Decision is to refuse to approve the 2014 DAU insofar as it relates to Aurizon Network's submitted MAR. Such a refusal would result in an overall decision in which we similarly refused to approve the 2014 DAU. Our proposed reasons for this refusal are set out in this Draft Decision. We consider the 2014 DAU should be amended to include a lower MAR.

In this Draft Decision, our proposed acceptable MAR for the 2014 DAU period (2013–14 to 2016–17) is \$3.88 billion, which we refer to as the 'proposed MAR'.

Figure 1 MAR Comparison over UT3 and 2014 DAU (\$ million, nominal)



Source: Aurizon Network April 2013 Financial Model; QCA analysis. Notes: Revenues include 2007–08 to 2010–11 revenue cap adjustments. 2011–12 and 2012–13 revenues include GAPE revenues. 2014 DAU revenues include smoothed UT3 CAPEX carryover adjustments.

The proposed MAR in our Draft Decision is:

- 19% lower than the \$4.78 billion MAR submitted by Aurizon Network on 30 April 2013
- 17% lower than Aurizon Network's updated estimate of \$4.67 billion provided in December 2013.

Overall, our Draft Decision of \$3.88 billion is 14% higher, in real terms, than the approved MAR for UT3.

In arriving at this Draft Decision, we consider our proposed MAR will provide Aurizon Network with expected revenue that is at least enough to meet the efficient costs of providing access to the CQCN declared service and includes a return on investment commensurate with the commercial and regulatory risks involved, consistent with section 138(2)(g) and section 168(A)(a) of the QCA Act.

Overall, we consider our Draft Decision provides a MAR which is consistent with meeting the legitimate business interests of Aurizon Network as required by section 138(2)(b) of the QCA Act.

Sections 138(2)(e) and (d) also require us to have regard to the interests of access seekers and the public interest. We also consider the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already 'access seekers' under section 138(2)(e). Consideration of all these interests leads to a conclusion that Aurizon Network should be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the objective of Part 5, section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its downstream operations – which could otherwise raises concerns under section 168A(c).

The key differences between our Draft Decision and Aurizon Network's 2014 DAU proposal are summarised below.

Maximum Allowable Revenue (MAR)

Our Draft Decision identifies that the proposed MAR for Aurizon Network for the 2014 DAU period is \$3.88 billion (unsmoothed and including UT3 capital expenditure carryover account adjustments). The MAR submitted by Aurizon Network on 30 April 2013 is in **Table 1**, and Aurizon Network's updated estimate provided in December 2013 is in **Table 2**.

Table 1 Aurizon Network's original submitted MAR, April 2013 (\$'000, nominal)

| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> | <i>Total UT4</i> |
|---|------------------|------------------|------------------|------------------|------------------|
| Operating expenditure | 205,671 | 218,061 | 234,288 | 241,634 | 899,653 |
| Maintenance expenditure | 232,696 | 261,536 | 279,007 | 294,793 | 1,068,032 |
| Return of capital (depreciation) | 269,692 | 291,121 | 346,457 | 348,587 | 1,255,858 |
| Inflation | (129,319) | (158,211) | (160,306) | (159,545) | (607,381) |
| Return on capital (WACC) | 422,927 | 517,417 | 524,270 | 521,779 | 1,986,393 |
| Tax | 73,713 | 76,600 | 92,216 | 100,339 | 342,868 |
| Value of imputation credits | (18,428) | (19,150) | (23,054) | (25,085) | (85,717) |
| Total (unsmoothed) MAR ^{1, 2} | 1,056,952 | 1,187,374 | 1,292,877 | 1,322,502 | 4,859,706 |
| Total (smoothed) MAR³ | 1,037,176 | 1,140,449 | 1,258,583 | 1,347,400 | 4,783,608 |

Source: Aurizon Network April 2013 Financial Model; QCA analysis. Notes: (1) Numbers may not sum due to rounding; (2) excludes UT3 CAPEX carryover account adjustments; (3) includes UT3 CAPEX carryover account adjustments.

Table 2 Aurizon Network's revised MAR, December 2013 (\$'000, nominal)

| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> | <i>Total UT4</i> |
|---|------------------|------------------|------------------|------------------|------------------|
| Operating expenditure ¹ | 205,817 | 218,066 | 234,300 | 241,652 | 899,835 |
| Maintenance expenditure | 232,561 | 261,162 | 278,443 | 294,061 | 1,066,226 |
| Return of capital (depreciation) | 265,052 | 288,122 | 313,371 | 357,939 | 1,224,484 |
| Inflation | (123,575) | (131,606) | (160,381) | (160,379) | (575,942) |
| Return on capital (WACC) | 404,144 | 430,409 | 524,515 | 524,506 | 1,883,574 |
| Tax | 73,654 | 76,294 | 89,595 | 95,572 | 335,115 |
| Value of imputation credits | (18,414) | (19,073) | (22,399) | (23,893) | (83,779) |
| Total (unsmoothed) MAR ^{2 3} | 1,039,240 | 1,123,373 | 1,257,443 | 1,329,458 | 4,749,514 |
| Total (smoothed) MAR⁴ | 1,006,778 | 1,077,672 | 1,256,704 | 1,328,604 | 4,669,758 |

Source: Aurizon Network December 2013 Financial Model; QCA analysis. Notes: (1) This table includes total operating expenditure that was submitted by Aurizon Network in December 2013. These values differ slightly from the detailed cost estimates provided by Aurizon Network in April 2013, as presented in Chapter 4. (2) Numbers may not sum due to rounding. (3) Excludes UT3 CAPEX account adjustments. (4) Includes UT3 CAPEX account adjustments.

Table 3 QCA Draft Decision proposed MAR (\$'000, nominal)

| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> | <i>Total UT4</i> |
|---|----------------|----------------|------------------|------------------|------------------|
| Operating expenditure | 175,539 | 184,895 | 197,524 | 202,818 | 760,776 |
| Maintenance expenditure | 174,388 | 178,127 | 187,774 | 197,491 | 737,780 |
| Return of capital (depreciation) | 270,693 | 300,456 | 351,946 | 375,766 | 1,298,860 |
| Inflation | (123,867) | (132,168) | (161,106) | (160,603) | (577,744) |
| Return on capital (WACC) | 355,179 | 378,983 | 461,958 | 460,515 | 1,656,635 |
| Tax | 56,091 | 59,585 | 74,594 | 79,916 | 270,185 |
| Value of imputation credits | (26,363) | (28,005) | (35,059) | (37,561) | (126,987) |
| Total (unsmoothed) MAR | 881,660 | 941,872 | 1,077,631 | 1,118,343 | 4,019,506 |
| UT3 CAPEX carryover account adjustments | (31,603) | (33,026) | (34,512) | (36,065) | (135,205) |
| (Adjusted) Total MAR | 850,057 | 908,846 | 1,043,119 | 1,082,278 | 3,884,300 |

Source: QCA analysis. Note: Numbers may not sum due to rounding

A summary of differences in the building blocks which inform this Draft Decision is provided below.

Operating costs

Our Draft Decision proposes an operating cost allowance for the 2014 DAU period of \$760.78 million, compared to the \$899.65 million originally proposed by Aurizon Network.⁴ In arriving at our Draft Decision, we have accepted many aspects of Aurizon Network's operating cost proposal.

⁴ This amount relates to the original proposal submitted by Aurizon Network in April 2013 and differs slightly from the total operating expenditure estimate submitted by Aurizon Network in December 2013 (as presented in Table 2). Our proposed reduction is \$139.06 million if compared to Aurizon Network's operating costs submitted in December 2013.

However, our Draft Decision is that Aurizon Network's operating cost proposal exceeds Aurizon Network's efficient costs of providing access to the declared service in the CQCEN. Accordingly, we are proposing a reduction of \$138.87 million over four years for operating costs, largely due to:

- a \$84.82 million reduction in the allowance for corporate overheads. While the proposed corporate overhead for the 2014 DAU period is less than that proposed by Aurizon Network, it is considerably more than the allowance included in UT3. We do not consider the corporate overhead proposed by Aurizon Network is reflective of the efficient costs of a stand-alone business providing a similar level of service as Aurizon Network for the declared service
- a \$31.37 million reduction to system-wide and regional costs (excluding corporate overheads). Our Draft Decision generally reflects Aurizon Network's actual costs in 2012–13. However, we have not accepted the case for further growth of costs including for train control, or Aurizon Network's proposal for cost escalation for its system-wide and regional costs
- removal of a cost allocation for environmental charges from Aurizon Network's operating cost proposals, amounting to \$22.59 million over four years, as this is already included in the electric charge arrangements.

Maintenance costs

The Draft Decision proposes a \$737.78 million allowance for maintenance costs for the 2014 DAU period compared to the \$1.07 billion submitted by Aurizon Network in December 2013. This reflects our Draft Decision to accept the direct maintenance costs proposed by Aurizon Network, with the exception of ballast undercutting costs. We consider Aurizon Network is showing evidence of real cost reductions from the UT3 to the 2014 DAU period for direct maintenance costs.

Our proposed \$328.46 million reduction to Aurizon Network's maintenance cost allowance over four years is due to:

- a \$116.84 million reduction to the allowance for ballast undercutting as we are unconvinced that the proposed cost allowance for ballast undercutting reflects efficient scope and costs over the UT4 period
- \$68.49 million of re-railing costs, reallocated to the capital indicator, as we consider these costs are better treated as renewals expenditure
- a \$55.46 million reduction relating to the removal of corporate overheads, noting our proposed operating expenditure allowance for corporate overheads has been calculated by taking account of all Aurizon Network activities including maintenance activities
- a \$10.20 million reduction to the allowance for the return on inventory and working capital as these costs are already provided for through assumptions in Aurizon Network's post-tax revenue model
- a \$19.80 million reduction to the return on fixed assets employed, as we are unconvinced about Aurizon Network's proposal to change from a historical cost approach to a gross replacement value approach for establishing the efficient capital costs of maintenance assets
- a \$12.06 million net reduction to the total maintenance allowance to account for revised volumes over the UT4 period
- a \$45.61 million reduction resulting from the use of our forecast escalation rates (e.g. the MCI, CPI).

Ballast impairment charge from UT3

Given the adjustment proposed to ballast maintenance costs for the 2014 DAU period, we propose to discontinue the ballast impairment applied to the RAB for pricing purposes for the 2014 DAU period only. However, we refuse to approve Aurizon Network's proposal to reverse the ballast impairment charge that

applied to the UT3 period as we do not consider Aurizon Network has provided evidence that its ballast maintenance arrangements prior to UT3 were cost effective or efficient.

Return of capital (depreciation)

Our Draft Decision is to refuse to accept Aurizon Network's proposal to change its depreciation arrangements to reflect its estimate of Weighted Average Mine Lives (WAML) in the CQCN. We agreed to a change to depreciation arrangements for UT3 to deal with concerns about asset stranding risk. We have not been convinced by the arguments submitted by Aurizon Network that its asset stranding risk has changed materially since UT3.

Hence, we propose to retain the 20-year rolling asset life for assets commissioned post 1 July 2009, with the remaining economic lives applied for assets commissioned prior to 1 July 2009. Further, as part of the 2014 DAU, Aurizon Network has proposed to commence depreciating its assets in the year after commissioning for the 2014 DAU period. Our Draft Decision is not to accept this change to the depreciation arrangements and continue depreciating Aurizon Network's assets from the year of commissioning.

Overall, the use of different assumptions for depreciation arrangements provides Aurizon Network with an additional \$74.38 million over four years relative to Aurizon Network's submitted depreciation in December 2013.

Capital indicator and capital expenditure carryover account

Aurizon Network is subject to an *ex post* capital expenditure assessment, which means we have only considered the reasonableness of costs, and our assessment of the prudence of Aurizon Network's costs and inclusion in the regulatory asset base (RAB) will not occur until after the proposed projects are completed.

We propose to accept Aurizon Network's proposed capital indicator, including the inclusion of the Wiggins Island Rail Project (WIRP) Stage 1, noting Aurizon Network has indicated the WIRP commissioning date has changed from 2014–15 to 2015–16. The capital indicator also reflects an increase in the annual renewals expenditure program compared to the UT3 period.

The Draft Decision includes Aurizon Network returning \$135.21 million over four years to customers in respect of over-recovery of its capital expenditure related revenues in UT3, as reflected in its carryover amount.

Weighted average cost of capital (WACC)

Our Draft Decision is to propose a post-tax nominal (vanilla) WACC for Aurizon Network for UT4 of 7.17%, incorporating: a cost of equity of 8.41%; a cost of debt of 6.15%; and a benchmark gearing of 55%.

Values for all parameter estimates that make up our Draft Decision on WACC are outlined in **Table 4**.

Table 4 WACC parameter estimates – Aurizon Network proposed WACC and QCA Draft Decision

| <i>Parameter</i> | <i>Aurizon Network (upper bound)</i> | <i>QCA's Draft Decision</i> |
|---------------------------|--------------------------------------|-----------------------------|
| Credit rating | BBB+ | BBB+ |
| Risk-free rate | 3.15% ¹ | 3.21% ² |
| Market risk premium | 7.0% | 6.5% |
| Asset beta | 0.6 | 0.45 |
| Debt beta | 0.12 | 0.12 |
| Debt to value | 55% | 55% |
| Equity beta | 1.0 | 0.8 |
| Gamma | 0.25 | 0.47 |
| Equity margin | 7.0% | 5.2% |
| Cost of equity | 10.15% | 8.41% |
| Debt risk premium (raw) | 3.28% | 2.72% |
| Debt transaction costs | 0.125% | 0.108% |
| Interest rate swap costs | – | 0.113% |
| Debt risk premium (total) | 3.405% | 2.94% |
| Cost of debt | 6.56% | 6.15% |
| WACC margin | 5.03% | 3.96% |
| WACC | 8.18% | 7.17% |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 149 and QCA analysis. Note (1) Based on a 10-year term to maturity and a 20 business day averaging period to 30 November 2012. (2) Based on a fouryear term to maturity and a 20 business day average to 31 October 2013.

The full reasoning for these positions is contained in the body of this Draft Decision.

THE ROLE OF THE QCA – TASK, TIMING AND CONTACTS

The Queensland Competition Authority (QCA) is an independent statutory authority established to promote competition as the basis for enhancing efficiency and growth in the Queensland economy.

Our primary role is to ensure that monopoly businesses operating in Queensland, particularly in the provision of key infrastructure, do not abuse their market power through unfair pricing or restrictive access arrangements. In 2012, that role was expanded to allow us to be directed to investigate, and report on, any matter relating to competition, industry, productivity or best practice regulation; and review and report on existing legislation.

Task, timing and contacts

On 11 August 2014, Aurizon Network submitted a Draft Access Undertaking (the 2014 DAU) for our approval. This follows extensive consultation between Aurizon Network and stakeholders on Aurizon Network's original UT4 proposal (the, now withdrawn, 2013 DAU).

We commenced an investigation into the 2014 DAU in accordance with section 146 of the QCA Act.

We are required to either approve, or refuse to approve, the 2014 DAU. We are assessing the 2014 DAU, in the context of the statutory access regime in the QCA Act and, in particular, the object of Part 5, section 69E, and the criteria for review of undertakings in section 138(2) of the QCA Act (see **Box 1**).

These criteria include promoting economically efficient operation of, use of and investment in regulated infrastructure with the effect of promoting competition in other markets (e.g. the above-rail haulage market). They also encompass the legitimate business interests of Aurizon Network, as well as the interests of access seekers and, more broadly, the public interest.

In making our assessment, we weighed the arguments and information put forward by Aurizon Network supporting its proposal, stakeholders' comments and submissions, as well as our own analysis. We recognise that stakeholders have already provided extensive and detailed comments on Aurizon Network's previous proposal. We will consider these submissions in our assessment of the 2014 DAU to the extent they remain relevant.

We commenced a public consultation process on the 2014 DAU and have:

- published on our website the 2014 DAU and Aurizon Network's supporting documentation
- sought submissions from interested parties.

We have previously published on our website extensive comments on Aurizon Network's 2013 DAU proposal; material from our cost of capital forum; and our consultants' reports on maintenance and operating costs and volume forecasts. These are still relevant for the MAR aspects of the 2014 DAU. The details of our consultation process are provided in Appendix A.

Box 1: The legal framework

The QCA may approve the 2014 DAU only if the QCA considers it appropriate to do so having regard to each of the matters set out in section 138(2) of the QCA Act:

The Authority may approve a draft access undertaking only if it considers it appropriate to do so having regard to each of the following —

- (a) *the object of this part;*
- (b) *the legitimate business interests of the owner or operator of the service;*
- (c) *if the owner and operator of the service are different entities—the legitimate business interests of the operator of the service are protected;*
- (d) *the public interest, including the public interest in having competition in markets (whether or not in Australia);*
- (e) *the interests of persons who may seek access to the service, including whether adequate provision has been made for compensation if the rights of users of the service are adversely affected;*
- (f) *the effect of excluding existing assets for pricing purposes;*
- (g) *the pricing principles mentioned in section 168A;*
- (h) *any other issues the authority considers relevant.*

The “object of this part” as referred to in section 138(2)(a) is set out in section 69E:

The object of this part is to promote the economically efficient operation of, use of and investment in, significant infrastructure by which services are provided, with the effect of promoting effective competition in upstream and downstream markets.

The section 168A pricing principles are:

The pricing principles in relation to the price of access to a service are that the price should —

- (a) *generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved; and*
- (b) *allow for multi-part pricing and price discrimination when it aids efficiency; and*
- (c) *not allow a related access provider to set terms and conditions that discriminate in favour of the downstream operations of the access provider or a related body corporate of the access provider, except to the extent the cost of providing access to other operators is higher; and*
- (d) *provide incentives to reduce costs or otherwise improve productivity.*

Section 138(3) sets out further constraints on the QCA’s entitlement to approve a DAU. In the specific circumstances of the 2014 DAU only subsections 138(3)(c) and (d) are relevant:

However, the authority may approve a draft access undertaking only if—

- (c) *it has published the undertaking and invited persons to make submissions on it to the authority within the time stated by the authority; and*
- (d) *it has considered any submissions received by it within the time.*

Key dates

In accordance with section 147A(2) of the QCA Act, we must use our best endeavours to decide whether to approve, or refuse to approve, the 2014 DAU within the time periods specified in that section. We gave notice of those time periods on 11 August 2014 and we also gave a notice of investigation to Aurizon Network under section 146 of the QCA Act and invited persons to make submissions with a closing date of 3 October 2014.

We have determined a proposed timetable for developing our final decision, as outlined in **Table 5** below.

In undertaking our investigation of the 2014 DAU, we must comply with Part 6 of the QCA Act. However, we have a high degree of flexibility in the manner in which we conduct an investigation. For the purposes of the current investigation, we consider it appropriate to sequence our consideration of the 2014 DAU so that we invite submissions on two Draft Decisions. We will therefore be publishing Draft Decisions:

- first, on the Maximum Allowable Revenue (MAR) aspects of the 2014 DAU
- second, the remainder of the 2014 DAU with a Draft Decision on the remaining matters (policy and tariffs) by the end of the year.

Our final decision will consolidate these two Draft Decisions in light of the submissions we receive.

Our consideration of the 2014 DAU is also running in parallel with our consideration of Aurizon Network's proposed standard user funding agreement (2013 SUFA DAAU).

Meeting this timetable will depend on the scope and complexity of issues raised by stakeholders in response to our Draft Decisions as part of the consultation and submission phases.

Table 5 Timetable

| <i>Task</i> | <i>Indicative Date</i> |
|--|-------------------------|
| 2014 DAU submission | 11 August 2014 |
| 2014 Draft Decision on Maximum Allowable Revenue (MAR) only | 30 September 2014 |
| Submissions on 2014 DAU due | 3 October 2014 |
| Submissions on 2014 DAU Draft Decision on MAR due | 12 December 2014 |
| 2014 DAU Draft Decision (on policy and pricing principles) | Mid-December 2014 |
| Submissions on 2014 DAU Draft Decision (policy and pricing principles) due | February 2015 |
| 2014 DAU Final Decision on policy, pricing and MAR | May 2015 |
| 2014 DAU Final Approval | By 30 June 2015 |
| UT4 Commences | July 2015 |

Submissions

We seek submissions to be presented in writing regarding our indicative views on Aurizon Network's proposed costs and MAR as set out in this first Draft Decision. Submissions must be received by no later than **12 December 2014**. We will consider all submissions received by us within this timeframe.

Contacts

Enquiries regarding this project should be directed to:

Queensland Competition Authority

GPO Box 2257

Brisbane QLD 4001

Tel (07) 3222 0555

Fax (07) 3222 0599

Aurizon@qca.org.au

This page has been left intentionally blank

1 INTRODUCTION

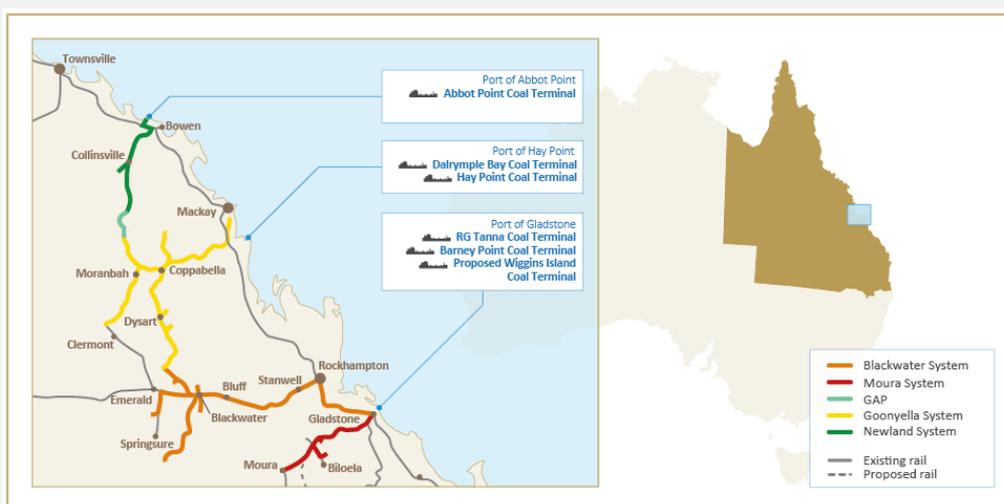
1.1 The market context

Aurizon Network is part of the broader coal supply chain in central Queensland. The CQC is the largest coal rail network in Australia, carrying coal from mines either for export or for domestic use including in power stations and industrial plants (Box 2). In 2013, coal exports accounted for 55% of the total value of Queensland's overseas merchandise exports.⁵

Box 2: Central Queensland Coal Network

The CQC is made up of around 2670 km of track servicing around 49 mines, three power stations and five port terminals. There are four major coal systems:

- the Moura system—connecting the Moura mine to Gladstone—primarily services coal mines in the Moura region and Callide Basin, with all coal being hauled to Gladstone, either for use at domestic industrial plants, Gladstone Power Station or for export via the Port of Gladstone
- the Blackwater system—connecting Gregory, Rolleston and Minerva to Gladstone, including the part of the North Coast Line between Parana and Rocklands—primarily services coal mines in the central and southern Bowen Basin and carries the product through to Stanwell Power Station, Gladstone Power Station and the Port of Gladstone
- the Goonyella system—connecting Gregory, North Goonyella and Blair Athol mine to the Port of Hay Point—services coal mines in the central and northern Bowen Basin and carries product to the ports at Hay Point. The Goonyella System connects to the Blackwater System in the south and the Newlands system in the north
- the Newlands system—connecting Newlands to the Port of Abbott Point, including the part of the North Coast Line between Durroburra and Kaili—is located at the northern end of the Bowen Basin connecting to the port at Abbot Point. The system services mines located in the Newlands System, as well as an increasing number of mines located in the Goonyella System via the Goonyella to Abbot Point Expansion (GAPE) project.



Source: Aurizon Network, 2013 DAU, sub. no. 2: 22; sub. no. 4: 15. See also section 250(3) of the QCA Act.

⁵ Queensland Treasury and Trade, 2014: 1 Appendix B

The Queensland coal industry is supplying coal into increasingly competitive global markets. Declining global coal prices caused by excess supply have outpaced cost-cutting, reducing margins and putting further pressure on the profitability and competitiveness of some Queensland coal mines. Despite positive cash margins on average, the variations in competitiveness between mines has meant around 30.7 million tonnes of metallurgical coal (21% of volumes) and 6.0 million tonnes of thermal coal (11% of volumes) had negative cash margins in 2013.⁶

These challenging conditions are continuing—with international markets remaining in oversupply and export prices remaining subdued. The QRC said the challenges confronting the resources sector in Queensland have intensified:

... the current coal industry downturn is as severe as any in the country's history and its recovery is likely to be a three to five year process ... mines have been forced to close and coal jobs have been lost ... based on current prices, it would be hard to find a thermal coal mine in Queensland operating at a profit ... For metallurgical coal miners, the situation is hardly better, noting that according to McCloskey's metallurgical coal on the spot market fell below 115 dollars a tonne last week – and that's for the highest quality coal.⁷

While accepting the challenging conditions for many of its customers in the short-term, Aurizon Network has indicated in its submission that it is cautiously confident about the outlook for the export coal industry in the medium to long term—noting the strong coal haulage volumes across 2013–14 for the CQCN (214.5 Mt, 27.1 Mt more than the previous best fiscal year of 2009–10), with a forecast volume of 204 Mt in 2014–15.⁸

1.2 A focus on efficient costs

Due to the challenging market conditions, coal producers and their suppliers have undertaken wide ranging cost reduction strategies across their businesses in order to improve productivity and remain globally competitive.⁹

Rail access charges have been identified by industry as a key cost concern in this environment.¹⁰ Stakeholders argued increases in rail access charges, even if seemingly minor, have a significant impact on the competitiveness of current coal mine operations and a chilling effect on investment.¹¹ The QRC said:

... coal miners are increasingly focussed on constraining costs, including corporate overheads, direct labour costs, reduced contract mining, maintenance and general contractor prices to stay competitive. Reduced transport costs are also needed to complement the incremental improvements made in other areas. ... Concerns of substantial increases in rail access charges

⁶ Queensland Treasury and Trade, 2014: 2

⁷ Roche, M. 2014, Speech to Bowen Basin Mining Club, 27 March, [[https://www.qrc.org.au/_dbase_upl/Bowen%20Basin%20Mining%20Club_\(web\)_27_March2014.pdf](https://www.qrc.org.au/_dbase_upl/Bowen%20Basin%20Mining%20Club_(web)_27_March2014.pdf)] accessed 3 April 2014.

⁸ Aurizon Network, 2013 DAU, sub. no. 2: 30; Aurizon Network, Financial Statements 2013–14, p. 2

⁹ Aurizon Network, 2013 DAU, sub. no. 1: 12; BMA, 2013 DAU sub. no. 41: 2; Glencore, 2013 DAU, sub. no. 74: 2; QRC, 2013 DAU, sub. no. 46: 22–24; RTCA, 2013 DAU, sub. no. 73: 3

¹⁰ Aurizon Network said its proposed below rail tariffs make a very modest contribution to coal producers' costs – and would have an insignificant impact on potential mine development (see Aurizon Network, 2013 DAU sub. no. 3: 32; 77: 8)

¹¹ QRC, 2013 DAU, sub. no. 46: 22; RTCA, 2013 DAU, sub. no. 73: 35; Anglo, 2013 DAU, sub. no. 78: 10

*and that Queensland's regulatory framework may be ineffectual in curtailing Aurizon Network's monopoly power will exacerbate the already poor investment sentiment.*¹²

That said, stakeholders did not want Aurizon Network to adjust its tariffs to reflect the commodity cycle, but rather, they were seeking to ensure that access charges are based on efficient costs in the context of all participants in the broader coal supply chain working towards improving the competitiveness of Queensland's export coal industry.¹³

Aurizon Network stated that it believes its revenue proposal reflects efficient costs that have, where possible, been benchmarked and are otherwise controlled through well established corporate governance practices.¹⁴ It said it is:

*... undertaking a transformation program aimed at reducing costs and improving productivity. Moreover, Aurizon Network has an ongoing obligation to prove its costs are efficient and to continue to seek to improve its operation of the rail network.*¹⁵

It said a major driver of the current tariffs is the under-utilisation of the network – with forecast volumes substantially below contracted volumes.¹⁶

1.3 Aurizon Network as a private company

The 2014 DAU has been developed by Aurizon Network as a privately-owned business. Aurizon Network states that it considers:

*... the change from privatisation has been profound Aurizon Network is now clearly required to act with the predominant and central objective of advancing the interests of its shareholders.*¹⁷

Aurizon Network's new obligations and drivers as a private business seem to be changing its approach to the provisions of rail access more broadly. Aurizon Network stated that it has made a commitment to its customers and its shareholders to achieve world class supply chain performance, and believes it is well on the way to fulfilling this goal.¹⁸ It said the increased accountability (to its shareholders and to the market) imposes strong commercial disciplines for it to improve efficiency, grow, and maximise performance.¹⁹ Reflecting this, Aurizon Network said it has pursued a rapid, transformative program of cost containment, precision operations, growth and safety.²⁰

Stakeholders are concerned that Aurizon Network has an increased incentive to 'push the boundaries' of the regulatory regimes in an effort to improve returns and reduce risk. The QRC said the coal industry has:

*... serious concerns about the effect that privatisation may have on the efficiency and competitiveness of the below-rail service and on the approach which a privatised monopoly service provider would take to its business.*²¹

This is of particular concern given the QRC has indicated that rail access charges comprise up to 15% of the total cost of bringing an extra tonne of coal to market.²²

¹² QRC, 2013 DAU, sub. no. 46: 23

¹³ QRC, 2013 DAU, sub. no. 84: 12

¹⁴ Aurizon Network, 2013 DAU, sub. no. 1: 11

¹⁵ Aurizon Network, 2013 DAU, sub. no. 1: 12

¹⁶ Aurizon Network, 2013 DAU, sub. no. 3: 11

¹⁷ Aurizon Network, 2013 DAU, sub. no. 2: 25

¹⁸ Aurizon Network, 2013 DAU, sub. no. 77: 13

¹⁹ Aurizon Network, 2013 DAU, sub. no. 77: 12–13

²⁰ Aurizon Network, 2013 DAU, sub. no. 3: 7

²¹ QRC, 2013 DAU, sub. no. 46: 7

However, Aurizon Network says there is a long term alignment between its shareholders and the coal industry to achieve world class supply chain performance and enable the future growth and development of the industry.

Aurizon Network's shareholders will have more than \$6 billion of the balance sheet invested in infrastructure supporting the coal industry by the end of UT4 in Regulatory Asset Base (RAB) terms, for which there is limited or no alternative use. Being highly leveraged to the Central Queensland Coal Network (CQCN), Aurizon Network is aligned with industry in the need to ensure that Queensland coal remains competitive²³

Aurizon Network also said that deliberately undermining the competitiveness or continued growth and expansion of the network is not in its shareholders' interests, who expect it to maintain and grow the value of their assets.²⁴

1.4 Our approach—a focus on costs and revenue

To assist our assessment of the 2014 DAU, we have prepared a Draft Decision on Aurizon Network's proposed costs and maximum allowable revenue (MAR).

We have chosen to do this now to provide Aurizon Network, industry and others with an early indication of our views on Aurizon Network's proposed costs and MAR.

We are able to do this because Aurizon Network has confirmed the 2014 DAU maintains its 2013 DAU costs and revenue position and the explanatory material supporting its 2013 DAU proposal remains relevant to the 2014 DAU.²⁵ We note stakeholders have already provided extensive and detailed comments on: Aurizon Network's 2013 DAU and supporting documentation; matters discussed at our December 2013 forum on the cost of capital; and our consultants' reports on maintenance and operating costs and volume forecasts.

While we are providing a Draft Decision on costs and MAR now, the 2014 DAU is, ultimately, one document. This means we cannot finalise our views on discrete parts of the 2014 DAU without considering if, and to the extent, the decision impacts on other parts of the 2014 DAU.

Therefore, in addition to our Draft Decision being subject to change having regard to Aurizon Network's submissions, stakeholders' submissions and further analysis, views on issues may also change as the wider context of the 2014 DAU is considered. We intend to release a Draft Decision on the remaining 2014 DAU matters (policy and pricing principles) later in the year.

²² QRC, 2013 DAU, sub. no. 46: 22

²³ Aurizon Network, 2013 DAU, sub. no. 77: 8

²⁴ Aurizon Network, 2013 DAU, sub. no. 77: 11–12

²⁵ This includes Aurizon Network, 2014 DAU, sub. no. 1–4.

2 MAXIMUM ALLOWABLE REVENUE AND INDICATIVE TARIFFS

An important aspect of the 2014 DAU is the pricing of access to the declared service. Under section 138 of the QCA Act, we are required to have regard to certain statutory criteria in deciding whether to approve, or refuse to approve, the 2014 DAU. In relation to pricing, we are required to have regard to the pricing principles mentioned in section 168A.

The pricing we have previously regarded as acceptable is determined subject to an overall revenue constraint, known as the Maximum Allowable Revenue (MAR). The MAR is the total revenue Aurizon Network is permitted to earn each year, determined in accordance with the 'regulatory asset base' (RAB) and 'building block methodology' (BBM).

The MAR forms the basis for calculating reference tariffs and determining system allowable revenues, both of which are contained in Schedule F of the 2014 DAU. This information is used to formulate access charges, including their adjustments.

Our Draft Decision is that the efficient MAR for Aurizon Network for the UT4 period is \$3.88 billion, including UT3 capital expenditure carryover account adjustments. The proposed MAR in our Draft Decision is 17% lower than the \$4.67 billion MAR submitted by Aurizon Network in December 2013. The key differences between our Draft Decision and Aurizon Network's 2014 DAU proposal are summarised below.

2.1 UT4 Maximum Allowable Revenue

2.1.1 Aurizon Network proposal

In April 2013, Aurizon Network proposed a total (smoothed) MAR for the CQC of \$1.04 billion in 2013–14, increasing to \$1.35 billion in 2016–17. This represented a total (smoothed) MAR of \$4.78 billion over four years.^{26,27}

Table 6 Aurizon Network's original 2014 DAU MAR for the CQC (\$'000, nominal)

| <i>Building Block</i> | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|------------------|------------------|------------------|------------------|
| Operating Expenditure | 205,671 | 218,061 | 234,288 | 241,634 |
| Maintenance Expenditure | 232,696 | 261,536 | 279,007 | 294,793 |
| Return of Capital | 269,692 | 291,121 | 346,457 | 348,587 |
| Inflation | (129,319) | (158,211) | (160,306) | (159,545) |
| Return on Capital | 422,927 | 517,417 | 524,270 | 521,779 |
| Tax | 73,713 | 76,600 | 92,216 | 100,339 |
| Value of Imputation Credits | (18,428) | (19,150) | (23,054) | (25,085) |
| Total (Unsmoothed) MAR ^{1,2} | 1,056,952 | 1,187,374 | 1,292,877 | 1,322,502 |
| Total (Smoothed) MAR³ | 1,037,176 | 1,140,449 | 1,258,583 | 1,347,400 |

Source: Aurizon Network April 2013 Financial Model; QCA analysis. Notes: (1) Numbers may not sum due to rounding; (2) Excludes UT3 CAPEX carryover account adjustments; (3) Includes UT3 CAPEX carryover account adjustments.

²⁶ All numbers in this chapter are nominal, unless otherwise indicated.

²⁷ This includes UT3 capital expenditure carryover account adjustments which relate to revenue differences derived from approved UT3 capital expenditure against the approved UT3 capital indicator from the 2010 AU.

Aurizon Network said, although its proposed return on capital for the 2014 DAU period is lower than for UT3, it is still forecasting an increase in revenue over the 2014 DAU period driven primarily by expansions and renewals expenditure, a change in depreciation assumptions (i.e. asset lives), and operating and maintenance costs.

Revised financial model - December 2013

In December 2013, Aurizon Network provided us with an updated financial model with a revised (smoothed) MAR proposal of \$4.67 billion over the 2014 DAU period. The updated financial model took account of a number of changes including:

- a deferment of the Wiggins Island Rail Project (WIRP) capital expenditure commissioning date from 2014–15 to 2015–16
- a change in circumstances from customers (i.e. the deferment of Newlands to Abbot Point Expansion (NAPE) operations to 2014–15 and Byerwen operations to 2015–16)
- an amendment to its proposed RAB roll-forward model to reflect approval of Aurizon Network's 2011–12 capital expenditure claim
- a consumer price index (CPI) update.

Table 7 shows Aurizon Network's revised 2014 DAU proposal, as reflected in its updated financial model of December 2013. Where possible, we have assessed the updated estimates in the December 2013 financial model as we consider these to be the most recent.

Table 7 Aurizon Network's submitted (revised) UT4 MAR for the CQCN (\$'000, nominal)

| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|--|------------------|------------------|------------------|------------------|
| Operating Expenditure | 205,817 | 218,066 | 234,300 | 241,652 |
| Maintenance Expenditure | 232,561 | 261,162 | 278,443 | 294,061 |
| Return of Capital | 265,052 | 288,122 | 313,371 | 357,939 |
| Inflation | (123,575) | (131,606) | (160,381) | (160,379) |
| Return on Capital | 404,144 | 430,409 | 524,515 | 524,506 |
| Tax | 73,654 | 76,294 | 89,595 | 95,572 |
| Value of Imputation Credits | (18,414) | (19,073) | (22,399) | (23,893) |
| Total (Unsmoothed) MAR ^{1,2} | 1,039,240 | 1,123,373 | 1,257,443 | 1,329,458 |
| Total (Smoothed) MAR³ | 1,006,778 | 1,077,672 | 1,256,704 | 1,328,604 |
| Aurizon Network's Original (Smoothed) MAR ³ | 1,037,176 | 1,140,449 | 1,258,583 | 1,347,400 |
| Difference (%) | (3.0%) | (5.8%) | (0.1%) | (1.4%) |

Source: Aurizon Network December 2013 Financial Model; QCA analysis. Notes: (1) Numbers may not sum due to rounding; (2) Excludes UT3 CAPEX carryover account adjustments; (3) Includes UT3 CAPEX carryover account adjustments.

2.1.2 Legislative framework

We are required to assess Aurizon Network's submitted MAR, having regard to the criteria in section 138(2) of the QCA Act. Section 138(2) describes matters we are required to 'have regard to'. However, the QCA Act does not prescribe the weightings for each matter. Section 138(2)(h) also provides that we can 'have regard to' any other issue(s) we consider relevant.

In the context of statutory interpretation in Australia, the phrase 'have regard to' has been consistently interpreted to require the decision-maker to take into account, the matter to which regard is to be had and given weight to, as an element in making the decision.²⁸

More specifically, the expression 'have regard to' is capable of different meanings depending on its context. In some contexts, it may require the decision-maker to take the matters into account and 'give weight to them as a fundamental element in making his [or her] determination'.²⁹ However, it can also simply require the decision-maker to merely consider the matters, rather than treat them as fundamental elements in the decision-making process, provided that consideration of the matters is a 'a jurisdictional prerequisite' to the making of the decision.³⁰

In this regard, the High Court of Australia has indicated that in the absence of any statutory or contextual indication of the weight to be given to factors to which a decision-maker must have regard (as is the case in the QCA Act), it is generally for the decision-maker to determine the appropriate weight to be given to them.³¹ A decision-maker, for example, is entitled to be brief in his or her consideration of a matter which has little or no practical relevance to the circumstances of a particular decision.³²

In the context of assessing Aurizon Network's MAR proposal, we have to take into consideration, all of the factors listed in section 138(2) as jurisdictional prerequisites for the decision, but with a weighting of each factor we consider appropriate based on the practical relevance of the factor to our decision.

In the context of assessing Aurizon Network's overall MAR for UT4, we also have to balance the factors listed in section 138(2), as we see appropriate, consistent with this weighting.

The criteria in section 138(2) apply to our overall decision whether to approve or refuse to approve the 2014 DAU. In order to make that decision, we also need to apply the criteria to the different components of that overall decision, including the acceptability of the MAR and, hence, the acceptability of each of the relevant components of the MAR. Different criteria may have different practical relevance to each of those components, meaning we are required to exercise our discretion and judgement in a manner consistent with previous judicial authority.

Conversely, while we have considered the section 138(2) criteria for each building block component in Aurizon Network's MAR, as set out in the remainder of this Draft Decision, we must also be satisfied that the MAR, as a whole, satisfies the section 138(2) criteria.

In addition to our assessment of Aurizon Network's MAR proposal, we have taken into account some additional considerations within section 138(2)(h) including:

- *predictability* – the regulatory arrangements should be as stable and predictable as possible given other objectives. Stability and predictability are likely to promote confidence in the regulatory arrangements and economic efficiency by reducing uncertainty associated with long term investment decisions

²⁸ DC Pearce and RS Geddes, *Statutory Interpretation in Australia* (7th Ed, 2011) [12.15]

²⁹ *R v Hunt; Ex parte Sean Investments Pty Ltd* (1979) 180 CLR 322 at 329 per Mason J

³⁰ *Minister for Immigration and Citizenship v Khadgi* (2010) 190 FCR 248

³¹ *Minister for Aboriginal Affairs v Peko-Wallsend Ltd* (1986) 162 CLR 24 at 41 (per Mason J)

³² *Elias v Commissioner of Taxation* (2002) 123 FCR 499 at [62] (p 512) (per Hely J)

- *the economic climate* – we consider that Aurizon Network's customers are undergoing challenging market conditions in the short term. It is in the public's interest for Queensland's mining industry to be as competitive as possible.

Efficient costs

Sections 69E and 138(2)(a) require us to have regard to the object of Part 5 of the QCA Act, namely to promote the economically efficient operation, use of, and investment in the CQCN, as the significant infrastructure by which the declared service are provided. Sections 138(2)(g) and 168A(a) require that we have regard to certain pricing principles, including that the price for access to declared service should generate expected revenue that is at least enough to meet the efficient costs of providing access to the service and include a return on investment commensurate with regulatory and commercial risks involved.

When assessing operating and maintenance costs, the QCA Act requires us to consider the factors in section 138(2). As identified above, this requires us to identify whether the costs proposed by Aurizon are efficient. We note that this task is not necessarily straightforward and requires us to make a decision based on the evidence available to us at the time. As we identified, for example, in the *Statement of Regulatory Pricing Principles for the Water Sector in December 2000*:

“The most common means of estimating efficient costs is to benchmark the performance of a particular utility against other relevant businesses, or to establish performance indicators independently. Under these approaches, efficiency levels for inputs, unit costs and quality of service are set on the basis of lowest-cost, highest-service standards (van den Berg 1997). Key difficulties include the general lack of an appropriate set of businesses against which valid operational conclusions can be drawn, and the scarcity of relevant information available to the regulator. Also important is recognition of the trade-off between capital maintenance and capital costs that utilities may employ—where higher operating, maintenance and administration (OM&A) costs may be offset by lower immediate capital refurbishment expenses.”

In that case, we indicated that given such difficulties, it was appropriate to evaluate the relevant costs on an individual basis, including by benchmarking against other relevant organisations. We also indicated that it was appropriate to have regard to the historical costs of the relevant organisation in light of any time series of comparative data:

“In at least one case, the relevant regulator has concluded that these difficulties are significant enough to warrant acceptance of the OM&A costs projected by the regulated organisations (at least until sufficient time has elapsed to enable a time series of comparative data to be collected). In general, the Authority considers that operating costs should reflect efficient service delivery given the scale and nature of the business activity, and that costs would be evaluated on an individual basis including benchmarking against other relevant organisations”.

In light of these comments and in the continued absence of robust, evidence-based benchmarks for assessing efficient costs in the CQCN, we have used a concept of 'reasonable costs' as an proxy for 'efficient costs' when assessing operating and maintenance costs for the 2014 DAU period. By 'reasonable', we mean, for example, that:

- the operating and maintenance costs are consistent with the costs of other relevant businesses (and would be therefore be reflective of efficient costs to the extent such organisations were exposed to competition);
- when the actual costs of Aurizon Network are analysed, the scope of activities and inputs is justifiable given the scale and nature of Aurizon Network's operations, those activities and inputs are casually related to the declared service provided, and that the expenditure on those activities and inputs is not excessive; and

- that an analysis of a time series of comparative data indicates that any escalation of costs is consistent with relevant cost indices.

We are continuing to refine our analysis of the operating and maintenance costs of Aurizon Network and will be considering scope for a more robust baseline and measurement system post the 2014 DAU.

We consider our proposed overall MAR provides Aurizon Network with sufficient revenue to operate its business, taking account of its commercial and regulatory risks.

We also consider our proposed MAR has regard to the legitimate business interests of Aurizon Network (section 138(2)(b)) given Aurizon Network's ability to recover its efficient operating and maintenance costs, a regulated return on capital and the depreciation allowance associated with prudently and efficiently incurred infrastructure investment in the CQCN. Within this context, section 138(2)(f) requires us to have regard to the effect of excluding existing assets from the RAB for pricing purposes.

Sections 138(2)(e) and (d) require us to have regard to the interests of access seekers and the public interest. We also consider that the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already 'access seekers' under section 138(2)(e). Consideration of all of these interests leads to a conclusion that Aurizon Network should be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the object of Part 5 specified in section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its downstream operations, which could otherwise raises concerns under section 168A(c).

We consider our proposed MAR, which balances the legitimate business interests of Aurizon Network, with the interests of access seekers (section 138(2)(e)), access holders (section 138(2)(h)) and the public interest (section 138(2)(d)), achieves an appropriate balance of the statutory factors under the QCA Act.

Allocation of costs

When considering cost allocation, we had regard to section 137(1A)(b) in addition to section 168A(c) of the QCA Act. Section 137(1A)(b) applies to Aurizon Network as a 'related access provider', namely an access provider that not only owns or operates the declared service, but also provides, or proposes to provide, access to the service to itself or a related body corporate.

Section 137(1A)(b) requires that Aurizon Network's access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the service. We therefore need to be satisfied that our proposed MAR provides neither a competitive advantage nor a competitive disadvantage for Aurizon Network's related parties.

The appropriate allocation of costs is a key consideration in developing the system allowable revenue (SAR) for each rail system in the CQCN to ensure equitable allocation of costs between systems.

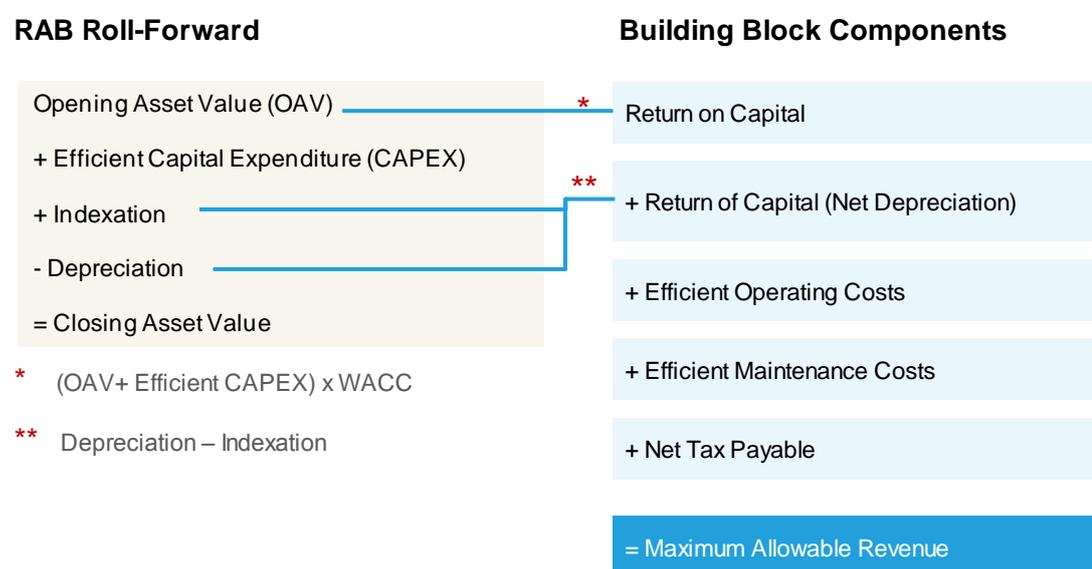
In terms of section 138 of the QCA Act, we consider sections 138(2)(a), (b), (d), (e), (g) and (h) most relevant. With respect to 138(2)(g) regarding the pricing principles in section 168A, we consider sections 168A(c) and (d) most relevant.

2.1.3 QCA assessment approach

In developing a MAR for the CQCN, we have assessed Aurizon Network’s proposal based on a 'building block' approach. The building block approach is the method traditionally applied by regulators in Australia to determine a revenue cap. It is a systematic approach to assessing the revenue requirements for regulated businesses to ensure a business has adequate revenue to meet the efficient costs of providing access to regulated services, including a return on investment commensurate with regulatory and commercial risks involved.

We consider the application of the building block model to be consistent with the requirements of the QCA Act. An overview of the building block model is provided in **Figure 2**.

Figure 2 Building Block Approach



Our assessment of each building block component is discussed in the remaining chapters of this Draft Decision, including a detailed discussion as to the nature of each building block component.

Our Draft Decision on the MAR aspects of the 2014 DAU has been informed by Aurizon Network's 2013 DAU proposal and supporting documentation; and assessment by independent consultants engaged by the QCA including Incenta Economic Consulting (Incenta), Energy Economics, RSM Bird Cameron (RSMBC) and Jacobs (Jacobs SKM).

We have also received submissions from 16 stakeholders to date and held meetings with Aurizon Network and its stakeholders to better understand certain information such as cost drivers and matters raised in submissions. The details of our consultation process are provided in **Appendix A**.

We have also undertaken a detailed analysis of Aurizon Network's UT4 models, which is based on a Post Tax Revenue Model (PTRM), as set out in **Appendix C**.

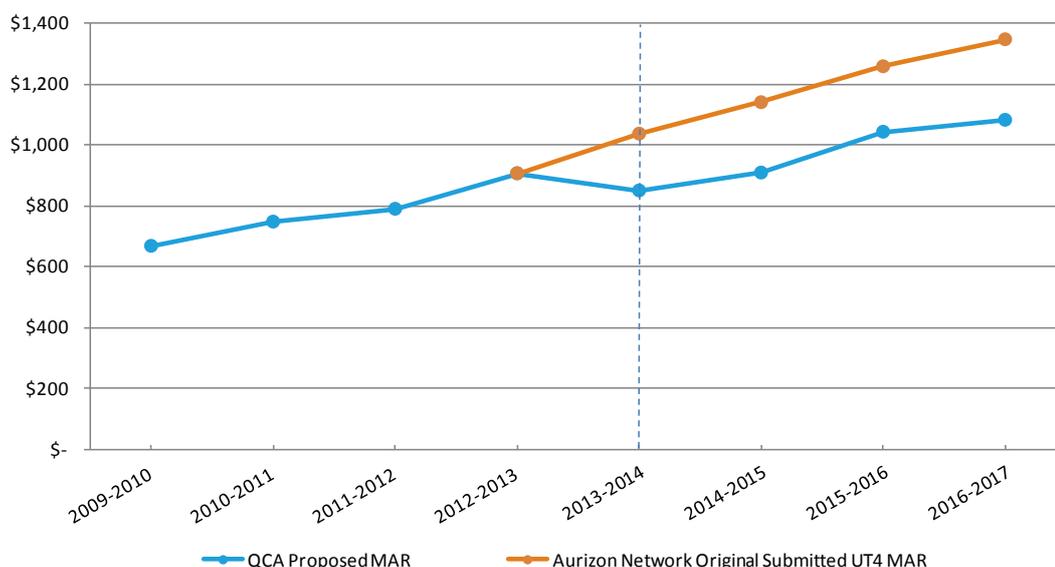
2.1.4 QCA analysis and Draft Decision

Our Draft Decision is to refuse to approve the 2014 DAU insofar as it relates to the MAR. This would result in an overall decision in which we similarly refused to approve the 2014 DAU.

Our proposed reasons for this refusal are set out in detail in this Draft Decision and are, in essence, that the MAR proposed by Aurizon Network is too high. Based on the evidence before us, we consider the 2014 DAU should be amended to include a lower MAR. Our proposed MAR for the UT4 regulatory period is \$3.88 billion.³³

Our proposed MAR is around 17% lower than the \$4.67 billion³⁴ (revised from the original \$4.78 billion³⁵) proposed by Aurizon Network (see **Figure 3**), although 14% higher, in real terms, than for the UT3 period.

Figure 3 MAR Comparison over UT3 and UT4 (\$ million, nominal)



Source: Aurizon Network April 2013 Financial Model; QCA analysis. Notes: Revenues include 2007–08 to 2010–11 revenue cap adjustments. 2011–12 and 2012–13 revenues include GAP system revenues. UT4 revenues include smoothed UT3 CAPEX carryover account adjustments.

In arriving at our Draft Decision, we consider our proposed MAR will provide Aurizon Network with sufficient revenue to meet the efficient costs of providing access to the declared service, including a return on investment commensurate with the commercial and regulatory risks involved, consistent with sections 138(2)(g) and 168(A)(a) of the QCA Act.

We also consider our proposed MAR has regard to the legitimate business interests of Aurizon Network as required by section 138(2)(b) of the QCA Act. Further, we consider our proposed MAR represents the efficient costs of providing a sustainable service via the CQCN, which is in the interest of access seekers and holders (section 138(2)(e)) and the public interest (section 138(2)(d)).

³³ This includes UT3 CAPEX carryover account adjustments.

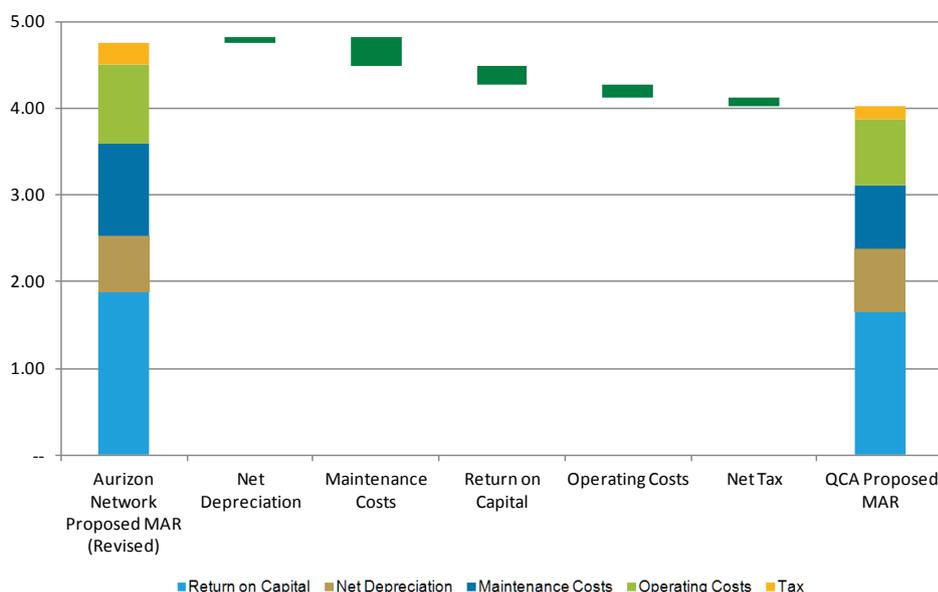
³⁴ This relates to Aurizon Network's smoothed MAR estimate.

³⁵ This relates to Aurizon Network's smoothed MAR estimate.

Key drivers for Draft Decision MAR

The key drivers for our proposed MAR are set out in **Figure 4**.

Figure 4 Key Drivers for UT4 MAR Difference (Aurizon Network and QCA) (\$ billion, nominal)



Source: Aurizon Network December 2013 Financial Model; QCA analysis. Note: Revenues are unsmoothed and exclude UT3 CAPEX carryover account adjustments.

The key differences include:

- a reduction of Aurizon Network's proposed UT4 operating cost allowance by \$139.06 million³⁶
- a reduction of Aurizon Network's proposed UT4 maintenance cost allowance by \$328.45 million
- the use of different assumptions for depreciation arrangements provides Aurizon Network with an additional \$74.38 million over four years
- a WACC of 7.17% compared with Aurizon Network's proposed WACC of 8.18%

Summary of QCA proposed Maximum Allowable Revenue

provides a breakdown of our proposed 2014 DAU MAR for the CQC. It contains Aurizon Network's submitted UT3 capital expenditure carryover account adjustments.³⁷ The UT3 capital expenditure carryover account adjustment revenues are smoothed with a 4.5% escalation factor and applied over the 2014 DAU regulatory period.

³⁶ Note that this relates to the difference between Aurizon Network's revised MAR proposal (December 2013) and the QCA proposed MAR. Our proposed reduction is \$138.87 million if compared with Aurizon Network's April 2013 submission, as shown in Executive Summary and Chapter 4.

³⁷ For a breakdown of MAR by non-electric and electric assets, and by system, refer to **Appendix D**.

Table 8 QCA proposed 2014 DAU MAR for the CQCN (\$'000, nominal)

| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|--|----------------|----------------|------------------|------------------|
| Operating expenditure | 175,539 | 184,895 | 197,524 | 202,818 |
| Maintenance expenditure | 174,388 | 178,127 | 187,774 | 197,491 |
| Return of capital (depreciation) | 270,693 | 300,456 | 351,946 | 375,766 |
| Inflation | (123,867) | (132,168) | (161,106) | (160,603) |
| Return on capital (WACC) | 355,179 | 378,983 | 461,958 | 460,515 |
| Tax | 56,091 | 59,585 | 74,594 | 79,916 |
| Value of imputation credits | (26,363) | (28,005) | (35,059) | (37,561) |
| Total (Unsmoothed) MAR | 881,660 | 941,872 | 1,077,631 | 1,118,343 |
| UT3 CAPEX Carryover Account Adjustments | (31,603) | (33,026) | (34,512) | (36,065) |
| (Adjusted) Total MAR | 850,057 | 908,846 | 1,043,119 | 1,082,278 |
| Aurizon Network's Proposed (Revised) MAR | 1,006,778 | 1,077,672 | 1,256,704 | 1,328,604 |
| Difference (%) | (15.6%) | (15.7%) | (17.0%) | (18.5%) |

Source: QCA analysis. Note: Numbers may not sum due to rounding.

Draft Decision

2.1 Our Draft Decision is to refuse to approve the 2014 DAU insofar as it relates to the MAR. This would result in an overall decision in which we similarly refused to approve the 2014 DAU. Our proposed reasons for this refusal are set out in detail in this Draft Decision and are, in essence, that the MAR proposed by Aurizon Network is too high. In this Draft Decision, our proposed MAR for the 2014 DAU period (2013–14 to 2016–17) is the (Adjusted) Total MAR identified in Table 8.

2.2 Indicative tariffs

Our Draft Decision relates to the MAR only. We are not making a decision on Aurizon Network's proposed reference tariffs at this time, but intend to do so in the second Draft Decision.

However, we understand that information on a MAR level may not be as useful to certain stakeholders, particularly Aurizon Network's customers, as the proposed reference tariffs themselves. As such, we are providing information (i.e. indicative tariffs) that takes account of volume forecasts to assist these stakeholders to respond to the Draft Decision. The indicative tariffs are intended to provide guidance to stakeholders on what they may be paying to gain access to Aurizon Network's declared service, on a dollar per net tonne basis, for the 2014 DAU period.

Table 9 presents the indicative tariffs (on a dollar per net tonne basis) that are derived from our proposed MAR and volume forecasts over the 2014 DAU regulatory period.³⁸

³⁸ Refer to **Chapter 3** for our discussion on UT4 volume forecasts.

Table 9 Indicative tariff by system (\$/net tonne, nominal)

| <i>Non-electric (dollar per net tonne)</i> | | | | | |
|---|----------------|----------------|----------------|----------------|----------------|
| <i>System</i> | <i>2012–13</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
| Blackwater | 4.58 | 3.83 | 4.36 | 4.45 | 4.69 |
| Goonyella | 2.88 | 2.45 | 2.58 | 2.76 | 2.69 |
| Moura | 3.67 | 3.28 | 3.33 | 3.29 | 3.33 |
| Newlands | 2.34 | 3.24 | 3.61 | 3.55 | 3.35 |
| Goonyella to Abbot Point | 9.63 | 8.59 | 8.19 | 8.19 | 8.16 |
| Simple average | 4.62 | 4.28 | 4.41 | 4.45 | 4.44 |
| Weighted average | 3.74 | 3.33 | 3.58 | 3.79 | 3.80 |
| <i>Electric (dollar per electric net tonne)</i> | | | | | |
| Blackwater | 2.25 | 1.85 | 2.15 | 1.70 | 1.36 |
| Goonyella | 0.83 | 0.63 | 0.76 | 0.86 | 0.84 |
| Simple average | 1.54 | 1.24 | 1.46 | 1.28 | 1.10 |
| Weighted average | 1.22 | 0.97 | 1.19 | 1.18 | 1.04 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 19; QCA analysis. Notes: Indicative tariffs are based on our proposed volume forecasts except for WIRP which uses 90% of contracted volumes. 2012–13 indicative tariffs relate to the UT3 period and are based on Aurizon Network submitted estimates.

2.3 Comparison of MAR and indicative tariffs

This section provides a comparison of Aurizon Network's proposed revised MAR and Aurizon Network's indicative tariffs against our Draft Decision.

In revenue terms, the System Allowable Revenues (SARs) in our Draft Decision are lower than Aurizon Network's proposal and are shown in **Figure 5**.

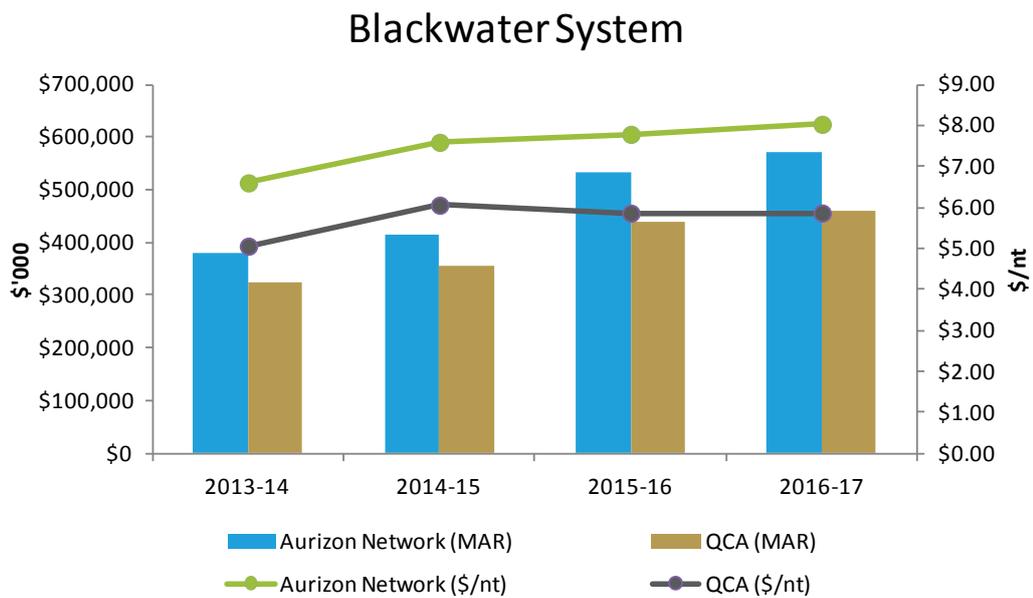
In dollar terms, our proposed MAR for the Blackwater, Goonyella and Moura systems are lower than Aurizon Network's proposal across all years.

However, in dollar per net tonne terms, the indicative tariffs implied by the Draft Decision for the Newlands and GAP systems are, on average, similar or higher than Aurizon Network's proposal. The similar or higher indicative tariffs in the Newlands and GAP systems are attributable to lower volume forecasts, particularly for 2015–16 and 2016–17.

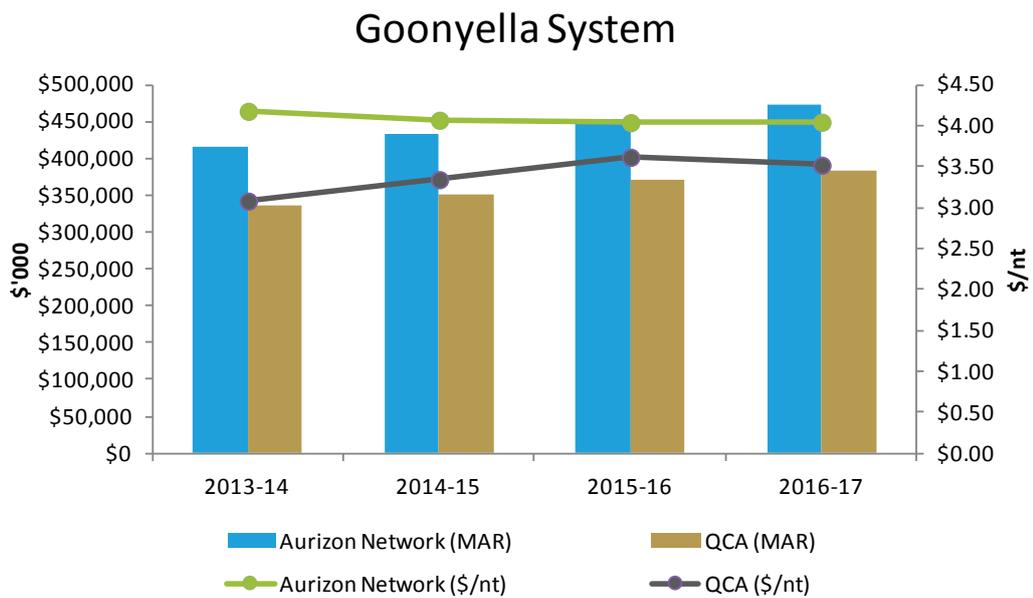
The annual difference between Aurizon Network's volumes forecasts and our volume forecasts ranges from:

- 12% to 21% lower for the Newlands system
- 24% to 39% lower for the GAP system.

Figure 5 MAR and indicative tariffs by system (nominal)

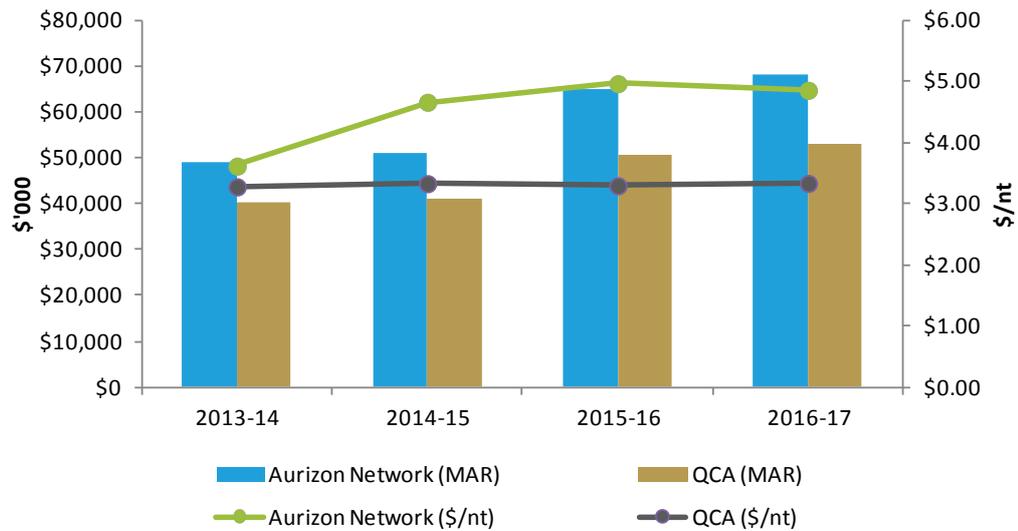


Source: QCA analysis. Note: Indicative tariffs are derived as total system MAR (electric and non-electric assets) inclusive of UT3 carryover adjustments divided by total net tonnes.



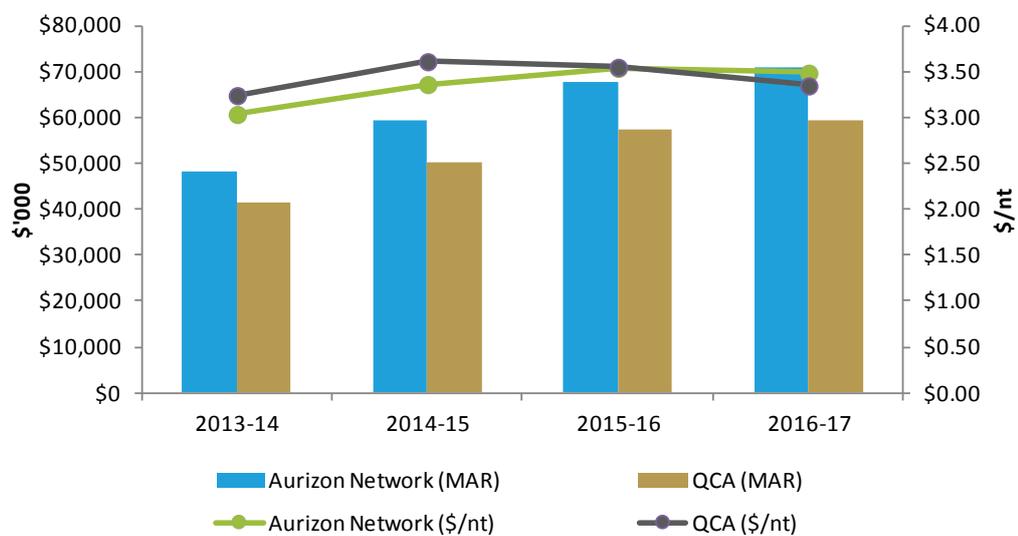
Source: QCA analysis. Note: Indicative tariffs are derived as total system MAR (electric and non-electric assets) inclusive of UT3 carryover adjustments divided by total net tonnes.

Moura System

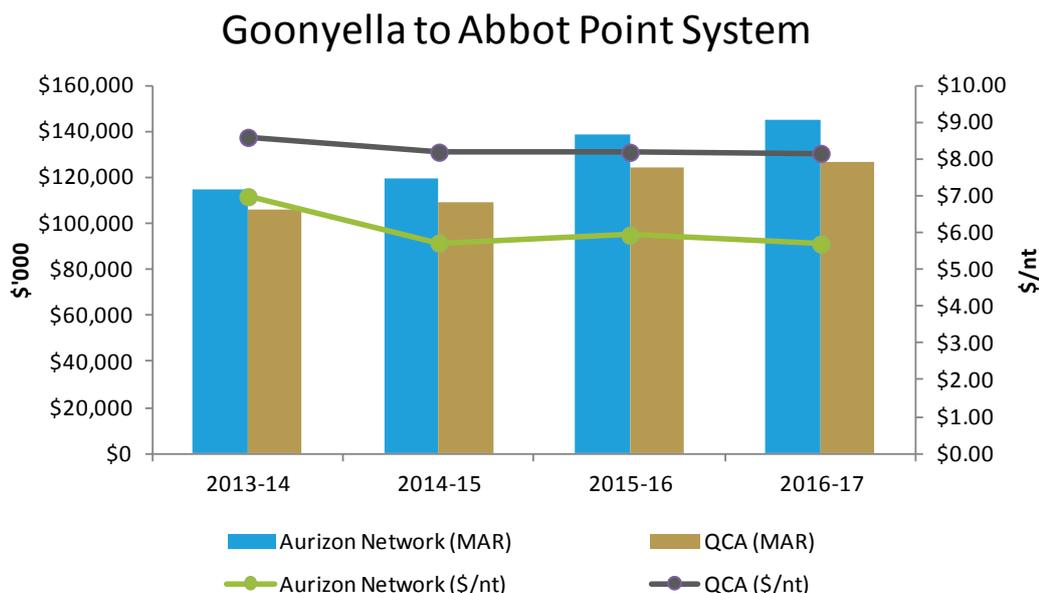


Source: QCA analysis. Note: Indicative tariffs are derived as total system MAR (electric and non-electric assets) inclusive of UT3 carryover adjustments divided by total net tonnes.

Newlands System



Source: QCA analysis. Note: Indicative tariffs are derived as total system MAR (electric and non-electric assets) inclusive of UT3 carryover adjustments divided by total net tonnes.



Source: QCA analysis. Note: Indicative tariffs are derived as total system MAR (electric and non-electric assets) inclusive of UT3 carryover adjustments divided by total net tonnes.

2.4 Transitional matters relating to UT4 MAR

2.4.1 Aurizon Network proposal

We have approved Aurizon Network's proposed extensions to its 2010 AU to provide transitional tariffs to customers while the 2014 DAU is being assessed.³⁹

As these are transitional tariffs, a 'true-up' process will be required. Aurizon Network proposed two options:

- *smoothing*—incorporating the differences between allowable revenues and actual revenues received in 2013–14 into the remaining years of the 2014 DAU regulatory period (i.e. 2014–15, 2015–16 and 2016–17)
- *adjustment charges*—after our final approval of the 2014 DAU.

2.4.2 Stakeholders' comments

Stakeholders provided comments on this issue in their submissions on Aurizon Network's proposed extensions to its 2010 AU. A summary is provided below.

Table 10 QRC comments on merits of smoothing versus adjustment charges

| <i>Smoothing</i> | <i>Adjustment charges</i> |
|---|---|
| <ul style="list-style-type: none"> • provides certainty due to consistency with Aurizon Network's May 2013 proposal—i.e. 'Departing from the process which was indicated at that time creates uncertainty in regard to regulatory processes and in formulating responses to these processes' | <ul style="list-style-type: none"> • provides certainty for 2013–14—it noted 'The uncertainty regarding tariffs to date has been a significant burden for industry in setting budgets and reporting performance. It is not acceptable to create a situation in which the true cost of access for 201314 year is not known until many |

³⁹ Refer to <http://www.qca.org.au/Rail/Aurizon/Intro-to-Aurizon/2010-Access-Undertaking/Variations/DAAU-Extensions> for further information on our approval of Aurizon Network's extension draft amending access undertaking proposals.

| Smoothing | Adjustment charges |
|--|--|
| <ul style="list-style-type: none"> prevents inequities between producers—while deferring adjustments may be NPV neutral for Aurizon Network, this is not the case for individual producers prevents adverse impacts on industry competitiveness in later years—there is a substantial risk finalising 2013–14 tariffs at the interim levels will artificially inflate 2014–15 to 2016–17 tariffs, impacting on industry competitiveness over an extended period. | <p>months after completion of that year'</p> <ul style="list-style-type: none"> avoids complexities and further debate regarding take-or-pay calculations—two 2013–14 adjustment charge processes would create significant uncertainty regarding how take-or-pay would be applied provides immediate cash-flow relief—for a majority of producers, and on a net industry-wide basis. |

Aquila Resources and Bandanna Energy supported an adjustment charge. These producers considered:

- it is likely the 2013–14 transitional tariffs, particularly for the Blackwater system, will be significantly lower than those approved in UT4. This means tariffs across 2014–15 to 2016–17 are likely to be disproportionately higher, to account for under-recovery in 2013–14
- Aurizon Network's revised proposal is likely to provide existing producers with an immediate cash flow benefit to the detriment of future producers, thereby decreasing the latter's competitiveness
- the revised proposal would, in effect, result in emerging producers subsidising existing producers for 2013–14, due to the additional capacity created by WIRP Stage 1.

2.4.3 QCA analysis and Draft Decision

We considered the two options as part of our Final Decision on Aurizon Network's 2014 Extension DAAU.

We indicated we understood the concerns of the new miners (and, potentially, other emerging or new coal producers) that the smoothing option may result in these producers facing disproportionately higher (or lower) reference tariffs for the 2014–15 to 2016–17 period, caused by under (or over) recovery in 2013–14. We note these concerns may have implications for competition in upstream markets and for the viability of new or emerging coal producers.

However, we also noted the normal revenue cap arrangements that apply in UT3 provide for revenue under-recoveries (over-recoveries) to be recouped (returned) two years later. This means these arrangements, while maintaining revenue neutrality for Aurizon Network, are never likely to do so in practice for all individual coal producers. It is always likely that, in the two years between an under-recovery (over-recovery) and it being recouped (returned), some producers will exit the market and some new producers will enter. In addition, even among producers who stay in the market, there will inevitably be significant ramp-ups in production, and reductions in production for others, within the two-year period.

While we accepted that (potentially) the under (or over) recovery of revenues from 2013–14 that may need to be recouped via approved reference tariffs over the remainder of the UT4 regulatory period could be significant, we noted revenue under-recoveries in past years that have been recouped two years later have also, on occasions, been significant.

Given the nature of the regulatory regime, and the operation of the revenue cap framework, our Draft Decision is it is not unreasonable to accept the proposal to smooth any adjustment required over the remainder of the 2014 DAU regulatory period. We are inclined to apply

smoothing for any under or over-recovery of revenues resulting from the 2013–14 transitional tariff arrangements.

Arrangements for reconciling 2014–15 transitional tariffs will be considered as part of our Final Decision on the 2014 DAU. We seek stakeholder input on this in response to this Draft Decision.

Draft Decision

2.2 We accept Aurizon Network's proposal to smooth the difference between 2013–14 allowable and actual revenues over the 2014–15, 2015–16, 2016–17 years.

2.3 We seek stakeholder input into the appropriate arrangements for reconciling allowable and actual revenues for 2014–15.

3 VOLUME FORECASTS

A key component in determining the Maximum Allowable Revenue (MAR) over the regulatory period is the volume forecasts. The volume forecasts underpin a range of cost factors, in particular the CQCN maintenance program. Volume forecasts are also used to convert the approved annual revenue requirement into reference tariffs for the coal-carrying train services in the CQCN.

Our Draft Decision is to use volume forecasts 6.3% lower than Aurizon Network's original proposal. Our estimates for 2013–14 is higher than Aurizon Network's original proposal, but lower in the remaining years of the 2014 DAU period largely reflecting a slower rate of increased production from mines supplied by the WIRP Stage 1 and GAPE/NAPE expansions.

3.1 Aurizon Network proposal

Aurizon Network has proposed volume forecasts for each coal system in central Queensland from 2013–14 to 2016–17 on a net tonne basis and provided the QCA with detailed confidential information in support of this on a mine level basis. Aurizon Network's application also sets out the volume forecasts on a gtk basis in Schedule F, 2014 DAU.

Aurizon Network said its forecasts were based on a range of factors, including:

- demand outlook for domestic and export coal in the CQCN taking account of economic conditions
- the capacity of the relevant supply chains within the context of this demand outlook
- current and anticipated contracted volumes and expected production growth
- the incremental capacity to be delivered by planned expansions and associated timing.

Aurizon Network stated the difficulties in forecasting volumes, and the errors inherent in this methodology, 'introduces a degree of volatility into price outcomes for access holders under a revenue cap form of regulation' and 'a degree of judgement needs to be applied in forecasting volumes over the next four years'.⁴⁰

Aurizon Network said its volume projections for UT4:

- reasonably consistent with industry sentiment over the next two years, with current volumes providing a guide to expected throughput in 2013–14
- consistent with the QRC's own publication predicts subdued thermal and metallurgical contract coal prices, which points to continued softness in demand
- reflect substantial reductions in employment numbers in the coal sector over the first half of 2012–13, with further reductions forecast in 2014, indicates the sector is not preparing for significant increases in production over 2013–14 and 2014–15.

Aurizon Network said the annual update of system volume forecasts that occurs as part of the annual review of reference tariffs is an important part of lowering the forecasting error and mitigating volume risks.⁴¹

⁴⁰Aurizon Network, 2013 DAU, sub. no.3: 20

⁴¹Aurizon Network, 2013 DAU, sub. no.3: 20

Table 11 Aurizon Network original 2014 DAU volume forecasts (million tonnes - mt)

| <i>System</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|---------------------|----------------|----------------|----------------|----------------|
| Blackwater | 51.3 | 51.6 | 48.5 | 49.0 |
| Goonyella | 100.4 | 109.4 | 114.8 | 119.7 |
| Moura | 12.5 | 11.0 | 10.4 | 11.3 |
| Newlands (exc GAPE) | 14.8 | 15.8 | 17.0 | 18.7 |
| GAPE | 20.6 | 25.4 | 27.1 | 29.0 |
| WIRP Stage 1 | – | 9.0 | 18.7 | 24.3 |
| Total | 199.6 | 222.2 | 236.5 | 252.1 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 20. Note: Numbers may not sum due to rounding.

Consistent with the approach for UT3, Aurizon Network says regard must be given to the capacity of the relevant supply chains when considering the demand outlook, in particular, the incremental capacity to be delivered by planned expansions and the expected timing of expansions.⁴²

Aurizon Network provided revised volume forecasts to the QCA in December 2013. However, for the purposes of comparison over the remainder of this chapter, we have referred to the original volume forecasts.

3.2 Stakeholders' comments

Most stakeholders commented on the subdued volumes over the UT4 period and the impact on tariffs:

- Asciano was concerned that the undertaking provides incentives for Aurizon Network to under-forecast volumes and considered the 2014 DAU should be amended to provide for improved forecasting⁴³
- Asciano also said the 2014 DAU forecasting should involve a process where supply chain stakeholders are further involved with the annual determination of forecasts and the annual forecasts are independently assessed by an expert⁴⁴
- Freightliner said that given the forecast volumes have already been noted to deviate down over the same period, questions must be raised regarding the adequacy and efficacy of the calculation of the tariff rates proposed by Aurizon Network⁴⁵
- the QRC was concerned about the accuracy of the UT4 tonnage forecasts as they relate to take-or-pay volumes under UT1 agreements and the proposed higher forecast for WIRP.⁴⁶

Given stakeholder concerns about the accuracy of the forecasts provided by Aurizon Network, we sought to independently verify the Aurizon Network forecasts. We note Aurizon Network's own statement that 'a degree of judgement needs to be applied', hence Aurizon Network does appear to have scope to exercise discretion in its forecasting. Moreover, we also note Asciano's comments regarding potential incentives on Aurizon Network that could affect the manner in which that discretion is exercised.

⁴² Aurizon Network, 2013 DAU, sub. no. 3: 20

⁴³ Asciano, 2013 DAU, sub. no. 43: 10

⁴⁴ Asciano, 2013 DAU, sub. no. 43: 10

⁴⁵ Freightliner, 2013 DAU, sub. no. 75: 2

⁴⁶ QRC, 2013 DAU, sub. no. 46: 90–91

3.3 Consultant's assessment

We engaged Energy Economics in April 2013 to independently review the forecast volumes for the regulatory period 2013–14 to 2016–17. We believed an independent review of forecast volumes would remove any risk of bias and ensure any discretion in forecasting was exercised free of any incentives to which Aurizon Network is subject.

At the time, Energy Economics' assessment took into account supply chain issues based on key components outlined in Aurizon Network's submission, including mine production, out loading facilities at port, and domestic and international demand for coal (thermal and metallurgical) over the next four years. In that review, Energy Economics' total systems railings was more than 10% lower than Aurizon Network's original forecast of 910.4 million tonnes, over the course of the four year forecast period.

However, following Aurizon Network's half year market report for financial year 2014, it became apparent that railings for 2013–14 were likely to be much higher than expected.⁴⁷ Subsequently, we engaged Energy Economics' to independently re-examine existing forecasts to take account of the current market conditions for coal production.

Energy Economics' revised findings in its April 2014 Report (see **Table 12**) suggested that while overcapacity (and lower coal prices) will continue to be the main theme in international coal markets over the next three to four years, coal producers are utilising existing capacity to increase output and production within existing mines. This is largely being attributed to mines needing to meet their take-or-pay commitments for both rail and port infrastructure.

The revised forecasts show that Energy Economics' anticipated volumes are still 6.3% lower than Aurizon Network's original submitted forecasts.⁴⁸ While the levels of coal railings forecasts by both Energy Economics and Aurizon Network are not expected to be constrained by rail and port capacity, the difference between Energy Economics' revised forecast and Aurizon Network's original forecast is mainly attributable to the differences around the scale and timing of production at the mine level, particularly associated with the commencement of production from mines contracted to use the WIRP infrastructure.

Energy Economics found that central Queensland's longwall mines have achieved very strong production performance in 2013–14, with no reported prolonged breaks in production. In addition, mine capacity expansion projects in the region have ramped up to full capacity more quickly than anticipated, particularly the Lake Vermont, Daunia and Middlemount expansion projects.

Table 12 Energy Economics April 2014 volume forecasts (million tonnes - mt)

| <i>Financial year to June</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> | <i>Total</i> |
|-------------------------------|----------------|----------------|----------------|----------------|--------------|
| Aurizon Network - April 2013 | 199.6 | 222.2 | 236.5 | 252.1 | 910.4 |
| Energy Economics - April 2014 | 211.0 | 205.6 | 211.1 | 225.1 | 852.8 |
| Difference | 11.4 | -16.6 | -25.3 | -27.0 | -57.6 |
| % difference | 5.7% | -7.5% | -10.7% | -10.7% | -6.3% |

Source: Energy Economics, 2013 DAU, 2014. Note: Differences may not align with components due to rounding.

⁴⁷ Aurizon Holdings, Investors Briefing, 17 February 2014

⁴⁸ Energy Economics, 2013 DAU, 2014: 5

3.4 QCA analysis and Draft Decision

The volume forecasts play a key role in estimating the efficient costs necessary for running the CQCN, for estimating reference tariffs and determining the triggers for take-or-pay.

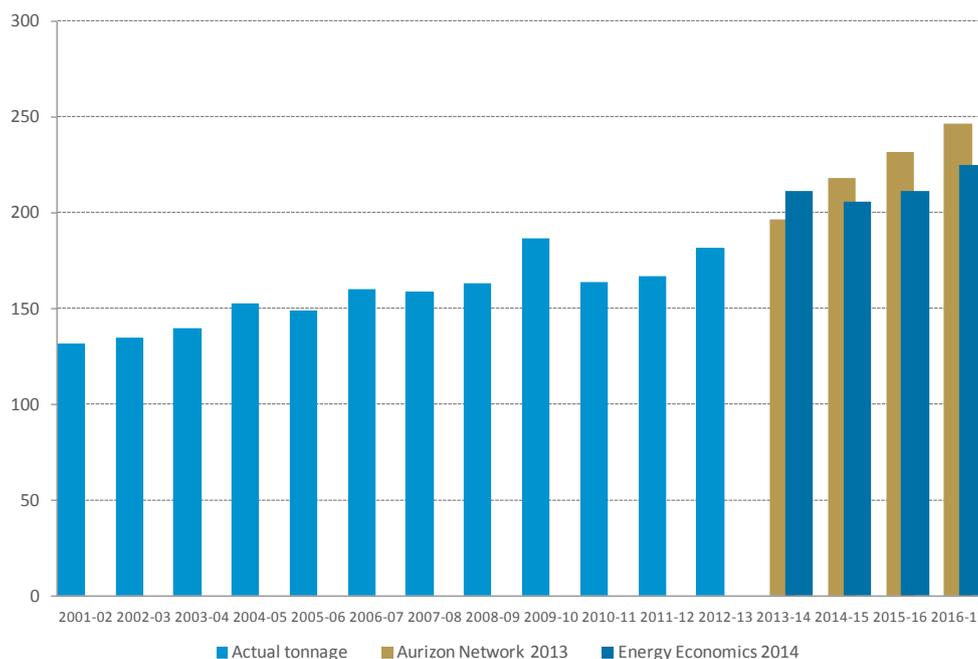
Given the differences between Aurizon Network's volume forecasts and the volume forecasts of Energy Economics, we are faced with a decision as to which of these forecasts is the more accurate forecast.

In this regard, tonnages on the CQCN will be influenced by a range of factors, both within and external to Aurizon Network's control including:

- the capacity and availability of rail infrastructure, which amongst other things is impacted by Aurizon Network's maintenance program
- the capacity and interaction with other parts of the coal supply chain including port capacity
- demand for rail haulage which will be impacted by broader market conditions including coal prices and mine operations.

Figure 6 shows the growth in coal tonnages transported in the CQCN since 2001–02 and that there are mixed views on the outlook for the UT4 period. The 2013–14 year has delivered the highest throughput on the network at 214.5 million tonnes.

Figure 6 UT1 to UT3 actual and 2014 DAU forecast tonnages (million tonnes mt)



Source: Aurizon Network, 2013 DAU, sub. no. 4: 35, Energy Economics, 2013 DAU, 2014: 5

Both Aurizon Network and Energy Economics forecast higher coal volumes over the UT4 period, driven by new infrastructure including GAPE and WIRP. The Energy Economics' estimates are for a lower rate of growth over the period than that originally proposed by Aurizon Network, largely driven by the rate at which the WIRP tonnages will commence and be raling at capacity.

Our Draft Decision is to use the Energy Economics' forecast for the 2014 DAU period. We consider the Energy Economics' forecast to be the best available and note the 2013–14 estimate is close to Aurizon Network's 2013–14 actual results. The Energy Economics' estimated tonnages for the 2014 DAU period, are set out in **Table 13**.

Table 13 QCA UT4 Volume Forecasts by System (million tonnes - mt)

| <i>System</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|---------------------|----------------|----------------|----------------|----------------|
| Blackwater | 64.3 | 58.9 | 57.6 | 59.1 |
| Goonyella | 109.4 | 105.1 | 102.8 | 108.8 |
| Moura | 12.3 | 12.4 | 12.7 | 13.2 |
| Newlands (exc GAPE) | 12.8 | 13.9 | 16.2 | 17.8 |
| GAPE | 12.3 | 13.3 | 15.2 | 15.5 |
| WIRP Stage 1 | 0.0 | 2.1 | 6.7 | 10.8 |
| Total | 211.0 | 205.6 | 211.1 | 225.1 |

Source: Energy Economics, 2013 DAU, 2014: 5 and supporting papers. Note: Totals may not sum due to rounding.

While we have applied the 2013–14 estimates for our Draft Decision, it will need to be revised for 2013–14 actual results for the Final Decision.

Draft Decision

3.1 We propose Aurizon Network to amend its forecast volumes for 2014 DAU consistent with Table 13 and its actual results for 2013–14.

4 OPERATING COSTS

Aurizon Network's operating costs proposal represents around 19% of its annual Maximum Allowable Revenue (MAR). Its operating costs include all costs associated with train control, planning and infrastructure management and business development. It also includes the corporate overheads for operation of the business, along with insurance and other costs.

Over the course of UT3, Aurizon Network's operations functions have undergone considerable change. Aurizon Network has therefore proposed that we assess its UT4 operating costs proposal on the basis of its UT3 actual costs rather than its UT3 cost allowances.

Our Draft Decision proposes an operating cost allowance for UT4 of \$761.03 million, compared to the \$899.65 million originally proposed by Aurizon Network. In arriving at our Draft Decision, we have accepted many aspects of Aurizon Network's operating costs proposal. However, our Draft Decision is that Aurizon Network's operating costs proposal is more than that necessary to provide efficient services for the CQCN. Accordingly, we are proposing a reduction of \$138.87 million over four years for operating costs.

4.1 Overview

4.1.1 Aurizon Network proposal

In its April 2013 submission, Aurizon Network proposed a total operating cost allowance of \$205.67 million in 2013–14 increasing to \$241.63 million in 2016–17 in nominal terms (see **Table 14**).⁴⁹ This represents a 17% rise over the 2014 DAU period. The operating costs are broken down into two categories: non-electric and electric.

Table 14 Aurizon Network's proposed operating costs (\$ million, nominal)

| <i>Cost component</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|--|----------------|----------------|----------------|----------------|
| Operating costs—non-electric | 137.33 | 143.61 | 153.03 | 158.69 |
| System-wide and regional costs | 57.58 | 60.23 | 65.40 | 67.22 |
| Corporate overheads | 65.97 | 68.62 | 71.29 | 73.87 |
| Insurance | 8.30 | 9.42 | 10.25 | 11.02 |
| Audit and condition-based assessment costs | 0.91 | — | — | — |
| Environmental charges | 4.57 | 5.34 | 6.09 | 6.58 |
| Operating costs—electric | 68.34 | 74.45 | 81.25 | 82.94 |
| Transmission connection costs | 68.34 | 74.45 | 81.25 | 82.94 |
| Total operating costs (\$nominal) | 205.67 | 218.06 | 234.29 | 241.63 |

Source: Aurizon Network, 2013 DAU, sub no 3: 70, 241, 252, 271, Aurizon Network April 2013 Financial Model.

Aurizon Network provided a revised operating cost forecast in December 2013 as part of its updated financial model. The revised forecast is at the total cost by system level, and differs only slightly to the April 2013 submission. However, for the purposes of comparison, over the

⁴⁹ Unless otherwise indicated, dollars in this chapter are nominal dollars

remainder of this chapter, we have referred to the detailed cost estimates submitted in April 2013.

Aurizon Network has proposed we use its actual operating expenditure as the base for assessing its efficient operating costs. Aurizon Network has said we should not rely on the historical operating expenditure allowances as the basis for assessing efficient costs for the 2014 DAU.

In particular, Aurizon Network said its current operational model is fundamentally different to that considered in previous assessments of the benchmark efficient below-rail costs. Given this, Aurizon Network said the below-rail network system-wide and regional cost allowances prior to the separation and listing of the business, are not an appropriate benchmark for UT4 operating expenses.⁵⁰

Aurizon Network attributes its proposed 2014 DAU increase in operating expenditure, relative to its UT3 cost allowances to:

- separation from Queensland Rail and transition to a 'stand-alone' below-rail coal network business. It has indicated the most significant consequences of the operational and structural changes have been a loss of economies of scale⁵¹
- a significant underestimation of corporate overheads in UT3, which it says it has absorbed over the previous regulatory period but this is no longer sustainable⁵²
- volume growth and increasing complexity of the CQCN, combined with a capacity constrained environment, affecting all key activities: from planning and development to day-to-day operations⁵³
- the absence of real labour escalation being included in UT3 cost allowances⁵⁴
- the inclusion of environmental charges (recovery of costs associated with the Australian Government's Renewable Energy Target) in its operating costs allowance.

4.1.2 Stakeholders' comments

Stakeholders were critical of Aurizon Network's proposed increases in operating expenditure, considering the expenditure to be inefficient and inordinately high relative to UT3.⁵⁵ RTCA said:

In an environment in which the Queensland coal industry - across the board - has been forced to take deep reductions in operating and overhead costs, Aurizon Network's operational expenditure claim highlights the extent to which it is out of touch with its customers and market realities.

BMA and RTCA both indicated concerns that Aurizon Network's proposed operating cost increases were disproportionate to the increased tonnages in UT4, highlighting total forecast volumes in UT4 of 910 Mt, which is only an 8% increase from UT3 forecast volumes of 841 Mt.

RTCA also said while costs appear to have increased across the board, the increase in operating costs is driven by a substantial increase in corporate overheads (47% of the total operating costs). It said these costs appear too high and are inconsistent with what it considers to be the

⁵⁰ Aurizon Network, 2013 DAU, sub. no. 3: 243

⁵¹ Aurizon Network, 2013 DAU, sub. no. 3: 197

⁵² Aurizon Network, 2013 DAU, sub. no. 3: 190

⁵³ Aurizon Network, 2013 DAU, sub. no. 3: 198

⁵⁴ Aurizon Network, 2013 DAU, sub. no. 3: 201

⁵⁵ Asciano, 2013 DAU, sub. no. 43: 9; BMA, 2013 DAU, sub. no. 41: 4–7; Peabody, 2013 DAU, sub. no. 37: 3; QRC, 2013 DAU, sub. no. 67: 3; RTCA, 2013 DAU, sub. no. 73: 10,102-103; Vale, 2013 DAU, sub. no. 42: 5

most immediate and obvious comparator—ARTC.⁵⁶ BMA also noted Aurizon Network had provided no reference to the publicly available ARTC HVCN cost structure—a relevant comparator that appears to operate at significantly lower costs than Aurizon Network.

4.1.3 Legislative framework

In the context of assessing Aurizon Network's proposed operating costs, we have to balance the factors listed in section 138(2) as we see appropriate, as set out in **Box 1**.

In the context of assessing Aurizon Network's operating expenditure proposal, we must have regard to the factors listed in section 138(2) and give them an appropriate level of weighting, as identified in section 2.1.2 of this Draft Decision.

Against this background:

- we consider that sections 138(2)(a), (b), (d), (e), (g) and (h) should be given more weight, as identified below
- section 138(2)(g) refers to the pricing principles mentioned in section 168A, of which we consider sections 168A(a), (c) and (d) should be given more weight, as identified below
- we consider that sections 138(2)(c), 138(2)(f) and 168A(b) should be given less weight as they are less practically relevant to our assessment of the operating expenditure.

Efficient costs

Sections 69E and 138(2)(a) of the QCA Act require that we have regard to the object of Part 5 of the QCA Act, namely to promote the economically efficient operation, use of and investment in the CQCN, as the significant infrastructure by which the declared service are provided.

Sections 138(2)(g) and 168A(a) require that we have regard to certain pricing principles, including that the price for access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and include a return on investment commensurate with regulatory and commercial risks involved. Operating expenditure should reflect the efficient costs of operating the CQCN.

In broad terms, we consider, pursuant to section 138(2)(b) of the QCA Act, that the legitimate business interests of Aurizon Network in relation to operating expenditure costs will be met if it is permitted to recover at least the efficient costs of operating and managing the CQCN, subject to its overarching legal obligations.

Conversely, sections 138(2)(e) and (d) require us to have regard to the interests of access seekers and the public interest. We also consider that the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already 'access seekers' under section 138(2)(e). As identified earlier in this Draft Decision, consideration of all of these interests leads to a conclusion that Aurizon Network should also be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the objective of Part 5 specified in section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its

⁵⁶ RTCA, 2013 DAU, sub. no. 73: 102

downstream operations - which could otherwise raise concerns under section 168A(c). The need for costs to be minimised is also particularly important in light of the current adverse economic climate in the Queensland mining industry, so is in the public interest, section 138(d).

A further additional factor relevant to our assessment of Aurizon Network's proposal is that, where possible, an approach should be adopted which provides for regulatory certainty. We have had regard to this factor pursuant to section 138(2)(h) of the QCA Act. We support a stable and predictable regulatory environment for Aurizon Network; an environment in which there are changes to methodology only where there is a clear case for such changes.

Allocation of costs

When considering cost allocation, in addition to section 138(2)(b) of the QCA Act we have also had regard to section 137(1A)(b) as well as section 168A(c). Section 137(1A)(b) applies to Aurizon Network as a 'related access provider', namely an access provider that not only owns or operates the declared service, but also provides, or proposes to provide, access to the service to itself or a related body corporate. Section 137(1A)(b) requires that Aurizon Network's access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the service.

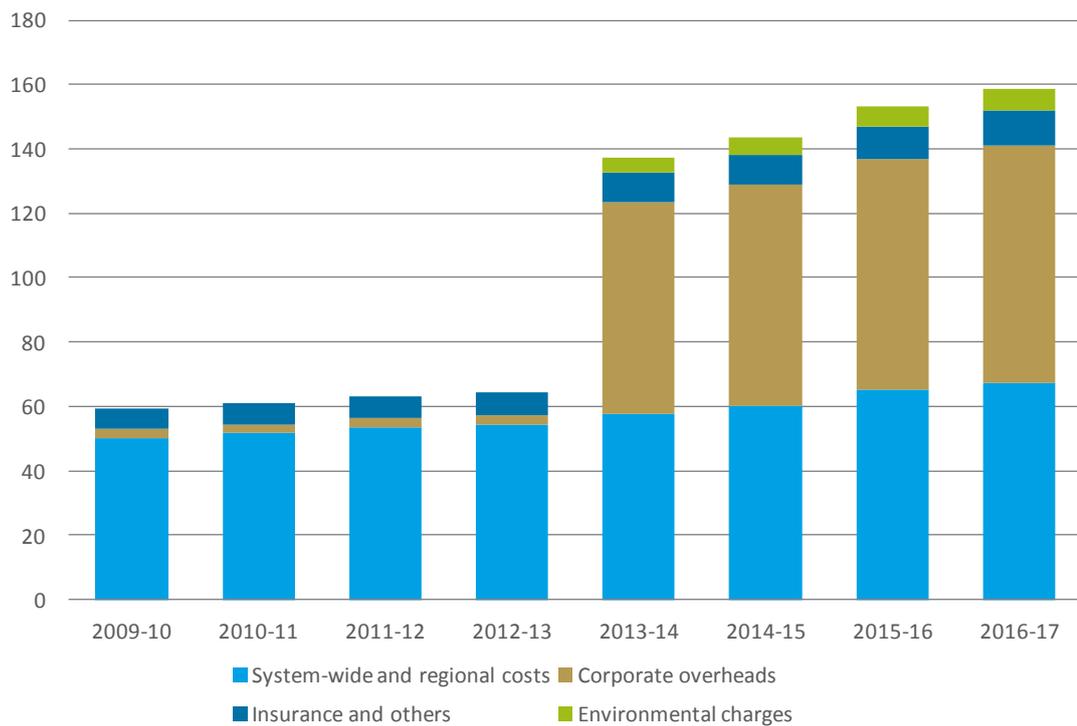
Our assessment of Aurizon Network's operating expenditure proposal is set out below. We have also identified our assessment approach and its linkages to the legislative framework.

4.1.4 QCA assessment approach for operating costs

Aurizon Network's forecast operating costs include a significant step change at the start of the 2014 DAU period relative to the UT3 approved operating costs.

There is a 109% increase in the forecast operating costs (non-electric) under the 2014 DAU for 2013–14 relative to the approved operating costs in 2012–13 (the final year of UT3). The most significant cost increase proposed relates to the proposed allowance for corporate overheads. The graph below summarises our estimate of how Aurizon Network's 2014 DAU proposals compare to the approved costs incurred over the UT3 period in real terms.

Figure 7 UT3 approved and 2014 DAU proposed operating costs (non-electric assets) 2009–10 to 2016–17 (\$2012–13 million)



Source: QCA analysis. Note: The system wide and regional cost allowances in UT3 include some costs which have since been reallocated to corporate overheads, including finance and HR costs, the telecommunications backbone and UT3 corporate overheads to reflect the 2010 QCA UT3 Final Decision.

Our role is to assess the efficient operating costs for Aurizon Network to deliver the declared service in the CQC. This includes considering what an efficient benchmark should be for assessing Aurizon Network's costs.

As part of our review of the 2014 DAU, we engaged RSM Bird Cameron (RSMBC) and Jacobs SKM (SKM) to review the efficiency of Aurizon Network's proposed operating costs. The consultants' reports have been made available for public consultation.

Our approach to assessing Aurizon Network's efficient costs for UT4 is set out in **Table 15**.

Table 15 QCA approach to assessing efficient costs for UT4 operating cost proposal

| | <i>Assessment approach for UT4 operating costs</i> |
|---|--|
| Are the costs proposed by Aurizon Network efficient? | <p>As identified above, the factors to which we must have regard in section 138(2) of the QCA Act require us to form a view as to whether Aurizon Network's forecast operating costs are efficient.</p> <p>In assessing what may constitute the efficient operating costs of a monopoly entity, we need to identify whether the same type and level of costs would be incurred by that entity if the market were competitive. In a competitive market, the forces of competition would drive a firm to minimise operating costs and adopt the most efficient practices and structures to do so. One way to identify whether costs are likely to be efficient is to benchmark those costs against the costs of activities undertaken by comparable firms in competitive markets.</p> <p>Against this background we consider that the corporate form (e.g. publicly listed or privately owned) and operational business structure are commercial decisions for the owners and hence would be optimised in a competitive context to reduce cost. What constitutes efficient operating costs need not therefore be defined by the current corporate form and business structure chosen by the company presently providing the service, but rather by the most efficient corporate form that could practically be adopted by that company to supply the service. More importantly, it also means that costs associated with supporting a particular corporate form and business structure should only be reflected in a customer's final price to the extent that the costs resulting from that form and structure are efficient costs.</p> <p>Similarly, the costs of restructuring businesses are internal commercial decisions for businesses. In a competitive market, businesses would be established with optimal structures and would only restructure to address changes in market circumstances that necessitated a transition to a different optimal structure. Consequently, restructuring costs are unlikely to be efficient in all but exceptional circumstances</p> <p>We consider these issues are particularly pertinent in the context of assessing what constitutes efficient corporate overheads, as discussed in this chapter.</p> <p>As discussed in section 2.1.2, In practice, we have used a 'reasonableness' test as the relevant 'proxy' for efficient costs for the 2014 DAU period, in the absence of robust, evidence-based benchmarks for assessing efficient costs in the QCN.</p> |
| What would be the efficient costs of operating the QCN as a stand-alone business? | <p>Aurizon Network is part of the vertically integrated Aurizon Holdings Limited. The QCA Act requires us to form a view on what constitutes the efficient operating costs of Aurizon Network not Aurizon Holdings.</p> <p>Specifically, section 138(2)(b) and (c) of the QCA Act focus on the legitimate business interests of the owner and operator of the declared service (and, if the owner is legally distinct from the operator, only the operator), hence Aurizon Network. Section 137(1A)(b) of the QCA Act requires that Aurizon Network's access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the declared service.</p> <p>In this context, we consider the 'stand-alone business' concept to be an appropriate tool that can assist when assessing whether access holders are paying the efficient operating costs which would be reasonably attributed to a 'stand-alone' business providing a similar service, to a similar customer composition and demand profile to that of Aurizon Network. We consider that the 'stand-alone business' concept relates to the process of understanding the bottom-up cost base of such an entity from an efficient cost perspective. It should be noted that this exercise need not result in a cost base that aligns with Aurizon Network's existing structure or any proposed structure.</p> <p>We are of the view that this is particularly relevant in assessing Aurizon Network's corporate overheads, given the vertically integrated nature of Aurizon Network. In forming our view we need to be satisfied that the magnitude of the corporate overhead allowance for Aurizon Network is efficient and that resulting prices do not allow Aurizon Network to discriminate in favour of a related party (contrary to section 168A(c) of the QCA Act).</p> |

| | Assessment approach for UT4 operating costs |
|---|---|
| The impacts of economies of scale | <p>The 'stand-alone business' concept needs to be considered in the context of economies of scale that may exist directly as a result of being part of an integrated group. Within this context, Aurizon Network has indicated that it has lost economies of scale in some functions, such as train control, due to separation from Queensland Rail.</p> <p>In order to substantiate any claim associated with the loss of economies of scale we consider that Aurizon Network would have to provide:</p> <ul style="list-style-type: none"> • an objectively justified position that outlines the magnitude of the scale impacts it considers relevant • empirical evidence of a direct causal relationship of the cost impact on Aurizon Network if it were not considered part of the integrated group • evidence that an efficiently operated 'stand-alone business' would not be able to mitigate some or all of any incremental operating cost increase. <p>Based on any such evidence provided by Aurizon Network, the issue for us would then be to strike an appropriate balance between the efficient costs of operating a stand-alone business and the inclusion of any net impact for scale effects as a result of being part of a vertically integrated group.</p> |
| Do Aurizon Network's UT3 actual costs, in particular 2012/13 actual costs, reflect an efficient cost base year for considering the 2014 DAU allowances? | <p>Aurizon Network has proposed that we use its UT3 actual costs as the baseline for assessing its UT4 cost proposal, rather than the approved UT3 cost allowances. As Aurizon Network will appreciate, actual costs are not necessarily efficient costs. If there are inefficiencies in a business, the actual costs will simply reflect those inefficiencies.</p> <p>Accordingly, we have not used UT3 actual costs as the baseline but as a guide in the process. In doing so, and in the context of the previous points, we have considered:</p> <ul style="list-style-type: none"> • if there is evidence of efficiency improvements in costs over the UT3 period • whether there are material changes proposed between the UT3 actual costs and those proposed for UT4, and whether these proposed cost increases were justified • relevant benchmarks to provide an assessment of how Aurizon Network's costs compare to similar entities, particularly entities operating in competitive environments. <p>When developing our assessment we have been conscious there are limitations in any benchmarking process. Consequently, we have been cautious in applying benchmarking results and we have reached conclusions based on the evidence before us at this time (while also identifying areas where we consider it would be valuable to obtain further evidence to inform future decisions). We are of the view that if we are to give significant weight to benchmarking studies going forward, a more robust approach would have to be developed.</p> |
| Is the proposed rate of escalation across the 2014 DAU period efficient? | <p>We have also considered an efficient rate of escalation for Aurizon Network's operating costs over the UT4 period. By this, we mean that if the costs are efficient, the rate of their escalation should correspond with the net effect of the changes in the underlying determinants of those costs over time. This includes considering:</p> <ul style="list-style-type: none"> • likely changes in costs of providing the service (labour and non-labour escalation) and • where there are other factors, such as changes in volume, how this will impact on efficient costs. |

Our assessment of Aurizon Network's operating costs is set out below.

4.2 System-wide and regional costs (excluding corporate overheads)

4.2.1 Aurizon Network proposal

Aurizon Network has proposed system-wide and regional costs (excluding corporate overheads) of \$57.58 million in 2013–14 increasing to \$67.22 million in 2016–17. On average, Aurizon Network's proposed costs represent an increase of around 5% per annum over the period.

Aurizon Network's system-wide and regional costs include train control, safe workings and operations, infrastructure management and business management. These costs account for around 42% of Aurizon Network's proposed (non-electric) operating expenses.

Table 16 Aurizon Network proposed system-wide and regional costs (excluding corporate overheads) (\$ million, nominal)

| <i>Cost component</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|--|----------------|----------------|----------------|----------------|
| Train control, safe working and operations | 31.13 | 32.65 | 34.21 | 35.72 |
| Infrastructure management | 15.94 | 16.63 | 17.34 | 18.04 |
| Business management | 10.51 | 10.95 | 13.85 | 13.46 |
| Total | 57.58 | 60.23 | 65.40 | 67.22 |

Source: Aurizon Network, 2013 DAU, sub no 3: 241

Train control, safe working and operations

Aurizon Network said a large portion of their cost of providing a service to coal customers is the operation and planning of train paths in an environment that is heavily capacity constrained. It also attributes some cost increases to separation from Queensland Rail.⁵⁷

Train control

Aurizon Network's CQC train control function is based at the Rockhampton Control Centre, with a fully functioning duplicate control facility in Mackay.

Aurizon Network said consolidation of its train control centres to the Rockhampton Control Centre in 2011–12 had resulted in more efficient train control costs with improved asset utilisation, lower staff costs, lower production costs and lower labour on-costs.⁵⁸

Safe working and operations

Aurizon Network said its costs of safe working and yard control have risen in recent years due to factors such as the increased need for manual safe working during construction and increased traffic in yards.⁵⁹

Network Operations consist of long-term, short-term, as well as Day-of-Operations (DOO) planning. According to Aurizon Network there has been significant growth in the number and scope of activities within network operations, driven by longer-term growth in volumes, increasing integration between coal systems and increased network complexity.⁶⁰

Infrastructure management

Aurizon Network's infrastructure management group is responsible for a range of functions, including:

- asset management and assurance—covering track as well as civil, electrical and telecommunications assets

⁵⁷ Aurizon Network, 2013 DAU, sub. no. 3: 201

⁵⁸ Aurizon Network, 2013 DAU, sub. no. 3: 212

⁵⁹ Aurizon Network, 2013 DAU, sub. no. 3: 212–213

⁶⁰ Aurizon Network, 2013 DAU, sub. no. 3: 215–223

- asset strategy—covering regulatory compliance for maintenance and renewals activities and corridor asset management.⁶¹

In 2012–13, Aurizon Network restructured and transferred its costs of the engineering and compliance functions from asset maintenance to operations. This resulted in around \$5.8 million of additional costs being included in system-wide operating expenditure.⁶² Aurizon Network also transferred its telecommunication backbone costs from infrastructure management to corporate overheads.

The proposed infrastructure management costs include a proportion of the costs of the Executive Vice President, Aurizon Network.⁶³

Business management

Aurizon Network's business management group is responsible for, amongst other things, commercial development and policy and regulation.

The commercial development function is the primary interface between Aurizon Network and its customers for the negotiation and provision of access—an area of significant growth given its capacity constrained environment. This function is also responsible for network planning and development, including the implementation of capital projects.

Business management also includes regulatory responsibilities, such as preparation and compliance with access undertakings. Regulatory costs are relatively constant over the regulatory period, although a one-off \$4.5 million is proposed to be spent across 2015–16 and 2016–17, for the preparation of UT5.⁶⁴

Cost escalation

Aurizon Network prepared its proposed UT4 system-wide and regional cost estimates using 2011–12 as the base year and escalated the cost forecasts as follows:

- non-labour costs escalated by forecast CPI of 2.5%
- labour costs escalated by BIS Shrapnel's proprietary forecasts for the Average Weekly Ordinary Time Earnings (AWOTE) at an average 4.98% per annum.⁶⁵

4.2.2 Consultants' assessment

SKM review of system-wide and regional costs

We engaged SKM to review Aurizon Network's forecast operating expenditure for reasonableness based on historical operating expenditure for the CQCN; and benchmarking of forecast operating expenditure against similar below-rail operations.

Specific aspects of SKM's review were:

- benchmarking of train control and related costs
- consolidation of train control functions
- infrastructure management costs

⁶¹ Aurizon Network, 2013 DAU, sub. no. 3: 223227

⁶² RSMBC 2013 DAU, 2014: 110

⁶³ Aurizon Network, Direct cost model emailed to the QCA on 13 September 2013

⁶⁴ RSMBC 2013 DAU, 2014: 110; Aurizon Network, 2013 DAU, sub. no. 3: 227

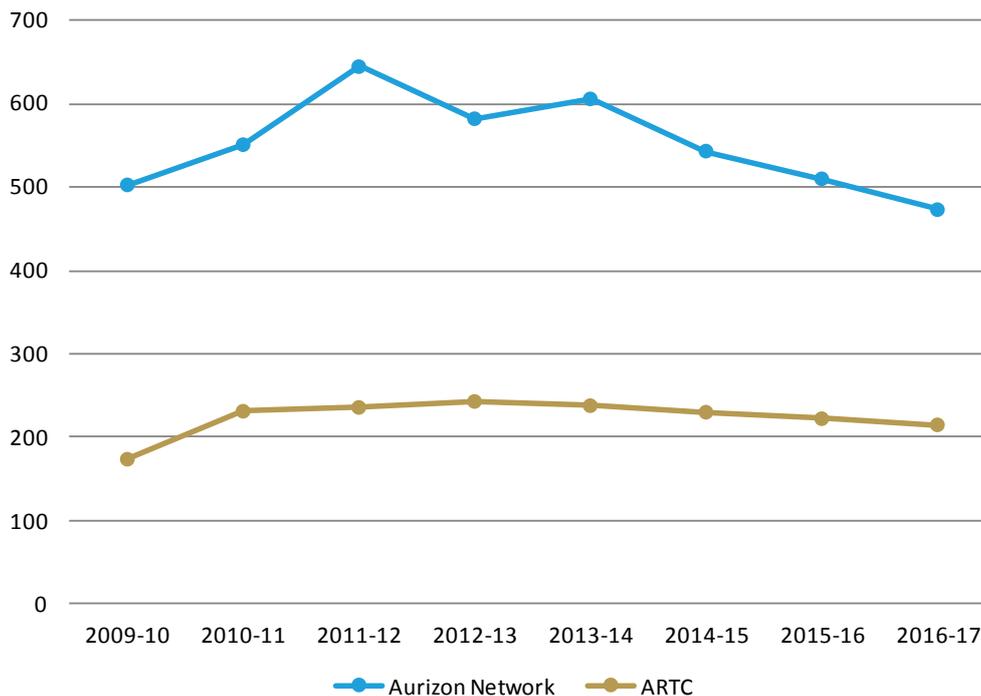
⁶⁵ Aurizon Network, Direct costs model

- allocation of safe workings/yard control costs
- separation of maintenance and capital works activities
- application of a productivity factor.

Benchmarking of train control and related costs

SKM's benchmarking showed the HVCN may be running more efficiently for network control — Aurizon Network's train control and related costs are significantly higher on a dollar per train path basis, in real terms, than those of the HVCN (**Figure 8**).⁶⁶

Figure 8 Train control, safe working and operations - dollars / train path (CQCN and HVCN)



Source: SKM, 2013 DAU, 2014: 23

SKM said network control is likely to be more complex for the HVCN in terms of traffic density, path and traffic mix but its overall haul length is shorter and network size smaller. SKM concluded the HVCN is likely to require fewer personnel for train scheduling than Aurizon Network, with scheduling in the Hunter Valley also being undertaken by the separate Hunter Valley Coal Chain Coordinator (HVCCC). SKM did not adjust HVCN's costs to include those of the HVCCC in its benchmarking exercise.

SKM also noted Aurizon Network's proposed train control costs include costs for succession planning and may partly explain its apparent cost inefficiency compared with the HVCN. While succession planning is an appropriate risk mitigation strategy, SKM did not provide a view regarding whether the succession planning costs included by Aurizon Network represented an efficient operating cost, as Aurizon Network did not provide sufficient information to enable it to form a view.

⁶⁶ SKM 2013 DAU, 2014: 23

Overall, SKM considered Aurizon Network's 2012–13 train control costs to be the best estimate of efficient train control costs for UT5, assuming the increase in costs for the 2014 DAU period was wholly attributed to succession planning.⁶⁷

Infrastructure management costs

SKM considered the costs of Aurizon Network's infrastructure management to be reasonable on the basis of various factors including: improving efficiency compared to the historical levels; operations being increasingly complex; and its benchmarking exercise showing CQCN forecast costs being significantly lower than for the HVCN.⁶⁸

Allocation of safe workings/yard control costs

SKM identified expenses in Aurizon Network's safe workings/yard control costs which should be attributed to capital project costs. These costs are associated with the suspension of normal signalling and safe working systems, with labour-intensive manual systems used during construction. SKM said these costs should not be included as operating expenditure, as they would not be incurred if the capital construction activities were not undertaken.⁶⁹

Separation of maintenance and capital works activities

SKM considered Aurizon Network's separation of maintenance activities (inspection, testing and fix on fail) from capital works activities has allowed for improved utilisation and a more targeted focus of both the maintenance and construction services.⁷⁰

Application of a productivity factor

SKM did not support the application of a productivity factor (CPI-X) to Aurizon Network's operating costs, provided productivity improvements have been built into the cost base.⁷¹ SKM considered it more appropriate for Aurizon Network to identify cost savings from specific and achievable changes to the operating environment.

RSMBC's assessment

RSMBC also reviewed Aurizon Network's proposed operating costs, including:

- benchmarking of operating expenditure
- adjustments to train control costs
- adjustments to security costs
- application of a productivity factor.

Benchmarking of operating costs

Noting the general limitations in undertaking a benchmarking process, RSMBC compared Aurizon Network's operating costs against the HVCN, as well as Brookfield Rail (WA), and developed its own 'shadow benchmark'. RSMBC observed:

- Aurizon Network and the HVCN's comparative operating costs per track km and per forecast gross tonne kilometres (gtk) are materially consistent.

⁶⁷ SKM, 2013 DAU, 2014: 37

⁶⁸ SKM, 2013 DAU, 2014: 29

⁶⁹ SKM, 2013 DAU, 2014: 24

⁷⁰ SKM, 2013 DAU, 2014: 31

⁷¹ SKM, 2013 DAU, 2014: 32

- Both Aurizon Network and the HVCN had significantly lower operating cost per track km than Brookfield Rail.
- Comparative costs for RSMBC's benchmark indicative 'shadow' would be 9% lower than Aurizon Network's forecast costs.⁷²

RSMBC did not draw strong conclusions on the basis of the operating costs benchmarking. However, its main observation was that there may be opportunities for Aurizon Network to reduce operating expenditure, particularly in relation to control room operations and yard management.⁷³

Adjustments to train control costs

While Aurizon Network's 2014 DAU submission suggested consolidation of train control costs had reduced overall train control costs, RSMBC identified that Aurizon Network's train control costs increased by 19% in 2011–12. Aurizon Network subsequently advised consolidation of the train control centres did not lead to a reduction in FTEs, due to the addition of two control boards and because its train control function had previously been operating below optimal staffing levels.⁷⁴

Further, during the course of the RSMBC review, Aurizon Network advised it had incorrectly estimated the non-coal traffic costs and revised its estimate down from 9% of costs to 2% of costs.⁷⁵ RSMBC said Aurizon Network had yet to provide evidence to substantiate its revised estimate, but said if non-coal volumes only reflected 2% of traffic, then train control costs would increase by \$5.28 million over UT4.⁷⁶

RSMBC also identified Aurizon Network had included a \$2.2 million increase in its train control allowance from 2013–14.⁷⁷ Aurizon Network advised RSMBC that its train control function has been operating at below optimal staffing levels in previous years with a number of positions vacant.⁷⁸ RSMBC said it was unable to assess the reasonableness of the proposed increased FTE numbers from a desktop review, but noted the increase in costs is consistent with the forecast increase in volumes and contracted volumes.⁷⁹

Adjustments to security costs

RSMBC recommended a reduction of \$0.45 million per annum for security costs for trespass incidents, to reflect actual costs in 2011–12, compared to the \$0.60 million per annum forecast.⁸⁰

Application of a productivity factor

RSMBC said Aurizon Network appears to have implemented productivity improvements within its system-wide operations costs, and hence the application of a further CPI-X adjustment to system-wide direct costs (excluding corporate overheads) does not appear to be required.

⁷² RSMBC, 2013 DAU, 2014: 20

⁷³ RSMBC, 2013 DAU, 2014: 20

⁷⁴ RSMBC, 2013 DAU, 2014: 113

⁷⁵ Aurizon Network, 2013 DAU, sub no. 109: 29–31

⁷⁶ RSMBC, 2013 DAU, 2014a: 8

⁷⁷ RSMBC, 2013 DAU, 2014: 114

⁷⁸ RSMBC, 2013 DAU, 2014: 114

⁷⁹ RSMBC, 2013 DAU, 2014: 114

⁸⁰ RSMBC, 2013 DAU, 2014: 114, 120

4.2.3 Stakeholders' comments

A summary of the major issues raised by stakeholders in response to the consultants' reports is provided in **Tables 17 to 19**.

Table 17 Industry comments on consultants' reports

| <i>Issue</i> | <i>Industry comments</i> |
|--------------------------------------|--|
| Reliance on historical costs | The QRC said the use of actual costs in a prior period may be a relevant basis for establishing cost allowances if the efficiency of these costs is verified and adjustments are made to reflect changes which occur between the past and future periods. The QRC did not consider such an exercise had been adequately undertaken. ⁸¹ |
| Increase in train control costs | Vale noted RSMBC was unable to assess the reasonableness of the proposed FTE numbers in the train control costs from the desktop review. Vale believes further investigation of cost is needed to identify the cost savings and improved efficiency given consolidation of the train control function to Rockhampton. ⁸² The QRC noted initiatives such as Project Pluto are cited as evidence of improved efficiency, yet Aurizon Network claims it must fill a number of train control positions which have been vacant for some time. ⁸³ |
| Non-coal traffic | The QRC supported the allocation of non-coal traffic costs to the Mackay train control centre, and suggested we assess the need for this facility. ⁸⁴ |
| Regulation and policy budget for UT5 | The QRC also questioned the reasonableness of the budget for 'regulation and policy' of more than \$12 million over the UT4 period, ⁸⁵ indicating its concerns that UT4 development had been an extremely inefficient process. Vale questioned whether the \$4.5 million identified for the preparation of UT5 was efficient given that UT4 was a complete redraft of the document and the budget was \$4.8 million. ⁸⁶ |
| Application of CPI-X factor | The QRC said a reasonable X-factor should be developed and be applied to baseline cost allowances which are efficient. ⁸⁷ |

Table 18 Aurizon Network comments on consultants' reports

| | |
|---|---|
| Proposed \$2.2 million increase in train control costs from 2013–14 | <p>Aurizon Network said these increases are due to:</p> <ul style="list-style-type: none"> • implementation of processes to establish a pool of control centre staff to meet rostering requirements in line with workplace health and safety. This assists in the preparation of a smooth transition from retiring staff to new train controllers • the control centre also encompassing the role of fault centre coordinator (six personnel) to monitor all of the technical equipment to support the control centre and in field equipment to ensure 24/7 operation • the control centre structure including the role of a Business Manager for each rostered shift. This is a 24/7 role involving five FTEs. The role is required on shift due to the complexity of the CQCN including Brisbane to Cairns non-coal traffic that interferes with the CQCN cyclic traffic.⁸⁸ |
|---|---|

⁸¹ QRC, 2013 DAU, sub. no. 110: 3

⁸² Vale, 2013 DAU, sub. no. 113: 4–5

⁸³ QRC, 2013 DAU, sub. no. 110: 6

⁸⁴ QRC, 2013 DAU, sub. no. 110: 25

⁸⁵ QRC, 2013 DAU, sub. no. 110: 23

⁸⁶ Vale, 2013 DAU, sub. no. 113: 5

⁸⁷ QRC, 2013 DAU, sub. no. 110: 5

⁸⁸ Aurizon Network, 2013 DAU, sub. no. 109: 28–29

| | |
|--|---|
| <p>Proposed \$2.2 million increase in train control costs from 2013–14</p> | <p>Aurizon Network said these increases are due to:</p> <ul style="list-style-type: none"> • implementation of processes to establish a pool of control centre staff to meet rostering requirements in line with workplace health and safety. This assists in the preparation of a smooth transition from retiring staff to new train controllers • the control centre also encompassing the role of fault centre coordinator (six personnel) to monitor all of the technical equipment to support the control centre and in field equipment to ensure 24/7 operation • the control centre structure including the role of a Business Manager for each rostered shift. This is a 24/7 role involving five FTEs. The role is required on shift due to the complexity of the CQCN including Brisbane to Cairns non-coal traffic that interferes with the CQCN cyclic traffic.⁸⁸ |
| <p>Non-coal traffic</p> | <p>Aurizon Network has proposed its non-coal traffic cost allocation be based on using FTEs for allocating the costs of non-coal traffic, noting its estimate that non-coal FTEs represents 4 of the 199 train control FTEs, or 2% of train control costs.⁸⁹ This means 98% rather than 91% of costs would be allocated to the coal traffic in the CQCN.⁹⁰</p> |
| <p>Commercial management costs</p> | <p>Aurizon Network said its commercial management function includes a range of functions including optioneering for alternative rail configuration, management of associated services including electricity services, transfer facility licences, installation operation of veneering systems and land management matters.⁹¹</p> |
| <p>Capitalisation of signalling/safe-working costs</p> | <p>Aurizon Network did not support SKM's view that costs associated with signalling and safe working during construction should be capitalised. Aurizon Network said it is complicated to separate these tasks between capital and maintenance. However, Aurizon Network said that it will provide further information to the QCA on how these costs could be directly allocated to a specific capital project.⁹²</p> |

Table 19 Aurizon Network and industry comments on benchmarking

| <i>Aurizon Network</i> | <i>Industry</i> |
|--|---|
| <p>Aurizon Network questioned RSMBC's benchmark comparison to the HVCN, particularly:⁹³</p> <ul style="list-style-type: none"> • It appears the build-up of HVCN costs is incomplete and inaccurate because it does not include forecast costs for asset management. They also do not include HVCN fixed costs. • RSMBC made no adjustment to reflect the HVCN network is non-electrified. The FTE requirements of resourcing for electrical control and fault officers are significant. • The Hunter Valley Coal Chain coordinator (HVCCC) performs some of the planning functions for the HVCN. If the HVCCC did not exist, the ARTC would likely be required to boost its manning levels for capacity planning and day to day train planning. • All costs for the HVCN are forecasts only (first | <p>The QRC questioned a number of the issues RSMBC had considered in developing its benchmarking against the HVCN including:⁹⁴</p> <ul style="list-style-type: none"> • Convergence of ARTC's network at one location may result in operational challenges which are lessened by Aurizon Network's more diversified system. • ARTC has two ports, one with cargo assembly and one closer to an 'even railings' arrangement. Aurizon Network only has to deal with this in the Goonyella system. • ARTC deals with significant volumes of domestic coal, which is only relevant for the Blackwater and Moura systems. • Different train types run within the system due to different axle loads at the upstream ends of certain hauls. This is not the case in all of the |

⁸⁹ Aurizon Network, 2013 DAU, sub. no. 109: 29–31

⁹⁰ QCA analysis

⁹¹ Aurizon Network, 2013 DAU, sub. no. 109: 41

⁹² Aurizon Network, 2013 DAU, sub. no. 109: 43

⁹³ Aurizon Network, 2013 DAU, sub. no. 109: 22–24

⁹⁴ QRC, 2013 DAU, sub. no. 110: 20

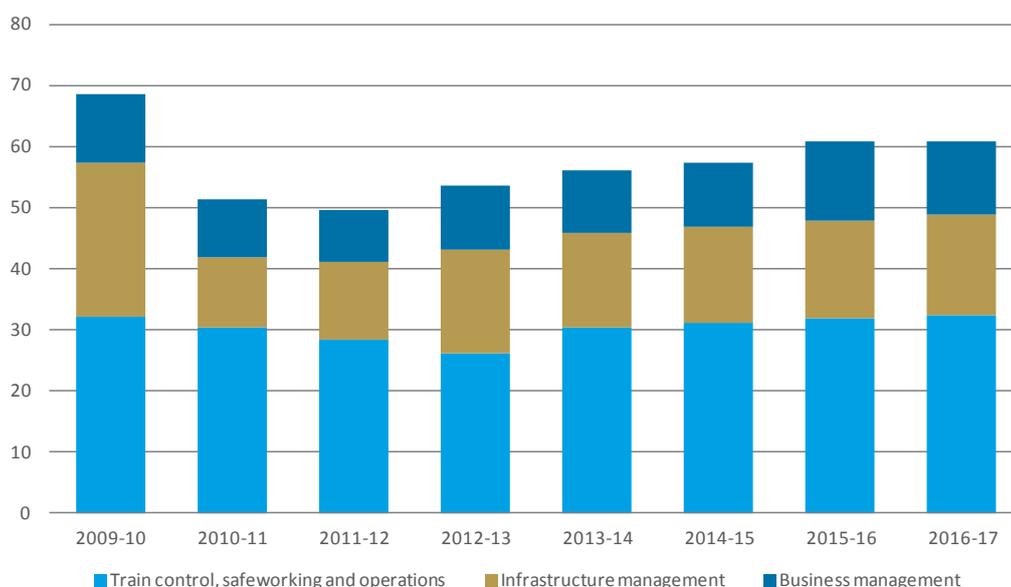
| Aurizon Network | Industry |
|---|---|
| <p>year 2010) and the remaining nine years are escalated by CPI, an efficiency factor and then adjusted for the relative increase in the proportion of gtk's in the relative Pricing Zone. This introduces potential for error.</p> <ul style="list-style-type: none"> • The use of a cost per track km as a useful measure, as well as the track km ascribed to the HVCN. • Aurizon Network considered RSMBC's conclusion that it is more expensive than comparable benchmarks based on gtk basis to be flawed and this is unlikely to be the case if the financial assessment is corrected. • Aurizon Network did not support RSMBC's use of the 'shadow' benchmark. | <p>CQCN.</p> <ul style="list-style-type: none"> • The HVCN features a number of significant lines off the main line. • There are four above rail-operators. • ARTC holds Access Holder Agreements with each individual miner, plus operator sub-agreements with each operator in respect of each haul. Aurizon Network holds relatively few agreements. • The QRC noted that the shadow benchmark indicates that Aurizon Network's costs may be overstated by around \$5 million or 9%. The QRC was concerned that RSMBC had developed a shadow benchmark and then adjusted for some changes which might not be efficient.⁹⁵ |

4.2.4 QCA analysis and Draft Decision

When assessing Aurizon Network's proposed system-wide and regional costs (excluding corporate overheads), we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the system-wide and regional costs. Our approach in applying these statutory factors has been guided by the questions set out in **Table 15**.

Aurizon Network has proposed system-wide and regional costs (excluding corporate overheads) of \$57.58 million in 2013–14, increasing to \$67.22 million in 2016–17. **Figure 9** shows Aurizon Network's 2014 DAU proposals relative to RSMBC's estimates of UT3 actual costs.

Figure 9 Aurizon Network actual and proposed operating expenditure (excluding corporate overheads) 2009–10 to 2016–17 (\$2012–13 million)



Source: RSMBC, 2013 DAU, 2013: 112–118

⁹⁵ QRC, 2013 DAU, sub. no. 110: 4

Aurizon Network has not provided a reconciliation of its UT3 actual costs with its UT3 cost allowances. Although there have been various restructures within Aurizon Network since 2010, we consider this to be a significant omission from Aurizon Network's proposal.

For the purposes of this Draft Decision we have considered actual expenditure for system-wide and regional costs against Aurizon Network's proposed operating costs. We would, however, welcome stakeholder views on the implications that this position has on estimating efficient baseline direct operating costs for the UT4 period.

The remainder of this section provides our assessment of direct operating costs and comprises:

- approach to cost escalation for direct system-wide and operations costs
- application of a productivity factor for direct operating costs
- train control, safe workings and operations
- infrastructure management
- business management.

Approach to cost escalation for direct system-wide and operations costs

Our Draft Decision is to accept Aurizon Network's proposal to escalate non-labour costs by CPI, estimated at 2.5%, noting the annual revenue cap adjustment process includes an adjustment for the difference between changes in forecast and actual CPI.

In UT3, Aurizon Network did not propose a separate labour cost escalation factor, with labour costs adjusted by CPI. For UT4, however, Aurizon Network has proposed its system-wide and operations costs be escalated on the basis of BIS Shrapnel forecasts of the AWOTE (**Table 20**).

Table 20 BIS Shrapnel AWOTE percentage change forecasts

| <i>Industry classification</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|--------------------------------|----------------|----------------|----------------|----------------|
| Train control | 4.5% | 5.2% | 5.1% | 4.7% |
| Professionals | 4.9% | 5.8% | 5.5% | 4.9% |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 240

While we accept there is a case for a separate labour cost adjustment factor, we do not accept Aurizon Network's proposal to escalate labour costs for wage inflation using the AWOTE. We consider the ABS wage price index (WPI) to be the better estimate of wage cost inflation for the 2014 DAU period.

The ABS WPI is designed to measure the pure price change in wages and salaries independent of compositional changes such as variations in the quality or quantity of work performed. Conversely, an observed change in the AWOTE may not necessarily reflect a change in wage inflationary pressure, but rather could be attributed to a shift in the workforce composition. It is difficult to separate the effects of compositional change over time to determine the causes of any particular movement.

As outlined in the BIS Shrapnel report submitted by Aurizon Network, a change in the skill levels of employees within a particular industry will be captured by the AWOTE but not the WPI.⁹⁶ However, we consider that the skills base of a company's workforce is a business choice for the

⁹⁶ Aurizon Network, 2013 DAU, sub. no. 36: A-1–A-2

owners. If a company chooses to pay for a higher skilled workforce, then it will get the associated productivity benefit of that decision. In our view, if the AWOTE series is used to escalate the labour cost allowance, it seems counterintuitive that the allowance should be increasing (due to an increase in the AWOTE) in the wake of improved labour productivity.

According to the ABS, the AWOTE is designed to produce point-in-time estimates, and is not designed for producing estimates of the movement in earnings over time.⁹⁷ The ABS notes that since the AWOTE is not designed for movement in labour costs, the standard errors for period-to-period movements are much higher proportionally than for level estimates. In a report commissioned by the AER, Deloitte Access Economics used data from the ABS to show that the labour price index has a lower standard deviation in quarterly wage growth over the 10 years to December 2011 than the AWOTE.⁹⁸

To determine the total labour cost escalation rate over the UT4 period, we have used Queensland Treasury's forecasts of annual growth in the Queensland WPI. Note that the annual revenue cap adjustment process will include an adjustment for the difference between Queensland Treasury's forecasts and ABS estimates of the Queensland WPI.

Table 21 Forecast Wage Price Index

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---------------------------------|----------------|----------------|----------------|----------------|
| Forecast Wage Price Index (WPI) | 2.75% | 3.0% | 3.25% | 3.5% |

Source: Queensland Treasury and Trade, Budget Paper no 2: Budget Strategy and Outlook 2014: 31

Application of a productivity factor for direct operating costs

We note there are mixed views on whether a CPI-X factor should be applied to Aurizon Network's system-wide and regional costs (excluding corporate overhead costs). Aurizon Network has not proposed a CPI-X factor, nor did RSMBC or SKM. The consultants both considered Aurizon Network would achieve real cost reductions over the UT4 period and other productivity gains had been factored in to the costs. By contrast, Aurizon Network's stakeholders supported a CPI-X factor to encourage productivity gains.

We consider the application of credible productivity analysis would require the development of significantly more robust methodologies and consistent data sets. In particular it would be necessary to develop suitably robust, objective evidence-based measurement systems and practical processes for the development and implementation of productivity targets. We consider limitations of the benchmarking studies undertaken for the 2014 DAU period highlight this need.

For the 2014 DAU we are of the view that in the absence of suitably robust benchmarking and productivity analysis, it is appropriate to adopt a cautious approach. By this we mean we are making a decision based on the evidence before us at this time. Consequently, we have chosen not to apply a productivity factor to direct costs. This is not to say that we do not consider there to be merit in setting productivity targets or that we consider all the potential productivity gains available have been included in Aurizon Network's 2014 DAU proposals.

However, we are of the view that our experience in assessing the 2014 DAU suggests that we need to evolve the regulatory framework to place greater emphasis on transparent, achievable

⁹⁷ ABS 2014, Average Weekly Earnings, Australia, Quality Declaration, May 2014

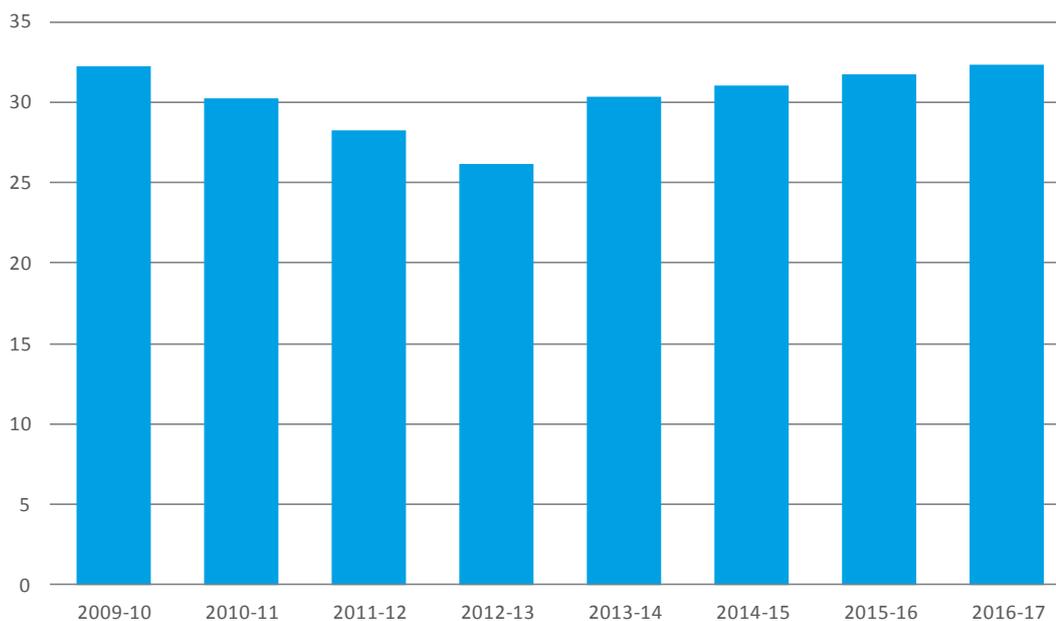
⁹⁸ Deloitte Access Economics, 2011: 1

and measurable productivity targets would be beneficial to all stakeholders but that this would need to be done effectively, objectively and equitably. We welcome stakeholder views on this.

Train control, safe workings and operations

Between 2009–10 and 2012–13, there has been a 20% (real) cost reduction in Aurizon Network's actual costs for the delivery of train control, safe workings and operations (excluding utility costs).⁹⁹ As outlined in **Figure 10** below this trend does not appear to be taken account of in Aurizon Network's submitted costs for the 2014 DAU.

Figure 10 Aurizon Network actual and proposed train control, safe working and operations costs 2009–10 to 2016–17 (\$2012–13 million)



Source: QCA analysis

Aurizon Network indicated it is investing in new IT systems to improve network planning and scheduling. Aurizon Network said these systems will automate some previously manual processes and assist in providing short-term transfers and making decisions about the operation of the network as a whole. Aurizon Network considers the benefits of these system improvements will, amongst other things:

- allow it to manage contracted tonnes (estimated to be 310 Mt by 2016–17) without the requirement for additional train control resources
- decrease the turnaround time of the weekly plan by 24–48 hours, freeing up the planning team to improve ad hoc access requests and secure non-invasive maintenance windows
- improve the interface between maintenance teams and network control, allowing the existing train control team to absorb the additional contracted capacity expected over the UT4 period.¹⁰⁰

Aurizon Network also noted it has structured train control to manage the movement of estimated contracted tonnages at the end of UT4. While Aurizon Network's operations may be

⁹⁹ RSMBC, 2013 DAU, 2014: 110–114

¹⁰⁰ RSMBC, 2013 DAU, 2014: 137–138

becoming more complex and we welcome the investment in new IT systems to improve network planning and scheduling, we are unconvinced by various aspects of Aurizon Network's proposals.

In particular we are not of the view the CQCN is operating in a capacity constrained environment. While Aurizon Network moved 214.5 Mt of coal in 2013–14, this is still well short of contracted levels.¹⁰¹ More importantly, we are not convinced it is efficient (or necessary) for Aurizon Network to be managing its train control functions in a manner where it has the capacity to deliver contracted tonnes in UT4, particularly given there is no realistic expectation this level of demand will occur over this period.

Assessment of train control, safe workings and operations costs

Of all the direct operating categories to assess, train control, safe workings and operations is the most complex. Our assessment of Aurizon Network's proposals is split into the following sections:

- developing a base year cost
- escalation and adjustments over the 2014 DAU period.

Developing a base year cost

Our approach to developing a base year cost comprises the following steps:

- **Step 1:** Adopt 2012–13 actual costs as a starting point.
- **Step 2:** Consider whether to include or exclude Aurizon Network's proposed step changes.
- **Step 3:** Consider whether to capitalise aspects of manual signalling and yard control costs.
- **Step 4:** Consider whether to adjust 2012–13 utility costs.

Adopting 2012–13 actual costs as a starting point

Aurizon Network has proposed we consider its actual costs during UT3, rather than the UT3 cost allowances when establishing benchmark efficient costs. Given the cost reductions achieved by Aurizon Network across the train control, safe workings and operation function over the course of UT3, we consider that 2012–13 actual costs are either at or are transitioning to an efficient baseline cost for these cost components.

We acknowledge this is a cautious position, yet it is a position we believe is appropriate based on the evidence before us at this time. This is because we do not have reliable information to reconcile between Aurizon Network's UT3 cost allowances and actual costs incurred. We have also taken some account of the indicative results of the benchmarking studies undertaken.

We are of the view that identification of further evidence would be appropriate for consideration for future undertakings and hence this can be rigorously tested prior to UT5 and any necessary adjustments made.

Inclusion/exclusion of Aurizon Network's proposed step changes

Aurizon Network's UT4 operating costs proposal is complicated by the fact that in its UT4 operating costs model Aurizon Network chose to re-base its 2012–13 costs relative to the actual costs incurred. The 2012–13 costs included in Aurizon Network's operating costs model were approximately \$4.3 million higher than Aurizon Network's actual costs for both 2011–12 and 2012-13.

¹⁰¹ Aurizon Network, Financial Statements 2013–14, p. 2

We do not consider there is any objective evidence based reason for this and consider the 2012–13 actual costs provide a reasonable starting point for assessing what constitutes efficient costs. Consequently we have excluded the re-basing from our assessment.

We are unconvinced there is a strong case that this step-change in costs is efficient, for the following reasons outlined below.

The step change primarily comprises incremental costs associated with succession planning and unfilled vacancies. We are of the view that in a competitive market succession planning would represent a baseline business activity. The costs associated with it would already be included in the existing cost base. Overall, we consider the incremental costs associated with succession planning should not be passed through to customers in the form of higher prices as this would not be the case in a competitive market as they would not reflect efficient costs.

We are also unconvinced by Aurizon Network's explanation about filling vacancies, given this was also the reason given for increased train control costs at the time of the consolidation of the Rockhampton and Mackay operations; it was not evident there was short staffing for 2012–13. Furthermore, we do not consider it appropriate for Aurizon Network to configure its present organisational staffing levels to deliver contracted tonnages forecast in 2016–17 given there is no realistic expectation this level of demand will occur over the 2014 DAU period.

Capitalisation of aspects of manual signalling and yard control

We have considered SKM's recommendation to capitalise expenses which arise due to manual signalling and yard control during capital projects. While we made an adjustment in our UT3 Decision,¹⁰² we are unconvinced the complexity of reallocating costs from operating costs to capital expenditure will have a significant implication for the efficient operation of the CQCN.

Adjustment of 2012–13 utility costs

We have also considered SKM's recommendation that we reduce utility costs to \$0.8 million, but consider the \$1.2 million proposed for UT4 to be a more realistic estimate of the costs incurred for UT3, noting the increase in utility costs over the period.

Summary

Based on the above analysis our Draft Decision is to use 2012–13 actual costs as the base cost for estimating efficient costs for train control, safe working and operations costs for the 2014 DAU period.

We consider this to be a cautious approach, yet it is an approach we believe is appropriate that we adopt based on the evidence before us at this time.

We note Aurizon Network's proposed train control costs are considerably higher than the benchmark for the HVCN. Despite the differing views of Aurizon Network and its stakeholders about the benchmarking exercises undertaken and the relative complexity of the two systems, we do not consider there is a strong reason why the CQCN costs should be over double the cost per train path of the HVCN.

We consider there is merit in developing a more rigorous benchmarking approach that can be adopted for UT5 in order to assess whether there is scope for further real cost reductions in addition to those seen in the 2009–10 to 2012–13 period.

¹⁰² QCA, 2013 DAU, December 2009: 41–42

Escalation and adjustments over the 2014 DAU period

We have used the escalation factors outlined in the previous sections to develop our cost profile over the UT4 period.

We have also made some adjustment to the cost allocation for non-coal traffic. Aurizon Network's original UT4 submission proposed non-coal traffic costs be shared on the basis of percentage of train kilometres for coal and non-coal traffic respectively. Accordingly, Aurizon Network estimated around 9% of its train control and scheduling costs should be allocated to non-coal traffic.¹⁰³ Aurizon Network's model made an adjustment for non-coal traffic at the Rockhampton Train Control Centre, but not the Mackay Train Control Centre.

Aurizon Network later proposed non-coal traffic in the CQCN should be revised to reflect 2% of costs, a method based on its estimated FTEs dedicated to train control for non-coal traffic.

We are unconvinced Aurizon Network's revised proposal to allocate 98% (rather than 91%) of train control costs to coal traffic is properly reflective of the costs associated with non-coal traffic. In particular:

- (a) In 2013–14, around 10% of train paths in the CQCN were non-coal train paths, which is generally consistent with the train kilometre approach initially proposed by Aurizon Network.
- (b) We do not consider non-coal traffic should be treated as marginal costs. We consider Aurizon Network's original proposal using a percentage of track kilometres is more likely to be representative of the resources used by Aurizon Network in providing this service to non-coal customers, given train control costs are a function of scheduling and the time spent on the track.

Overall, we consider Aurizon Network's original approach for estimating non-coal traffic to be the better estimate of non-coal's share of train control costs and it is more likely to avoid a cross-subsidy between coal and non-coal traffic. On this basis, we have adjusted the costs for the Mackay Train Control Centre to reflect a 91% allocation of costs for coal traffic.

The table below summarises the adjustments we have made to Aurizon Network's proposal based on our views regarding the starting base year cost, escalation factors and adjustments for non-coal traffic. This represents a \$22.81 million (nominal) reduction across the UT4 period.

Table 22 QCA proposed adjustments to train control, safe workings and operations (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|--------------|--------------|--------------|--------------|
| Aurizon Network proposed costs | 31.13 | 32.65 | 34.21 | 35.72 |
| QCA adjustments (including labour indexation) | (4.66) | (5.40) | (6.10) | (6.66) |
| QCA proposed costs | 26.47 | 27.25 | 28.11 | 29.07 |

Source: Aurizon Network, 2013 DAU, sub no 3: 241; QCA analysis. Note: Numbers may not sum due to rounding.

Infrastructure management

Developing a base year cost

Aurizon Network has been working to improve its infrastructure management arrangements, including identifying opportunities to improve the performance of the network through

¹⁰³ Aurizon Network, 2013 DAU, sub. no. 3: 212

improved maintenance scheduling. SKM said the separation of maintenance activities from capital works has allowed for the improved utilisation and targeted focus of both the maintenance and construction services.

We also note Aurizon Network is implementing its Network Asset Management System (NAMS) which is intended to address some of the significant asset management challenges.¹⁰⁴

Against this background, in 2012–13, \$5.8 million (\$2012–13) of engineering and compliance function expenditure was transferred from asset maintenance costs to system-wide costs.¹⁰⁵ We are satisfied this cost re-allocation has been excluded from Aurizon Network's maintenance cost estimates.

Having regard to Aurizon Network's actual costs in 2012–13, including the above cost re-allocation, and the reviews by SKM and RSMBC, we consider Aurizon Network's overall actual costs for 2012–13 infrastructure management to be generally efficient.

Escalation and adjustment factors over the 2014 DAU period

We have used the escalation factors outlined in the previous sections to develop our cost profile over the 2014 DAU period.

In terms of adjustments over the 2014 DAU period, our Draft Decision is not to approve the inclusion of costs for the Executive Vice President, Aurizon Network (the equivalent position to CEO of network) in this group of costs. We consider those costs should be considered as part of the assessment of corporate overheads, to avoid any potential double counting of the costs normally attributed to a CEO.

Table 23 summaries the adjustments we have made to Aurizon Network's proposal based on our view regarding the starting base year cost, escalation factors and adjustments for the costs associated with the Executive Vice President, Aurizon Network. This represents a \$5.75 million reduction across the 2014 DAU period.

Table 23 QCA proposed adjustments to Infrastructure Management (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|--------------|--------------|--------------|--------------|
| Aurizon Network proposed costs | 15.94 | 16.63 | 17.34 | 18.04 |
| QCA adjustments (including labour indexation) | (1.06) | (1.33) | (1.58) | (1.78) |
| QCA proposed costs | 14.88 | 15.30 | 15.76 | 16.26 |

Source: Aurizon Network, 2013 DAU, sub no 3: 241; QCA analysis. Note: Numbers may not sum due to rounding.

Business management

Developing a base year cost

We have adopted the 2012–13 actual cost for the base year. We are of the view that this is at the efficient level or transitioning to the efficient level.

Escalation and adjustment factors over the UT4 period

We have used the escalation factors outlined in the previous sections to develop our cost profile over the 2014 DAU period. In terms of adjustments over the 2014 DAU period, we note that the

¹⁰⁴ SKM, 2013 DAU, 2014: 31

¹⁰⁵ RSMBC, 2013 DAU, 2014: 110

major driver of the increase in business management costs in UT4 is the costs for the preparation of UT5 in the latter two years of the UT4 period.

We are unconvinced that the \$4.5 million proposed for the preparation of UT5 is an efficient level of expenditure, considering the extensive re-write of the 2014 DAU and general stakeholder concerns regarding the cost efficiency of the overall UT4 process. However, we do recognise that there is some associated incremental cost in preparing an undertaking and have included \$3 million over the last two years of the 2014 DAU period to account for this.

Table 24 summarises the adjustments we have made to Aurizon Network's proposal based on our view regarding the starting base year cost, escalation factors and adjustments for the costs associated with the preparation of UT5. This represents a \$2.8 million reduction across the UT4 period.

Table 24 QCA proposed adjustments to Business Management (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|--------------|--------------|--------------|--------------|
| Aurizon Network proposed | 10.51 | 10.95 | 13.85 | 13.46 |
| QCA adjustments (including labour indexation) | (0.01) | (0.29) | (1.09) | (1.40) |
| QCA Draft Decision | 10.50 | 10.66 | 12.75 | 12.05 |

Source: Aurizon Network, 2013 DAU, sub no 3: 241; QCA analysis. Note: Numbers may not sum due to rounding.

Summary

A summary of our Draft Decision in respect of system-wide and regional costs is provided in **Table 25**.

Table 25 QCA proposed adjustments to system-wide and regional costs (excluding corporate overheads) (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|--------------|--------------|--------------|--------------|
| Aurizon Network proposed costs | 57.58 | 60.23 | 65.40 | 67.22 |
| QCA Adjustments | | | | |
| Train control, safe workings and operations | (4.66) | (5.40) | (6.10) | (6.66) |
| Infrastructure management | (1.06) | (1.33) | (1.58) | (1.78) |
| Business management | (0.01) | (0.29) | (1.09) | (1.40) |
| QCA Draft Decision | 51.85 | 53.21 | 56.63 | 57.38 |

Source: Aurizon Network, 2013 DAU, sub no 3: 241; QCA analysis. Note: Numbers may not sum due to rounding.

Draft Decision

- 4.1 We refuse to approve the system-wide and regional costs (excluding corporate overheads) proposed by Aurizon Network. We consider it appropriate that Aurizon Network amend its proposed system-wide and regional costs (excluding corporate overheads) to reflect our estimate of efficient costs as set out in Table 25.**
- 4.2 We approve Aurizon Network's proposal to escalate non-labour costs by CPI.**
- 4.3 We refuse to approve Aurizon Network's proposal to escalate labour costs by the Average Weekly Ordinary Time Earnings (AWOTE). We consider it appropriate that Aurizon Network amend its 2014 DAU to remove this escalation by AWOTE**
- 4.4 We consider it appropriate that Aurizon Network amend its labour cost escalation rate to reflect escalation in line with the ABS Wage Price Index.**
- 4.5 We approve Aurizon Network's proposal not to include a CPI-X adjustment factor to be applied for the 2014 DAU.**

4.3 Corporate overheads

4.3.1 Aurizon Network proposal

Overview

For the 2014 DAU, Aurizon Network has proposed corporate overheads for its system-wide and regional costs of \$65.97 million in 2013–14 increasing to \$73.87 million in 2016–17. This is a substantial increase compared to UT3, and a significant contributor to the proposed increase in tariffs for the 2014 DAU.

Aurizon Network said the corporate overhead costs allocated to below-rail network using the methodology proposed would result in around 18% of the Aurizon Holdings Limited corporate overhead base being allocated to the regulated below-rail business. Aurizon Network said this is reasonable given the total corporate overhead base and benchmarking data, but acknowledged it results in a higher proposal for corporate overheads than in previous years.¹⁰⁶

Aurizon Network also proposed \$13.05 million in 2013–14 increasing to \$14.89 million in 2016–17 for its maintenance corporate overheads.¹⁰⁷ We have included analysis of Aurizon Network's maintenance corporate overheads in this section.

In addition to the corporate overheads separately identified, Aurizon Network's infrastructure management costs included the office of the Executive Vice President Network (EVP Network).

Aurizon Network's overall proposal for corporate overhead costs is shown in **Table 26**.

¹⁰⁶ Aurizon Network, 2013 DAU, sub no. 3: 238

¹⁰⁷ RSMBC, 2013 DAU, 2014: 62

Table 26 Aurizon Network's proposed corporate overheads (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---------------------------------------|--------------|--------------|--------------|--------------|
| Corporate overheads (operating costs) | 67.03 | 69.73 | 72.46 | 75.09 |
| Corporate overheads (maintenance) | 13.05 | 13.66 | 14.29 | 14.89 |
| Corporate overheads (Total) | 80.08 | 83.39 | 86.75 | 89.98 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 241; Aurizon Network, 2013 DAU, sub. no. 4: 14; Aurizon Network unpublished information; QCA analysis. Note: Operating cost corporate overhead includes Office of the EVP Network

Aurizon Network says its proposed 2014 DAU corporate overhead costs reflect the costs that would be reasonably attributable to the provision of services for the CQCN, if it operated as a stand-alone entity.¹⁰⁸

In UT3, Aurizon Network's corporate overhead costs were calculated as a 'mark-up' on operating costs excluding fuel, energy, depreciation and maintenance costs. Aurizon Network said the UT3 method:

- resulted in an under-recovery of costs over the UT3 period
- was no longer consistent with the QCA Act
- was deficient because it failed to adequately consider the corporate costs that were not allocated to business units and that would have been incurred by a stand-alone entity.¹⁰⁹

Aurizon Network's approach to corporate overhead cost allocation for operating costs

To support its 2014 DAU, Aurizon Network engaged Ernst & Young to develop a cost-allocation method for corporate overheads and to benchmark Aurizon Network's proposed corporate overheads with those of other comparable entities.¹¹⁰

Approach to corporate overhead cost allocation

Aurizon Network proposed using an allocation of corporate costs to the below-rail regulated business based on 'causal' and 'blended' allocation. **Table 27** below provides an example of this process for 2012–13. Aurizon Network's FTEs were considered the cost driver for 61 of the corporate cost centres, its revenue the cost driver for four of the corporate cost centres and so forth. The 'blended' allocation approach was used for 141 of the corporate cost centres for which there was no 'causal' cost driver. This accounted for approximately 65% of the corporate cost allocation to Aurizon Network.

The blended allocation is based on a blended average of network FTEs, revenue and assets. Aurizon Network said using these three factors allows the materiality, scale and size of non-regulated activities, in comparison to regulated activities, to be taken into account.¹¹¹

Aurizon Network's proposed cost allocation method for operating costs is shown in **Table 27**.

¹⁰⁸ Aurizon Network, 2013 DAU, sub no. 3: 229

¹⁰⁹ Aurizon Network, 2013 DAU, sub no. 3: 229

¹¹⁰ Aurizon Network, 2013 DAU, sub. no. 11: 2

¹¹¹ Aurizon Network, 2013 DAU, sub. no. 109: 11

Table 27 Cost allocation applied to 2012-13 forecast costs (\$2012-13 million)

| <i>Cost driver</i> | <i>Cost allocation (\$ million)</i> | <i>Number of cost centres</i> |
|----------------------|-------------------------------------|-------------------------------|
| Network FTE | 2.327 | 61 |
| Network revenue | 2.197 | 4 |
| Network direct costs | 3.104 | 8 |
| Blended rate | 41.566 | 141 |
| 100% allocation | 14.277 | 12 |
| Total | 63.470 | 226 |

Source: RSMBC, 2013 DAU, 2013: 4. Note: Numbers may not sum due to rounding.

Approach to benchmarking

Aurizon Network was of the view that a number of the cost differences between it and its benchmark comparators were attributable to Aurizon Holdings Limited being a listed public company, whereas the comparator companies were both government-owned.¹¹²

Ernst & Young also noted organisational strategy and structure, geographic location, regulatory regime, and organisational maturity can materially affect an entity's cost performance.¹¹³

Aurizon Network's approach to corporate overhead allocation for maintenance costs

For its maintenance activities, Aurizon Network has proposed an allocation of \$12.62 million (\$2012–13) for corporate overhead costs attributable to the office of the CEO and Board, human resources, finance, procurement, information systems, system development, legal and audit.

Aurizon Network provided a report by Deloitte Access Economics¹¹⁴ in support of its proposal. The Deloitte Access Economics report provided a 'bottom up' estimate for the corporate overheads of an efficient stand-alone maintenance business.

The Deloitte Access Economics Report indicated Aurizon Network's maintenance cost overhead proposal was a 6% overhead on the \$200 million estimated maintenance costs and was consistent with benchmark corporate overheads for other regulatory decisions, which suggested an average corporate overhead of around 7%.¹¹⁵

4.3.2 Consultant's assessment

We asked RSMBC to assess whether Aurizon Network's forecast corporate overhead costs were reasonable.

RSMBC review of Aurizon Network blended cost allocation methodology and benchmarking

RSMBC reviewed Aurizon Network's corporate overhead cost centres and identified \$1.04 million in costs which should not be allocated to the below-rail function.¹¹⁶

RSMBC also considered whether Aurizon Network's proposed blended allocator was reasonable. Aurizon Network's blended allocator is an average of Aurizon Network's proportion of revenue,

¹¹² Aurizon Network, 2013 DAU, sub. no. 3: 233

¹¹³ Aurizon Network, 2013 DAU, sub no. 11: 10

¹¹⁴ Aurizon Network, 2013 DAU, sub no. 35 Annex AE

¹¹⁵ Aurizon Network, 2013 DAU, sub no. 35 Annex AE: 10

¹¹⁶ RSMBC, 2013 DAU, 2014: 5

assets and operations FTEs. RSMBC was of the view that Aurizon Network's blended allocator resulted in 24.55% of Aurizon Holdings corporate overheads, for the 141 corporate overhead cost centres for which there is no 'causal' link, being allocated to Aurizon Network.¹¹⁷

While RSMBC noted the selection of a cost allocation method is highly subjective, it found:

- there is generally a stronger correlation between an entity's direct costs and its corporate overheads than the value of an entity's assets and its corporate overheads
- the use of direct costs instead of revenue to be more appropriate as part of any blended allocation rate adopted
- the use of direct cost as a percentage of total costs is the most commonly adopted methodology in the regulatory environment.¹¹⁸

RSMBC also assessed the Ernst & Young benchmarking report. RSMBC concluded the benchmark costs used to support Aurizon Network's proposed corporate cost allocation were likely to be overstated primarily due to:¹¹⁹

- costs being normalised solely based on revenue (i.e. size of business rather than other factors)
- no allowance being made for the benefits of Aurizon Network being part of a larger group with centralised overhead functions
- no allowance or explanation being made for outlying costs when assessing cost in total.¹²⁰

RSMBC alternative options for estimating overheads

RSMBC proposed two alternative methods for allocating corporate overheads for the 141 Aurizon Holdings cost centres for which there was no 'casual' link:

- a direct cost allocation approach or
- an alternative blended cost allocation approach which used an average of direct costs, FTEs and assets.

RSMBC's alternative options for allocating corporate overhead costs are set out in **Table 28**.

Table 28 Allocation of corporate overheads using alternative allocation approaches (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|----------------|----------------|----------------|----------------|
| Aurizon Network proposed blended method | 65.97 | 68.62 | 71.29 | 73.87 |
| RSMBC direct cost allocation method | 48.01 | 49.80 | 51.61 | 53.37 |
| RSMBC alternative blended allocation method | 58.00 | 60.32 | 62.65 | 64.91 |

Source: RSMBC, 2013 DAU, 2013: 55

RSMBC found that the direct cost allocation method is more closely aligned with the benchmark costs on a \$/track km and a \$/gtk basis, particularly compared to the HVCN.¹²¹

¹¹⁷ RSMBC, 2013 DAU, 2014: 7

¹¹⁸ RSMBC, 2013 DAU, 2014: 52

¹¹⁹ RSMBC, 2013 DAU, 2014: 55–57

¹²⁰ RSMBC, 2013 DAU, 2014: 9

Identification of cost savings within the corporate overhead function

RSMBC also reviewed Aurizon Holdings' historic and forecast corporate overhead expenditure and identified a number of savings. RSMBC's analysis highlighted costs for certain areas where forecasts varied compared to actual costs.

RSMBC recommended a number of cost reductions which should be factored into the Aurizon Holdings' corporate overhead forecasts. The cost reductions include an allowance for Aurizon Holdings' budgeted corporate overhead savings in 2013–14. This had not been reflected in Aurizon Network's 2014 DAU submission. As Aurizon Network has claimed confidentiality over the detail of these cost reductions, they have not been detailed in this Draft Decision. However, the savings recommended by RSMBC are included in **Table 29**:

Table 29 RSMBC identified cost savings, (\$2012–13 million)

| <i>Aurizon Network proposed</i> | <i>Direct cost allocation</i> | <i>Alternative blended rate</i> |
|---------------------------------|-------------------------------|---------------------------------|
| 7.907 | 3.629 | 6.848 |

Source: RSMBC, 2013 DAU, 2013: 23

RSMBC review of maintenance overheads

RSMBC recommended Aurizon Network's corporate overheads for maintenance be reduced by \$2 million per annum.¹²² This reduction takes account of reduced allocations of some corporate overhead functions to maintenance services, including the Office of CEO and Board, as well as legal services. RSMBC said the reduction for legal costs took account of the fact that allocations had already been made to Aurizon Network within operating costs for legal services and so it was not clear why additional legal costs were required in relation to maintenance activities.

RSMBC said its proposed allowance is reasonable and reflects Aurizon Network being part of a larger group with centralised overhead functions that should have lower corporate overheads than a stand-alone entity.¹²³

4.3.3 Stakeholders' comments

Stakeholders considered Aurizon Network's proposal for corporate overhead costs to be flawed. Vale said it had expected corporate costs under the 2013 DAU to be lower, but instead had observed a significant increase in these costs.¹²⁴

The QRC, BMA/BMC and RTCA were concerned that Aurizon Network's proposed corporate overheads are:

- based on a poor benchmarking exercise by Ernst & Young, with insufficient information on comparable companies, noting two government-owned (and no privately owned) network service providers were used as comparators, and said the parameters for the analysis were flawed^{125,126}

¹²¹ RSMBC, 2013 DAU, 2014: 134, 136

¹²² RSMBC, 2013 DAU, 2014: 67

¹²³ RSMBC, 2013 DAU, 2014: 63, 69

¹²⁴ Vale, 2013 DAU, sub. no. 42: 5

¹²⁵ QRC, 2013 DAU, sub. no. 67: 6

¹²⁶ BMA and BMC, 2013 DAU, sub. no. 41: 8

- a potential masking of inefficient work practices.¹²⁷

Stakeholders questioned the approach to allocating corporate costs between Aurizon Network and Aurizon Holdings' other functions. Asciano said Aurizon Network should use an approach that considers the integrated structure of Aurizon Holdings.¹²⁸ Asciano suggested Aurizon Network may have reallocated corporate costs from above-rail to below-rail activities. Asciano said Aurizon Network's approach hindered above-rail competition:

The immediate impact of the 2013 DAU cost allocation is that Aurizon above rail is no longer carrying a reasonable allocation of corporate costs which then provides Aurizon above rail with an advantage in competing with other above rail providers¹²⁹ and ... is based on an allocation of corporate costs not reasonably attributable to Aurizon Network.¹³⁰

Stakeholders' and Aurizon Network's comments on the RSMBC report are provided in **Table 30** and **Table 31** respectively.

Table 30 Stakeholders' comments on RSMBC report

| <i>Issue</i> | <i>Comments</i> |
|---|--|
| Direct cost allocation method | The QRC was concerned that RSMBC's analysis clearly indicates direct costs are the most appropriate allocator for costs with no clear causal driver, but RSMBC's report lacked a clear recommendation to adopt this method. ¹³¹ The QRC considered it appropriate to exclude electricity pass-through costs from calculation of corporate overheads using the direct cost allocation method. ¹³² Asciano broadly supported the use of direct costs as an allocator as suggested by RSMBC (noting the need for further investigation to ensure the high percentage of electricity costs in the direct costs is not skewing the allocator). ¹³³ |
| Efficient cost | The QRC considered the benchmarking work supported the view that RSMBC's calculation of corporate costs using the direct cost allocation method substantially exceeds an efficient cost. It also considered the proposed corporate costs remain inflated due to reliance on Aurizon Holdings' 2012-13 Plan as a base, and the lack of any adjustment to reflect the complexity of the operations of the remainder of Aurizon Holdings' operations. ¹³⁴ |
| Potential double counting | The QRC noted RSMBC's comments regarding double-counting, but was unclear whether RSMBC had considered the need to deduct the maintenance overheads from the total overheads of Aurizon Network prior to commencing allocations. ¹³⁵ |
| Treatment of legal costs-unregulated activities | The QRC said 100% of legal costs are allocated to regulated activities when Aurizon Network is also engaged in unregulated activities. ¹³⁶ |
| Costing Manual | Asciano said the cost misallocations identified by RSMBC reinforce the need for an updated Aurizon Network costing manual which is developed and implemented with a high degree of regulatory oversight. Asciano said the undertaking should include a |

¹²⁷ QRC, 2013 DAU, sub. no. 67: 3, RTCA, 2013 DAU, sub. no. 73: 10

¹²⁸ Asciano, 2013 DAU, sub. no. 43: 47

¹²⁹ Asciano, 2013 DAU, sub. no. 43: 49

¹³⁰ Asciano, 2013 DAU, sub. no. 43: 47

¹³¹ QRC, 2013 DAU, sub. no. 110: s 2.1

¹³² QRC, 2013 DAU, sub. no. 110: s 2.1

¹³³ Asciano, 2013 DAU, sub. no. 112: 2

¹³⁴ QRC, 2013 DAU, sub. no. 110: s 2.1

¹³⁵ QRC, 2013 DAU, sub. no. 110: 14

¹³⁶ QRC, 2013 DAU, sub. no. 100: 23

| <i>Issue</i> | <i>Comments</i> |
|--------------|--|
| | requirement for Aurizon Network to meaningfully update its costing manual to provide substantially more detail on its cost allocation approach. ¹³⁷ |

Table 31 Aurizon Network comments on RSMBC report

| <i>Issue</i> | <i>Comments</i> |
|--|---|
| Use of the direct cost allocation method | <p>Aurizon Network disagreed with RSMBC's conclusion about using a direct cost allocation method.</p> <p>It considered its blended rate allocator best reflects its main business drivers as an asset based business, comprising over 25% of the Aurizon Holdings' group earnings before interest and tax.¹³⁸ Further, Aurizon Network considered that:</p> <ul style="list-style-type: none"> the largest proportion of Aurizon Network's direct costs is its energy costs. This has no strong causal relationship to its overhead costs as an asset intensive business, the RSMBC allocator excludes capital costs which will result in an unreasonably low allocation of capital overheads.¹³⁹ <p>Aurizon Network said RSMBC's direct cost method would substantially under allocate costs to Aurizon Network from Aurizon Holdings Limited and would result in the unregulated parts of the Aurizon Group funding the regulated business' shortfall.¹⁴⁰</p> <p>Aurizon Network said in the absence of a conclusive justification, the blended allocator should not be rejected in favour of the proposed direct cost allocation methodology. It also said the RSMBC report does not substantiate or provide conclusive evidence that its submitted operating allowances are not efficient.¹⁴¹</p> |
| Exclusion of capital costs from direct costs | <p>Aurizon Network said the exclusion of capitalised costs, or asset values from the determination of direct costs is erroneous as it results in an unreasonably lower allocation of corporate overheads for many functions and would also understate costs such as finance (which provide advice on funding of the assets and maintenance of the fixed asset register); insurance (which arranges cover for CQCN declared assets); IT (which is used to monitor assets); safety (mitigating assets from major incidents); and procurement).¹⁴²</p> |
| Maintenance cost overheads | <p>Aurizon Network did not accept the reasons for RSMBC's proposed decrease in corporate overheads for maintenance costs by \$2.04 million per annum (\$2011-12). It questioned RSMBC's conclusion that there should be benefits from Aurizon Network's maintenance functions operating as part of a broader group and said Aurizon Network is required to operate essentially as a stand-alone business.</p> <p>Aurizon Network also questioned the basis on which RSMBC adjusted the maintenance corporate overheads, suggesting RSMBC had not taken account of all relevant costs.¹⁴³</p> |

4.3.4 QCA analysis and Draft Decision

When assessing Aurizon Network's proposed corporate overheads for its system-wide and regional costs, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our Decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the proposed corporate overheads for system-wide and regional costs.

¹³⁷ Asciano, 2013 DAU, sub. no. 112: 2

¹³⁸ Aurizon Network, 2013 DAU, sub. no. 109: 11

¹³⁹ Aurizon Network, 2013 DAU, sub. no. 109: 12

¹⁴⁰ Aurizon Network, 2013 DAU, sub. no. 109: 11–12

¹⁴¹ Aurizon Network, 2013 DAU, sub. no. 109: 4

¹⁴² Aurizon Network, 2013 DAU, sub. no. 109: 12

¹⁴³ Aurizon Network, 2013 DAU, sub. no.109: 16

Our approach in applying these statutory factors has been guided by the questions set out in **Table 15**.

Aurizon Network has proposed a substantial increase in the corporate overhead allowance for the 2014 DAU. This is based on its view that the allowance provided in UT3 was inadequate and no longer compatible with the QCA Act.

Because Aurizon Network is also part of a vertically integrated company, we must also ensure the corporate overhead allowance would not allow Aurizon Network to set terms and conditions that discriminate in favour of its downstream operations (section. 168A (c)). Importantly, section 137(1A)(b) also requires that Aurizon Network's access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the service.

Consequently, we also need to ensure we neither overstate nor understate the corporate overhead allowance attributable to the declared service.

For the reasons set out below, our Draft Decision is not to accept Aurizon Network's proposed corporate overhead cost as an efficient cost. The reasons for this Draft Decision are outlined in:

- use of the stand-alone business concept
- cost category inclusion and duplication
- benchmarking and comparator companies
- use of the blended cost allocation method
- treatment of maintenance overheads.

The stand-alone business concept

Aurizon Network has made a case that its corporate overhead allowance should be increased substantially, with a large part of its argument being these costs are necessary to reflect the costs of a 'stand-alone business'.

Whilst we would agree that the concept of an efficient 'stand-alone business' is a useful tool to adopt when assessing efficient corporate overhead costs, we are not of the view that Aurizon Network has used this approach in all circumstances. We note Aurizon Network has developed its corporate overheads for maintenance costs on a 'bottom up', stand-alone basis. However, this approach has not been used for assessing the corporate overheads associated with operating costs. Corporate overhead costs applied to operating costs have been developed using a cost allocation methodology.

Cost category inclusion and duplication

We are unconvinced that Aurizon Network's combined proposal for corporate overheads (operating costs, maintenance and EVP Network) accurately reflects the costs that would be incurred by an efficient 'stand-alone business' providing a similar service, to a similar customer base and demand profile to that of Aurizon Network. In particular:

- (a) We are of the view that Aurizon Holding's corporate overheads include a range of costs that are not necessary to the same extent as for an efficiently operated stand-alone business of a similar size and in a similar industry. Such costs include:
 - (i) investor relations and corporate branding
 - (ii) company secretary, which is much higher than is reasonable for a 'stand-alone business' the size of Aurizon Network.

- (b) We consider there is duplication across the three overhead proposals made by Aurizon Network. For example:
- (i) an allowance for a CEO appearing three times and an allowance for a board appearing twice. The combined allowances for a CEO and Board amounts to over \$5 million in 2013–14, as shown in **Table 32**.

Table 32 Combined costs proposed for CEO (including Board) (\$2013–14 million)

| | <i>\$ million</i> |
|--|---------------------|
| Managing Director/CEO (Corporate overheads proposal) | 2.203 |
| Office of the CEO (Maintenance overheads proposal) | 2.167 |
| Office of EVP Network (Direct costs proposal) | XXXX ¹⁴⁴ |
| Total | XXXX |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 241, unpublished information; RSMBC, 2013 DAU, 2013: 62; SKM, 2013 DAU, 2014(b) MCI report: 3; QCA analysis.

- (ii) we share RSMBCs concerns about the duplication of costs for a fully identified legal service function within Aurizon Network and the legal services proposed for the maintenance corporate overhead
- (iii) similarly, we are not confident Aurizon Network's proposed methodology does not give rise to potential duplication across its finance costs.¹⁴⁵
- (c) We consider there is potential duplication between Aurizon Network's system-wide and regional costs and its corporate overhead allowance, compared to an efficiently operated stand-alone business of a similar size and in a similar industry. This includes the proposed costs for stakeholder relations and national policy, which would otherwise be undertaken by Aurizon Network's business management group.

Benchmarking and comparator companies

With the Ernst & Young report as supporting evidence we are concerned that Aurizon Network has not provided us with benchmarks of efficient businesses. As identified above, an important means of evidencing that Aurizon Network's costs are efficient is to demonstrate that those costs are consistent with those of an efficient business in similar circumstances (i.e., a comparable business in a competitive market).

While Aurizon Network did not specifically identify the two government-owned corporations used as benchmarks in the report, our understanding is that one of the government-owned corporations was Energex.

In this context, we note the Queensland Government engaged the Independent Review Panel on Network Costs to review the performance of Energex and Ergon, including corporate overhead costs. It concluded:

*The Panel also reviewed the DNSP's (Energex and Ergon) corporate overhead costs relative to their peers. The results for both DNSPs showed that the corporate overhead and support costs were among the least efficient.*¹⁴⁶

¹⁴⁴ Aurizon Network has indicated this information is confidential.

¹⁴⁵ Aurizon Network has subsequently indicated that its finance costs should be separately identified as Aurizon Network specific costs but did not identify areas where these costs would be duplicated.

¹⁴⁶ Independent Review Panel on Network Costs, Electricity Network Costs Review Final Report, p. 36

Use of the blended cost allocation method

Our Draft Decision is not to accept Aurizon Network's proposed use of the blended cost allocation method (average of revenue, FTEs and assets) for the following reasons:

- inclusion of both revenue and assets in the allocator: revenue includes a return on and return of assets. Consequently including assets in the blended allocator appears to overstate the impact of assets as a driver of corporate overhead costs
- inclusion of revenue in the allocator: revenue will be affected by changes in policies which have no direct link to overhead costs, such as depreciation rates. Furthermore, revenue includes the pass-through of electricity costs, which appear to have no strong relationship to overheads
- inclusion of assets in the allocator: we note Aurizon Network's view that assets should be considered as part of the assessment because it is an infrastructure intensive business and this should be reflected in costs for IT, insurance, safety and procurement

However, we consider that a direct cost method for allocating Aurizon Network's overheads will reflect the direct costs of an infrastructure intensive business. This is because it includes the costs associated with infrastructure management and maintenance of the assets.

Overall, we are of the view that the proposed blended allocation method appears to overstate the level of corporate overheads reasonably attributable to the operation of Aurizon Network. Furthermore, we are not satisfied that the below-rail business would not be cross-subsiding the above-rail functions.

In coming to this position, we acknowledge the blended allocation method has previously been approved in the Costing Manual in October 2013. However, we do not consider that approval of the Costing Manual infers we should adopt this approach for estimating what should be an efficient corporate overhead allowance to be included in prices for access holders.

We are strongly of the view that the Cost Allocation Manual requires a thorough review to ensure that it appropriately accounts for the more integrated structure of Aurizon Holdings. We consider this should occur prior to the preparation of the regulatory accounts for 2015–16. This issue will be considered in more detail in our next Draft Decision on the 2014 DAU.

Treatment of maintenance overheads

We accepted the use of a separate corporate overhead allocation method for maintenance costs in UT3. This comprised a 5.75% allowance on maintenance costs for corporate overheads and working capital that applied to labour costs only.¹⁴⁷

For the 2014 DAU, we are concerned the use of two different approaches to estimate corporate overheads for Aurizon Network could lead to potential duplication of costs. Given these concerns we consider an allowance for corporate overheads for Aurizon Network should be considered consistently so there is greater confidence that duplication is not occurring.

On this basis our Draft Decision is to not provide a separate allowance for corporate overheads for maintenance costs, but treat these costs as part of the overall estimate for Aurizon Network's corporate overhead costs.

¹⁴⁷ QCA (2010), Draft Decision, QR Network's 2010 DAU- Tariffs and Schedule F, June 2010: 79

QCA's proposed approach – direct cost allocation for operating and maintenance costs

Given the concerns expressed regarding Aurizon Network's approach to developing an efficient corporate overhead allocation, we have undertaken the following process to assess corporate overheads.

- **Step 1:** We have used Aurizon Network's corporate overhead allocation cost model and applied this to both operating and maintenance costs.
- **Step 2:** Within this model, where the blended allocator approach was used to apportion corporate overhead costs to Aurizon Network, we replaced this with a direct cost allocation methodology.
- **Step 3:** We have removed any costs within the corporate overhead function that we do not consider appropriate for a stand-alone business.
- **Step 4:** Cross-check the implications of our assessment against relevant benchmarks.

Steps 2, 3 and 4 are outlined in more detail below.

Direct cost allocation approach

Our Draft Decision is to replace, where applicable, the Aurizon Network blended allocator with a direct cost allocator to allocate corporate overheads. This will apply to operating and maintenance costs. We consider a direct cost allocator to be more reflective of an efficient corporate overhead cost allocation because:

- (a) Using direct costs as a percentage of total direct costs is a tried and tested methodology adopted in the regulatory environment.¹⁴⁸ We have previously applied a direct cost allocation method to allocate corporate overheads in regulated businesses including for Sunwater and Seqwater irrigation prices.
- (b) We consider there to be a clearer relationship between Aurizon Network's corporate overhead costs and direct costs than there is between the value of its revenue and assets (the blended allocator created by Aurizon Network) and its corporate overhead costs.
- (c) A large proportion of Aurizon Network's revenue relates to the return on and the return of capital in relation to the RAB. The use of revenue would therefore appear to include reference to the value of Aurizon Network's asset values.¹⁴⁹ Further, many of the asset-intensive activities are already reflected in the costs of infrastructure management and maintenance.

We do not consider the direct cost allocation method should include the costs of electricity (and fuel) as these costs are generally cost pass-through items. Consequently, there is not a clear relationship between these costs and overheads.

On this basis, we have developed an updated version of the RSMBC direct cost allocator method. This includes maintenance costs, but excludes the costs of electricity. The derivation of the direct cost allocator we have used to replace the blended cost allocator is shown in **Table 33**.

¹⁴⁸ RSMBC, 2013 DAU, 2014: 52

¹⁴⁹ RSMBC, 2013 DAU, 2014: 7

Table 33 QCA calculations for direct cost allocation method (operating and maintenance costs) (\$'000, \$2012-13)

| Aurizon Network Direct Costs* | Costs | Aurizon Holdings Direct Costs**** | Costs |
|--|--------------------------|--|--------------------------|
| Consumables | \$300,000 | Consumables | \$1,353,000 |
| less electricity** | (\$103,600) | less electricity and fuel | (\$374,800) |
| less finance corporate overhead | (\$XXX) ¹ | less overhead costs*** | (\$XXX) ¹ |
| Employee expenses | \$63,500 | Employee expenses | \$1,182,500 |
| Less voluntary redundancy** | (\$6,100) | Less voluntary redundancy | (\$95,700) |
| Total Direct Costs Aurizon Network | \$XXX¹ | Total Direct Costs Aurizon Holdings | \$XXX¹ |
| Percentage of direct costs to be allocated to Aurizon Network - XX¹% | | | |
| <i>Source:</i> | | | |
| *Aurizon Network Audited Annual Report - 30 June 2013 | | | |
| **Aurizon Network Audited Annual Report - 30 June 2013 (Note 5) | | | |
| *** Aurizon Holdings - Historic Corporate Costs Spreadsheet | | | |
| ****Aurizon Holdings Audited Annual Report - 30 June 2013 | | | |
| Aurizon Network FTEs | | Aurizon Holdings FTEs | |
| Operations | 444 | | |
| Maintenance | 850 | | |
| Total | 1294 | Total | 8386 |
| Percentage of FTE costs to be allocated to Aurizon Network - 15.43% | | | |

Source: RSMBC, 2013 DAU, 2013: 7, 54; QCA analysis. Note:(1) Aurizon Network has indicated this information is confidential

We consider this direct cost approach for the allocation of corporate overheads represents a sufficiently robust method for allocating overhead costs between Aurizon Network and the remainder of Aurizon Holdings.

Stand-alone cost base for corporate overheads

We have completed our own review of Aurizon Holdings' corporate overhead costs in order to develop an appropriate starting cost base from which to assess the efficient corporate overhead costs of a 'stand-alone business'. We note that as Aurizon Network has claimed confidentiality over its corporate overhead costs, we are unable to provide the underlying detail of the implications of this assessment. However, in summary we have made the following adjustments:

- (a) adjust for costs which would not be considered part of the efficient cost base for a 'stand-alone business' providing a similar service, to a similar customer composition and demand profile to that of Aurizon Network. This includes:
 - (i) providing an allowance for a single CEO and Board
 - (ii) removing costs associated with investor and stakeholder relations, as well as corporate branding. Although these are relevant to the operations of Aurizon

Holdings, we are of the view that it is unclear that they would be part of the efficient cost base of a 'stand-alone business'

- (iii) reducing costs allowances which are higher than would be expected for a 'stand-alone business'.
- (b) remove costs which would be considered as Aurizon Holding's business re-engineering costs and not part of the efficient cost of providing a rail network
- (c) remove costs associated with corporate restructuring as these represent commercial decisions for an integrated entity and need not represent part of the efficient cost base that a 'stand-alone business' would pass through to access holders
- (d) allocate identified savings in the Aurizon Holdings group to Aurizon Network, taking account of the cost savings identified by RSMBC, but adjusted to reflect the costs excluded as part of (a) above. These savings are then escalated by CPI.
- (e) adjust Aurizon Network's legal costs to reflect the proportion for un-regulated activities based on the 87% allocation of costs assumed for the business management costs
- (f) include \$9.5 million per annum (\$2013–14) for the telecommunications backbone
- (g) adjust the labour costs escalation factors to reflect the forecast Wage Price Index, rather than the AWOTE index.

Taking all of these factors into consideration provides Aurizon Network with corporate overheads for the UT4 period as outlined in **Table 34**.

Table 34 QCA estimated efficient stand-alone costs for Aurizon Network corporate overheads 2013–14 to 2016–17 (\$million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|--|----------------|----------------|----------------|----------------|
| Aurizon Network proposed corporate overheads (including operating costs and maintenance costs) | 80.08 | 83.39 | 86.75 | 89.98 |
| QCA adjustments | (33.84) | (35.51) | (37.19) | (38.74) |
| QCA proposed costs | 46.24 | 47.88 | 49.56 | 51.24 |

In developing the above view we have had regard to the net impact of economies of scale and have made no adjustments. We consider that in order for us to assess whether any scale adjustments are relevant, Aurizon Network would need to provide:

- an objectively justified position that outlines the magnitude of the scale impacts it considers relevant
- empirical evidence of a direct causal relationship of the cost impact on a 'stand-alone business' if it were not considered part of the integrated group
- evidence that an efficiently operated stand-alone business would not be able to mitigate some or all of any incremental operating cost increase.

We are of the view that Aurizon Network has yet to provide this.

Moreover, it should be noted that we consider the approach we have adopted to be cautious, yet it is a position we believe it is appropriate that we adopt based on the evidence before us at this time. For the purposes of this Draft Decision, we have not had the benefit of a rigorous

bottom-up assessment of the corporate overhead costs of an optimally configured 'stand-alone business'.

Benchmarking

There has been considerable discussion about the costs of Aurizon Network's corporate overheads, particularly relative to the HVCN. The difficulty in applying a benchmark cost estimate for Aurizon Network is that it has included a range of costs, including its telecommunications backbone, and health and safety functions in its overheads allocation. This means only high-level comparisons between Aurizon Network and other rail comparators can be drawn and these should be viewed cautiously.

Against this background, by way of a high-level comparison we estimate that Aurizon Network's corporate overhead costs, excluding the costs of the telecommunications backbone, will represent around 0.05c/gtk, compared to 0.04c/gtk in the HVCN in 2013–14. This is more than 20% higher than in the HVCN.

Draft Decision

4.6 We refuse to approve Aurizon Network's proposed methodology for estimating its corporate overhead costs, that is, the use of a blended cost allocator for allocating Aurizon Holdings' corporate overhead costs.

4.7 We consider it appropriate that Aurizon Network amend its 2014 DAU in relation to the corporate overhead allowance to reflect our current estimate of the efficient corporate overheads costs that is associated with all aspects of Aurizon Network's business, as identified in Table 34.

4.4 Risk and insurance

4.4.1 Aurizon Network proposal

Aurizon Network holds commercial insurance for a range of activities, but self-insures for force majeure events (in excess of \$1 million), dewirement and derailment.

Aurizon Network has proposed insurance premium costs based on a Willis Australia Ltd (Willis) report, while the estimates for self-insurance costs are based on a (confidential) Finity Consulting report.

Aurizon Network's proposed costs for risk and insurance are set out in **Table 35**.

Table 35 Risk and insurance costs (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---------------------------------|----------------|----------------|----------------|----------------|
| Insurance premium costs | 3.33 | 3.77 | 4.00 | 4.14 |
| Self-insurance costs | 4.97 | 5.65 | 6.25 | 6.88 |
| Total risk and insurance | 8.30 | 9.42 | 10.25 | 11.02 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 192

The proposed risk and insurance costs include insurance premium and self-insurance costs, totalling approximately \$39 million over the UT4 period. Aurizon Network has assumed a 4% cost escalation factor for its insurance premium costs.¹⁵⁰

Aurizon Network says its insurance coverage, including commercial arrangements, is largely the same between UT3 and the 2014 DAU period. A summary of these arrangements is included in **Table 36**.

Table 36 Aurizon Network proposed insurance arrangements

| <i>Risk</i> | <i>2014 DAU Assumptions</i> |
|---|--|
| Damage to rail infrastructure from force majeure events Industrial and special risks | Self-insurance arrangements to a value of \$1 million for weather related events, then covered by cost-pass through provisions. Nominated major rail infrastructure assets commercially insured |
| Dewirement | Self-insured to \$1 million, then included in the cost-pass through arrangements |
| Derailment | Self-insured to \$8 million per incident, then assumed to be a cost-pass through arrangement |
| Liability | Self-insured to \$8 million per incident, then assumed to be a cost-pass through arrangement (including for derailment) |
| General liability | \$350 million per occurrence and in the aggregate in respect of product, pollution and bushfire liability. \$500,000 deductible on each and every loss. |

Source: Aurizon Network, 2013 DAU, sub. no. 3

4.4.2 Consultants' assessment

RSMBC provided an opinion on the reasonableness of Aurizon Network's insurance premium costs. RSMBC approached two comparable entities (on a confidential basis) for details on their insurance policies. RSMBC also reviewed Aurizon Network's insurance premium cost for the year 2012–13 against that of the benchmark entities and Aurizon Holdings Limited. Following these reviews, RSMBC concluded the proposed insurance premium costs are reasonable.¹⁵¹

SKM assessed Aurizon Network's proposed self-insurance costs for derailment and dewirement. SKM found:

- Aurizon Network's derailment risks may be overstated because i) the impact of preventive maintenance on these risks is not adequately represented; and ii) the data supporting Aurizon Network's claim is, among other things, based on a year characterised by unusually severe weather events.
- Aurizon Network's proposed dewirement costs were likely to be inflated because the risk-of-dewirement data covered an 'outlier' year (i.e. 2011), which was characterised by a period of severe weather events.

Although SKM was not asked to consider the reasonableness of self-insurance costs related to weather, it recommended Aurizon Network's proposed weather self-insurance costs be

¹⁵⁰ Aurizon Network, 2013 DAU, sub. no. 3: 271

¹⁵¹ RSMBC, 2013 DAU, 2014: 14, 70–74

examined for any double-counting (i.e. to ensure these costs do not include compensation for derailments and dewirements which are caused by weather-related events).¹⁵²

4.4.3 Stakeholders' comments

Stakeholders noted Aurizon Network's proposed insurance costs have risen significantly in the 2014 DAU period.¹⁵³ The QRC and BMA/BMC were concerned about the insurance costs' appropriateness and efficiency, and their relationship to forecast maintenance and capital programs.

BMA also indicated concerns about Aurizon Network's self-insurance program, including Aurizon Network being in a position to 'bundle' losses and to determine the repair scope, so the \$1 million threshold can always be exceeded. It also noted the 'blurring' of costs between self-insurance claims and maintenance cost allowances and opportunities for 'double recovery'.

BMA also requested we consider including the share of the Industrial Special Risk premium for feeder station insurance in the AT₅ component of reference tariffs.¹⁵⁴

The QRC questioned whether it is reasonable to forecast that insurance premiums will continue to increase at a rate which is well in excess of CPI on a sustained basis; and the relevance of 'movements in rolling stock values' to a below-rail business.

4.4.4 QCA analysis and Draft Decision

When assessing Aurizon Network's proposed risk and insurance costs, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the proposed risk and insurance costs. Our approach in applying these statutory factors has been guided by the questions set out in **Table 15**.

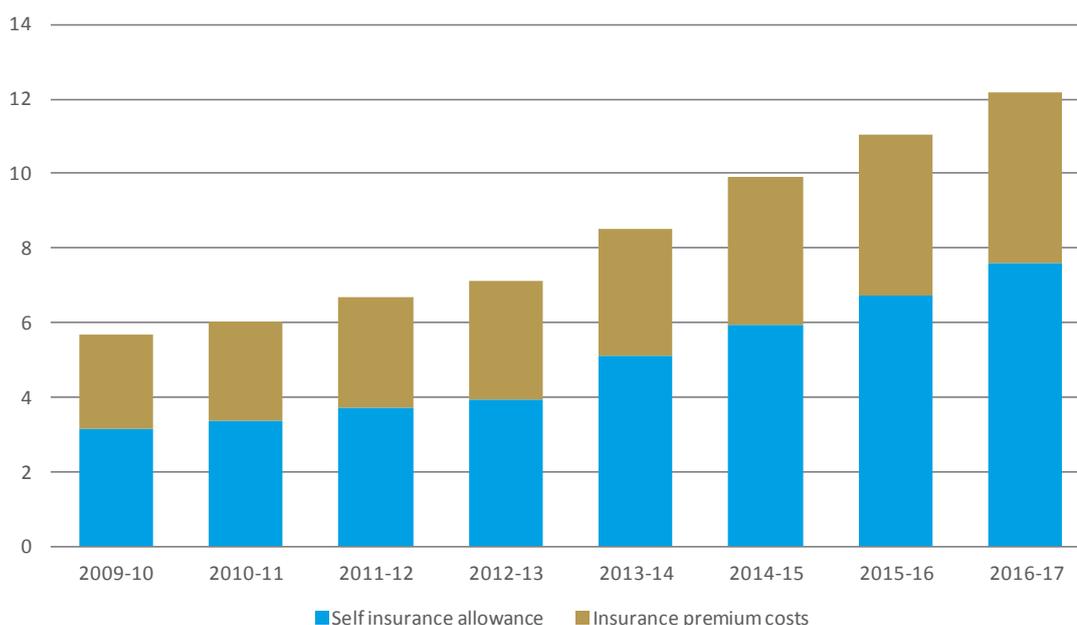
Aurizon Network's revenues should include allowance for efficient insurance costs. We have previously accepted the proposal from Aurizon Network that its insurance and risk arrangements for the CQCN will include a combination of corporate insurance premiums, self insurance and cost pass-through arrangements.

Aurizon Network has proposed a 20% (real) increase in insurance allowance from 2012–13 to 2013–14, as shown in **Figure 11**. The main cost increase proposed is the self-insurance allowance, with an increase of almost 30% (real) from 2012–13 to 2013–14.

¹⁵² SKM, 2013 DAU, 2014: 44

¹⁵³ QRC, 2013 DAU, sub. no. 67: 5; BMA and BMC, 2013 DAU, sub. no. 41: 5; RTCA, 2013 DAU, sub. no. 73: 102

¹⁵⁴ QRC, 2013 DAU, sub. no. 67: 5; BMA and BMC, 2013 DAU, sub. no. 41: 5

Figure 11 UT3 allowed costs and UT4 proposed costs 2009–10 to 2016–17 (\$2012–13 million)

Source: QCA analysis

Self-insurance

We have previously accepted Aurizon Network's decision to self-insure for some costs. We have, however, had continuing concerns about the robustness of data used to estimate self-insurance claims and about the lack of transparency of events covered by self insurance.

Given these concerns, in UT3 we provided for Aurizon Network to implement a formal self-insurance function by 31 December 2010. However, Aurizon Network decided not to do this and has excluded this provision from its 2014 DAU.¹⁵⁵

The major increase in self-insurance related costs in UT4 is driven by an increased allowance for weather-related events, with an increase of over 100% in real terms.¹⁵⁶ This was a result of the UT3 period including a number of flood and cyclone events which caused a higher level of damage to the network than had occurred in previous periods. It has also been impacted by derailment costs being around 30% higher than expected over the UT3 period.

Overall, we accept the methodology proposed by Aurizon Network (Finity) for the development of the self-insurance estimates, although these estimates and the methodology are not transparent to Aurizon Network's customers. We note that reports supporting self-insurance arrangements are publicly available for electricity network providers and see no reason why Aurizon Network should not disclose the information.

We note Finity has highlighted that Aurizon Network should develop and maintain a comprehensive database of self-insured losses, which would significantly streamline the analysis and provide for more robust results. This is a similar comment made for the UT3 process. We consider this to be good practice and it can be used to demonstrate there is no duplication of maintenance costs and the costs associated with dealing with self-insurance related events.

¹⁵⁵ Aurizon Network, 2013 DAU, sub. no. 2: 276

¹⁵⁶ Aurizon Network, 2013 DAU, sub. No. Annex H: 32 [confidential]

Accordingly, as part of our Draft Decision on policy and pricing we will require Aurizon Network to report on its self-insurance arrangements as part of the annual regulatory accounts including disclosing the number of self-insurance events by type and value each year.

Aurizon Network's proposed self-insurance allowance increases by 13–16% (real) across the 2014 DAU. Cost escalation has been driven by the factors listed in **Table 37**.

Table 37 Summary of exposure measures self insurance

| <i>Loss type</i> | <i>Exposure measure</i> |
|------------------------|-------------------------|
| Derailment | gtk (billions) |
| Weather related losses | Track km |
| Dewirements | Electrified Track km |
| Liability | Turnover (million) |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 272

Given this, the self-insurance estimates will be impacted by a number of factors in this decision, particularly changed volumes and turnover. We will require Aurizon Network to provide updated estimates prior to our Final Decision, but have used Aurizon Network's forecasts for the purpose of this Draft Decision.

Self-insurance – cost pass-through events

Review events (with cost pass-through arrangements) are a common regulatory arrangement for the recovery of costs associated with force majeure events, including weather.

The review event arrangements were triggered on two occasions during UT3 following two major flood events in the CQCR. These two events amounted to \$7.9 million (\$2010–11) following the 2011 flood event and \$16.1 million (\$2011–12) following the 2013 flood event.

Particularly as a result of the 2013 flood event, we are no longer convinced that the process for recovery of costs through reference tariffs (Clause 4.3 (c), Schedule F, 2014 DAU) represents an efficient balance of risk between Aurizon Network and its customers, in comparison to a commercial insurance arrangement where insurance costs would be shared across all customers.

The 2013 flood event was concentrated in the Moura and Blackwater systems, with the majority of the costs arising in the Moura system. Given the small number of customers in that system, it means that recovery of the 2013 flood event costs will have a significant impact on tariffs in the Moura system once the costs of the event are recovered. The costs of a large force majeure event may have a material financial impact if miners are small.

As was evident following the 2013 flood event, the practical effect of the review event clause is the recovery of costs of force majeure events is not shared equally across the CQCN but is recovered within impacted systems. We are considering, for future events only, whether such an arrangement is consistent with an effective insurance arrangement.

Insurance premium costs

We accept Aurizon Network's proposed insurance premium costs for 2013–14 as the base year, but do not accept Aurizon Network escalating its premium costs using a 4% factor, based on 'Insurance and Financial Services' data obtained from the ABS. While we note the increases in 2014 DAU period regulatory period to be reasonable, our view is insurance cost increases have

already been reflected in the premium increases and there seems to be no reason for these costs to continue increasing at rates above CPI.

Our Draft Decision is not to accept Aurizon Network's proposal to use a 4% escalation factor for its insurance premium costs.

Our Draft Decision is also to require Aurizon Network to separately identify the costs of insuring feeder stations, which are wholly attributable to the operation of the electric network, with these costs to be allocated to operating costs for electric assets and included in AT5.

Our estimated insurance costs for the 2014 DAU period are set out in **Table 38**.

Table 38 QCA estimated insurance costs (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---------------------------------|----------------|----------------|----------------|----------------|
| Insurance premium costs | 3.33 | 3.78 | 4.01 | 4.13 |
| Self-insurance costs | 4.97 | 5.57 | 6.08 | 6.59 |
| Total risk and insurance | 8.30 | 9.35 | 10.08 | 10.72 |

Draft Decision

- 4.8 We accept the methodology proposed by Aurizon Network for estimating self-insurance costs, but will require Aurizon Network to resubmit its cost escalations to be adjusted for volumes and turnover, consistent with the Draft Decision.**
- 4.9 Aurizon Network is to report on its self-insurance arrangements as part of the annual regulatory accounts including disclosing the number of self-insurance events by type and value each year.**
- 4.10 We refuse to approve Aurizon Network's proposed insurance premium costs. We would accept Aurizon Network's insurance premium costs if:**
- (a) insurance premium costs are escalated at 2.5% not at the proposed 4%, and**
 - (b) the insurance costs of feeder stations are allocated to the operating costs for electric assets only.**

4.5 Audit and condition-based assessment

Aurizon Network incurs annual audit costs associated with the preparation of its regulatory accounts and maintenance report. It said these costs are reflected in its proposed system-wide and regional costs. Further, in UT3, we required Aurizon Network to prepare a condition-based assessment to inform our consideration of asset condition and maintenance requirements.

Aurizon Network has proposed recovering an adjustment of \$248,620 (in \$2012–13 dollars) for actual audit costs in UT3, recognising that these costs were higher than the forecast included in the UT3 operating expenditure allowance.¹⁵⁷ Aurizon Network has proposed that for UT4 audit costs shall be payable by Aurizon Network, but has proposed in its explanatory material to vary

¹⁵⁷ Aurizon Network, 2013 DAU, sub. no. 3: 70

the system allowable revenues for any unrecovered audit costs.¹⁵⁸ Aurizon Network's forecast audit costs for UT4 are included in their system-wide and regional costs.¹⁵⁹

Aurizon Network has also proposed recovering the costs of the condition-based assessment of \$636,000 (2012–13 dollars) from UT3 (for which there was no allowance) during the 2014 DAU period.¹⁶⁰ Aurizon Network subsequently identified it had not included an allowance in its operating cost expenses for a condition-based assessment in during the 2014 DAU period and has proposed an amount of \$550,000 in 2016–17.¹⁶¹

Table 39 Audit and condition-based assessment costs (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|----------------------------------|-------------|---------|---------|---------|
| Audit costs | 0.25 | – | – | – |
| Condition-based assessment costs | 0.65 | – | – | – |
| Total costs | 0.91 | – | – | – |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 70

Aurizon Network also noted there are some external costs it incurs as a direct consequence of its compliance with the undertaking and some costs are uncertain as the QCA can request an audit of any matter under the undertaking, provided we have reasonable grounds to do so.

4.5.1 Consultant's assessment

RSMBC reviewed Aurizon Network's forecast audit costs for accounting practices and assessing the physical condition of its network. RSMBC considered Aurizon Network's historical compliance audit costs, and also benchmarked these costs against those of other regulated entities. It concluded the proposed audit costs are reasonable.¹⁶²

4.5.2 Stakeholders' comments

The QRC did not support Aurizon Network's proposal that the difference between actual and forecast audit costs should be recovered through adjustments to system allowable revenue. Instead, it considered that audits costs should be recovered through the QCA levy.¹⁶³

4.5.3 QCA Analysis and Draft Decision

When assessing Aurizon Network's proposed audit costs, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the audit costs. Our approach in applying these statutory factors has been guided by the questions set out in **Table 15**.

¹⁵⁸ Aurizon Network, 2013 DAU, sub. no. 2: 246

¹⁵⁹ Aurizon Network, 2013 DAU, sub. no. 3: 226

¹⁶⁰ Aurizon Network, 2013 DAU, sub. no. 3: 34, 70

¹⁶¹ Aurizon Network, 2013 DAU, sub. no. 109: 31

¹⁶² RSMBC, 2013 DAU, 2014: 89

Audit costs

Our Draft Decision is to accept the annual audit costs included in the system-wide and regional costs for Aurizon Network. However, we do not accept these costs should be subject to any form of *ex post* review. As a result, we do not accept the proposed adjustment for the difference between UT3 actual and forecast costs.

With regard to unplanned audits, we note Aurizon Network's concerns and the QRC's preference that such costs be included as part of the QCA levy. As the QCA levy can only be used to recover costs we incur, not those incurred by Aurizon Network, we accept that any unplanned audit costs Aurizon Network incurs could be treated as a cost-pass through and reflected in adjustments to system allowable revenue. This is subject to the condition that such costs have been efficiently incurred and Aurizon Network can provide objective evidence that they cannot be absorbed.

Condition-based assessment

With regard to the recovery of the costs of the condition-based assessment undertaken by Evans & Peck in UT3, our Draft Decision is to accept Aurizon Network's revised proposal of \$0.80 million being recovered in 2013–14.

We consider a condition-based assessment should occur during each regulatory period. Considering the amount Aurizon Network incurred for the condition-based assessment in UT3, we consider that the \$0.55 million in 2016–17 proposed by Aurizon Network to be reasonable.

Draft Decision

- 4.11 We accept the proposed costs for the annual audit process to be included as part of the system-wide and regional costs, but not subject to an ex-post review.**
- 4.12 We accept audit costs for any audits initiated by the QCA being treated as a cost pass-through item to be reflected in an adjustment to system allowable revenues. This is subject to such costs being efficiently incurred and Aurizon Network providing objective evidence that they cannot be absorbed.**
- 4.13 We accept the condition-based assessment costs proposed by Aurizon Network, including recovery of the condition-based assessment costs from UT3 of \$0.8 million in 2013–14, and including \$0.55 million in 2016–17 for a UT4 condition-based assessment.**

4.6 Environmental charges

4.6.1 Aurizon Network proposal

Environmental charges are the costs relating to compliance with relevant State and Australian government energy legislation, including the Queensland Gas Scheme (which ceased from 1 January 2014), and the Enhanced Renewable Energy Target, which is separated into the following two parts — Large-scale Renewable Energy Target (LRET) and Small-scale Renewable Energy Scheme (SRES).¹⁶⁴

Aurizon Network has proposed the following for environmental charges:

¹⁶⁴ Aurizon Network, 2013 DAU, sub. no. 3: 252

Table 40 Aurizon Network proposed environmental charges (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|-----------------------|----------------|----------------|----------------|----------------|
| Environmental charges | 4.57 | 5.34 | 6.09 | 6.58 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 252.

Aurizon Network has also proposed environmental charges be included in the non-electric operating cost expenditure:

In order to avoid distorting the competitiveness of more efficient electric traction services Aurizon Network has classified the costs associated with compliance with schemes as a tax and included as an overhead.¹⁶⁵

4.6.2 Stakeholders' comments

Neither BMA/BMC nor the QRC supported electricity environmental charges being included in general overhead costs but considered it should be part of the electrical charge (EC).¹⁶⁶

4.6.3 QCA analysis and Draft Decision

When assessing Aurizon Network's proposed environmental costs, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the environmental costs. Our approach in applying these statutory factors has been guided by the questions set out in **Table 15**.

Our Draft Decision is to refuse to approve Aurizon Network's proposal to include environmental charges in its operating expenditure costs for non-electric assets.

We do not see merit in Aurizon Network's view that environmental charges should be included in operating costs for all train services (electric and non-electric) 'to avoid distorting the competitiveness of the more efficient electric traction services'.

Environmental charges arise solely due to the operation of electric train services and should be attributed to the EC tariff only. These costs should not be borne by non-electric users.

Draft Decision

4.14 We refuse to approve the environmental charges proposed by Aurizon Network. We consider it appropriate that Aurizon Network amend its 2014 DAU in relation to operating costs to remove environmental charges from the operating expenditure allowances. These costs are to be included in the electric charge only.

4.7 Operating costs - electric assets

4.7.1 Aurizon Network proposal

Aurizon Network has proposed \$68.34 million in 2013–14, increasing to \$82.94 million in 2016–17 for operating costs for its electric network.

¹⁶⁵ Aurizon Network, 2013 DAU, sub. no. 3: 253

¹⁶⁶ BMA and BMC, 2013 DAU, sub. no. 41: 4; QRC, 2013 DAU, sub. no. 67: 4

These costs reflect the transmission connection charges only and are recovered through the AT5 tariff. Transmission connection charges are the costs of connection to the National Electricity Market (NEM) via Powerlink's overhead power systems. Aurizon Network pays regulated charges for older connections and negotiated charges for newer connections.¹⁶⁷

Aurizon Network's proposal does not include the actual costs of electricity purchase. Electricity costs are treated as a separate cost-pass through item through the EC.

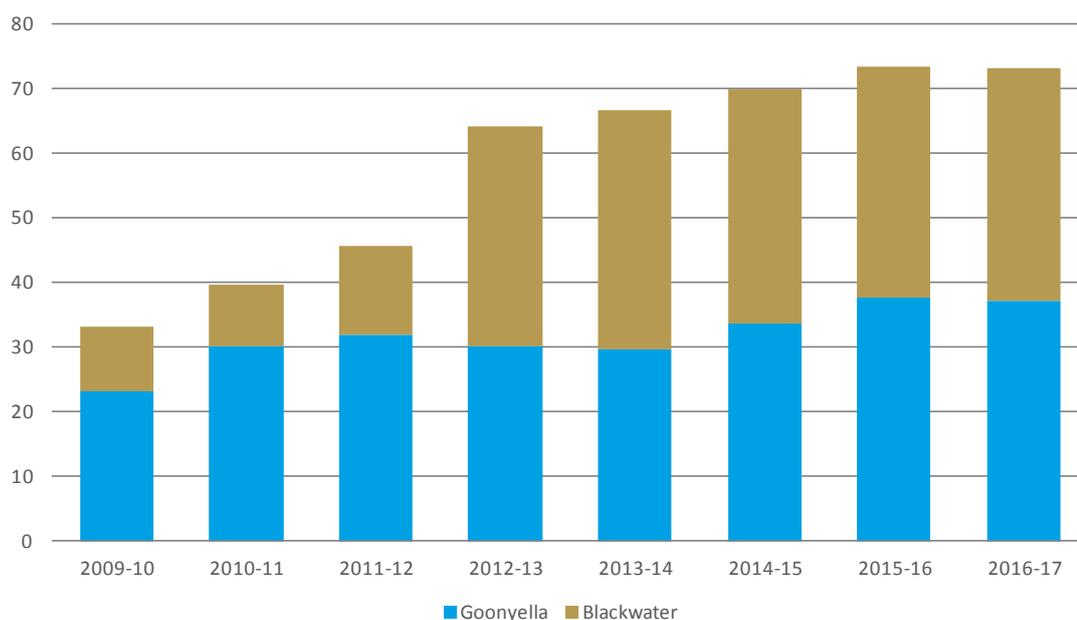
Table 41 Aurizon Network's proposed operating expenditure - electric assets (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|--|--------------|--------------|--------------|--------------|
| Transmission connection costs | 68.34 | 73.44 | 79.18 | 80.81 |
| Rolleston transmission connection costs | – | 1.01 | 2.08 | 2.13 |
| Total transmission connection costs | 68.34 | 74.45 | 81.25 | 82.94 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 21, 248

As the graph below shows, Aurizon Network's transmission connection charges increased significantly in 2012–13, largely driven by increased costs in the Blackwater system.

Figure 12 Actual and proposed transmission connection charges (excluding Rolleston) 2009–10 to 2016–17 (\$ million, 2012–13 dollars)



Source: QCA analysis

Aurizon Network said it has committed to one additional connection in UT4, with the Wotonga feeder station expected to be commissioned in 2014–15. The need for the Wotonga feeder station was identified in the 2010 Coal Rail Infrastructure Master Plan (CRIMP) and Aurizon Network obtained user support for the project in February 2012.¹⁶⁸

¹⁶⁷ Aurizon Network, 2013 DAU, sub. no. 3: 243–244

¹⁶⁸ Aurizon Network, 2013 DAU, sub. no. 3: 247

Aurizon Network has indicated an additional connection is being studied to support electrification of the Rolleston branch line. Aurizon Network considers there are incremental benefits in this investment, with electric train services from the Rolleston branch line to make a positive contribution to common system costs.¹⁶⁹

4.7.2 Stakeholders' comments

The QRC noted Aurizon Network had voluntarily committed to continue to supply electricity at cost for the 2014 DAU duration, and indicated industry would like this arrangement to continue.¹⁷⁰

The QRC also noted the proposed transmission connection costs have increased substantially since UT3, and said we should verify these costs are being passed through at cost.¹⁷¹ BMA/BMC noted the proposed sharp increase in transmission connection costs in the Goonyella and Blackwater coal systems may impact on the relative economics of diesel versus electric traction.¹⁷²

RTCA noted the proposed transmission connection costs are significantly higher compared to those allowed in the UT3 period. RTCA was concerned Aurizon Network had not provided enough information or transparency for industry to test the claims.¹⁷³

RTCA also raised the issue that Aurizon Network's proposed operating expenditure may include the Powerlink contract costs that were part of the Blackwater electric traction draft amending access undertaking (DAAU) process. RTCA requested we assess whether this is the case.¹⁷⁴

4.7.3 QCA analysis and Draft Decision

When assessing Aurizon Network's proposed operating costs for its electric network, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the operating costs for the electric network.

Our approach in applying these statutory factors has been guided by the questions set out in **Table 15**.

Transmission connection charges

Stakeholders raised concerns regarding the proposed increases in transmission connection costs. Principally, concerns relate to the lack of transparency of information and involvement of stakeholders in the negotiation and decision making process. We have reviewed the transmission connection costs and note the 2013–14 proposed costs are comparable to the actual costs in 2012–13. We understand the increased costs are due, in part, to Powerlink negotiating unregulated charges for new connection assets with Aurizon Network.

We share stakeholder's concerns regarding substantial increases in connection charges and Aurizon Network's commitment to prepayment and proposal for an annuity recovery from customers. We understand from stakeholders' submissions, they have had limited information

¹⁶⁹ Aurizon Network, 2013 DAU, sub. no. 3: 159

¹⁷⁰ QRC, 2013 DAU, sub. no. 67: 4

¹⁷¹ QRC, 2013 DAU, sub. no. 67: 4

¹⁷² BMA and BMC, sub. no. 41: 4

¹⁷³ RTCA, 2013 DAU, sub. no. 73: 102

¹⁷⁴ RTCA, 2013 DAU, sub. no. 73: 103

about how these charges were developed, negotiated or accepted. In particular, we are concerned that both Aurizon Network and Powerlink each operate from a monopoly position and we are not confident that the Powerlink costs reflect an efficient cost as they have not been subject to consultation and external scrutiny by a broader group of effected stakeholders.

Our Draft Decision is that we have yet to form a view as to whether the proposed costs are either prudent or efficient. We are considering appointing a consultant to review the prudence and efficiency of the proposed expenditure with a particular focus on the commerciality of the commercial terms settled between Aurizon Network and Powerlink. Part of the review would entail engagement with and submissions from stakeholders and provision of the terms of the Powerlink contracts and demonstrating how the arrangements were cost effective compared to other energy procurement options or above-rail locomotion alternatives.

We consider the proposed Rolleston transmission connection costs of \$5.22 million to be reasonable, based on evidence (confidential agreements) from Aurizon Network. However, we note that as it is subject to an *ex post* capital expenditure approval process, we have yet to accept the Rolleston electrification capital expenditure into the RAB and that connection would also be subject to the above-mentioned review.

Regenerative braking

SKM noted Aurizon Network had identified 'cost savings of \$2.5m from 6.5% less feeder station power usage, through regenerative braking, and recommended adjusting allowable expenditure accordingly.¹⁷⁵ In response, Aurizon Network said it is currently running a project to test the capacity and impacts of regenerative power on the CQCN and will credit adjustments for the electricity returned to the grid on electricity bills; the reduced cost is reflected in the EC tariff.¹⁷⁶

Draft Decision

4.15 To conduct a review of the proposed transmission connection costs for all electrified systems and defer our decision subject to the outcomes of the review.

4.8 Summary

Our Draft Decision on operating costs for the 2014 DAU is summarised in **Table 42**. The most significant driver of our proposed increase is corporate overheads, noting our Draft Decision on corporate overheads takes into account an overhead allowance for maintenance.

¹⁷⁵ Aurizon Holdings, Investors Briefing, 18 July 2013, Slide 70.

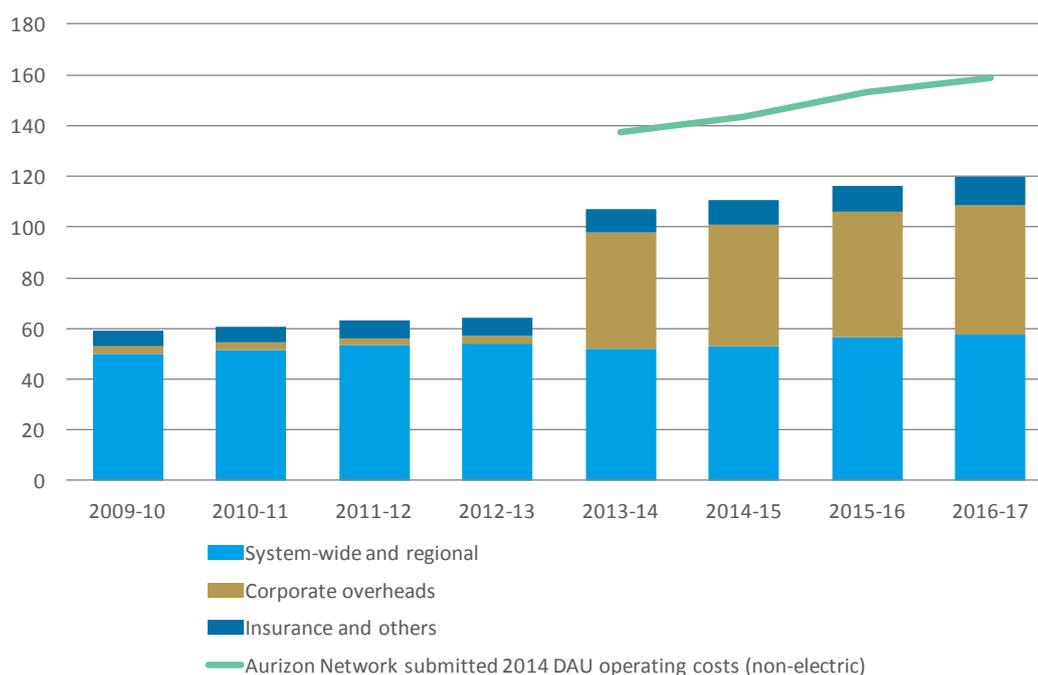
¹⁷⁶ Aurizon Network, 2013 DAU, sub. no. 109: 43

Table 42 QCA proposed operating expenditure (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|---------------|---------------|---------------|---------------|
| System wide and regional costs | 51.85 | 53.21 | 56.63 | 57.38 |
| Corporate overheads | 46.24 | 47.88 | 49.56 | 51.24 |
| Insurance | 8.30 | 9.35 | 10.08 | 10.72 |
| Audit and condition-based assessment costs | 0.80 | — | — | 0.55 |
| Environmental charges | — | — | — | — |
| QCA proposed operating costs—non-electric | 107.19 | 110.45 | 116.27 | 119.88 |
| Transmission connection costs | 68.34 | 74.45 | 81.25 | 82.94 |
| QCA proposed operating costs—electric | 68.34 | 74.45 | 81.25 | 82.94 |
| QCA proposed total operating costs (\$nominal) | 175.54 | 184.89 | 197.52 | 202.82 |

Source: QCA analysis

While we have refused to approve Aurizon Network's full 2014 DAU proposal for operating costs, we have accepted a substantial increase in the allowed operating costs relative to the UT3 approved allowance, as shown in **Figure 13** (transmission connection costs are excluded).

Figure 13 Operating costs UT3 allowances and UT4 QCA Draft Decision (\$ million, nominal)

Source: QCA analysis

5 MAINTENANCE COSTS

Aurizon Network's maintenance cost proposal represents around 22% of its annual MAR. The 2014 DAU submitted maintenance costs consist of costs associated with internal labour and externally procured resources used in undertaking maintenance activities; a return on and return of maintenance assets; a return on inventory; a return on working capital; and corporate overheads.

Our Draft Decision proposes a maintenance cost allowance (excluding ballast undercutting costs) for the 2014 DAU period of \$527.85 million, compared to the \$739.58 million proposed by Aurizon Network in December 2013. In arriving at our Draft Decision, we have accepted many aspects of Aurizon Network's maintenance cost proposal, especially in relation to the direct maintenance costs. However, our Draft Decision is that Aurizon Network's maintenance cost proposal is more than that necessary to provide efficient services for the CQCN. Accordingly, we are proposing a reduction of \$211.73 million over the 2014 DAU period for maintenance costs (excluding ballast undercutting costs).

5.1 Overview

5.1.1 Aurizon Network proposal

Aurizon Network has proposed a total maintenance expenditure of \$232.56 million in 2013–14, escalating to \$294.06 million in 2016–17 (in nominal terms based on Aurizon Network's proposed escalation rates, including the updated maintenance cost index (MCI) provided in December 2013). This represents approximately 22% of Aurizon Network's submitted 2014 DAU MAR.¹⁷⁷

Aurizon Network's proposed maintenance expenditure (in \$2011–12 and nominal terms) over the 2014 DAU period is presented in **Table 43**.

Table 43 Aurizon Network's proposed maintenance cost (\$2011–12 million)

| <i>Maintenance Discipline</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|-------------------------------|----------------|----------------|----------------|----------------|
| Direct costs | 189.51 | 204.26 | 210.33 | 213.91 |
| Mechanised maintenance | | | | |
| • Ballast undercutting | 55.27 | 64.86 | 65.88 | 66.36 |
| • Resurfacing | 18.98 | 19.02 | 20.87 | 20.93 |
| • Rail grinding | 12.51 | 13.52 | 13.96 | 14.44 |
| General track maintenance | 47.32 | 50.47 | 52.00 | 53.58 |
| Re-railing | 15.27 | 15.06 | 15.72 | 16.14 |
| Structures | 2.65 | 2.77 | 2.84 | 2.94 |
| Traction power | 9.56 | 9.60 | 9.60 | 9.60 |
| Signalling | 22.59 | 23.46 | 23.94 | 24.42 |
| Telecommunications | 5.37 | 5.51 | 5.52 | 5.52 |
| Indirect costs | 22.86 | 24.86 | 24.52 | 24.41 |

¹⁷⁷ Aurizon Network, 2013 DAU, sub. no. 3: 21

| <i>Maintenance Discipline</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|--|----------------|----------------|----------------|----------------|
| Return on inventory, working capital & fixed assets employed | 10.77 | 12.77 | 12.43 | 12.33 |
| Corporate costs | 12.09 | 12.09 | 12.09 | 12.09 |
| Total maintenance costs (\$2011–12) | 212.37 | 229.12 | 234.85 | 238.33 |
| Total maintenance costs (\$nominal)¹² | 232.56 | 261.16 | 278.44 | 294.06 |

Source: Aurizon Network, sub. no. 4: 13–14; subsequent information provided by Aurizon Network on escalation rates in December 2013; QCA analysis. Notes: (1) Based on updated MCI provided by Aurizon Network in December 2013. (2) Aurizon Network has applied different escalation rates for different components of the maintenance expenditure: (a) direct maintenance costs (excluding depreciation) and return on fixed assets are escalated based on the maintenance cost index (MCI); (b) depreciation is escalated based on the CPI; (c) return on inventory is escalated based on a consumables index; (d) corporate costs are escalated based on a weighted labour and CPI index.

Aurizon Network provided a revised maintenance cost forecast in December 2013 as part of its updated financial model. In real terms (\$2011–12), the maintenance cost forecasts provided in December 2013 remained unchanged from the original April 2013 submission. In nominal terms, total maintenance costs differ slightly to the April 2013 submission primarily due to a revised MCI.

As seen below, the maintenance expenditure is broken down into two broad categories: direct and indirect costs. Direct costs comprise costs associated with internal labour, externally procured resources (e.g. network materials, fuel, etc.) used in undertaking a number of maintenance activities, as well as depreciation of maintenance assets (e.g. plants, trucks, etc.).¹⁷⁸ Indirect costs include a return on inventory, a return on working capital, a return on maintenance assets, and corporate costs.

Aurizon Network has provided a range of technical reports to support its maintenance expenditure proposal. Evans & Peck, commissioned by Aurizon Network, benchmarked the maintenance cost of CQCN against those of other networks, including the ARTC's HVCN. In the report, Evans & Peck stated:

*... extensive analysis has been carried out comparing QR Network's four systems with the ARTC HVCN and this analysis clearly indicated QR Network's CQCN cost efficiency to be reasonable and prudent when compared with the ARTC HVCN on a unit cost basis of dollars' per track kilometre versus net system tonnage.*¹⁷⁹

For the most part, the information provided by Aurizon Network has been made publicly available, although in some cases significant redaction has been applied to the public version, particularly Aurizon Network's proposed maintenance scope.

5.1.2 Legislative Framework

In forming a view on Aurizon Network's proposed maintenance expenditure for the 2014 DAU, we must have regard the factors in section 138(2) of the QCA Act, as set out in the 'Role of the QCA' section of this Draft Decision, and give them an appropriate level of weighting, as identified in Section 2.1.2 of this Draft Decision.

Against this background, we consider:

¹⁷⁸ Aurizon Network, 2013 DAU, sub. no. 4: 112

¹⁷⁹ Aurizon Network, 2013 DAU, sub. no. 18: 44

- the factors listed in sections 138(2)(a), (b), (d), (e), (g) and (h) should be given more weight, as identified below;
- section 138(2)(g) refers to the pricing principles mentioned in section 168A, of which we consider the factors listed in sections 168A(a), (c) and (d) should be given more weight, as identified below;
- the factors listed in sections 138(2)(c), 138(2)(f) and 168A(b) should be given less weight, as they are not practically relevant to our assessment of the maintenance expenditure proposal.

Efficient costs

Sections 69E and 138(2)(a) of the QCA Act require that we have regard to the object of Part 5 of the QCA Act, namely to promote the economically efficient operation, use of and investment in the CQCN, as the significant infrastructure by which the declared service are provided.

Sections 138(2)(g) and 168A(a) of the QCA Act require that we have regard to certain pricing principles, including that the price for access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and include a return on investment commensurate with regulatory and commercial risks involved. These factors suggest that Aurizon Network's proposed maintenance expenditure should reflect the efficient cost and scope associated with the requisite level of maintenance required.

Aurizon Network's legitimate business interests in relation to maintenance expenditure (which we have considered in accordance with section 138(2)(b) of the QCA Act) can encompass a range of things depending on the activity. However, in broad terms, we consider that:

- Aurizon Network has an interest in ensuring its assets are maintained to a standard that allows it to meet its safety and other obligations
- Aurizon Network has an obligation to manage, operate, repair and maintain the CQCN in accordance with good operating practices, in line with safety and environmental laws and authorisations, and to the extent necessary to maintain insurance required by its lease arrangement; and
- these interests will be satisfied if Aurizon Network is permitted to recover at least the efficient costs of delivering an efficient maintenance regime for the CQCN, in a manner which meets its legal obligations and its customers' requirements, both present and future.

Conversely, sections 138(2)(e) and (d) of the QCA Act require us to have regard to the interests of access seekers and the public interest. We also consider that the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already "access seekers" under section 138(2)(e). As identified earlier, consideration of all of these interests leads to a conclusion that Aurizon Network should also be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the objective of Part 5 specified in section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its downstream operations—which could otherwise raise concerns under section 168A(c). The

need for costs to be minimised is also important in light of the current adverse economic climate in Queensland mining industry, so is in the public interest under clause 138(d).

A further additional factor relevant to our assessment of Aurizon Network's proposal is that, where possible, an approach should be adopted which provides for regulatory certainty. We have had regard to this factor pursuant to section 138(2)(h) of the QCA Act. We support a stable and predictable regulatory environment for Aurizon Network; an environment in which there are changes to methodology only where there is a clear case for such changes.

Efficient allocation of costs

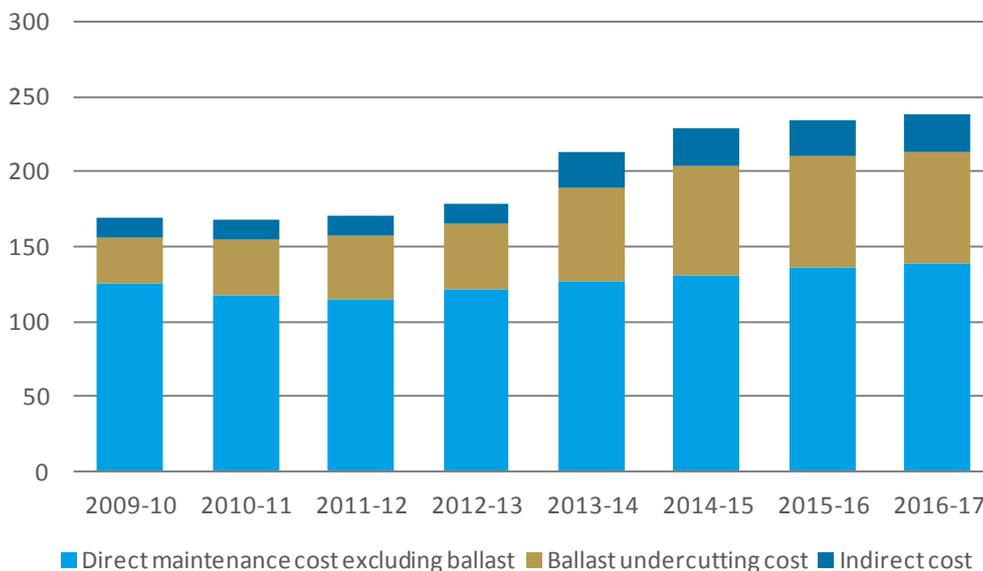
In considering the allocation of costs, in addition to section 138(2) of the QCA Act, we have also had regard to section 137(1A)(b). Section 137(1A)(b) applies to Aurizon Network as a "related access provider", namely an access provider that not only owns or operates the declared service, but also provides, or proposes to provide, access to the service to itself or a related body corporate. Section 137(1A)(b) requires that Aurizon Network's access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the service.

Our assessment of Aurizon Network's proposal is set out below. We have also identified our assessment approach and its linkages to the legislative framework.

5.1.3 QCA assessment approach

Aurizon Network's submitted maintenance expenditure for 2013–14 is approximately 19% higher than the actual maintenance expenditure for 2012–13 (final year of UT3). **Figure 14** shows Aurizon Network's actual and proposed maintenance expenditure over the UT3 and 2014 DAU periods respectively.

Figure 14 Aurizon Network's actual and proposed 2014 DAU maintenance costs (\$2011–12 million)



Source: SKM. Note: The general track maintenance costs, as defined by Aurizon Network (see **Table 43**), include some costs associated with ballast undercutting. These costs have been removed from the general track maintenance costs and added to the ballast undercutting costs.

To assess efficient maintenance costs for UT4 in the context of section 138(2) of the QCA Act, we have applied the assessment approach as set out in **Table 44**.

Table 44 QCA's assessment approach for Aurizon Network's proposed maintenance costs

| <i>Assessment criterion</i> | <i>Rationale</i> |
|---|--|
| Is the proposed scope efficient for the 2014 DAU period? | For the purposes of this Draft Decision, we consider an efficient scope comprise the requisite level of maintenance necessary to maintain the CQCN for the 2014 DAU period, assuming the requisite level of maintenance for maintaining the CQCN has occurred in prior periods. |
| Are the proposed costs efficient for the 2014 DAU period? | <p>For the purposes of this Draft Decision, we consider efficient costs comprise:</p> <ul style="list-style-type: none"> • an allowance for efficient costs associated with providing the requisite level of maintenance for the CQCN for the 2014 DAU period • an appropriate return on and return of investment associated with fixed assets employed • an appropriate escalation factor to take account of changes in costs outside of Aurizon Network's control. <p>In practice, as outlined in section 2.1.2, we have used a 'reasonableness' test as the relevant 'proxy' for efficient costs for the 2014 DAU period, in the absence of robust, evidence-based benchmarks for assessing efficient costs in the CQCN.</p> |

We consider that, taken as a whole, this assessment approach for identifying efficient maintenance costs allows us to have regard to an appropriate weighing of factors set out section 138(2) of the QCA Act, as contemplated earlier in this chapter.

Our assessment of Aurizon Network's maintenance expenditure proposal is set out below. We split the assessment into three parts: direct maintenance costs; indirect maintenance costs; and the maintenance cost index (MCI). Our discussion of ballast undercutting costs is covered separately in Chapter 6 given the significance of these costs (which comprise around 35% of the forecast direct maintenance costs).

As part of our assessment, we engaged Jacobs SKM (SKM) to independently assess Aurizon Network's direct maintenance costs and forecast MCI. We also engaged RSMBC to independently review the indirect maintenance costs proposed by Aurizon Network. The consultants' reports have been made available for public consultation.

5.2 Direct maintenance costs (excluding ballast undercutting costs)

5.2.1 Aurizon Network proposal

Excluding ballast undercutting costs, Aurizon Network's proposed direct maintenance expenditure in 2013–14 is \$136.55 million, increasing to \$168.11 million in 2016–17 (nominal values based on Aurizon Network's forecast MCI). The breakdown of the proposed direct maintenance costs over the UT4 period is presented in **Table 45**.

Table 45 Aurizon Network's proposed direct maintenance costs excluding ballast undercutting costs (\$2011–12 million)

| <i>Maintenance Discipline</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|--|----------------|----------------|----------------|----------------|
| Mechanised maintenance | | | | |
| • Resurfacing | 18.98 | 19.02 | 20.87 | 20.93 |
| • Rail grinding | 12.51 | 13.52 | 13.96 | 14.44 |
| General track maintenance ¹ | 39.75 | 42.09 | 37.32 | 44.66 |
| Re-railing | 15.27 | 15.06 | 15.72 | 16.14 |

| <i>Maintenance Discipline</i> | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|----------------|----------------|----------------|----------------|
| Structures | 2.65 | 2.77 | 2.84 | 2.94 |
| Traction power | 9.56 | 9.60 | 9.60 | 9.60 |
| Signalling | 22.59 | 23.46 | 23.94 | 24.42 |
| Telecommunications | 5.37 | 5.51 | 5.52 | 5.52 |
| Total direct costs (in \$2011–12) | 126.68 | 131.03 | 135.77 | 138.65 |
| Total direct costs (\$nominal)² | 136.55 | 146.94 | 158.21 | 168.11 |

Source: Aurizon Network, sub. no. 4: 13–14; nominal costs based on subsequent information provided by Aurizon Network on proposed escalation rates; QCA analysis. Notes: (1) the general track maintenance costs, as defined by Aurizon Network (see Table 43), include some costs associated with ballast undercutting. These costs have been removed from the general track maintenance costs in the table above; (2) based on Aurizon Network's updated MCI and CPI forecasts provided in December 2013.

Aurizon Network said its actual maintenance expenditure in 2011–12 was used to develop the UT4 cost inputs. Each identified cost input was extrapolated to reflect the resources required for the UT4 maintenance scope, adjusted for assumed efficiency improvements.¹⁸⁰ In estimating the UT4 maintenance scope and expenditure, Aurizon Network stated it has taken into account the following factors:

- increase in the total quantity of assets on the CQCN (e.g. WIRP Stage 1 infrastructure)
- ageing of the CQCN resulting in an increased potential for faults and asset failures
- more stringent safety obligations requiring greater effort in conducting maintenance activities
- higher tonnage profile increasing the total amount of maintenance task required and reducing access time to the track for maintenance activities due to increased traffic density).¹⁸¹

Despite these factors, Aurizon Network pointed out that it has included a number of efficiency gains in its cost build-up, including:

- non-mechanised labour efficiency improvement of approximately 4%
- plant production improvement estimated to be between 10% and 30%
- an increase in the use of externally procured resources to above 50% of the cost base.¹⁸²

Aurizon Network stated that since productivity improvements have been directly included in the cost build-up, the efficiency factor (i.e. X-factor) previously applied to the MCI escalation under UT3 is no longer appropriate.¹⁸³

Condition-based assessment

In December 2012, Aurizon Network engaged Evans & Peck to conduct a condition-based assessment.¹⁸⁴ The 2010 AU required independent assessments of Aurizon Network's rail

¹⁸⁰ Aurizon Network, 2013 DAU, sub. no 4: 105–107

¹⁸¹ Aurizon Network, 2013 DAU, sub. no 4: 107

¹⁸² Aurizon Network, 2013 DAU, sub. no 4: 107–108

¹⁸³ Aurizon Network, sub. no. 4: 108

¹⁸⁴ Evans & Peck 2013 CQCN Condition Based Assessment Initial Assessment August 2013

infrastructure as part of the reporting requirements. There was to be one assessment at the beginning of the regulatory period and one at the end. However, due to timing issues, the Evans & Peck study was the only assessment conducted. The condition based assessment occurred in the second half of the UT3 period.

The initial purpose of the Evans & Peck's study was to establish a baseline condition of the CQCN, which could then be tracked over time through subsequent assessments. The series of results would inform future judgement on whether the network had 'deteriorated by more than would have been the case had good operating practice and prudent and effective maintenance and asset replacement policies and practices been pursued'.

Evans & Peck found, on the basis of the 2011–12 asset records, the CQCN generally performed and was maintained in a manner consistent with the targets for lagging indicators, leading indicators and operational key performance indicators. **Figure 15** shows the network's performance as found by Evans & Peck, with respect to two key performance indicators—Below Rail Transit Time (BRTT)¹⁸⁵, and Overall Track Condition Index (OTCI).¹⁸⁶

Figure 15 Results from the condition-based assessment

| System | Operational KPI | |
|------------------|--------------------------|---|
| | BRTT | OTCI |
| Newlands | BRTT: 3 month above BRTT | OTCI - overall good condition |
| Goonyella | BRTT: 1 month above BRTT | OTCI - overall good condition |
| Blackwater | BRTT: 0 month above BRTT | OTCI - overall good condition |
| Moura | BRTT: 0 month above BRTT | OTCI - above median threshold & trending upwards |
| Condition Coding | | Description |
| Green | | Asset performing at or better than specified |
| Yellow | | Minor non-conformance |
| Amber | | Trend of minor non-conformance |
| Red | | Major non-conformance |
| Grey | | Unavailable/insufficient data to make an assessment |

Source: Evans & Peck CQCN Condition Based Assessment Initial Assessment August 2013

SKM's assessment

We engaged SKM to review Aurizon Network's forecast maintenance expenditure including benchmarking against similar below-rail operations as well as historical maintenance expenditure for the CQCN. This included consideration for productivity improvements and identification of any irregularities such as 'double counting' and adjusting the forecast maintenance costs as required.

¹⁸⁵ Below Rail Transit Time (BRTT) represents Aurizon Network's commitment to stakeholders that the below rail asset can allow trains to travel a certain route at or better than a target transit time. The BRTT is based on the theoretical cumulative section run times for a particular route, factored up by an agreed amount to allow for system delays and an allowance for Temporary Speed Restrictions (TSR) imposed by Aurizon Network for track condition or maintenance activities.

¹⁸⁶ Overall Track Condition Index (OTCI) is a comprehensive system of geometric track measurements. Target OTCI range for a system varies with the type of track and nature of traffic—a more demanding task for a length of track leads to a more demanding acceptable OTCI target range.

As part of the assessment, SKM undertook a combination of high level and detailed review of Aurizon Network's forecast maintenance expenditure. SKM used the following information from Aurizon Network:

- historical and forecast maintenance expenditure
- historical and forecast operating volumes
- detailed information on Aurizon Network's expected productivity improvements
- key assumptions underpinning the maintenance cost forecast.¹⁸⁷

This section identifies SKM's findings and recommendations in relation to Aurizon Network's direct maintenance expenditure.¹⁸⁸

Maintenance approach

Aurizon Network has expressed its intention to implement a planned approach to the maintenance task from 2013–14.¹⁸⁹ As part of this approach, Aurizon Network's proposed 2014 DAU maintenance expenditure has been determined based on unit cost of maintenance in 2011–12, and the level of maintenance scope planned in accordance with coal supply chain demands.

SKM found that while Aurizon Network's bottom-up approach to developing its 2014 DAU cost base is reasonably robust, Aurizon Network is yet to have the detailed asset knowledge required to program condition-based maintenance. SKM noted Aurizon Network knows what level of preventative maintenance it expects to do in the 2014 DAU, but it cannot predict where maintenance will be required.¹⁹⁰

SKM recommended that at the beginning of each year Aurizon Network provide locations of its planned preventative maintenance activities, and at the end of each year provide details and locations of actual maintenance spend. This would not only improve transparency, but also result in more robust cost estimates and minimise variations from forecasts.¹⁹¹

Assessing efficient scope and cost - benchmarking against historical maintenance costs

SKM found that the forecast maintenance for the 2014 DAU period for the CQCN and individual systems is reasonable on the basis of:

- *declining unit costs compared to the UT3 period*
- *the cost composition compared to historical actual, noting that the cost and maintenance basis includes consideration of costs incurred and the scope of maintenance task achieved in the 2011–12 financial year; and*
- *the cost per track kilometre compared to tonnage over 8 years between the UT3 and UT4 period, which reflects allocation of maintenance expenditure across individual systems and would be expected based on size, tonnage and system characteristics.*¹⁹²

Figure 16 shows Aurizon Network's actual and proposed direct maintenance expenditure over the UT3 and 2014 DAU periods.

¹⁸⁷ SKM 2013 DAU, 2014(a): 4

¹⁸⁸ Following the release of SKM's final report, SKM has made a number of changes in response to stakeholders' comments as well as revised volume forecasts. These changes are reflected in this section.

¹⁸⁹ SKM 2013 DAU, 2014(a): 7

¹⁹⁰ SKM 2013 DAU, 2014(a): 7

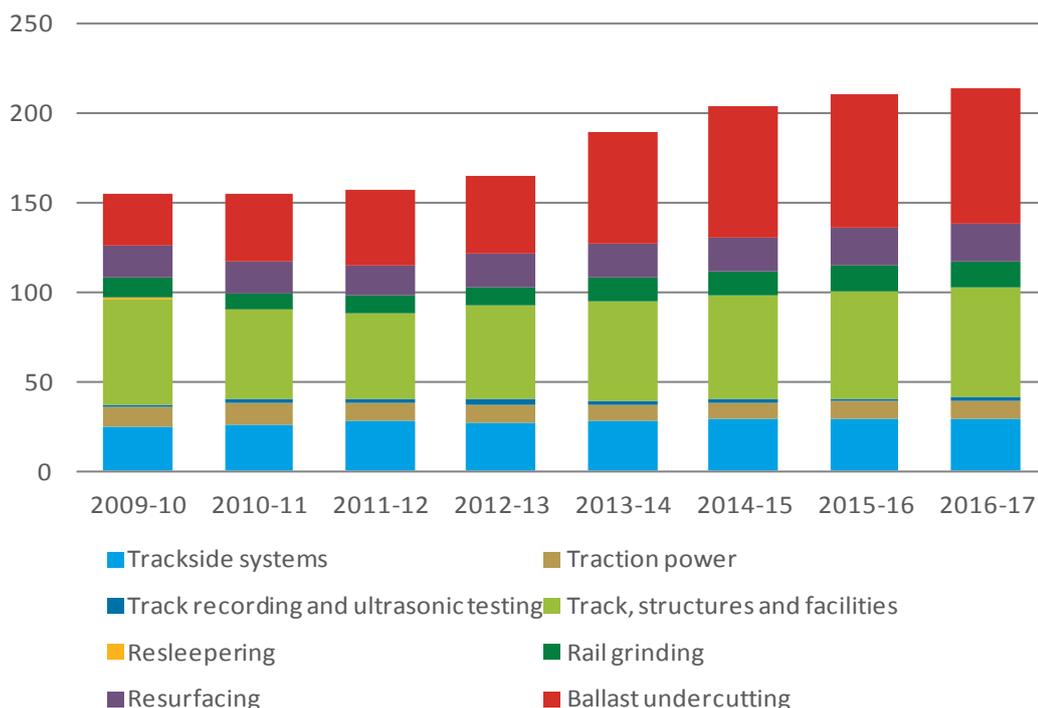
¹⁹¹ SKM 2013 DAU, 2014(a): 7–8

¹⁹² SKM 2013 DAU, 2014(a): Table 3-1

In 2011–12 price terms, Aurizon Network's forecast direct maintenance expenditure (excluding ballast undercutting costs) in 2013–14 represents a 4% increase from the actual expenditure in 2012–13. Including ballast undercutting costs, the proposed direct maintenance expenditure in 2013–14 represents a 15% (real) increase from 2012–13. The increase in ballast undercutting cost is the biggest contributor to Aurizon Network's proposed UT4 increase for maintenance expenditure.

We note that Aurizon Network has proposed an approximately 10% increase in volumes between 2012–13 and 2013–14.¹⁹³

Figure 16 Aurizon Network's actual and proposed direct maintenance costs (\$2011–12 million)



Source: SKM. Notes: SKM and Aurizon Network have grouped the maintenance expenditure differently: (a) ballast undercutting costs include some costs from Aurizon Network's general track maintenance costs; (b) tracks, structures and facilities costs comprise part of Aurizon Network's general track maintenance costs, as well as the re-railing and structures costs; (c) track recording and ultrasonic testing costs are part of Aurizon Network's general track maintenance costs; and (d) trackside system costs comprise signalling and telecommunications costs.

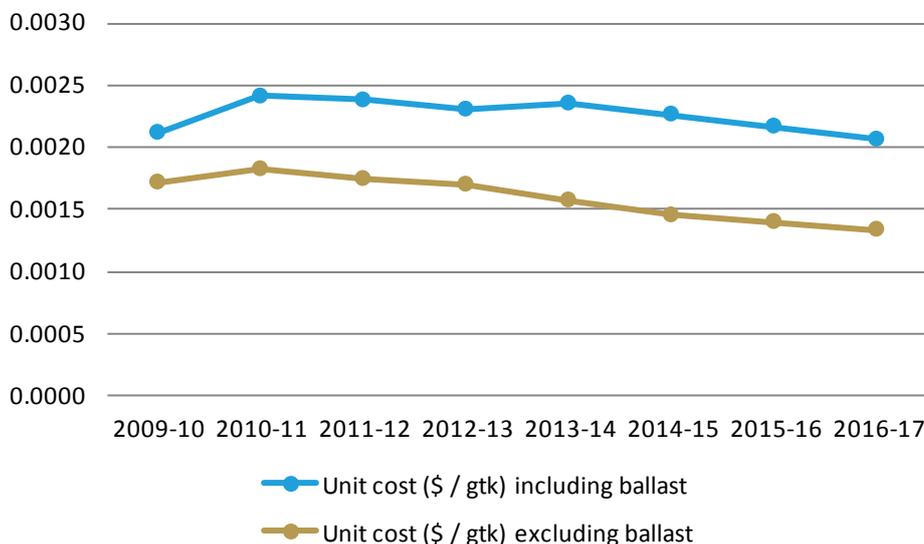
SKM noted that, while the total direct maintenance expenditure forecast for the 2014 DAU period (with or without ballast undercutting costs) will be higher in real terms relative to the UT3 actual expenditure, the forecast change is negligible in terms of the direct maintenance cost per gtk (see **Figure 17**).

Excluding ballast undercutting costs, the unit cost (i.e. the direct maintenance cost per gtk) in each year of the 2014 DAU period is lower than for the UT3 period. When ballast cutting costs are included, the unit cost in 2013–14 is approximately 2% higher than 2012–13, and is forecast to decline over time during the 2014 DAU period. According to SKM, this reflects economies of scale for the maintenance task, plus the productivity improvements that have been factored into the cost build-up by Aurizon Network.

¹⁹³ The actual volume in 2012–13 is 182.3 Mt and Aurizon Network's forecast volume in 2013–14 is 199.6 Mt.

When comparing the composition of maintenance costs in the UT3 and 2014 DAU periods, SKM found the individual components (excluding ballast undercutting costs) remain relatively stable or decline slightly as a proportion of total costs.

Figure 17 Aurizon Network's direct maintenance cost per gtk (\$2011–12)



Source: SKM 2014

System allocation of maintenance costs

In SKM's view, the system allocation of maintenance costs in the context of the CQCN should be made based on system size, condition, forecast volumes and specific geographical inefficiencies, given the individual systems have similar characteristics that influence the maintenance task.

SKM found Aurizon Network's system cost allocation reasonable after accounting for the differences in the aforementioned factors between systems. While the Blackwater system's tonnage profile is approximately half of the Goonyella system's, the two systems have approximately the same allocation of maintenance expenditure. According to SKM, this is because the Blackwater system is not only the largest of all CQCN systems, but also has the worst condition of the systems due to the age of its assets.¹⁹⁴

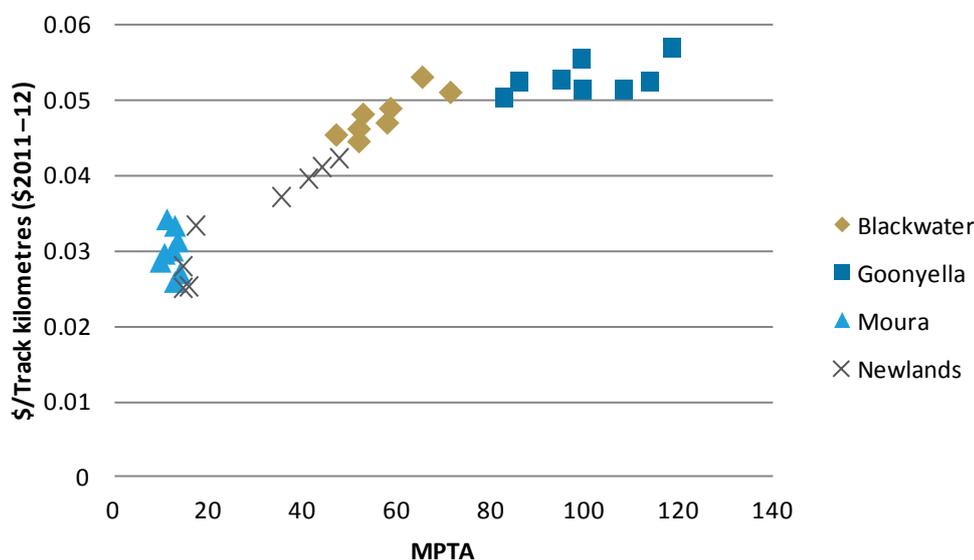
Figure 18 provides the relationship between the direct maintenance cost per track kilometre and the tonnage profile, on an individual system basis and over the UT3 and 2014 DAU periods. The data show that, for any particular CQCN system, the total maintenance cost increases with the annual system tonnage. Besides that, systems with relatively larger tonnage profiles, such as the Blackwater and Goonyella systems, have higher direct maintenance cost per track kilometre. These results provide an indication that Aurizon Network's system cost allocation is appropriate.

Moreover, SKM said the level of sensitivity of maintenance costs to tonnage varies across systems. For instance, the cost impact of an increase in tonnage is less substantial for the Goonyella and Blackwater systems compared to the Newlands system. According to SKM, this is most likely because historically the maintenance efforts have been focused on the Goonyella and Blackwater systems (as they are larger systems), meaning that a proportional increase in maintenance expenditure with increased tonnage is not always justified for these systems,

¹⁹⁴ SKM 2013 DAU, 2014(a) Attachment A:46

while a step increase in maintenance costs is required for the Newlands system in response to the inclusion of GAPE. The results also show that the Moura system has reached a steady-state maintenance cost, therefore small fluctuations in volumes would have a significant impact on the unit cost.

Figure 18 Direct maintenance cost (excluding ballast) per track kilometre vs. annual tonnage by system over the UT3 and UT4 periods (\$2011–12)



Source: SKM

Benchmarking against ARTC's maintenance costs

SKM compared the forecast unit prices paid by Aurizon Network for key maintenance materials/consumables and prices paid by the ARTC for the Willow Tree Passing Loop Project.¹⁹⁵ SKM found that, relative to ARTC, Aurizon Network is paying a much lower price for ballast, but higher yet comparable prices for concrete sleeper and head hardened rail. SKM suggested the lower unit price for ballast is a reflection of the buying power associated with Aurizon Network due to the greater requirement for ballast replacement on the CQCN, as well as efficiencies passed on from suppliers. SKM concluded the benchmarking results indicate that Aurizon Network's purchase prices for key maintenance materials/consumables are efficient in comparison to the HVCN.

Double counting of maintenance costs

We requested SKM to assess if there was 'double-counting' of maintenance costs in Aurizon Network's forecast. SKM said it is difficult to determine if inappropriate allocations have been made to the maintenance costs, as this would require either a review of expensed costs or a detailed audit of costs on a line by line basis, which was beyond the scope of SKM's engagement.

However, SKM noted Aurizon Network's approach (as recommended by GHD as part of the UT3 cost review) to allocating costs to maintenance tasks should mitigate the risk of misappropriation of maintenance costs. Such an approach, as pointed out by SKM, ensures that expensed costs refer to particular sections of track and for specific maintenance products.

¹⁹⁵ The Willow Tree Passing Loop Project formed part of the Hunter Valley Corridor Capacity Improvement (2007) Strategy Program.

Productivity improvements

Aurizon Network's submitted maintenance expenditure includes a number of productivity improvements that have been factored into the cost base. Aurizon Network has assumed improved productivity for ballast, mainline resurfacing, mainline and turnout rail grinding, re-railing and non-mechanised labour.

SKM's review of these productivity improvements indicates most of the forecast improvements are reasonable, but noted that forward planning would be paramount in realising these savings. SKM also suggested that further savings could be made from Aurizon Network's assumed efficiency improvement in turnout rail grinding maintenance task. SKM proposed an additional annual savings of \$0.04 million (in \$2011–2012) from turnout rail grinding, which translates to \$0.14 million savings over the 2014 DAU period.

Given Aurizon Network has embedded a number of productivity improvements in its cost base, SKM agreed with Aurizon Network's argument that the efficiency factor (i.e. the X-factor), previously applied to the MCI under UT3, is no longer required. SKM viewed Aurizon Network's approach to efficiency challenges for the 2014 DAU period as more realistic relative to a general X-factor parameter, since the 2014 DAU approach set specific and transparent targets for various maintenance tasks.

Aurizon Network has stated that it would transition from an unplanned to planned/preventative approach to maintenance. SKM viewed that the savings from Aurizon Network's change in maintenance approach should extend beyond the 2014 period.

In addition, Aurizon Network has indicated that it planned to increase the use of external procured resources to above 50% of the cost base. SKM considered this would lead to productivity gains provided that there is sufficient competition in the supply market.

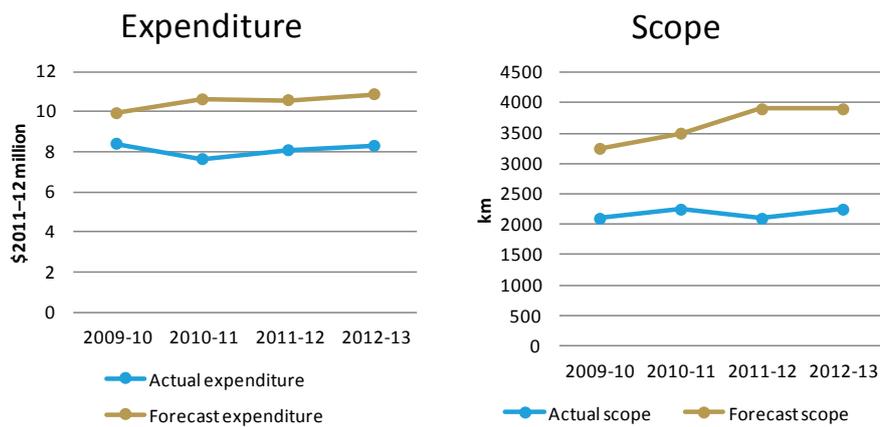
Performance during UT3

We asked SKM to review Aurizon Network's actual maintenance spend and scope undertaken over the UT3 period. The review, however, was limited to those areas where there is sufficient historic data from Aurizon Network's annual maintenance cost reports.

Overall, while Aurizon Network's total actual expenditure was close to the maintenance allowance, for almost all individual maintenance components actual expenditure differed from forecast. SKM also observed for the most part, Aurizon Network did not meet its scope targets for UT3 (e.g. rail grinding and resurfacing).

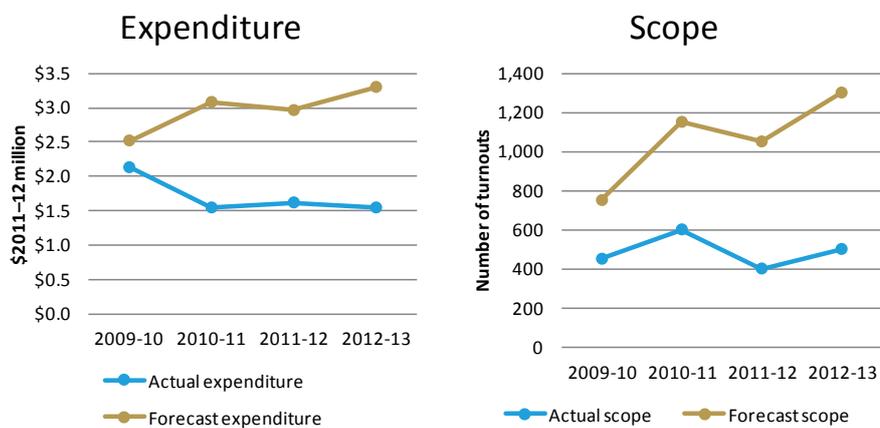
Figures 19 to 22 compare the forecast and actual expenditure and scope for a number of maintenance activities (see Section 6.2.2 for discussion of ballast maintenance scope) based on the information available to SKM.

Figure 19 Rail grinding (mainline) expenditure and scope—actual vs. forecast



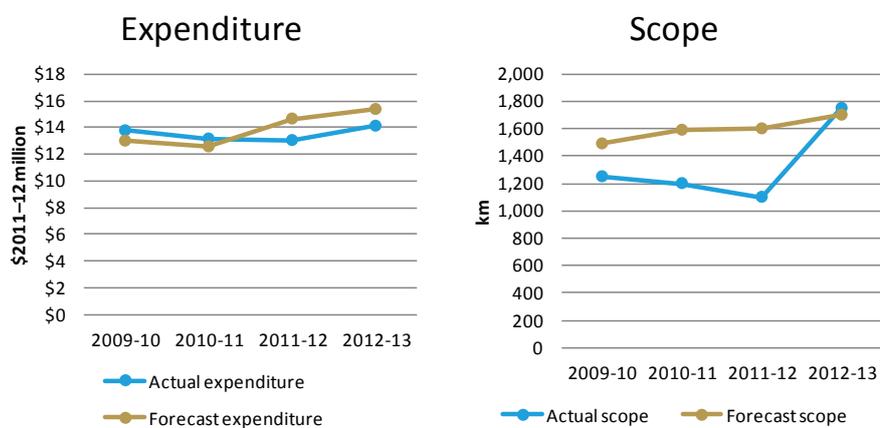
Source: SKM unpublished

Figure 20 Rail grinding (turnouts) expenditure and scope—actual vs. forecast



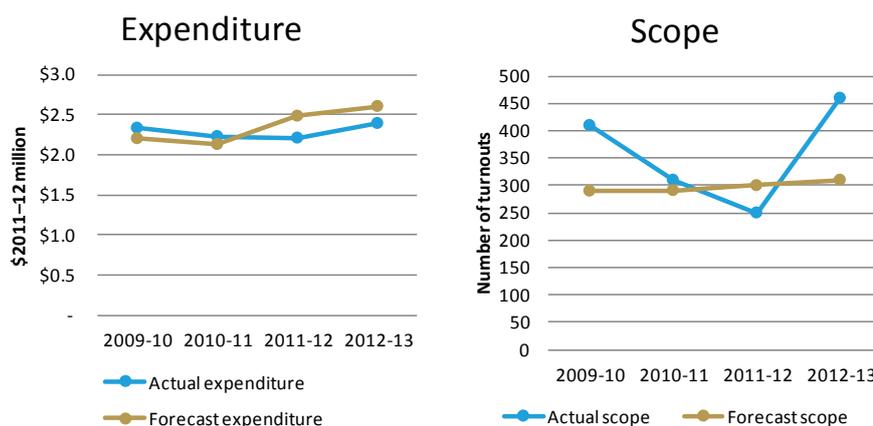
Source: SKM unpublished

Figure 21 Resurfacing (mainline) expenditure and scope—actual vs. forecast



Source: SKM unpublished

Figure 22 Resurfacing (turnouts) expenditure and scope—actual vs. forecast



Source: SKM unpublished

As seen above, Aurizon Network underspent in mainline and turnout rail grinding maintenance activities over UT3, and did not achieve its scope targets. For mainline and turnout resurfacing, the actual expenditure was close to forecast, but actual levels of scope were different from targets (due to under-delivery for mainline and over-delivery for turnouts).

While the actual maintenance expenditure in UT3 was close to the approved allowance, SKM found that there was under-delivery of maintenance scope in UT3. SKM suggested the under-delivery of scope in UT3 was likely a result of the following factors:

- reduced maintenance scope in response to lower realised volumes, for which lower spending would offset by lower revenue from AT₁
- increased costs associated with extreme weather events (in two out of four years)
- increased margins from safe work requirements, which reduced the scope which could be delivered with the allowed expenditure.

SKM also noted deviations from planned maintenance scope are likely to be inefficient in cases where:

- actual levels of scope delivered are less than forecasts but total expenditure meets or exceeds the forecast (i.e. less maintenance undertaken, but the total cost does not fall)
- total expenditure does not decline proportionally with a decline in scope due to fixed costs which cannot be offset (such rail grinding).

In response to stakeholders' concerns about under-delivery of maintenance, SKM supported adjustments to annual allowable revenue in the event that Aurizon Network fails to achieve the proposed maintenance scope. SKM also recommended we consider the extent to which non-delivery might accelerate asset degradation resulting in a greater maintenance or asset renewal requirement in the future.

Maintenance cost adjustment for revised volume forecasts

As part of maintenance cost review, we asked SKM to propose adjustments to the maintenance cost allowance on the basis of Energy Economics' volume forecasts.

In order to estimate these adjustments, SKM took account of the cost elasticity of individual maintenance components to tonnages, calculated on the basis of Aurizon Network's forecast maintenance costs and volumes. An elasticity factor of 0 indicates changes in volumes have no

impact on the cost of the individual component, and above 1 indicates that costs increase/decrease at a higher rate than changes in volumes.

SKM proposed adjustments to maintenance costs associated with ballast, rail grinding, resurfacing and track, structures and facilities. There was no adjustment proposed for signals, communications and traction maintenance as SKM viewed that these activities are not responsive to volumes.

Table 46 presents SKM's proposed adjustments for revised volume forecasts (excluding ballast undercutting cost).

Table 46 SKM's proposed maintenance adjustments for revised volume forecasts (\$2011–12 million)

| <i>Maintenance activity</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
|--|----------------|----------------|----------------|----------------|
| Rail grinding | 0.72 | (1.15) | (1.50) | (1.52) |
| Resurfacing | 0.20 | (0.03) | (3.40) | (0.10) |
| Track, structures and facilities | 0.82 | (1.36) | (1.70) | (1.81) |
| Total adjustments (\$2011–12) | 1.74 | (2.54) | (6.60) | (3.43) |
| Total adjustments (\$nominal)¹ | 1.84 | (2.75) | (7.34) | (3.94) |

Source: SKM 2014. Notes: (1) based on our proposed MCI (see Table 56).

5.2.2 Stakeholders' comments

Stakeholders were critical of Aurizon Network's proposed maintenance expenditure for the 2014 DAU as well as the maintenance regime of the CQCN.

The QRC raised a number of concerns regarding Aurizon Network's proposed direct maintenance costs:

- Proposed 2014 DAU increase in maintenance cost is disproportionate to the increase in forecast tonnage.¹⁹⁶
- Aurizon Network's tonnage forecasts, which form the basis of the maintenance scope, might be overly optimistic.¹⁹⁷
- HVCN's maintenance cost in 2011 is significantly lower than that of the CQCN's 2013–14 forecast on the unit cost basis of dollars per gtk.¹⁹⁸
- Evans & Peck's benchmarking analysis did not include a number of material mechanised maintenance activities.¹⁹⁹

Similar concerns were expressed by other stakeholders, such as BMA, RTCA and Vale.²⁰⁰ Vale noted that Aurizon Network has proposed to increase asset renewals in UT4 but this has not led to a corresponding decrease in the proposed maintenance expenditure. BMA stated that the UT4 efficiency gains embedded in the cost base have not been clearly outlined.²⁰¹

¹⁹⁶ QRC, 2013 DAU, sub. no. 68: 2

¹⁹⁷ QRC, 2013 DAU, sub. no. 68: 3

¹⁹⁸ QRC, 2013 DAU, sub. no. 68: 6

¹⁹⁹ QRC, 2013 DAU, sub. no. 68: 6–7

²⁰⁰ BMA, 2013 DAU, sub. no. 41: 6; RTCA, 2013 DAU, sub. no. 73: 21; Vale, 2013 DAU, sub. no. 42: 4

²⁰¹ BMA, 2013 DAU, sub. no. 41: 5

A common theme found in a number of stakeholders' submissions is the lack of transparency and accountability framework in relation to Aurizon Network's maintenance performance. Stakeholders were concerned Aurizon Network was not achieving the maintenance scope targets it set and appeared to be reallocating its budget on an *ad hoc* basis to respond to short term problems, rather than to meet the requirements of the long term asset plan presented to industry each period.²⁰² RTCA said Aurizon Network should be accountable for its performance and one way of doing this was to make delivery of the maintenance scope linked to the maintenance cost allowance (i.e. non-delivery of scope results in a decreased maintenance cost allowance).²⁰³

Stakeholders suggested genuine transparency and involvement in defining and overseeing the maintenance task was required. The QRC and RTCA proposed a five-year rolling maintenance plan be developed, with a more detailed annual plan approved by industry (or the QCA).²⁰⁴

The QRC suggested the reporting requirements should include:

| | |
|---|---|
| <ul style="list-style-type: none"> • 12-month detailed maintenance plan • actual performance against planned scope for: <ul style="list-style-type: none"> • resleeping • resurfacing • rail grinding • track recording • re-railing • ballast cleaning • non-destructive testing | <ul style="list-style-type: none"> • routine maintenance • measures to maintenance staff productivity • actual against forecast costs of key inputs such as ballast and rail • scheduled closure performance • Overall Track Condition Index • Track Condition Index reporting over shorter sections than what is reported now.²⁰⁵ |
|---|---|

Stakeholders considered these plans should be complemented by a maintenance reporting regime so it is clear whether Aurizon Network is performing to the plan. This would also help determine whether efficiency gains built into the costs have been achieved, as it is not clear whether similar improvements in forecast in previous periods eventuated.

Aurizon Network acknowledged the concerns raised and said it embraced the concept of transparency. It is working with all supply chain participants and stakeholders to improve how relevant data and information is provided.²⁰⁶

Stakeholders' comments on SKM assessment

Stakeholders raised a number of issues in relation to SKM's assessment of Aurizon Network's maintenance expenditure. This section sets out the issues raised by stakeholders in relation to SKM's assessment, except for those specific to ballast undercutting cost. It also highlights SKM's and Aurizon Network's response to stakeholders' comments.

Overall, stakeholders were not confident that SKM's assessment provides a sufficient basis upon which we could make an informed decision.²⁰⁷

Specific stakeholders' comments are presented in **Table 47**.

²⁰² QRC, 2013 DAU, sub no. 68:1–2; BMA 2013 DAU, sub no. 41: 1

²⁰³ RTCA, 2013 DAU, sub. no. 73: 21

²⁰⁴ QRC, 2013 DAU, sub. no. 68: 8; RTCA, 2013 DAU, sub. no. 73: 21

²⁰⁵ QRC, 2013 DAU, sub. no. 68: 8

²⁰⁶ Aurizon Network, 2013 DAU, sub. no. 77: 32

²⁰⁷ QRC, 2013 DAU, sub. no. 111: 3; BMA, 2013 DAU, sub. no. 114: 1; Asciano 2013 DAU, sub. no. 112:2

Table 47 Stakeholders' comments on SKM's assessment

| <i>Issue</i> | <i>Comments</i> |
|------------------------|---|
| Information quality | Asciano was concerned about the information inadequacy issue faced by SKM in its maintenance cost assessment. ²⁰⁸ SKM said it did not have sufficient information on age, condition and remaining capability of the CQCN's assets. In Asciano's view, the review should have been based on detail cost and asset information, which ideally would have been collected over a period of time at regular intervals using a consistent approach. |
| Efficiency improvement | Vale stated the forecast decline in the unit maintenance cost was largely a result of increased volume rather than productivity improvements. ²⁰⁹ Vale viewed the change to the planned maintenance approach should lead to further improvement in cost efficiency, even in the absence of increased tonnage, but this is not reflected in Aurizon Network's proposal. Vale also pointed out that many of Aurizon Network's proposed changes would result in future cost savings beyond the UT4 period and these should be recognised in future pricing reviews. |
| Benchmarking | <p>The QRC suggested the UT3 and UT4 maintenance cost data used in SKM's assessment might not be directly comparable.²¹⁰ Similar concern was expressed by BMA.²¹¹ The QRC noted the UT3 direct cost data included allocations for return on assets and corporate overheads, while these costs are classified as indirect costs in UT4.</p> <p>In addition, there have been a number of potential changes in methodologies used by Aurizon Network to compile costs, including the depreciation treatment of maintenance equipment and internal accounting processes. In the QRC's view, these potential methodological changes might have, in aggregate, biased the UT3 figures upwards relative to the UT4's counterparts. The QRC considered further assessment be undertaken.²¹²</p> <p>The QRC also outlined a number of issues regarding SKM's benchmarking analysis:</p> <ul style="list-style-type: none"> • Aurizon Network's direct data excludes corporate overheads and return on assets while in the case of HVCN, because the majority of maintenance costs are outsourced, their direct costs would include corporate overheads and other indirect costs.²¹³ • SKM failed to investigate in detail the structural differences between the CQCN and HVCN and how they affect the maintenance task.²¹⁴ • There are a number of unexplained discrepancies in SKM's data collection and presentation of data, such as the maintenance cost associated with the Blackwater system is taken as the maintenance costs for the whole CQCN.²¹⁵ • The reported benchmarking results (e.g. the Blackwater system's direct maintenance cost per track kilometre is approximately double of the HVCN's when ballast and re-railing costs are included) do not support SKM's conclusion.²¹⁶ • SKM's benchmarking exercise relies solely on the HVCN and fails to gather other appropriate benchmarks.²¹⁷ |
| Monitoring | A number of stakeholders reiterated the importance to monitor Aurizon Network's maintenance performance. ²¹⁸ The QRC viewed the current arrangements provide too much management flexibility to Aurizon Network. ²¹⁹ The QRC pointed out that maintenance forecasts prepared for regulatory purposes and the actual management of the maintenance task may not be connected, and significant changes to the forecast plan can be made with no |

²⁰⁸ Asciano, 2013 DAU, sub. no. 112: 2

²⁰⁹ Vale, 2013 DAU, sub. no. 113: 2

²¹⁰ QRC, 2013 DAU, sub. no. 111: 5

²¹¹ BMA, 2013 DAU, sub. no. 114: 2

²¹² QRC, 2013 DAU, sub. no. 111: 5–6

²¹³ QRC, 2013 DAU, sub. no. 111: 8

²¹⁴ QRC, 2013 DAU, sub. no. 111: 8

²¹⁵ QRC, 2013 DAU, sub. no. 111: 9

²¹⁶ QRC, 2013 DAU, sub. no. 111: 9–10

²¹⁷ QRC, 2013 DAU, sub. no. 111: 10

²¹⁸ Asciano, 2013 DAU, sub. no. 112: 2; QRC, 2013 DAU, sub. no. 111: 14

²¹⁹ QRC, 2013 DAU, sub. no. 111: 14

| <i>Issue</i> | <i>Comments</i> |
|------------------|---|
| | <p>consultation with industry or the regulator. Stakeholders supported SKM's proposal in relation to maintenance performance reporting and <i>ex post</i> adjustment to the MAR in the event Aurizon Network fails to achieve its maintenance targets.²²⁰</p> <p>The QRC suggested actual costs presented by Aurizon Network should be produced in a manner such that they are directly comparable with the cost build-up Aurizon Network has used to produce the forecasts.²²¹</p> |
| Non-coal traffic | <p>The QRC stated that SKM had failed to address the impact of non-coal traffic on maintenance costs.²²² The QRC said it is unclear if Aurizon Network has made adjustments for non-coal traffic.</p> |

Responding to stakeholders' comments, SKM confirmed Aurizon Network's UT3 direct cost data had indeed included a number of indirect cost components, and subsequently made adjustments to the data.²²³ SKM did not consider the exclusion of corporate costs when comparing the CQC and HVCN costs would have a significant impact on its conclusion.²²⁴ SKM also undertook additional benchmarking and considered the variation in costs between the CQC and HVCN reasonable given the overall differences between the two networks.²²⁵

Aurizon Network did not agree with SKM's recommended additional savings from turnout rail grinding.²²⁶ Aurizon Network noted that the related productivity improvements have already been factored into the rail grinding scope. With regard to improving transparency, Aurizon Network stated that it is committed to improving the provisions of relevant data and information to stakeholders and making the operations and performance of the CQC more visible.²²⁷

5.2.3 QCA analysis and Draft Decision

Our Draft Decision is to refuse to approve Aurizon Network's proposed direct maintenance expenditure (excluding ballast undercutting costs, which are dealt with separately in Chapter 6). As set out below, we consider it is appropriate for Aurizon Network to amend the 2014 DAU to make the following adjustments:

- for updated volume estimates (based on SKM's recommendations)
- to reallocate re-railing costs included in the maintenance allowance to renewals.

Table 48 provides details of our proposed adjustments.

²²⁰ QRC, 2013 DAU, sub. no. 111: 14; Vale, 2013 DAU, sub. no. 113: 2

²²¹ QRC, 2013 DAU, sub. no. 111: 15

²²² QRC, 2013 DAU, sub. no. 111: 15–16

²²³ SKM 2013 DAU, 2014(d): 6

²²⁴ SKM 2013 DAU, 2014(d): 11

²²⁵ SKM 2013 DAU, 2014(d): 16

²²⁶ Aurizon Network, 2013 DAU, sub. no. 109: 38

²²⁷ Aurizon Network, 2013 DAU, sub. no. 109: 38

Table 48 Proposed adjustments to Aurizon Network's direct maintenance cost excluding ballast undercutting cost (\$2011–12 million)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|----------------|----------------|----------------|----------------|
| Aurizon Network's proposed direct maintenance expenditure (excluding ballast undercutting costs) | 126.68 | 131.03 | 135.77 | 138.65 |
| QCA adjustments to re-railing costs ¹ | (15.27) | (15.06) | (15.72) | (16.14) |
| QCA adjustments for revised volumes | 1.74 | (2.54) | (6.60) | (3.43) |
| QCA's proposed direct maintenance expenditure (excluding ballast undercutting costs) (\$2011–12) | 113.15 | 113.43 | 113.45 | 119.08 |
| QCA's proposed direct maintenance expenditure (excluding ballast undercutting costs) (\$nominal)² | 119.62 | 122.94 | 126.03 | 136.59 |

Notes: (1) we have proposed to re-allocate re-railing cost to asset renewals; (2) based on our proposed MCI (see Table 56) and CPI forecasts.

As identified above, when assessing Aurizon Network's proposed direct maintenance expenditure (excluding ballast undercutting costs), we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter, and we have applied this approach to the direct maintenance expenditure.

In prior undertakings, we have not made adjustments to Aurizon Network's costs to reflect coal and non-coal traffic, on the basis that the non-coal traffic and associated revenue was considered to be modest. However, as this is an issue raised by stakeholders, we will consider whether this matter should be reconsidered as part of our 2014 DAU Draft Decision on policy and pricing.

As identified above, our approach to applying these statutory factors has been guided by our assessment approach as set out in **Table 44**. Our analysis is set out below.

Maintenance efficiency

Overall, we consider Aurizon Network's proposed direct maintenance expenditure (excluding ballast undercutting cost) reasonable to meet the scope proposed for the 2014 DAU, so long as the maintenance proposed is delivered.

Informing this view, we have taken into account:

- the unit cost (i.e. the direct maintenance cost per gtk) in each year of the 2014 DAU period is lower than that of the UT3 period, and is forecast to decline over the 2014 DAU period
- productivity improvements proposed by Aurizon Network for the 2014 DAU.

We acknowledge the limitations associated with SKM's benchmarking analysis. That being said, the outcome of this exercise is only one of the few findings that have informed our view. We consider the direct maintenance cost per unit (excluding ballast) to be reasonable, and find comfort in the fact that it is forecast to fall over the 2014 DAU period.

We also accept Aurizon Network's assumed efficiency improvements. We consider the inclusion of efficiency improvements in Aurizon Network's cost base means that there is no need to apply a general X-factor parameter to the MCI. This is consistent with SKM's view.

Nevertheless, we recognise the maintenance efficiency is strongly dependent on Aurizon Network's actual performance in the 2014 DAU period.

We note Aurizon Network's under-delivery of maintenance scope in UT3 as found by SKM. We consider this outcome inefficient given the fact that the actual maintenance spend in UT3 was close to the approved allowance. In our view, this issue is best dealt with in an *ex post* review of Aurizon Network's maintenance performance. It also suggests careful consideration is needed about the operation of the AT₁ tariff input.²²⁸

With regard to the revised volumes, we accept SKM's recommended adjustments to the direct maintenance cost.

Re-railing costs

Allocating costs to maintenance or renewals has an impact on the timing of Aurizon Network recouping these costs from customers. Maintenance costs are recovered over the same regulatory period where they are expensed through tariffs, whereas renewals costs are recovered over a longer period (depending on their economic lives) in the form of return on and return on capital.

Aurizon Network has traditionally treated re-railing as maintenance. However, we believe that this would be better classified as asset renewals (and hence subject to cost capitalisation). We consider this activity goes beyond pure spot repairs or maintenance—re-railing extends the useful life of the asset as it involves replacing tracks over a certain length with new tracks. If such activity is classified as maintenance, today's users are effectively subsidising future users by bearing the full costs of assets that will also be used by the latter. SKM confirmed it is standard practice for other railways (e.g. ARTC, Westnet, Railcorp) to capitalise costs associated with re-railing.

Accordingly, we consider Aurizon Network should remove the re-railing cost from maintenance and re-allocate them to capital expenditure. We propose the following additions to the capital indicator:

Table 49 QCA's proposed addition to the capital indicator for re-railing task (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|------------|----------------|----------------|----------------|----------------|
| Re-railing | 14.93 | 15.20 | 16.26 | 17.12 |

Source: Aurizon Network December 2013 Financial Model; QCA analysis. Note: these figures are 'start-of-year' values.

Similar to all capital expenditure, the actual re-railing expenditure will be subject to the prudence review and capital expenditure carry-over account adjustments.

Proposed development of a maintenance performance incentive scheme

One key issue for our Draft Decision is that we generally consider Aurizon Network's proposed maintenance scope and costs to be efficient, but only if Aurizon Network achieves its proposed maintenance scope during the 2014 DAU period.

²²⁸ AT₁ is the incremental maintenance tariff levied on a gtk basis. Under UT3, the revenue cap mechanism does not apply to AT₁, meaning that there is no *ex post* adjustment to any shortfall or over-recovery of AT₁ forecast revenue. Such an arrangement is to account for changes in Aurizon Network's variable maintenance costs when actual demand deviates from forecast.

It is evident that Aurizon Network, as an infrastructure-based organisation, has a clear commitment to maintaining its network. This is generally reflected in the good overall condition of the network that was a finding of the first condition-based assessment.

We have seen evidence that Aurizon Network has been changing its maintenance work practices and investing in systems (including Network Asset Management Systems) to improve the overall delivery of its maintenance activities.

However, we have also discussed the issues Aurizon Network has experienced in delivering the maintenance scope targets in UT3, noting the period included some poor weather conditions and a down-turn on demand for coal.

We consider there is merit in developing a more formal approach to monitoring Aurizon Network's performance against its maintenance scope targets, and ultimately linking it to a financial incentive mechanism for the delivery of major aspects of maintenance scope.

In developing an incentive arrangement, we are mindful about balancing the risks of an unnecessary level of regulatory intrusion in the maintenance program, against the need to hold Aurizon Network accountable to achieve the maintenance plans it sets, noting the views of stakeholders.

The objective of a maintenance performance incentive would be to ensure Aurizon Network delivers on its planned maintenance program and achieves the targets and efficiencies it has set for itself, within the cost allowance it has requested. This could be based on a:

- 'revenue at risk' arrangement; or
- 'pay as you go' arrangement: similar to the ARTC in the HVCN where efficient maintenance cost are assessed by the ACCC at the end of each financial year as part of the revenue adjustment process.

A maintenance performance incentive would need to be structured in a manner which provides Aurizon Network with an incentive to 'out-perform', but also with consequences for not delivering on planned scope.

However, we also acknowledge that the development of a robust maintenance performance incentive would need to occur in conjunction with a full review of the AT₁ tariff input (variable maintenance tariff). The structure of the AT₁ tariff input (which was developed in 2001 and has had little subsequent review) makes it difficult to develop a clear relationship between the change in cost allowances due to changes in volumes and the related change in scope. We note that stakeholders have suggested that we review the AT₁ tariff input.

Overall, we consider that the development of a maintenance performance incentive framework would improve transparency and increase stakeholders' confidence in Aurizon Network's maintenance performance. We also consider the QRC's specific suggestions on monitoring of Aurizon Network's maintenance performance have merit. These additional reporting provisions will require separate and ongoing consideration and are relevant to our consideration of the remainder of the 2014 DAU, so will be dealt with in greater detail in our 2014 DAU Draft Decision on policy and pricing.

Draft Decision

- 5.1 Our Draft Decision is to refuse to approve Aurizon Network's forecast direct maintenance costs (excluding for ballast undercutting). We consider it appropriate for Aurizon Network to amend the 2014 DAU to make the following adjustments:**
- (a) revising its maintenance estimates to reflect revised volume forecasts and**
 - (b) reclassifying its re-railing costs as asset renewals.**
- 5.2 We seek stakeholder views on the merits of developing a maintenance performance incentive during the course of the UT4.**

5.3 Indirect maintenance costs

5.3.1 Aurizon Network proposal

Aurizon Network has proposed indirect costs of around \$28.44 million in 2013–14, increasing to \$35.18m in 2016–17 (in nominal terms). **Table 50** presents the breakdown of the indirect cost component.

Table 50 Aurizon Network's proposed indirect maintenance cost (\$2011–12 million)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|--------------|--------------|--------------|--------------|
| Return on assets | 8.49 | 10.40 | 10.03 | 9.90 |
| Return on inventory | 1.21 | 1.21 | 1.21 | 1.21 |
| Return on working capital | 1.08 | 1.16 | 1.20 | 1.22 |
| Corporate costs | 12.09 | 12.09 | 12.09 | 12.09 |
| Indirect costs (\$2011–12)¹ | 22.86 | 24.86 | 24.52 | 24.41 |
| Indirect cost (\$nominal)² | 28.44 | 32.43 | 33.72 | 35.18 |

Source: Aurizon Network, 2013 DAU, sub. no. 4: 13-14; nominal costs based on subsequent information provided by Aurizon Network on detailed costs and proposed escalation rates; QCA analysis. Notes: (1) numbers may not sum due to rounding. (2) based on Aurizon Network's updated MCI (see Table 53) provided in December 2013, and Aurizon Network's forecasts of consumables index and weighted labour and CPI index.

Return on assets, inventory and working capital

Aurizon Network has proposed applying a gross replacement value (GRV) annuity approach to calculate the return on assets employed in the maintenance function.²²⁹ The GRV annuity approach involves calculating a single revenue stream that covers both the return on and return of assets. This revenue stream is calculated on the asset value representing the lowest current cost to replace the existing assets with assets that have the capacity to provide the level of service that meets the actual and reasonably projected demand or are, if appropriate, modern equivalent assets.

In the context of maintenance, Aurizon Network stated the GRV approach is preferable to the UT3 historical cost approach as:

²²⁹ Aurizon Network, 2013 DAU, sub. no. 4: 113–117

- the historical cost approach calculates the return on capital on the basis of book values, which yields maintenance costs that would not be expected to prevail in a competitive market
- the GRV approach uses the current replacement cost, hence it ensures the maintenance costs reflect the opportunity cost of providing the service.

Aurizon Network stated that for these reasons, it has applied a real pre-tax WACC of 6.8% to calculate the GRV annuity stream. Depreciation (added to the direct cost) is removed to obtain the return on assets for the 2014 DAU period.

Aurizon Network has also applied a real pre-tax WACC of 6.8% to:

- the value of the maintenance inventory base (constant over the UT4 period) to estimate the return on inventory
- one-twelfth of the total direct maintenance expenditure (e.g. \$189.51 million in 2013–14) to estimate the return on working capital.

Corporate overheads

Aurizon Network stated its proposed annual corporate overhead allowance of \$12.09 million (in \$2011–12) provides for an allocation of costs involved in the delivery of maintenance services but not included in the direct cost component. It comprises costs associated with the office of the CEO and board, human resources, finance, information systems, systems development, legal and audit.²³⁰

Aurizon Network, assisted by Deloitte Access Economics, has used the combination of a bottom-up cost build up (based on a hypothetical business providing \$200 million maintenance service) and a benchmarking exercise to estimate the corporate overhead cost.

Aurizon Network said its proposed corporate cost represented a conservative estimate, as the amount is equivalent to approximately 6% of the total annual maintenance cost. Aurizon Network said Deloitte's report indicated that recent regulatory decisions, on average, provided for an allowance of 7%.²³¹

5.3.2 Consultant's assessment

We asked RSMBC to independently assess Aurizon Network's proposed indirect maintenance cost. RSMBC's findings and recommendations are set out below.

Return on assets

RSMBC considered it was reasonable for Aurizon Network to use the GRV approach when calculating its return on assets. This approach takes into account the opportunity cost of using maintenance assets.²³²

According to RSMBC, the GRV methodology assumes assets are always in 'as new' condition and therefore any major periodic maintenance (for these assets) should be excluded under such an approach. Nevertheless, RSMBC could not confirm if Aurizon Network has excluded major periodic maintenance in its proposed maintenance allowance.²³³

²³⁰ Aurizon Network, 2013 DAU, sub. no. 4: 117–118

²³¹ Aurizon Network, 2013 DAU, sub. no. 4: 118

²³² RSMBC 2013 DAU, 2014:160

²³³ RSMBC 2013 DAU, 2014:157

RSMBC estimated the use of the GRV approach, as compared with the UT3 historical cost approach, results in Aurizon Network earning an additional return on assets of \$13 million (in 2011–12 price terms). However, RSMBC also pointed out that this amount is likely to be overstated as the costs associated with major periodic maintenance should be removed.

RSMBC noted Aurizon Network's return on motor vehicle assets were calculated on the basis of asset lives of 90–99 years. RSMBC said an asset life of approximately 11.5 years is more appropriate for motor vehicles. If this was adopted, the return on assets would increase by around \$1.8 million per year.²³⁴

Return on inventory and working capital

RSMBC initially stated a return on inventory and a return on working capital should not be required given the change in modelling framework in UT4. The UT4 framework assumes all costs and revenues are occurring at the end of the year. On the other hand, the UT3 framework assumed mid-year costs and revenues, hence a working capital allowance was applied to manage intra-year cash flows.²³⁵

In response to RSMBC's query, Aurizon Network clarified that the 'working capital allowance' applied under UT3 was intended to compensate the volatility inherent in the intra-year cash flows. This, as Aurizon Network said, is fundamentally different to the return on working capital proposed by Aurizon Network under UT4. On this basis, RSMBC considered it reasonable to include a return on inventory and working capital.²³⁶

RSMBC found Aurizon Network's return on inventory calculation reasonable, but recommended the return on working capital calculation be reduced to reflect supplier payment terms. RSMBC noted any change to the regulatory WACC would require the pre-tax WACC applied to be adjusted accordingly and applied to all calculations.

Corporate overheads

RSMBC recommended Aurizon Network's corporate overheads be reduced by \$2 million per annum in 2011–12 price terms.²³⁷ This total adjustment comprises reduced allocations of some corporate overhead functions to maintenance services, including the Office of CEO and Board and legal services.

As explained by RSMBC, the proposed adjustments are reflective of:

- Aurizon Network being part of a larger group with centralised overhead functions and should have lower corporate overheads than a stand-alone entity
- allowance for legal costs have already been made to within Aurizon Network's proposed operating expenditure.²³⁸

5.3.3 Stakeholders' comments

Aurizon Network proposal

Stakeholders were concerned about Aurizon Network's proposed use of the GRV approach. The QRC stated the GRV approach should be used in conjunction with maintenance costs consistent

²³⁴ RSMBC 2013 DAU, 2014: 155

²³⁵ RSMBC 2013 DAU, 2014: 162

²³⁶ RSMBC 2013 DAU, 2014: 163

²³⁷ RSMBC 2013 DAU, 2014: 69

²³⁸ RSMBC 2013 DAU, 2014, p. 69

with new assets. The QRC expressed its preference for the use of historical cost approach along with the commensurate maintenance costs.²³⁹

While the QRC supported Aurizon Network's approach of using a hypothetical stand-alone maintenance company with set revenue to arrive at its proposed corporate overheads allowance, it questioned:

- the assumptions used to allocate costs (e.g. it seemed unlikely that a maintenance company providing long term services to a single customer would require a five person legal team to manage the function)
- whether any of the corporate costs were being double counted so that Aurizon Group costs (i.e. logistics) were also being allocated to maintenance services.²⁴⁰

BMA and Vale also expressed these concerns about the corporate costs.²⁴¹

Consultant's assessment

This section highlights stakeholders' comments on RSMBC's assessment of Aurizon Network's proposed indirect maintenance expenditure.

BMA said RSMBC had failed to provide sufficient justification for the use of such an approach and how it should be properly applied.²⁴² The QRC disagreed with the use of the GRV approach on the grounds that maintenance services in the CQCN are not provided in a competitive environment.²⁴³

With regard to the return on working capital, the QRC questioned why maintenance costs are an exception, while there is no similar allowance required for operating expenditure. It is unclear why a different treatment is required for maintenance expenditure.²⁴⁴

5.3.4 QCA analysis and Draft Decision

Our Draft Decision is to refuse to approve Aurizon Network's indirect maintenance cost proposal. As explained below, we consider it appropriate for Aurizon Network to amend its 2014 DAU to make the following adjustments:

- calculate its return on assets using our post-tax real WACC (and escalate by CPI) and the historical cost approach
- remove cost allowances for return on inventory and working capital
- remove allocations for corporate overheads (considered alongside corporate overheads in operating expenditure in Chapter 4).

Our proposed adjustments to the indirect maintenance cost are set out in **Table 51**:

²³⁹ QRC, 2013 DAU, sub. no. 111: 5–7

²⁴⁰ QRC, 2013 DAU, sub. no. 68:7

²⁴¹ BMA, 2013 DAU, sub. no. 41: 6; Vale, 2013 DAU, sub. no. 42: 4

²⁴² BMA, 2013 DAU, sub. no. 114: 1–2

²⁴³ QRC, 2013 DAU, sub. no. 110: 27

²⁴⁴ QRC, 2013 DAU, sub. no. 110: 27

Table 51 QCA's proposed adjustments to Aurizon Network's indirect maintenance cost (\$2011–12 million)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|--|----------------|----------------|----------------|----------------|
| Aurizon Network's proposed indirect maintenance costs | 22.86 | 24.86 | 24.52 | 24.41 |
| QCA adjustments to return on assets ¹ | (4.62) | (3.93) | (4.50) | (5.38) |
| QCA adjustments to return on inventory and working capital | (2.29) | (2.37) | (2.40) | (2.42) |
| QCA adjustments to corporate costs ² | (12.09) | (12.09) | (12.09) | (12.09) |
| QCA's proposed indirect maintenance costs (\$2011–12) | 3.87 | 6.55 | 5.65 | 4.66 |
| QCA's proposed indirect maintenance costs (\$nominal)³ | 4.07 | 7.07 | 6.25 | 5.28 |

Notes: (1) calculated based on a real post-tax WACC of 4.55%; (2) we have dealt with the issue of corporate overheads as an overall package; (3) based on our CPI forecast.

As identified above, when assessing Aurizon Network's proposed indirect maintenance expenditure, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and have applied this approach to the indirect maintenance expenditure.

As identified above, our approach in applying these statutory factors has been guided by the approach set out in **Table 44**. Our analysis is set out below.

Return on assets

Our Draft Decision is to refuse to approve Aurizon Network's proposed change to calculating its return on maintenance assets to a GRV annuity method.

We do not accept Aurizon Network's case that there is a need to change the methodology for calculating the return on assets employed for maintenance. We consider Aurizon Network has been including assets at replacement costs in its maintenance asset base since the regulatory process commenced and are unconvinced of the need for a revaluation.

One of our concerns about moving to the GRV methodology is the absence of transparency about the efficient size of the maintenance asset base. In particular, we are concerned there is limited incentive to remove older or redundant assets from the base when they no longer contribute to the provision of maintenance services.

We are also unconvinced Aurizon Network has applied the GRV annuity approach correctly. As noted by Aurizon Network, the use of the GRV approach requires a maintenance cost profile that is consistent with that required for a permanently new asset.²⁴⁵ However, Aurizon Network has not demonstrated the change of approach to the GRV approach has been complemented by an appropriate adjustment to the maintenance allowance for these assets. We note SKM concluded one of the reasons for the increase in ballast undercutting costs was in part due to the increased costs of maintaining ageing assets.²⁴⁶

²⁴⁵ Aurizon Network, 2013 DAU, sub. no. 4: 116

²⁴⁶ SKM, 2013 DAU, April 2014(d): 20

In this context, we are not convinced with the relevance of the contestability argument. We acknowledge some of these activities could potentially be outsourced to external parties. However, Aurizon Network has invested a significant amount of capital in its maintenance assets—the undepreciated value of these assets in 2013–14 is \$52.88 million. Given these assets are highly customised for use in the CQCN, it is unlikely to be efficient for Aurizon Network to sell these assets and outsource the maintenance activity as of now. For this reason, we view the main priority should be to ensure that:

- the maintenance task is cost reflective; and
- Aurizon Network should be allowed to recover appropriate return for its initial investment in these maintenance assets, as it would be the case for any other assets included in the RAB.

The historical cost approach is appropriate because it provides a stream of return on and return of capital that has a present value equivalent to the initial cost of assets.

We also consider the rate of return should be based on the post-tax WACC as Aurizon Network has not demonstrated that tax liability is indeed attached with the maintenance allowance (which the return on maintenance assets is a part of).

Return on inventory and working capital

Our Draft Decision is to refuse to approve Aurizon Network's proposed costs for return on inventory and working capital.

We consider that providing Aurizon Network with a return on inventory and working capital is inconsistent with the application of the PTRM's 'end-of-year' assumption (see **Appendix C**). We consider the 'end-of-year' assumption provides Aurizon Network with more than sufficient revenues to operate its business on an annual basis over the course of the 2014 DAU period, and this includes any costs associated with working capital and inventory management.

Corporate overheads

Aurizon Network has proposed separate corporate overhead allocations in both operating and maintenance costs. These allowances have been developed using different approaches—the cost allocation method for operating expenditure and the 'bottom-up' approach for maintenance cost. We have included analysis of Aurizon Network's maintenance corporate overheads in the operating cost chapter (see Chapter 4). Our Draft Decision is to not provide a separate allowance for corporate overheads for maintenance costs, but treat these costs as part of the overall corporate overhead estimate for Aurizon Network's operating cost allowance.

Draft Decision

5.3 Our Draft Decision is to refuse to approve Aurizon Network's proposed indirect maintenance costs. We consider it appropriate for Aurizon Network to amend its 2014 DAU to make the following adjustments:

- (a) calculating the return on assets using our post-tax real WACC (and escalated by CPI) and the historical cost valuation approach**
- (b) removing allocations for the return on inventory and working capital**
- (c) removing allocations for corporate costs.**

5.4 Maintenance Cost Index (MCI)

The MCI is a special-purpose index used to escalate Aurizon Network's maintenance costs. It is developed to represent a 'basket' of goods and services that closely align with the cost drivers for maintenance tasks undertaken by Aurizon Network. As part of the annual revenue cap adjustment, the MCI is updated to account for actual inflation compared to forecast, and any revenue differentials are adjusted in arrears. The MCI weightings and the choice of sub-indices, however, remain fixed over the regulatory period as approved by the QCA.

5.4.1 Aurizon Network proposal²⁴⁷

For the 2014 DAU period, Aurizon Network proposed to apply the MCI to escalate direct maintenance costs excluding depreciation, and the return on working capital.²⁴⁸

Aurizon Network's submitted UT4 MCI has the same basic framework as the approved UT3 counterpart. However, Aurizon Network has modified the cost weightings to reflect the composition of its proposed 2014 DAU maintenance costs, and for some cost categories used different sub-indices.²⁴⁹ According to Aurizon Network, these proposed changes are intended to better align the MCI with the proposed maintenance costs.²⁵⁰ Alongside the maintenance submission, Aurizon Network provided a report from BIS Shrapnel that included forecasts for proposed sub-indices over the UT4 period.²⁵¹

From its initial review of Aurizon Network's proposed MCI, it was evident to SKM that the proposed MCI weightings were not consistent with corresponding proposed UT4 maintenance costs. As a result, in December 2013 Aurizon Network resubmitted updated MCI weightings.²⁵²

Aurizon Network's proposed 2014 DAU MCI and the UT3 approved counterpart are set out below in **Table 52**.

Table 52 Aurizon Network's proposed changes to the MCI

| <i>Category</i> | <i>Approved UT3 weighting</i> | <i>Approved UT3 Sub-index components</i> | <i>AN UT4 proposed weighting</i> | <i>AN updated weightings</i> | <i>AN Proposed UT4 Sub-index components</i> |
|------------------------|-------------------------------|---|----------------------------------|------------------------------|---|
| Accommodation | 1.5% | ABS average room rate per occupied night (equal weighting for Fitzroy and Mackay) | 2.3% | 2.3% | No change |
| CPI (Balance of Costs) | N/A | [Included in consumables] | 23.6% | 20.7% | ABS CPI Brisbane all groups |
| Consumables | 34.9% | ABS producer price indices: 18% each for construction, metal products, transport equipment, fabricated metal; 28% weighting | 29.5% | 29.8% | 48% weighting for Proprietary BIS Shrapnel Hire of Heavy Plant index; ABS producer price indices: 35% for |

²⁴⁷ Aurizon Network has not included details of the UT4 MCI in its submissions, but provided them to SKM after an information was request.

²⁴⁸ This is inferred from Aurizon Network's proposed maintenance costs in nominal terms. However, as shown in the SKM's MCI report, Aurizon Network has included the return on maintenance assets and corporate overheads when calculating the MCI weightings (see Table 3.2 of SKM, 2013 DAU, 2014(b) MCI Report).

²⁴⁹ Aurizon Network, 2013 DAU, sub. no. 4: 120–121

²⁵⁰ Aurizon Network, 2013 DAU, sub. no. 116: 14

²⁵¹ Aurizon Network, 2013 DAU, sub. no. 36

²⁵² SKM, 2013 DAU, 2014(f) MCI Report: 2

| <i>Category</i> | <i>Approved UT3 weighting</i> | <i>Approved UT3 Sub-index components</i> | <i>AN UT4 proposed weighting</i> | <i>AN updated weightings</i> | <i>AN Proposed UT4 Sub-index components</i> |
|-----------------|-------------------------------|--|----------------------------------|------------------------------|---|
| | | for Brisbane CPI | | | fabricated metal and 20% for transport parts |
| Labour | 44.5% | ABS Average Weekly Earnings: 33% each for Queensland all industries, Mining and Construction | 42.5% | 45.1% | Proprietary BIS Shrapnel index for Mining Queensland average weekly earnings ¹ |
| Fuel | 3.2% | Australian Automobile Association (AAA): unleaded and diesel retail prices | 2.1% | 2.1% | Australian Institute of Petroleum and AAA data: unleaded and diesel wholesale and retail prices Gladstone, Emerald and Mackay (equal weighting for each location) |
| Assets | 15.9% | Index largely fixed at 100, except for new purchases are indexed by Brisbane CPI | N/A | N/A ² | Not included |

Source: Aurizon Network; UT3 sub-indices explained in more detail in QCA, June 2010: 20. UT4 weightings not included in Aurizon Network's submission, but were provided to our consultant after an information request was made. Notes: (1) Aurizon Network subsequently changed this to ABS AWOTE series for the Australian mining industry; (2) Aurizon Network UT4 proposed that MCI weighting excluded asset depreciation from its calculation and separately escalated depreciation by the CPI (Brisbane all groups).

Two key changes in the Aurizon Network's submitted 2014 DAU MCI relative to UT3 are:

- To track labour cost inflation, Aurizon Network proposes to reference the Average Weekly Ordinary Time Earnings (AWOTE) series for the Australian mining industry, rather than using a mix of AWOTE indices as was the case under UT3. Aurizon Network stated that it competes directly with the mining industry for the vast majority of its maintenance labour services and resources.
- Aurizon Network has included a Hire of Heavy Plant and Equipment index into the MCI (as a sub-index for consumables), stating that this cost category averages 15% of the total UT4 maintenance cost base.²⁵³

In the BIS Shrapnel report submitted by Aurizon Network, it is stated that as the Wage Price Index (WPI) does not reflect changes in the skill levels of employees within a given sample, it will therefore understate (or overstate) wage inflation if there is a change in the overall skill levels. Besides that, the WPI does not capture situations where promotions are given in order to achieve a higher salary for a given individual, often to retain them in a tight labour market. For these reasons, BIS Shrapnel preferred to use the AWOTE to measure the increase in wage cost.²⁵⁴

In the December submission, Aurizon Network also provided the updated MCI forecasts for the 2014 DAU period (see **Table 53**).

²⁵³ Aurizon Network, 2013 DAU, sub. no. 116: 14

²⁵⁴ Aurizon Network, 2013 DAU, sub. no. 36: A1–A2

Table 53 Aurizon Network's updated MCI forecast compared to UT4 submission

| <i>Financial year</i> | <i>UT4 submission</i> | <i>Updated MCI Forecast</i> |
|-----------------------|-----------------------|-----------------------------|
| 2013–14 | 7.8% | 8.0% |
| 2014–15 | 12.2% | 12.5% |
| 2015–16 | 16.6% | 17.0% |
| 2016–17 | 21.4% | 21.9% |

Source: SKM, 2013 DAU, 2014(f) MCI Report: 3. Note: MCI converts from the 2011–12 financial year as a base year.

5.4.2 Stakeholders' Comments

Stakeholders did not comment in detail on the MCI. The QRC agreed with Aurizon Network's proposal to retain the MCI in the revenue cap calculation.²⁵⁵ Vale said the proposed MCI forecast changes Aurizon Network's risk or exposure to maintenance costs.²⁵⁶

5.4.3 Consultant's assessment

SKM independently reviewed the reasonableness of Aurizon Network's proposed 2014 DAU MCI.

A summary of SKM's assessment is set out in **Table 54**.

Table 54 SKM's assessment of Aurizon Network's proposed UT4 MCI

| <i>Issue</i> | <i>Analysis</i> |
|---|--|
| Assigned indices in Aurizon Network's submitted MCI | SKM highlighted a number of concerns in relation to sub-indices included by Aurizon Network in its UT4 MCI: <ul style="list-style-type: none"> SKM did not consider Aurizon Network would compete with the mining industry for all types of labour. Hence, a balanced industry composition as per the UT3 period will be more appropriate. SKM also mentioned that the AWOTE and WPI are two commonly used labour-cost indices, and the ABS does not publishes Queensland-specific indices for Mining and Construction. SKM did not consider it reasonable to assume that fuel would be purchased entirely from retail sources, and noted that the maintenance equipment employed by Aurizon Network primarily uses diesel fuel. SKM stated the Hire of Heavy Plant and Equipment index is not appropriate as it is a proprietary index and hence not independently verifiable. |
| System-wide MCI | SKM noted that a system-wide MCI is reasonable as the monetary impacts are not significant from socialisation of escalation costs between systems. |
| Fixed cost composition for the UT4 period | SKM found that using a fixed set of weightings over the 2014 DAU period might not be appropriate as there would be some variation in the actual cost base. This should be considered alongside the impact on users from a lack of certainty around the MCI weightings. |
| Forecast MCI based on the total UT4 nominal cost | SKM noted that an MCI based on the total nominal cost over the 2014 DAU period is appropriate in the context of the forecast expenditure. However, as mentioned previously, the realised cost base may differ from forecast. |

Source: SKM 2013 DAU, 2014(f) MCI Report

²⁵⁵ QRC, 2013 DAU, sub. no. 46: 97

²⁵⁶ Vale, 2013 DAU, sub. no. 42: 3

We have requested SKM to propose an MCI that applies only to direct maintenance costs excluding depreciation. SKM took into account its findings as well as our request, and recommended the following sub-indices (and weightings) to be included in the MCI:

Table 55 SKM's proposed MCI structure

| <i>Category</i> | <i>SKM proposed UT4 sub-index components</i> |
|------------------------|---|
| Accommodation | ABS Average room rate per occupied night: <ul style="list-style-type: none"> • Mackay (50%) • Central Queensland (50%) |
| CPI (Balance of Costs) | ABS CPI all groups Brisbane (100%) |
| Consumables | ABS producer price indices: <ul style="list-style-type: none"> • Fabricated metal (34.8%) • Transport equipment and parts (19.57%) • Non-residential building construction (45.6%) |
| Labour | ABS wage price indices: <ul style="list-style-type: none"> • National construction (33.3%) • National mining (33.3%) • Queensland all industries (33.3%) |
| Fuel | Australian Institute of Petroleum terminal gate diesel price, Brisbane (100%) |

Source: SKM, 2013 DAU, 2014(f) MCI Report: 23–24. Notes: Due to rounding, the sum of all category weightings may not equal 100%.

SKM also provided forecast MCI on a system-wide basis based on Aurizon Network's submitted 2014 DAU period maintenance costs and BIS Shrapnel's forecasts for a number of sub-indices. This is presented in **Table 56** as part of our Draft Decision.

5.4.4 QCA analysis and Draft Decision

Our Draft Decision is to refuse to approve Aurizon Network's proposed MCI for the 2014 DAU period. We consider it is appropriate for Aurizon Network to amend its 2014 DAU to make the following adjustments:

- limiting its application to the direct maintenance costs less depreciation
- escalating labour costs based on equal proportions of the WPI for the national mining and construction industries and Queensland all industries
- escalating fuel costs based the wholesale price of diesel (AIP TGP)
- escalating hire of heavy plant and equipment costs based on the producer price index for non-residential building construction; and
- escalate depreciation by the Brisbane CPI (all groups).

As identified above, when assessing Aurizon Network's proposed MCI, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the MCI.

Our approach in applying these statutory factors has been guided by our assessment approach as set out in **Table 44**. Our analysis is set out below.

We generally agree with the goal of improving estimation processes, provided that inputs can be independently verified from publicly available indices; that the methodology and calculations

are transparent; that outcomes are statistically relevant; and expenditures are monitored to prove the relevance of the index is warranted to improve forecasting accuracy.

We consider this means, it is necessary that the MCI should be constructed in the following manner:

- weightings reflect the composition of Aurizon Network's maintenance tasks, consistent with the assessment of efficient costs
- apply independently verified publicly available data sources
- sub-indices reflect the cost pressure faced by Aurizon Network, that falls outside its control.

In this context, we do not consider Aurizon Network's proposed MCI has satisfied these criteria.

Weightings

Our Draft Decision is that the final version of the MCI will need to apply weightings that reflect the composition of the approved maintenance forecasts. In the interim, the MCI has been constructed with the Aurizon Network's submitted maintenance costs in this Draft Decision.

We accept the application of a system-wide MCI, noting that SKM has found that the monetary impacts of socialisation of escalation costs is not material.

We also consider fixed MCI weightings over the 2014 DAU period based on the total maintenance costs in real terms appropriate. We view that while there is a risk that the actual cost composition faced by Aurizon Network will differ significantly from the pre-approved MCI, this risk is partially mitigated by the Review Event provisions under Schedule F of the 2014 DAU (pending approval).

As part of our Draft Decision, we propose to apply the MCI only to the direct maintenance costs excluding depreciation. This is related to our Draft Decision in relation to other aspects of the MAR, namely:

- We do not consider it appropriate to provide Aurizon Network allowances for a return on working capital and a return on inventory.
- We have treated the corporate overheads in maintenance as part of the overall corporate overhead estimate for Aurizon Network's operating cost allowance.
- We consider escalating the return on and return of (i.e. depreciation) maintenance assets by the CPI appropriate as this will yield the same outcome as if these assets were part of the RAB. We encourage Aurizon Network to include maintenance assets in the RAB to improve transparency and to ensure consistent treatment for all assets.

Publicly available

Our Draft Decision is that Aurizon Network should replace the proposed proprietary (e.g. the Hire of Heavy Plant and Equipment index) and discontinued sub-indices it has proposed with publicly available and current published indices identified in SKM's report. We note that Aurizon Network is prepared to accept the indices for consumables recommended by SKM.²⁵⁷

Sub-indices

Developing a customised index, such as the MCI, requires selection of appropriate sub-indices. The overall index should be expected to rise and fall in line with the cost faced by Aurizon

²⁵⁷ Aurizon Network, 2013 DAU, sub. no. 36: 19

Network in its central Queensland maintenance activities, so the sub-indices should correlate with the underlying cost components they are expected to track.

We have considered SKM's assessment and accept its recommendations (see **Table 55**). There are two particular proposed changes by Aurizon Network that we intend to address here.

In relation to labour cost inflation, we do not consider the AWOTE series, as proposed by Aurizon Network, to be an appropriate measure. Rather, we consider the WPI the preferred measure for labour cost inflation. We have dealt with this issue in Chapter 4.

Having established the WPI as the preferred measure, the question is which variant(s) of WPI should be included into the MCI. We are aware that the ABS does not provide the WPI at the 'state by industry' level. We also note that Aurizon Network does not compete with the mining industry for all types of labour, as previously mentioned by SKM and subsequently acknowledged by Aurizon Network.²⁵⁸ We accept SKM's recommendation that a mixed industry composition should be adopted, in the view that a combined index would be more reflective of Aurizon Network's workforce.

With regard to fuel cost inflation, our Draft Decision is to accept SKM's recommendation to reference the Australian Institute of Petroleum's Terminal Gate Price for diesel. As noted by SKM, most of the maintenance equipment (e.g. the RM900 machine) used by Aurizon Network requires the use of diesel fuel, and it is most likely for Aurizon Network to procure diesel from wholesale sources.

MCI forecast

In arriving at our proposed MAR in nominal terms, we have adopted SKM's MCI forecast (see **Table 56**). We note that SKM has used BIS Shrapnel's forecasts for most sub-indices (e.g. CPI). We will update these indices with the latest forecasts in our Final Decision.

Table 56 SKM's proposed adjusted MCI (system-wide)

| <i>Cost driver</i> | <i>Accommodation</i> | <i>CPI</i> | <i>Consumables</i> | <i>Fuel Prices</i> | <i>Labour</i> | <i>Weighted Index</i> | <i>MCI Estimate</i> |
|--------------------|----------------------|------------|--------------------|--------------------|---------------|-----------------------|---------------------|
| Weights | 2.6% | 11.0% | 33.5% | 2.4% | 50.6% | — | — |
| 2011-12 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | — |
| 2013-14 | 104.4 | 106.6 | 99.7 | 115.1 | 109.1 | 105.4 | 5.4% |
| 2014-15 | 101.7 | 110.1 | 99.2 | 118.4 | 113.9 | 108.0 | 8.0% |
| 2015-16 | 96.5 | 113.3 | 99.6 | 120.3 | 118.5 | 110.6 | 10.6% |
| 2016-17 | 93.5 | 116.2 | 103.2 | 118.9 | 123.0 | 113.9 | 13.9% |

Source: SKM 2013 DAU, 2014(f) MCI Report: 23. Note: due to rounding, the sum of all category weightings may not equal 100%. The weightings have been calculated based on Aurizon Network's proposed maintenance costs.

²⁵⁸ SKM 2013 DAU, 2014(f) MCI p. 14; Aurizon Network, 2013 DAU, sub. no. 36: 18

Draft Decision

- 5.4 Our Draft Decision is to refuse to approve Aurizon Network's proposed MCI. We consider it is appropriate for Aurizon Network to amend the draft access undertaking to make the following adjustments:**
- (a) limiting its application to the direct maintenance costs less depreciation
 - (b) escalating labour costs based on equal proportions of the WPI for the national mining and construction industries and Queensland all industries
 - (c) escalating fuel costs based the wholesale price of diesel (AIP TGP)
 - (d) escalating hire of heavy plant and equipment costs based on the producer price index for non-residential building construction.
- 5.5 Our Draft Decision is to require Aurizon Network to escalate depreciation by the Brisbane CPI (all groups).**

5.5 Summary

Our Draft Decision on maintenance costs (excluding ballast undercutting) for the 2014 DAU is summarised in **Table 57**. We have proposed a number of changes to Aurizon Network's submitted maintenance costs, and these changes are consistent with our assessment of efficient costs for the CQCN.

Table 57 QCA Draft Decision 2014 DAU maintenance costs (excluding ballast undercutting) (\$ million, nominal)

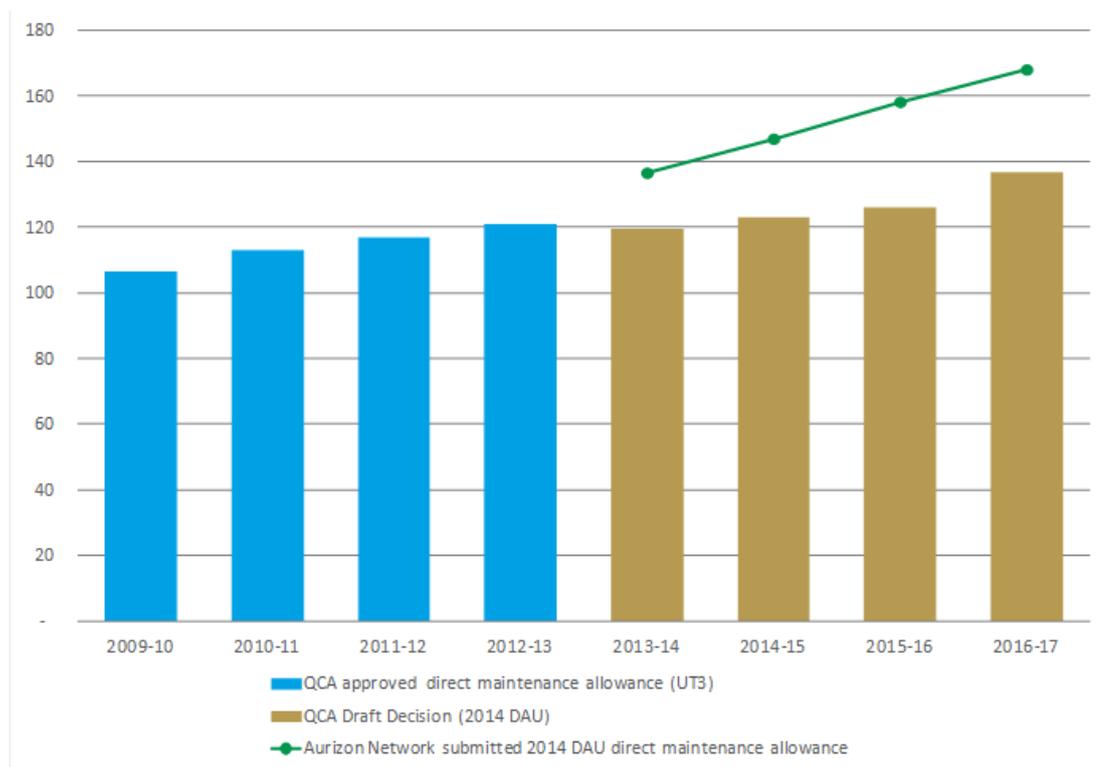
| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|--|---------------|---------------|---------------|---------------|
| Direct costs excluding ballast undercutting costs ¹ | 119.62 | 122.94 | 126.03 | 136.59 |
| Indirect costs ² | 4.07 | 7.07 | 6.25 | 5.28 |
| Total maintenance costs | 123.69 | 130.01 | 132.28 | 141.87 |

Source: QCA analysis. Notes: (1) re-railing costs are re-classified as asset renewals and included in the capital indicator; (2) corporate overheads for maintenance costs included in the operating cost allowance.

While we refuse to approve Aurizon Network's forecast for 2014 DAU direct maintenance costs (excluding ballast undercutting), we have accepted the majority of Aurizon Network's direct maintenance costs. However, our Draft Decision is the re-railing costs should be treated as part of the capital expenditure allowance for Aurizon Network. Overall, this means Aurizon Network's direct maintenance costs should remain relatively consistent from UT3 to the 2014 DAU period.

Figure 23 presents a comparison of Network's direct maintenance cost allowance for UT3 and its submitted 2014 DAU direct maintenance costs, and our Draft Decision for the 2014 DAU.

Figure 23 Direct maintenance costs over the UT3 and 2014 DAU periods (\$ million, nominal)



Source: QCA analysis

6 BALLAST UNDERCUTTING COSTS

Ballast undercutting costs represent around 35% of Aurizon Network's direct maintenance costs for the 2014 DAU period. The 2014 DAU submitted ballast undercutting costs consist of mechanised ballast undercutting and off-track ballast cleaning.

Our Draft Decision proposes a ballast undercutting cost allowance for the 2014 DAU period of \$209.93 million, compared to the \$326.64 million originally proposed by Aurizon Network. The reasons for our Draft Decision are set out in more detail in this chapter, including our view that:

- *we do not have sufficient evidence to convince us that Aurizon Network's proposal reflects an efficient scope and cost of ballast undercutting for the 2014 DAU period*
- *we do not have sufficient evidence to convince us that Aurizon Network's proposal does not include costs that have already been recovered from customers in previous undertaking periods, reflected as corrective maintenance, and*
- *Aurizon Network has not provided sufficient evidence to support the impairment charge attributable to the UT3 period being reversed.*

However, our Draft Decision also reflects that we propose to approve the ballast impairment charge associated with the 2014 DAU period be reversed²⁵⁹.

Our Draft Decision is based on the information we have at this time. We have indicated we may reconsider our position if Aurizon Network is able to provide more information to demonstrate its ballast undercutting scope and costs for the 2014 DAU period are efficient.

6.1 Overview

6.1.1 Background

Ballast fouling and ballast cleaning in the CQCN has been an issue since UT1. For the 2014 DAU, the ballast cleaning costs proposed by Aurizon Network represent around 35.0% of direct maintenance costs for the period.

Ballast is the rock material that is laid on the rail bed under the sleepers, providing stability and drainage to the track structure. It is an essential structural component of the track because it transfers the load of the train through the sub-ballast and formation.

Over time, ballast deteriorates by fracturing into smaller pieces, losing its sharp edges and becoming contaminated with dirt and mud rising from below the ballast. Ballast fouling is the accumulation of material (including coal fines) within the ballast layer. In the CQCN, coal product spilt or blown from wagons also contributes to ballast fouling. Ballast cleaning (undercutting) is necessary to deal with ballast fouling (see **Figure 24**).

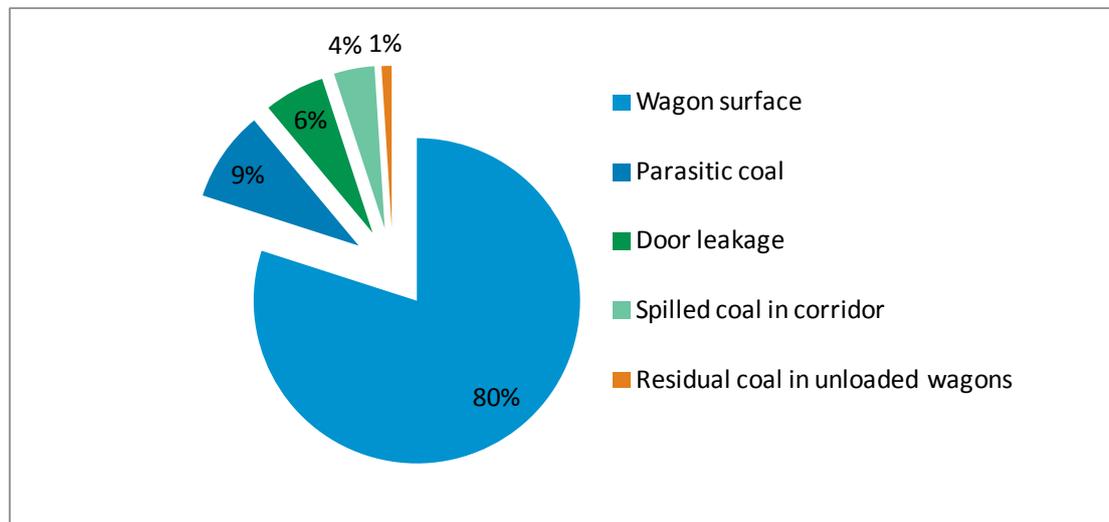
Ballast cleaning (also known as 'ballast undercutting') is a critical infrastructure maintenance activity to improve both above and below rail costs and efficiency through:

- minimising track related speed restrictions
- reducing the risk of derailment

²⁵⁹ This increases Aurizon Network's MAR by \$90.5 million over the 2014 DAU period, compared to our UT3 Final Decision that the ballast impairment charge should be continued for the 2013-14 to 2016-17 period.

- avoiding premature replacement of formation, sleepers, rail and fastenings
- re-using ballast
- extending service life of the whole track and its components.

Figure 24 Aurizon Network - causes of ballast fouling in the CQCN



Source: Aurizon Network, 2013 DAU, sub. no. 3: 42

6.1.2 Previous consideration of ballast cleaning by the QCA

The issue of whether QR Network's proposed scope and cost for ballast cleaning for the UT3 period was efficient, was a difficult one in UT3.

At the time, we concluded QR Network's UT3 proposal included a level of costs to address a backlog of ballast cleaning and this backlog would need to be address over UT3 and UT4. As a result, in the Final Decision on UT3, we:

- approved an allowance that, while high, we considered necessary for Aurizon Network to do the scope of work it proposed; and
- reduced QR National's RAB by \$107 million, which was our estimated net present value of additional maintenance work necessary to take account of the condition and cost of ballast.²⁶⁰

We also said we would consider reversing the decision if Aurizon Network could demonstrate:

- its past approaches to ballast fouling had been cost effective
- it had adopted an efficient approach to maintaining a sound ballast (whether through ballast cleaning and/or fouling prevention).

6.1.3 Aurizon Network proposal

Aurizon Network's 2014 DAU proposal for ballast undercutting consists of two parts.

²⁶⁰ QCA (2010) Draft Decision QR Network's 2010 DAU - Tariffs and Schedule F: 78. The \$107 million was derived as the difference in NPV terms between an efficient level of maintenance and the amount QR Network will spend over the next 7 years in order to address concerns with the condition of the ballast.

Part 1: Aurizon Network's proposed ballast cleaning costs

Aurizon Network has submitted costs of \$326.64 million for ballast undercutting for its 2014 DAU.²⁶¹ Aurizon Network said it bears most of the costs of ballast cleaning, even though the primary factors causing coal fouling are not within its direct control.²⁶²

Table 58 Aurizon Network proposed ballast cleaning costs (\$ million, 2011-12)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|---|----------------|----------------|----------------|----------------|
| Mechanised ballast undercutting | 55.27 | 64.86 | 65.88 | 66.36 |
| Ballast undercutting (other) | 7.56 | 8.37 | 8.68 | 8.90 |
| Total ballast undercutting costs (\$2011-12) | 62.83 | 73.23 | 74.57 | 75.26 |
| Total ballast undercutting costs (\$nominal) | 67.56 | 81.79 | 86.51 | 90.76 |

Source: Aurizon Network Reporting Module - 30 April 2013 lodgement. Note: Numbers may not sum due to rounding.

Part 2: Treatment of UT3 ballast impairment charge

Aurizon Network has also proposed that:

- the \$107 million impairment charge included in UT3 be reversed in the 2014 DAU period;²⁶³ and
- the estimated \$43.4 million value (\$ 2012-13) to recover the net costs associated with the impairment charges and the ballast undercutting costs in the UT3 period.²⁶⁴

Aurizon Network's forecast revenue associated with the reversal of the impairment charge is shown in **Table 59**.

Table 59 Estimated revenue impact of removing the ballast impairment charges applied in UT3 (\$ million, nominal)

| | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|---|----------------|----------------|----------------|----------------|
| Aurizon Network's assumed revenues from reversing ballast impairment charge in UT4 | 25.59 | 25.19 | 24.74 | 24.27 |
| Aurizon Network's assumed revenues from reversing ballast impairment charge in respect of UT3 | 12.34 | 12.90 | 13.48 | 14.08 |
| Total (\$nominal) | 37.93 | 38.09 | 38.22 | 38.35 |

Source: Aurizon Network December 2013 Financial Model; QCA analysis.

This chapter considers both these issues.

6.1.4 Legislative framework

In forming a view on Aurizon Network's proposed ballast undercutting costs for the 2014 DAU, we must have regard to all of the criteria in section 138(2) of the QCA Act.

²⁶¹ All numbers in this Chapter in nominal dollars unless otherwise indicated

²⁶² Aurizon Network, 2013 DAU, sub. no. 33: 3

²⁶³ Aurizon Network, 2013 DAU, sub. no. 3: 43-44

²⁶⁴ Aurizon Network, 2013 DAU, sub. no. 3: 67

In the context of assessing Aurizon Network's ballast undercutting proposal, we must have regard to the factors listed in section 138(2) and give them an appropriate level of weighting, as identified in Section 2.1.2 of this Draft Decision. Against this background we consider:

- sections 138(2)(a), (b), (d), (e), (f), (g) and (h) should be given more weight, as identified below;
- section 138(2)(c) should be given less weight as it is not practically relevant to our assessment of the ballast undercutting proposal;
- section 138(2)(g) refers to the pricing principles mentioned in section 168A, of which we consider sections 168A(a), (c) and (d) should be given more weight, as identified below;
- section 168A(b), relating to multi-part pricing and price discrimination when it aids efficiency, can be accorded less weight as it is not practically relevant to our assessment of the ballast undercutting proposal.

Efficient operating and use of infrastructure

Sections 69E and 138(2)(a) of the QCA Act require that we have regard to the object of Part 5 of the QCA Act, namely to promote the economically efficient operation, use of and investment in the CQCN, as the significant infrastructure by which the declared service are provided.

Sections 138(2)(g) and 168A(a) require that we have regard to certain pricing principles, including that the price for access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and include a return on investment commensurate with regulatory and commercial risks involved. Ballast undercutting costs should reflect the efficient cost and scope associated with the requisite level of maintenance required for the 2014 DAU period.

In broad terms, we consider, pursuant to section 138(2)(b) of the QCA Act, that the legitimate business interests of Aurizon Network for ballast undercutting will be met if it is permitted to recover at least the efficient costs of maintaining and managing the ballast asset.

Conversely, sections 138(2)(e) and (d) require us to have regard to the interests of access seekers and the public interest. We also consider that the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already 'access seekers' under section 138(2)(e). As identified earlier, consideration of all of these interests leads to a conclusion that Aurizon Network should also be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the objective of Part 5 specified in section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its downstream operations which could otherwise raise concerns under section 168A(c).

In the context of sections 138(2)(e), (d) and (h), as well as section 168A(c), we also consider that access seekers should not be required to contribute to the cost of ballast cleaning in the 2014 DAU to the extent that costs have already been pre-recovered by Aurizon Network in previous undertaking periods for ballast cleaning that has not taken place. Aurizon Network's proposal to again recover those costs would, in practical effect, lead to access seekers paying twice for the same service. We consider it inconsistent with the interests of access seekers and the public interest for access seekers to contribute more than once to the relevant costs.

Specifically for ballast cleaning, we must also consider section 138(2)(f) in the context of the existing ballast asset impairment charge. Section 138(2)(f) related to the effect of excluding assets for pricing purposes.

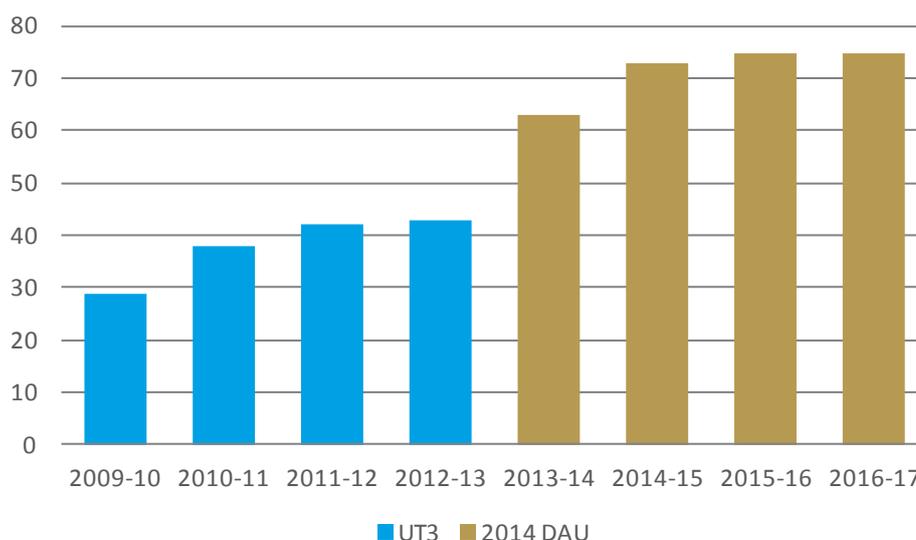
Allocation of costs

When considering cost allocation, in addition to section 138(2) of the QCA Act we have also had regard to section 137(1A)(b) as well as section 168A(c). Section 137(1A)(b) applies to Aurizon Network as a 'related access provider', namely an access provider that not only owns or operates the declared service, but also provides, or proposes to provide, access to the service to itself or a related body corporate. Section 137(1A)(b) requires that Aurizon Network's access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the service.

6.1.5 QCA assessment of ballast cleaning costs

Aurizon Network's forecast ballast undercutting costs the 2014 DAU are almost 90% higher, in real terms, than Aurizon Network's actual ballast undercutting costs in the UT3 period. Aurizon Network's submitted ballast cleaning costs also represent around 35% of Aurizon Network's submitted total direct maintenance costs for the 2014 DAU, compared to 19% in UT3.

Figure 25 Aurizon Network's actual and proposed 2014 DAU ballast cleaning costs (\$2011–12 million)



Source: SKM, QCA analysis

We use an *ex ante* (up front) approach to assessing Aurizon Network's forecast ballast undercutting costs. This requires Aurizon Network to satisfactorily show, prior to the approval of the 2014 DAU, that its proposal reflects the efficient scope and cost for ballast undercutting for the 2014 DAU period.

To assess efficient ballast cleaning costs for the 2014 DAU in the context of section 138(2) of the QCA Act, we have applied the assessment approach as set out in **Table 60**.

Table 60 QCA approach to assessing efficient 2014 DAU period ballast cleaning costs

| <i>Assessment Criterion</i> | <i>Rationale</i> |
|---------------------------------|---|
| Establish a baseline assessment | This provides a position from which to assess Aurizon Network's scope and |

| Assessment Criterion | Rationale |
|--|---|
| of the condition of the ballast | cost proposals for the 2014 DAU. For the purposes of the Draft Decision, we consider the asset condition based assessment of the CQCN completed by Evans & Peck in August 2013 to be a useful guide. |
| Is the proposed scope efficient for the 2014 DAU period? | For the purposes of the Draft Decision, we consider an efficient scope comprises: <ul style="list-style-type: none"> the requisite level of baseline ballast undercutting for the 2014 DAU period, subject to no incremental corrective ballast undercutting to account for identified legacy issues associated with historic rates of ballast undercutting the separate identification of any incremental corrective ballast undercutting considered appropriate, the extent to which its existence was within management control and the actions taken to mitigate it. |
| Are the forecast costs efficient for the 2014 DAU | For the purposes of the Draft Decision, we consider the efficient costs comprise: <ul style="list-style-type: none"> an allowance for all efficient costs associated with providing the requisite level of baseline ballast undercutting for the 2014 DAU period, subject to no incremental corrective ballast undercutting to account for identified legacy issues associated with the historic rates of ballast undercutting an allowance for all efficient costs that it is appropriate for Aurizon Network's customer base to bear with respect to any incremental corrective ballast undercutting considered appropriate an appropriate escalation factor to take account of changes in costs outside of Aurizon Network's control. <p>In practice, as discussed in section 2.1.2, we have used a 'reasonableness' test as the relevant 'proxy' for efficient costs for the 2014 DAU period, in the absence of robust, evidence-based benchmarks for assessing efficient costs in the CQCN.</p> |
| If there is corrective maintenance necessary, is there a case for the costs to be borne by access holders? | We consider that it would only be efficient for access holders to meet the costs of corrective maintenance, if: <ul style="list-style-type: none"> it was clear the corrective maintenance has arisen due to factors outside the control of Aurizon Network; and it was clear Aurizon Network had not already received payment for the maintenance task in a prior period, i.e., access holders should not be required to pay twice for the same activity. |

We consider that taken together, this assessment approach for considering efficient ballast undercutting costs best meets the s138(2) criterion.

As part of our review of the 2014 DAU, we engaged Jacobs SKM (SKM) to review Aurizon Network's ballast undercutting proposals. SKM's report has been made available for public consultation.

6.2 2014 DAU ballast undercutting costs

6.2.1 Aurizon Network proposal

Aurizon Network's forecast 2014 DAU proposed costs for ballast undercutting of \$62.83 million in 2013–14 increasing to \$75.26 million in 2016–17, in \$2011–12.

Table 61 Aurizon Network forecast ballast cleaning costs (\$2011–12 million)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---------------------------------|----------------|----------------|----------------|----------------|
| Mechanised ballast undercutting | 55.27 | 64.86 | 65.88 | 66.36 |

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|------------------------------|--------------|--------------|--------------|--------------|
| Ballast undercutting (other) | 7.56 | 8.37 | 8.68 | 8.90 |
| Total (\$2011–12) | 62.83 | 73.23 | 74.57 | 75.26 |

Source: Aurizon Network Reporting Module – 30 April 2013 lodgement. Note: numbers may not sum due to rounding.

This section outlines Aurizon Network's rationale with respect to the:

- proposed UT4 ballast undercutting scope
- need for increased ballast cleaning for the 2014 DAU
- 2014 DAU ballast cleaning cost increases
- coal dust management plan.

Proposed 2014 DAU ballast undercutting scope

Aurizon Network has claimed confidentiality over its proposed 2014 DAU ballast undercutting scope. However, Aurizon Network said it determined the scope using the Network Strategic Asset Plan tool forecast scopes for ballast undercutting requirements for the 2014 DAU. These are based on:

- the current condition of the network
- an average fouling rate of 5% per 100 million net tonne
- the forecast tonnage profile across the network.²⁶⁵

Further, during UT3, Aurizon Network used Ground Penetrating Radar (GPR) to more accurately determine the level of fouling across the network. Aurizon Network analysed 1170 km of data for the most highly used parts of each of the CQCN. Aurizon Network said it has used this information to better target and prioritise ballast undercutting activities.²⁶⁶

Need for increased ballast cleaning in the 2014 DAU period

Aurizon Network's supporting material makes a number of references to the need for Aurizon Network to increase its level of ballast maintenance comprising:

- the CQCN has many locations where high levels of coal contamination are present²⁶⁷
- Aurizon Network's ballast cleaning levels should be increased on all four systems²⁶⁸
- Evans & Peck's report provided by Aurizon Network also cited a 2010 Worley Parson's Asset Condition Report on the CQCN which stated there was considerable coal dust contamination across the CQCN in 2010.²⁶⁹

2014 DAU ballast cleaning cost increases

Aurizon Network said it is planning to increase its ballast cleaning effort in UT4, by upgrading the ballast cleaning machine, and providing extra shifts and an extra spoil wagon in order to address ballast fouling levels over UT4.²⁷⁰

²⁶⁵ Letter from Aurizon Network, 11 March 2014

²⁶⁶ Aurizon Network, 2013 DAU, sub. no. 33:5

²⁶⁷ Aurizon Network, 2013 DAU, sub. no. 18:2

²⁶⁸ Aurizon Network, 2013 DAU, sub. no. 18: 3

²⁶⁹ Aurizon Network, 2013 DAU, sub. no. 18: 40

Aurizon Network said it has based its costs on its 2011-12 costs. This means ballast cleaning cost increases from the UT3 period to the 2014 DAU are attributed, in part to:

- projected ballast return rates being considerable lower for the UT4 period than those seen in UT3 (i.e. a lower rate of ballast recycling)
- higher labour costs and increased staff numbers
- the introduction of new Rail Safety and Workplace Health and Safety legislation
- higher plant maintenance costs
- fouled ballast storage and removal being more difficult than was envisaged in the production assumption modelling due to environmental law implications.²⁷¹

Coal dust management plan

Aurizon Network said it has been actively working with supply chain participants, and investing in new technologies and modifying its practices to reduce coal spillage under the Coal Dust Management Plan (CDMP). It has also developed a Coal Loss Management Plan which, together with coal veneering, Aurizon Network estimates will reduce ballast fouling by up to 10%, including from coal veneering.²⁷²

6.2.2 Consultant's assessment

We engaged SKM to review Aurizon Network's forecast maintenance costs, including:

- assessment of Aurizon Network's forecast maintenance expenditure and benchmarking against similar below rail operations as well as historical actual maintenance expenditure for the CQCN, including consideration for productivity improvements; and
- identify any irregularities, such as 'double counting' and adjust the forecast maintenance costs as required.

The Evans & Peck August 2013 Condition Based Assessment of the CQCN is also relevant to our assessment. This section outlined the consultants' assessment of the following:

- August 2013 Evans & Peck Condition Based Assessment
- SKM's assessment of Aurizon Network's proposed scope
- SKM's assessment of Aurizon Network's proposed costs
- SKM's assessment of corrective ballast undercutting
- SKM's assessment of the achievability of the proposed scope
- SKM's benchmarking with the Hunter Coal Valley Network (HVCN).

August 2013 Evans & Peck Condition Based Assessment

In August 2013, Evans & Peck completed the first condition based assessment of the CQCN. This was undertaken in collaboration with the QCA.

²⁷⁰ Aurizon Network - Asset Renewal and Maintenance, QCA and SKM Briefing 22 August 2013; Aurizon Network 2013 DAU, sub. no. 4: 195–196

²⁷¹ Letter from Aurizon Network, 11 March 2014

²⁷² Aurizon Network 2013 DAU, sub. no. 4: 91.

Overall, the condition based assessment for the CQCN showed the track in good condition. It did, however, identify some issues that require ongoing monitoring and further consideration in future condition based assessments.

Ballast contamination was raised in a few areas of the report. In particular, it was noted that contamination of track ballast in Newlands was not dissimilar to conditions experienced in other asset systems in the CQCN. Evans & Peck noted this has the potential to reduce the serviceable life of the asset and options should be explored to reduce the future impact it will have on the network.²⁷³

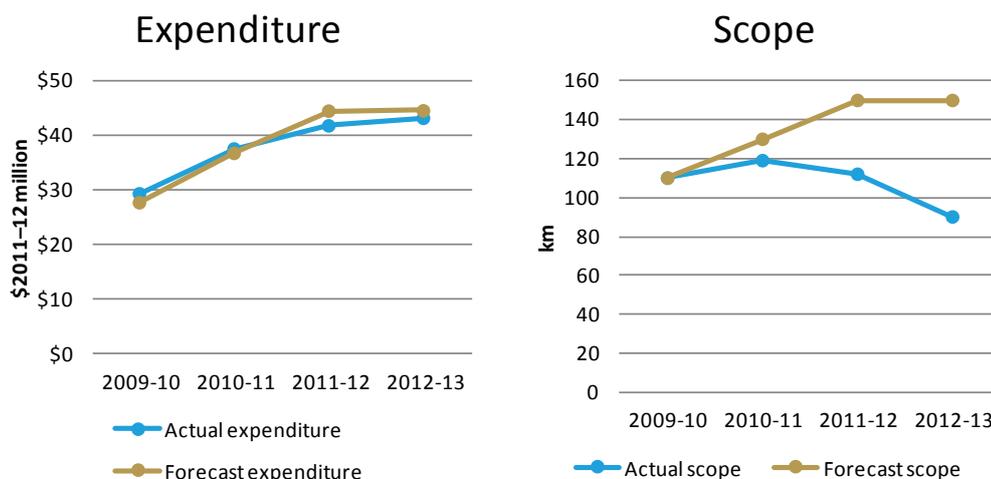
The condition based assessment, however, did not conclusively suggest that significant remedial work was needed.

Aurizon Network's proposed scope

SKM considered Aurizon Network's proposed 2014 DAU scope was reasonable in the context of historical levels of ballast contamination and contamination from the impact of new volumes.²⁷⁴

SKM considered the ballast undercutting task is high due to existing fouling that was not addressed in the UT3 period, and this is contributing to high costs. SKM found that the rate of ballast undercutting should reduce in the UT5 period.²⁷⁵ Aurizon Network's expenditure and scope delivery performance for UT3 is provided in **Figure 26**.

Figure 26 Aurizon Network UT3 ballast undercutting expenditure and scope—actual vs. forecast



Source: SKM unpublished

Aurizon Network's proposed costs

SKM considered the increase in the average UT4 unit cost, compared to the UT3 unit rate, to be reasonable, provided both the proposed scope and cost were realised. SKM said:

*Significant deviations from planned scope would not be reasonable... particularly given the significant increase in the scope of ballast undercutting... and the historical under-deliver of scope.*²⁷⁶

²⁷³ Evans & Peck, Condition Based Assessment, Appendix C, 2013: 63, 65, 81, 83

²⁷⁴ SKM, 2013 DAU, January 2014(a):12, 30; SKM, 2013 DAU, April 2014(d):21–22.

²⁷⁵ SKM, 2013 DAU, April 2014 (b):11

²⁷⁶ SKM, 2013 DAU, January 2014(a): 11

'(it would)...not be appropriate for Aurizon Network to under-deliver on the forecast ballast undercutting scope... and transfer the ballast undercutting allocation to other maintenance activities'.²⁷⁷

SKM also noted that the unit cost increase occurred because of:

- the relatively higher unit cost of off-track cleaning solutions
- the use of a more realistic ballast return rate, compared to those estimated in UT3
- the depreciation on the new and upgraded spoil wagons
- increased maintenance on the ageing ballast undercutting machine.²⁷⁸

Corrective ballast undercutting

SKM said it is reasonable to assume that Aurizon Network's proposed provision of ballast undercutting for the UT4 period includes both corrective maintenance for current fouling and maintenance for forecast levels of fouling which will be caused by growth in volumes during the UT4 period²⁷⁹.

SKM undertook a review of ballast for the proposed ballast undercutting scope and found that the proposed scope is efficient for:

- historical levels of contamination; and
- contamination from increasing volumes.²⁸⁰

SKM said it would be appropriate for us to give consideration to whether Aurizon Network should be required to bear the cost of non-delivery of ballast undercutting scope from the previous undertaking.²⁸¹ Given that there is such significant contamination on the network, however; SKM recommends that even if the allowable maintenance expenditure is reduced, that Aurizon Network should be required to undertake a level of ballast undercutting for which access seekers have already incurred costs.²⁸²

SKM subsequently said it did not recommend that the allowable maintenance cost be reduced, since this will only result in a reduction in the scope of maintenance task which will have longer term impacts on network quality, but that ongoing monitoring will be important in ensuring users receive value for money.²⁸³

Achievability of the proposed scope

SKM considered the proposed scope for the 2014 DAU period is only achievable after Aurizon Network purchases new spoil wagons and upgrades existing ones (forecast in 2014–15) and, following this, the forecast productivity improvements outweigh the additional costs (as seen in the declining unit cost rate in 2015–16 and 2016–17). SKM suggested:

- costs associated with the proposed upgrade of existing wagons and acquisition of new spoil wagons should not be approved until both have occurred
- we monitor the results of the GPR on the network and ensure future scope is reasonable

²⁷⁷ SKM, 2013 DAU, January 2014(a): 32

²⁷⁸ SKM, 2013 DAU, April 2014(d): 20

²⁷⁹ SKM 2013 DAU, January 2014(a): 83

²⁸⁰ SKM 2013 DAU, January 2014(a): 75

²⁸¹ SKM 2013 DAU, January 2014(a): 75

²⁸² SKM 2013 DAU, January 2014(a): 75

²⁸³ SKM 2013 DAU, April 2014 (b):11

Benchmarking with the Hunter Valley Coal Network (ARTC)

SKM undertook some benchmarking on the costs of ballast undercutting for the CQC compared to HVCN. SKM said that although costs are higher for the CQC than the HVCN, it cannot definitively be determined that Aurizon Network's costs are too high. Specifically, SKM said it did not have information about the breakdown of scope for the HVCN to determine if the maintenance levels are appropriate.²⁸⁴

SKM noted a significant difference in the way Aurizon Network undertakes ballast treatment works to that of the ARTC. These comprise:

- Aurizon Network undertakes ballast undercutting to formation level (as per the US class 1 railroads). By contrast, ARTC undertakes ballast undercutting to a site specific pre-determined depth following data analysis and pot-hole investigations.
- Aurizon Network also has a requirement to remove all contaminated ballast from site, whereas ARTC is able to spoil the bank.

Importantly, SKM noted the additional effort undertaken by Aurizon Network means its cleaning effort is more expensive but should last between 8 and 10 years before needing to be renewed. This compares to ARTC's 4-year cycle time.

6.2.3 Stakeholders' comments

Stakeholders were very concerned at the increasing need and cost for ballast cleaning proposed for the 2014 DAU period. Of particular concern, was the lack of (or no) allowance or acknowledgement provided for the non-delivery of maintenance scope, including ballast undercutting, in the UT3.²⁸⁵

Stakeholders were concerned about the level of ballast undercutting costs and the lack of improvement in the condition of the ballast. In particular, stakeholders said:

- we should require Aurizon Network to report actual cost and scope delivery on a monthly basis, with any unspent budget being netted off their allowance in future years²⁸⁶
- consideration should be given to whether capitalising the 'corrective' portion of ballast costs is appropriate²⁸⁷
- Aurizon Network may have made a correct decision not to purchase the wagons for which funding was provided in UT3, but at present there is no process to ensure this was the case.²⁸⁸

Stakeholders' comments on SKM report

The QRC provided a number of comments on SKM's review of ballast cleaning, specifically it said, amongst other things:

Ballast cleaning has been a contentious issue for the past three regulatory periods and it is not an activity that can be benchmarked effectively on a unit rate basis (primarily for the reason that the scope is heavily dependent on local factors). It is an activity that's specific purpose is to address a problem that is building up slowly over time.

²⁸⁴ SKM 2013 DAU, April 2014 (b):11

²⁸⁵ BMA, 2013 DAU, sub. no. 41: 6; QRC, 2013 DAU, sub. no: 46: 13

²⁸⁶ QRC, 2013 DAU, sub. no. 111: 12

²⁸⁷ BMA, 2013 DAU, sub. no. 114:1

²⁸⁸ QRC, 2013 DAU, sub. no. 111: 14

Reallocation of the budget away from ballast undercutting (as occurred in UT3) cannot be justified on the basis of 'responsiveness' because while other activities are concerned with keeping the network operating on a day to day basis, ballast cleaning addresses a long term maintenance deficit that, if not addressed, will have significant negative impacts sometime in the future.

Aurizon Network significantly under delivered its ballast cleaning scope in UT3 and reallocated around \$20 million in its approved maintenance allowance to other tasks in 2012–13.

The QRC said SKM has gone part of the way to addressing some of the issues (by recommending removal of some of the proposed ballast cleaning budget until such time as Aurizon Network actually purchases new wagons and demonstrates their efficiency). However, the QRC said SKM had not:

- *Provided an assessment of the appropriateness of the proposed scope increases in the context of the technical information available in relation to the extent of ballast fouling*
- *Addressed why Aurizon Network has chosen to increase its investment in ballast cleaning in 2013–14 when it significantly underspent its ballast cleaning allocation in the final years of UT3*
- *Explained why the ballast undercutting costs increase from \$47m to \$62.8m between 2012–13 and 2013–14, even without including the indirect costs in the 2013–14 figures*
- *Detailed how the mechanised and non-mechanised components of the ballast undercutting budget is to be planned spent and monitored*
- *Detailed how the efficiency of the operation should be monitored over time, given the lack of available benchmarks.*

BMA/BMC noted SKM had concluded that Aurizon Network's claim for ballast cleaning costs was only reasonable in the context of the poor condition of the network due to the failure to maintain the network in previous regulatory periods, yet BMA/BMC commented that the report lacks clear recommendations regarding how this issue should be dealt with. BMA/BMC submitted that the RAB should be reduced to reflect the condition of the network, and that costs incurred to restore the assets should then be capitalised.

[Aurizon Network comment on SKM Report](#)

In response to SKM recommending the scope of the ballast undercutting tasks being limited until such time as the new spoil wagons have been acquired, Aurizon Network said:

it had committed to a suite of logical support enhancements and productivity improvements to the current undercutting programme which will enable the delivery of the full maintenance scope for the regulatory period. Aurizon Network confirmed that the Investment Approval Request for the procurement of the Ballast Upgrade Program was authorised in 2013.

Aurizon Network recommended the full scope for ballast undercutting remain in place to ensure its statutory and contracted obligations for rail safety, asset condition and asset performance is not put at risk. Aurizon Network said:

it is committed to providing the supply chain and the QCA with additional reporting and greater transparency. This will include regular updates on the performance of the ballast undercutting program and scope delivery. This reporting will also be included in the Annual Maintenance Report. In addition, Aurizon Network recommended it include in the above reports a detailed pricing analysis and cost reconciliation to confirm that there are not additional costs passed onto the supply chain through the implementation of the Ballast Upgrade Program.²⁸⁹

²⁸⁹ Aurizon Network March 2014.sub. no. 109: 37–38

6.2.4 QCA analysis and Draft Decision

When assessing Aurizon Network's proposed ballast undercutting costs, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our Decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the proposed risk and insurance costs. Our approach in applying these statutory factors has been guided by the assessment approach set out in **Table 60**.

Our Draft Decision is to refuse to approve Aurizon Network's proposed ballast undercutting costs. As we explain below, we consider it appropriate for Aurizon Network to amend its 2014 DAU to reduce its proposed ballast undercutting costs to a level we consider is more consistent with the efficient scope and cost of ballast cleaning for the 2014 DAU period.

In this regard, we do not consider Aurizon Network should be able to recover from its customers the cost of undertaking ballast undercutting work that exceeds an efficient scope of work — this includes corrective maintenance from previous periods. Moreover, Aurizon Network should not be able to recover from its customers any costs that are not efficient, even for an efficient scope of work.

It is evident to us that Aurizon Network has been working actively over the UT3 period to develop a better understanding of the condition of the ballast on the CQCN, including through use of Ground Penetrating Radar (GPR) to provide a more accurate picture of the ballast cleaning task.

However, Aurizon Network's forecast ballast undercutting costs for the 2014 DAU are almost 90% higher, in real terms, than for the UT3 period and represent around 35% of Aurizon Network's proposed 2014 DAU maintenance budget (excluding indirect costs). As identified below, in light of the concerns of stakeholders and our conclusions above, we do not have sufficient confidence in the evidence presented by Aurizon Network to conclude that such an increase is warranted.

To assess Aurizon Network's forecast 2014 DAU ballast undercutting costs we have considered the following matters:

- the baseline condition of Aurizon Network's ballast
- identifying efficient scope for ballast cleaning
- the extent to which Aurizon Network's forecast 2014 DAU costs are efficient
- QCA assessment of efficient ballast cleaning allowance for the 2014 DAU
- treatment of the ballast impairment charges for the 2014 DAU

Baseline condition of Aurizon Network's ballast

As noted previously, in August 2013, Evans & Peck completed a condition-based assessment of the CQCN. This was a collaborative project between Aurizon Network and the QCA. The assessment identified that the track condition for the CQCN was generally good and it did not conclusively suggest that significant remedial work was needed for ballast.

Aurizon Network has provided us with confidential information about its ballast cleaning performance during UT3 using its Ground Penetrating Radar (GPR) results.²⁹⁰ It shows that in

²⁹⁰ Aurizon Network, Information Sharing Management of Ballast and Asset Matters for the QCA, 11 March 2014 sub. no. 119

2011-12, the Blackwater and Moura systems were close to or within its satisfactory range, although the Goonyella and Newlands systems still need work. We note Aurizon Network made progress in improving ballast quality in the Goonyella system in the relevant period, whilst increasing tonnage at the same time.

On the other hand, SKM noted significant contamination on the CQCN.²⁹¹ This is a repeated theme through the maintenance submission.

Based on the evidence we have for the Draft Decision, we do not consider it to be conclusive to suggest the condition of the ballast in the CQCN is one of significant deterioration.

We also consider the continued use of GPR will generate a robust objective data set that can be used to enhance knowledge of the condition of the ballast and how this changes over time.

Identifying efficient scope for ballast cleaning

A critical element in identifying an efficient scope for ballast cleaning is having a clear and transparent understanding of what the appropriate intervention rate is, how this has been calculated and why it is considered efficient. In general terms, the intervention rate defines a tonnage threshold for a particular track network. This defines the cleaning cycle time for ballast cleaning for the relevant track. This, in turn, defines the scope in terms of the amount of track that has to be cleaned each year.

Example

Assume a network 100km long that transports 200 million tonnes of coal annually.

If the intervention frequency is 800 million tonnes, the 100 km of track would have a cycle cleaning time of 4 years (800 million tonnes divided by 200 million tonnes). Spreading the cleaning task equally across the four-year cycle would require 25 km to be cleaned each year.

Effectively for a given annual tonnage, the lower the intervention frequency, the shorter the cycle cleaning time and the greater the amount of cleaning.

With respect to Aurizon Network's submission, it has been difficult for us to determine exactly how the scope of ballast cleaning for UT4 has been determined, and more importantly, whether the scope proposed by Aurizon Network for the 2014 DAU is efficient for the period.

Aurizon Network has provided us with a range of material on how the ballast cleaning scope for the 2014 DAU was determined. This includes references to a number of different methodologies, some of which seem inconsistent.

As some of this material has been provided on a confidential basis, we have not provided the details in this Draft Decision. **Table 62** below sets a summary of the different methodologies for determining the ballast undercutting scope for the 2014 DAU, as referred to be Aurizon Network.

²⁹¹ SKM 2013 DAU, January 2014(a): 75

Table 62 Different methodologies referred to be Aurizon Network in relation to its UT4 ballast cleaning scope

| <i>Scope developed to reflect</i> | <i>Discussion</i> |
|---|---|
| Intervention frequency based on the GPR Data | <p>Aurizon Network advised the ballast cleaning scope for UT4 has taken account of an estimated intervention level indicated by the use of GPR that is based on an intervention level for its Network Strategic Asset Plan.²⁹² Aurizon Network has indicated it is confident this is a prudent and efficient level of intervention.</p> <p>Aurizon Network has not clearly identified how it has taken account of the scope for the existing state of the ballast for turnouts. Aurizon Network appears to have included work which needs to occur immediately plus its assessment of the number of turnouts to be cleaned on an annual basis.²⁹³ This would suggest that the intervention rate has an element of corrective ballast undercutting within it.</p> |
| Previous (more frequent) intervention frequency than the rate estimated using the GPR | <p>Aurizon Network's, supporting material, including an Evans & Peck report, is based on a ballast cleaning rate at a level more frequent than that determined by Aurizon Network using GPR.²⁹⁴</p> <p>Aurizon Network has advised that this previous intervention level (pre-GPR) is now outdated and not used for the 2014 DAU. However it appears from our review of the submissions and information provided by Aurizon Network that its long term maintenance forecast continues to use this intervention rate.²⁹⁵ Our understanding is that this intervention rate also includes an element of corrective ballast undercutting.</p> <p>Our review also suggests that the ballast cost projections for the 2014 DAU period appear to align with the long term forecast series provided to us for UT4.²⁹⁶ We are of the view that this may imply that the actual cost proposals for ballast undercutting in Aurizon Network's UT4 submission may not actually be based on the GPR intervention rate but the pre-GPR intervention rate.</p> |
| Increasing the production levels of the ballast cleaning machine | <p>The final approach to developing a scope for ballast undercutting referred to, but not specifically linked to the intervention rate approach. Aurizon Network's supporting material appears to indicate it plans to complete more ballast cleaning in the 2014 DAU period than for UT5.²⁹⁷</p> <p>SKM advised us it had not been provided with a build up of how the scope had been developed. Instead, it understood the scope for the 2014 DAU was based around increasing the production levels of the existing ballast cleaning machine in order to manage historical and new volume levels of ballast fouling.</p> |

²⁹² Aurizon Network, 2013 DAU, sub. no. 33:

²⁹³ Aurizon Network, 2013 DAU, sub. no. 33:7

²⁹⁴ Aurizon Network, 2013 DAU, sub. no. 18:2–3

²⁹⁵ Aurizon Network, June 2014

²⁹⁶ Evans & Peck, CQC Independent Forecast of Asset Maintenance and Renewal Costs, FY2018–2033 (December 2013), Commercial-in-Confidence

²⁹⁸ Aurizon Network - Asset Renewal and Maintenance, QCA and SKM Briefing 22 August 2013; Aurizon Network 2013 DAU, sub. no. 4: 122

Table 62 indicates that Aurizon Network has not clearly identified how it developed its ballast undercutting scope. Moreover, there are inconsistencies between the different methodologies that Aurizon Network has referenced. Such features undermine our confidence in the submissions made by Aurizon Network on these issues.

From the perspective of assessing the efficiency of Aurizon Network's proposals, we are of the view that the key points are:

- As there is inconclusive evidence that there is a substantial need for corrective ballast undercutting in the 2014 DAU period, the most efficient scope appears to be that generated by the analysis of the GPR results, notwithstanding the possibility that this may include an element of corrective ballast undercutting
- Despite this, there appears to be a strong possibility that Aurizon Network's UT4 submission with respect to the costs associated with ballast undercutting are based on Aurizon Network's pre-GPR intervention rate.

Other things being equal, as the GPR intervention rate leads to longer cleaning cycle times relative to the pre-GPR intervention rate, this implies a potential overestimation of ballast undercutting costs in Aurizon Network's 2014 DAU proposals.

Extent to which Aurizon Network's proposed 2014 DAU cost are efficient

As noted above, our view is there is inconclusive evidence of a substantive need for corrective ballast undercutting for the 2014 DAU period.

Based on our understanding of Aurizon Network's submissions, we also consider the GPR intervention rate the most appropriate to adopt for the 2014 DAU. This rate is based on Aurizon Network's estimate of the efficient level of ballast undercutting.

However, we are of the view the proposed costs provided in Aurizon Network's submission seem to be based on the pre-GPR intervention frequency. Our review of Aurizon Network's cost estimates indicate that the significant increase in costs for the 2014 DAU are being driven by upgrading the ballast cleaning machine and the purchase of extra spoil wagons in order to address ballast fouling levels over the 2014 DAU period.²⁹⁸

Importantly, the evidence before us leads us to the conclusion that at least some part of the forecast cost increases costs for the 2014 DAU arises from a significant ramping-up of ballast undercutting to account for a perceived need for corrective ballast undercutting. We also consider this relates, in part, to previous management decisions by Aurizon Network.

We note Aurizon Network underestimated its ballast cleaning costs (including labour and level of ballast replacement) in UT3 and said this contributed to its under delivery of scope. In addition, it made the commercial decision not to purchase the MSF wagons included in the maintenance allowance for UT3. The decisions made by Aurizon Network during UT3 are factors are all outside the control of Aurizon Network's customers.

Overall, we are not confident that Aurizon Network's proposed ballast undercutting costs are efficient for the 2014 DAU period. Our Draft Decision reflects that we do not have sufficient evidence to convince us that:

- Aurizon Network's proposal reflects an efficient scope of ballast undercutting for the 2014 DAU period, and

²⁹⁸ Aurizon Network - Asset Renewal and Maintenance, QCA and SKM Briefing 22 August 2013; Aurizon Network 2013 DAU, sub. no. 4: 122

- it does not include costs which have already been recovered from customers in previous undertaking periods.

In this respect we note the mixed recommendations from SKM's about the extent to which we consider whether Aurizon Network should be required to bear the cost of non-delivery of ballast undercutting scope from the previous undertaking²⁹⁹ and that the allowable maintenance cost not be reduced, since this will only result in a reduction in the scope of maintenance task which will have longer term impacts on network quality.

As indicated in our assessment approach in **Table 60**, we do not consider Aurizon Network should be permitted to include in the current period the costs of any corrective ballast undercutting to the extent that Aurizon Network pre-recovered costs for such undercutting in previous periods but did not deliver the associated scope of work.

In this regard, we consider the issue of recovering the costs of corrective maintenance to be a separate consideration to that of the level of corrective maintenance that may be required to maintain long term network quality. From this perspective, we do not consider our view to be inconsistent with that of SKM, ie. that Aurizon Network should complete the maintenance task necessary, including any corrective maintenance, to maintain network quality.

QCA assessment of the efficient ballast cleaning allowance for the 2014 DAU period

As Aurizon Network has claimed confidentiality over the scope and intervention levels being used for the 2014 DAU, this limits our ability to disclose our assessment. The key proposals in making our assessment are:

- we consider that there is inconclusive evidence that substantive corrective ballast undercutting is required in the 2014 DAU period.
- the cost of any corrective ballast undercutting required in the 2014 DAU period which pertains to previous undertaking periods should be met by Aurizon Network, rather than its customer base having to provide further funding (and hence, paying twice)
- the GPR intervention rate should be used in assessing the costs of ballast undercutting, rather than the pre-GPR intervention rate which appears to have been adopted.

Against this background, we propose a reduction in the ballast cleaning allowance for the 2014 DAU period as shown in **Table 63** (below). We have derived these figures based on the information available to us and using the approach outlined in **Appendix E**.

Table 63 Estimated ballast undercutting allowance for UT4, based on reducing Aurizon Network's cost estimates to reflect efficient scope (\$2011–12 million)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|--------------|--------------|--------------|--------------|
| Aurizon Network proposed ballast cleaning allowance | 62.83 | 73.23 | 74.57 | 75.26 |
| QCA proposed adjustments | (20.94) | (24.41) | (24.86) | (25.09) |
| QCA adjustments for volumes | 6.09 | (4.39) | 0.27 | (1.61) |
| QCA proposed ballast costs (\$2011-12) | 47.98 | 44.43 | 49.98 | 48.56 |
| QCA proposed ballast costs (nominal)¹ | 50.70 | 48.12 | 55.49 | 55.62 |

Notes: (1) based on our forecast MCI and CPI.

²⁹⁹ SKM 2013 DAU, January 2014(a): 75

If Aurizon Network is able to provide better information on how it has built up its 2014 DAU cost and scope proposal, particularly identifying the extent to which its proposal includes corrective maintenance, we will review this information for our final decision. We are also of the view that for the purposes of transparency and to encourage informed debate it would be beneficial if information regarding ballast cleaning was not confidential. In this manner, we can better test the information with third parties to determine its veracity.

In reaching our Draft Decision on ballast undercutting costs, we have had regard to all of the factors in section 138(2), and note that these factors do not justify a decision that would allow Aurizon Network to recover costs more than once. Our analysis of the relevant factors is set out earlier in this chapter.

QCA Draft Decision

6.1 We refuse to approve Aurizon Network's proposed ballast cleaning costs for the 2014 DAU. We consider we would accept a ballast cleaning allowance for the 2014 DAU, consistent with Table 63.

6.3 Treatment of UT3 RAB impairment – ballast undercutting

6.3.1 Aurizon Network proposal

Aurizon Network has proposed that:

Until a full analysis has been undertaken and an appropriate regime designed for managing fouling that appropriately imposes costs on the parties that cause spillage, Aurizon Network's proposal is that the impairment charge imposed in UT3 be reversed through an adjustment.³⁰⁰

Aurizon Network has proposed a \$43.4 million (\$2012-13) adjustment to the 2014 DAU revenue allowance to recover the net costs associated with the asset base impairment charges and ballast undercutting costs incurred over UT3.

Aurizon Network says there are three key principles it considers are fundamental to the assessment of whether an impairment to its RAB could reasonably have been applied:

- in imposing a penalty on the network provider for an action (or perceived failure to act) consideration can only be given to matters that are or were within the direct scope of responsibility of the network provider
- an assessment of historical management decisions should be based on relevant information and standards that were available at the time the decision was made
- the consequences of decisions made by the business should have been reasonably foreseeable at the time.³⁰¹

Aurizon Network also said it does not consider it reasonable that impairment charges are applied until a detailed cost benefit analysis has occurred. It said the analysis should be directed at ensuring the maintenance cost associated with removing and managing coal fouling are appropriately attributable to the beneficiaries of the practices leading to spillage, taking account the costs which have been avoided from that spillage.³⁰²

³⁰⁰ Aurizon Network 2013 DAU, sub. no. 3: 45

³⁰¹ Aurizon Network 2013 DAU, sub. no. 3: 44

³⁰² Aurizon Network 2013 DAU, sub. no. 3: 44

Within the context of the previous principles outlined by Aurizon Network it also said it was unreasonable for the UT3 adjustment to be made because:

- it does not have direct control over the factors that lead to coal spillage and this function is not necessarily its primary responsibility
- it did not take into account the information and standards available to management at the time
- it was not reasonably foreseeable that the RAB would be reduced for management's failure to observe the relevant standard in relation to coal fouling, and no past maintenance failure had occurred so the 2001 decision is not relevant
- the application of the Hunter Valley as a comparator for the purposes of assessing the efficiency of ballast cleaning was inappropriate.

Efficiency of its past maintenance practice

Aurizon Network says since the decision in 2001 (UT1), it has undertaken the required amount of ballast cleaning which was commensurate with:

- the condition of the asset as it existed at the time of the original DORC valuation
- the increased train movements and therefore the reduction in the intervention cycle
- the rate of coal spillage associated with the loading and unloading practices over the period
- accepted standards for maintenance intervention.³⁰³

On 11 March 2014, Aurizon Network provided us with a confidential submission on *'Management of Ballast Fouling in the CQCN, A review of ballast management 2010–2017'*. Amongst other things, the submission outlines Aurizon Network's approach to the management of ballast fouling, with the submission indicating Aurizon Network has made considerable progress over the UT3 in better understanding the management of this part of its network.

6.3.2 Stakeholders' comments

Stakeholders said Aurizon Network's arguments in favour of reversing the asset impairment were not well founded or justified, nor do they provide an adequate rebuttal of the original reasons for reducing the value of the RAB.³⁰⁴

Stakeholders also said it may be appropriate to further write down Aurizon Network's RAB to reflect deterioration of the ballast due to non-delivery of scope during UT3.³⁰⁵ BMA/BMC considered Aurizon Network's RAB should be reduced to reflect the condition of the network, and that costs incurred to restore the assets should then be capitalised.

6.3.3 QCA analysis and Draft Decision

When assessing Aurizon Network's proposal that we reverse the RAB impairment from UT3, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our Decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to the proposed reversal of the UT3 RAB impairment.

³⁰³ Aurizon Network, 2013 DAU, sub. no. 3: 64

³⁰⁴ QRC, 2013 DAU, sub. no. 70: 1–2

³⁰⁵ QRC 2013 DAU, sub. no. 70:1–2

Our Draft Decision is:

- Aurizon Network has not provided sufficient evidence to support the impairment charge attributable to the UT3 period being reversed
- subject to the overall package of proposals we have included in the Draft Decision for ballast cleaning, the ballast impairment charge associated with the 2014 DAU period (but not other), not be continued.

Specifically, in our UT3 Final Decision, we said we would consider reversing the ballast impairment decision if Aurizon Network could demonstrate:

- it had adopted an efficient approach to maintaining a sound ballast (whether through ballast cleaning and/or fouling prevention), and
- its past approaches to ballast fouling had been cost effective.

These matters are discussed below, along with a summary of our overall view of the issues raised by Aurizon Network.

[Has Aurizon Network adopted an efficient approach to maintaining a sound ballast cleaning regime?](#)

Aurizon Network said its past approach to maintaining its ballast has been efficient. However, we consider that Aurizon Network has provided us with little evidence to support this assertion.

We note Aurizon Network's submission says that, since the UT1 decision in 2001, it has undertaken the required amount of ballast cleaning which was commensurate with:

- the condition of the asset as it existed at the time of the original DORC valuation
- the increased train movements and therefore the reduction in the intervention cycle
- the rate of coal spillage associated with the loading and unloading practices over the period
- accepted standards for maintenance intervention.³⁰⁶

However, if this has been the case we do not consider there should be any need for the proposed 90% increase in ballast cleaning costs for the 2014 DAU period, which was outlined earlier in this chapter. Further, we should not be seeing a theme, also discussed earlier in this chapter, of there being a need to increase ballast cleaning in UT4, except to deal with a change in coal volume.

We note that, it is evident from Aurizon Network's confidential submission on 11 March 2014, that Aurizon Network is much better placed to manage ballast cleaning in the future. The use of GPR appears to be providing valuable information into the performance of the ballast asset, where to best provide ballast cleaning and a better understanding of the relationship between tonnes being railed and the associated rate of ballast cleaning required.

However, we do not consider Aurizon Network has sufficiently evidenced it had an efficient approach to maintaining a ballast cleaning regime prior to UT3. As such, we are not of the view that the UT3 decision in relation to the impairment charge should be reversed.

³⁰⁶ Aurizon Network, 2013 DAU, sub. no. 3: 64

Has Aurizon Network's past approaches to ballast fouling been cost effective?

In considering whether Aurizon Network's approach to maintaining a sound ballast has been cost effective we are of the view that it is important to clarify Aurizon Network's role in respect of ballast fouling. In this regard, we consider Aurizon Network's role is:

- to provide the requisite level of ballast cleaning necessary to maintain the CQCN and to do so in an efficient manner from a cost and scope perspective
- to provide information to supply chain participants about ballast cleaning costs so they can make informed decisions including trade-offs about coal fouling and maintenance cost.

In this context, we note that Aurizon Network's discussion about whether it was more cost effective at the time to over-fill wagons and incur higher ballast cleaning costs at a later date does not specifically deal with the issue of whether Aurizon Network was undertaking adequate ballast cleaning. Further, Aurizon Network has not shown evidence that deferring maintenance was agreed with access holders at the time.

Instead, Aurizon Network has suggested:

Should stakeholders consider Aurizon Network has obtained a benefit for which it should make some contribution, or is expected to incur inefficient maintenance costs from not seeking to impose additional costs on the supply chain, then Aurizon Network considers it reasonable that stakeholders should be willing to fund the necessary studies required to undertake that cost benefit analysis.³⁰⁷

We consider that this statement seems at odds with Aurizon Network's view that it has undertaken an efficient level of ballast cleaning since 2001. We also note that Aurizon Network has not provided us with evidence to indicate its maintenance approach prior to UT3 was cost effective or adequate given the rate of ballast fouling occurring.

For the future, we note Aurizon Network has been working with supply chain participants to reduce coal spillage under the Coal Dust Management Plan (CDMP). It has also developed a Coal Loss Management Plan (which includes coal veneering) which it estimates will reduce ballast fouling by up to 10%.³⁰⁸ We note there are still a number of other options which could reduce ballast fouling, although the work has not occurred to determine if mitigation measures are cost effective.

Overall, we do not consider Aurizon Network has provided sufficient evidence to demonstrate that its approach to ballast cleaning (prior to UT3) was cost effective. As such, we are of the view that the UT3 decision should not be reversed.

Summary of matters raised by Aurizon Network

In addition to the issues discussed above, Aurizon Network's submission raised a number of further concerns around the process that was applied for UT3 in arriving at the decision to impair the RAB, and which it considers we should take into consideration in considering its proposal to reverse the impairment. **Table 64** provides a summary of our response to these concerns and those previously discussed.

³⁰⁷ Aurizon Network, 2013 DAU, sub. no. 3: 67

³⁰⁸ Aurizon Network, 2013 DAU, sub. no. 4: 91

Table 64 QCA response to other issues raised by Aurizon Network in respect of the ballast impairment charge

| <i>Aurizon Network view</i> | <i>QCA response</i> |
|---|---|
| In imposing a penalty on the network provider for an action (or perceived failure to act) consideration can only be given to matters that are or were within the direct scope of responsibility of the network provider. | <p>Since 2001, Aurizon Network has operated in a regulatory framework based on an <i>ex ante</i> assessment of its efficient maintenance costs.</p> <p>We consider Aurizon Network is responsible for providing the requisite level of ballast cleaning necessary to maintain its assets at an efficient scope and cost.</p> <p>We can see no reason why Aurizon Network should not be held accountable for delivering, or otherwise, an efficient ballast cleaning program.</p> |
| An assessment of historical management decisions should be based on relevant information and standards that were available at the time the decision was made. | Aurizon Network has not provided us with information to indicate its ballast cleaning approach prior to UT3 was cost effective or adequate given the rate of ballast fouling. Accordingly, we cannot assess whether the historical decisions were based on information and standards available at the time of the decision. |
| The consequences of decisions made by the business should have been reasonably foreseeable at the time. | <p>As Aurizon Network operates in an <i>ex ante</i> assessment environment, we consider it should understand the risks (and potential benefits) of having its ballast cleaning allowances agreed at the commencement of a regulatory period.</p> <p>We can see no reason why Aurizon Network should have formed a view it should not be held accountable for delivering, or otherwise, an efficient ballast cleaning program.</p> <p>We consider it reasonably foreseeable for the business to bear the consequences of its decisions and for one of those consequences be that it is held accountable.</p> |
| <p>It is not reasonable that impairment charges are applied until a detailed cost benefit analysis has occurred.</p> <p>The analysis should be directed at ensuring that the maintenance cost associated with removing and managing coal fouling are appropriately attributable to the beneficiaries of the practices leading to spillage, taking account the costs which have been avoided from that spillage.</p> | Aurizon Network has not provided an objectively justified cost benefit analysis to explain and support its proposition. |
| It does not have direct control over the factors that lead to coal spillage and this function is not necessarily its primary responsibility. | We agree Aurizon Network does not have direct control over coal spillage. We consider Aurizon Network's primary role is to ensure an efficient level of ballast cleaning is occurring to deal with coal spillage. |
| The QCA did not take into account the information and standards available to management at the time. | We consider it the role of Aurizon Network to provide sufficient information to allow the QCA (and its engineers) to make a fully informed decision. |
| It was not reasonably foreseeable that the RAB would be reduced for management's failure to observe the relevant standard in relation to coal fouling. | <p>We note Aurizon Network's recognition of the role of management failure in observing the relevant standard in relation to coal fouling.</p> <p>We are of the view that it is not unreasonable for Aurizon Network to expect that management failure will be addressed through the regulatory framework.</p> |

| <i>Aurizon Network view</i> | <i>QCA response</i> |
|---|--|
| | In this context, the QCA could have either reduced the RAB or reduced the maintenance allowance to an efficient level to achieve the same financial outcome. Providing the requested maintenance allowance, but reducing the RAB was intended to provide Aurizon Network with signal that the QCA considered addressing ballast maintenance to be an important priority. |
| The application of the HVCN as a comparator for the purposes of assessing the efficiency of ballast cleaning was inappropriate. | For UT3, the QCA applied the benchmark costs of the HVCN, considering it to be the best available information at the time about what an efficient cost benchmark should be. |

QCA conclusion on reversal of ballast impairment charge in respect of UT3

We note stakeholders' view that Aurizon Network's arguments for reversing the asset impairment were not well founded or justified, nor do they provide an adequate rebuttal of the original reasons for reducing the value of the RAB.³⁰⁹ We share this view for the reasons identified in detail below.

Overall, we do not consider Aurizon Network has provided sufficient evidence to satisfy us that our UT3 decision to impair the RAB while the ballast costs reflected corrective maintenance, should be reversed. Specifically, we do not consider Aurizon Network has provided sufficient evidence to show its ballast maintenance approach prior to UT3 was cost effective or efficient. For this reason we do not propose to accept Aurizon Network's proposal to reverse the UT3 ballast impairment charge in respect of the UT3 period.

In forming this view, we have had regard to all of the factors in section 138(2). Specifically, we do not consider that the legitimate business interests of Aurizon Network (which we have considered in accordance with section 138(2)(b)), nor the pricing principles in section 168(A)(a) of the QCA Act (which we have considered in accordance with section 138(2)(g)), nor any other factor justifies a decision that allows Aurizon Network to avoid responsibility for failing to provide the requisite level of ballast cleaning for the CQCN in previous regulatory periods. We have also not seen evidence that deferring maintenance work was agreed with access holders at the time.

We have also considered the effect of excluding existing assets for pricing purposes, in accordance with section 132(f) of the QCA Act. However, we do not consider section 132(f) of the QCA Act to mean that an access provider should be allowed to avoid accountability for the provision of a service and, in this context, for failing to provide the requisite level of ballast cleaning in a previous regulatory period.

We are also satisfied that our decision to retain the impairment charge aligns with the interests of access seekers and holders (which we have considered in accordance with s 138(2)(e)) and the broader public interest (which we have considered in accordance with s 138(2)(d)).

³⁰⁹ QRC, 2013 DAU, sub. no. 70: 1–2

Draft Decision

6.2 Our Draft Decision is to refuse to approve Aurizon Network's proposal that we reverse the ballast impairment charge attributable to the UT3 period. We consider that the 2014 DAU should remove this proposal.

Treatment of the ballast impairment charge for the 2014 DAU period

While we consider there is a case to continue the ballast impairment charge from UT3 into the 2014 DAU period, our preferred approach to dealing with efficient ballast undercutting costs in the 2014 DAU period is through an adjustment to the ballast undercutting cost allowance as discussed above.

Given this decision we propose the ballast impairment charge associated with the 2014 DAU period be reversed, noting that it is being considered as the overall package of measures for ballast cleaning for the 2014 DAU. This increases Aurizon Network's MAR by \$90.5 million over the 2014 DAU period, compared to our UT3 Final Decision that the ballast impairment charge should be continued for the 2013-14 to 2016-17 period.

If for the Final Decision on the 2014 DAU we consider it appropriate to change our approach to the proposed ballast undercutting costs, this may impact on our view of how the ballast impairment should be treated.

Table 65 QCA estimated revenue impact of removing the ballast impairment charges applied in UT3 for the 2014 DAU period only (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|--|---------|---------|---------|---------|
| Revenue impact of reversing ballast impairment charge for the 2014 DAU period only | 23.02 | 22.77 | 22.50 | 22.21 |

Source: QCA analysis

Draft Decision

6.3 We propose to approve Aurizon Network's proposal that the ballast impairment charge associated with the 2014 DAU period (but not other) be reversed.

6.4 Is ballast undercutting renewals or maintenance expenditure?

6.4.1 Aurizon Network proposal

Aurizon Network has included its ballast undercutting costs in its maintenance allowance.

6.4.2 Consultant's assessment

SKM noted that Aurizon Network's renewals policy suggests the age of ballast is used to estimate when ballast should be treated as renewals expenditure. However, SKM noted that in practice, on a particular stretch of track it is difficult for Aurizon Network (or an independent auditor) to confirm this in most cases (particularly because a portion of the ballast could have been replaced during punctual maintenance activities or small sections could have been replaced after a flood event).

SKM suggested that suitable 'cut off' points for renewals rather than maintenance expenditure could be:

Length (i.e. a ballast replacement activity could be deemed a renewal/capital task based on the length of ballast being replaced): a suitable length could be 50m. The length replaced would depend on machinery, resources and time available to perform the task (ballast renewal work will be undertaken during a line closure or possession); and

The required use of the ballast undercutting/cleaning machines.³¹⁰

6.4.3 Stakeholders' comments

BMA/BMC considered Aurizon Network's RAB should be reduced to reflect the condition of the network, and that costs incurred to restore the assets should then be capitalised.

6.4.4 QCA analysis and Draft Decision

For the 2014 DAU, we have considered whether the costs of ballast undercutting, which includes significant replacement of the actual ballast, should be treated as:

- renewals expenditure, with the costs recovered from access holders over the useful life of the ballast; or
- maintenance expenditure, with the costs recovered from access holders in the year the expenditure is incurred.

For 2014 DAU pricing purposes, we have taken the view ballast undercutting costs should continue to be included as part of the maintenance expenditure allowance.

However, we note that the costs of ballast undercutting have many of the features which would be considered to be renewals expenditure. We intend to keep the issue of whether ballast undercutting being treated as renewals expenditure open for consideration for UT5.

6.5 Summary

Our Draft Decision on ballast undercutting costs for the 2014 DAU is summarised in **Table 66**. We have proposed a reduction to Aurizon Network's submitted ballast undercutting costs, because we are unconvinced Aurizon Network's submitted scope and costs reflect the efficient costs for providing this service for the CQCN.

Table 66 QCA Draft Decision 2014 DAU ballast undercutting costs (\$ million, nominal)

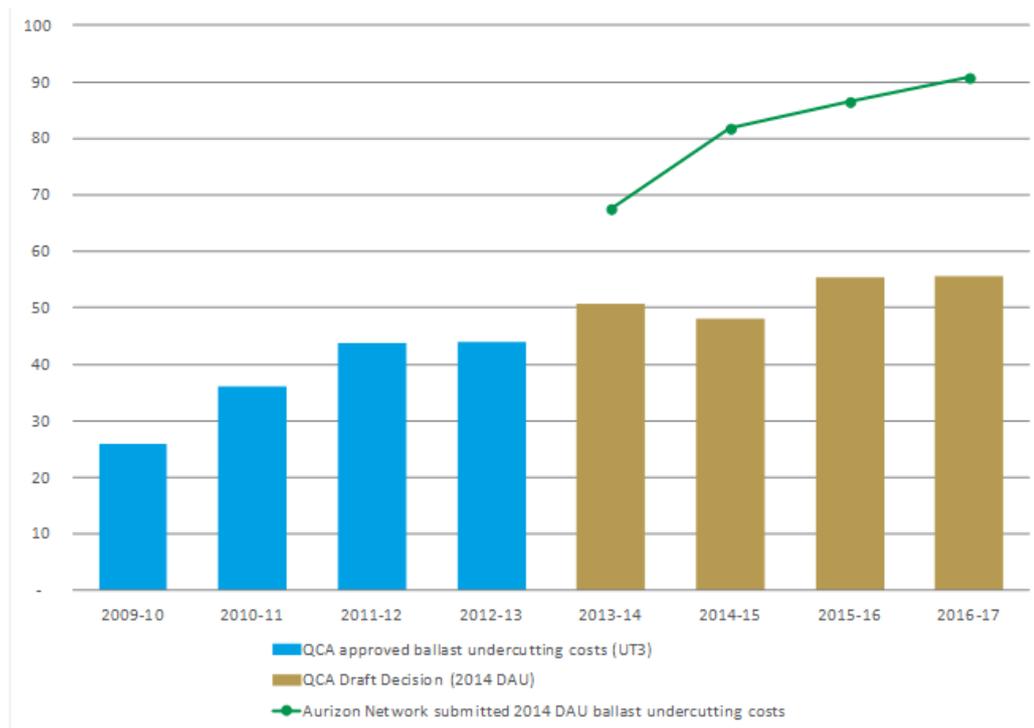
| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|--------------|--------------|--------------|--------------|
| Total ballast undercutting costs | 50.70 | 48.12 | 55.49 | 55.62 |

Source: QCA analysis

While we refuse to approve Aurizon Network's submitted ballast undercutting costs for 2014 DAU, we have accepted an increase in the proposed ballast undercutting costs compared to UT3 (**Figure 27**). We also propose the ballast impairment charge associated with the 2014 DAU period (but no other) be reversed.

³¹⁰ SKM, 2013 DAU, File note May 2014

Figure 27 Ballast undercutting costs over the UT3 and 2014 DAU periods (\$ million, nominal)



Source: QCA analysis

7 OPENING ASSET VALUE

The opening asset value of the regulatory asset base (RAB) for UT4 is derived via the roll-forward process in accordance with section 1.2 of Schedule A of the 2010 Undertaking (UT3). The roll-forward process reflects:

- indexation for inflation using the CPI (All-Groups Brisbane)
- depreciation, applying the asset lives and depreciation profile approved by the QCA
- adjustments for disposals and transfers of assets in the RAB
- the inclusion of UT3 capital expenditure that has been approved by the QCA, based on the final balance of the capital expenditure carryover account.

7.1 Opening asset base (RAB roll-forward)

7.1.1 Aurizon Network proposal

Aurizon Network's RAB for the 2014 DAU is to be rolled forward as per the proposed 2014 DAU Schedule E, clause 1.1., for which the opening balances are rolled forward consistent with clause 1.2, Schedule A of the 2010 AU.

Aurizon Network's 2013 DAU proposed an opening asset value of \$4.90 billion as at 1 July 2013. This was subsequently revised to \$4.86 billion following approval of Aurizon Network's 2011–12 capital expenditure (October 2013), RAB roll-forward (December 2013) and 2012–13 capital expenditure (May 2014) (see **Table 67**).

Table 67 Aurizon Network's opening asset value for the 2014 DAU (\$'000, nominal)

| | <i>UT3 roll-forward - closing value</i> | | | | <i>Opening value 2014 DAU</i> |
|----------------------------------|---|------------------|------------------|------------------|-------------------------------|
| <i>Non-electric</i> | <i>2009–10</i> | <i>2010–11</i> | <i>2011–12</i> | <i>2012–13</i> | <i>2013–14</i> |
| Blackwater | 1,078,532 | 1,083,433 | 1,082,823 | 1,103,347 | 1,103,347 |
| Rolleston | 238,756 | 235,676 | 225,503 | 225,339 | 225,339 |
| Minerva | 74,338 | 74,021 | 71,507 | 69,669 | 69,669 |
| Goonyella | 1,234,808 | 1,313,681 | 1,300,032 | 1,315,228 | 1,315,228 |
| Vermont | 48,132 | 47,627 | 45,320 | 43,421 | 43,421 |
| GAPE | – | – | 900,346 | 984,848 | 984,848 |
| Moura | 255,373 | 256,614 | 251,472 | 251,089 | 251,089 |
| Newlands | 164,217 | 164,659 | 312,586 | 341,261 | 341,261 |
| Total Non-Electric Assets | 3,094,157 | 3,175,711 | 4,189,589 | 4,334,202 | 4,334,202 |

| <i>Electric</i> | 2009–10 | 2010–11 | 2011–12 | 2012–13 | 2013–14 |
|------------------------------|----------------|----------------|----------------|----------------|----------------|
| Blackwater | 140,731 | 129,352 | 291,605 | 284,040 | 284,040 |
| Goonyella | 236,545 | 246,573 | 233,754 | 227,084 | 227,084 |
| Vermont | 8,803 | 8,646 | 8,228 | 7,883 | 7,883 |
| GAPE Electric | – | – | – | 4,421 | 4,421 |
| Total Electric Assets | 386,061 | 384,552 | 533,587 | 523,428 | 523,428 |

Source: QCA analysis. Notes: Numbers may not sum due to rounding. There are minor differences between the RAB values in this table and those used to develop prices for the Minerva, GAPE and Newlands systems. Appendix D provides the full details of these adjustments.

7.1.2 Legislative framework

We are required to assess Aurizon Network's RAB proposal having regard to all of the criteria in section 138(2) of the QCA Act, which are as set out in the 'Role of the QCA' section of this Draft Decision. In the context of assessing Aurizon Network's opening asset value proposal, we must have regard to the factors listed in section 138(2) and give them an appropriate level of weighting, as identified in Section 2.1.2 of this Draft Decision.

Against this background we consider:

- sections 138(2)(a), (b), (d), (e), (g) and (h) should be given more weight, as identified below
- section 138(2)(g) refers to the pricing principles mentioned in section 168A, of which we consider sections 168A(a), (c) and (d) should be given more weight, as identified below
- sections 138(2)(c), 138(2)(f) and 168A(b) should be given less weight as they are less practically relevant to our assessment of the opening asset value.

We have considered Aurizon Network's proposal for the roll-over of its existing RAB in the context of the above with respect to the extent that it reflects prudently incurred infrastructure investment and appropriate allocation of the costs associated with the existing RAB.

Prudent and efficiently incurred infrastructure investment

Sections 69E and 138(2)(a) of the QCA Act require that we have regard to the object of Part 5 of the QCA Act, namely to promote the economically efficient operation, use of and investment in the CQCEN, as the significant infrastructure by which the declared service are provided.

Sections 138(2)(g) and 168A(a) require that we have regard to certain pricing principles, including that the price for access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and including a return on investment commensurate with regulatory and commercial risks involved.

To meet these objectives, the return on, and of, capital must reflect prudent and efficiently incurred infrastructure investment in the CQCEN. In broad terms, we consider, pursuant to section 138(2)(b) of the QCA Act, that the legitimate interests of Aurizon Network will be met if it is permitted to recover at least a regulated return on capital and the depreciation allowance associated with prudently and efficiently incurred infrastructure investment in the CQCEN that meets its legal obligations.

Conversely, sections 138(2)(e) and (d) require us to have regard to the interests of access seekers and the public interest. We also consider that the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already 'access seekers' under

section 138(2)(e). As identified earlier, consideration of all of these interests leads to a conclusion that Aurizon Network should be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the objective of Part 5 specified in section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its downstream operations—which could otherwise raise concerns under section 168A(c). The need for costs to be minimised is also particularly important in light of the current adverse economic climate in Queensland mining industry, so is in the public interest under clause 138(d).

A further additional factor relevant to our assessment of Aurizon Network's existing RAB is that, where possible, an approach should be adopted which provides for regulatory certainty. We have had regard to this factor pursuant to section 138(2)(h) of the QCA Act. We support a stable and predictable regulatory environment for Aurizon Network; an environment in which there are changes to methodology only where there is a clear case for such changes.

7.1.3 Stakeholders' comments

Stakeholders did not comment on Aurizon Network's proposed opening asset value.

7.1.4 QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's opening asset value model, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to Aurizon Network's opening asset value model.

We have reviewed Aurizon Network's opening asset value model and our Draft Decision is to approve it, having considered:

- the 2011–12 RAB roll-forward approved in December 2013
- the capital expenditure of \$226.4 million (nominal) in 2012–13, based on the claim submitted by Aurizon Network in December 2013 and approved by the QCA in May 2014³¹¹
- the calculations being consistent with the requirements in the 2010 undertaking (UT3) for:
 - actual indexation at CPI (Brisbane All Groups)
 - depreciation and approved asset lives.

The 2013–14 opening RAB reflects the 2012–13 capital expenditure approved and the roll-forward process in UT3 (**Table 67**). We consider that this process achieves the balancing of the factors set out in section 138(2) of the QCA Act that we have previously identified.

³¹¹ On 21 May 2014, the QCA approved Aurizon Network's revised claim of \$226.4 million for 2012-13.

Draft Decision

7.1 We propose to approve Aurizon Network's opening asset base as set out in Table 67 for the 2014 DAU, based on the 2012–13 RAB roll-forward.

7.2 Equity raising costs

Financing costs are incurred by owners in accessing capital for developing an asset. These costs typically include two principle elements:

- interest during construction (IDC) (discussed in Chapter 8)
- up-front financing costs—costs associated with raising debt and equity finance.

Of the two components, IDC is significantly more important, given its relatively greater magnitude. Up-front financing costs are the costs paid to raise the debt and/or equity capital required to finance the project.

7.2.1 Aurizon Network proposal

Aurizon Network has proposed that we approve:

- \$5.77 million (\$2012–13) in equity-raising costs in the RAB as at 30 June 2013 in respect of equity raising for UT3³¹²
- future equity-raising costs, as proposed in the 2014 DAU, Schedule E, with these costs to be included in the RAB at the conclusion of a regulatory period.

Aurizon Network said the approved allowable revenues for the UT3 period did not include provision for up-front debt or equity raising costs, because the regulatory cash flows generated sufficient retained earnings to finance the capital expenditure assumed in the capital indicator.³¹³

Aurizon Network considers it reasonable and prudent that an ex-post assessment is performed following approval of the 2012–13 capital expenditure amounts to determine an amount for equity raising in the RAB.³¹⁴

7.2.2 Stakeholders' comments

The QRC said it relies on the QCA to determine whether to include equity-raising costs in the RAB and whether the proposed approach to determining the value to be added is reasonable.³¹⁵

7.2.3 QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's equity raising costs, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to Aurizon Network's equity raising costs.

³¹² Aurizon Network, 2013 DAU, sub. no. 3: 36

³¹³ Aurizon Network, 2013 DAU, sub. no. 3: 35

³¹⁴ Aurizon Network, 2013 DAU, sub. no. 3: 35

³¹⁵ QRC, 2013 DAU, sub. no. 46: 82–83, 85

In this particular case, our Draft Decision is to refuse to approve an ex-post adjustment to the RAB roll-over for UT3 for equity raising costs. This is because we consider this to be a retrospective review of the capital expenditure costs approved for UT3. In particular:

- QR Network, as it was at the time, did not include a proposal for equity raising costs in its UT3 submission.
- Access holders have made commercial decisions, including in respect of projects such as GAPE, without anticipating additional equity-raising costs.

We consider that a retrospective review of the capital expenditure costs approved by UT3 does not achieve an appropriate balancing of the factors set out in section 138(2) of the QCA Act as it is biased in favour of the interests of Aurizon Network as the access provider, to the detriment of access seekers and the public interest.

However, we are giving consideration to the merits of allowing for equity-raising costs for capital expenditure in the 2014 DAU period, and in what circumstances this may be appropriate. We intend to address the issue of equity-raising costs for the 2014 DAU period in the next Draft Decision, in the context of our assessment of Schedule E, 2014 DAU.

Draft Decision

7.2 We refuse to approve inclusion of \$5.77 million in equity-raising costs in respect of UT3 in the regulatory asset base as at 30 June 2013.

8 REGULATORY ASSET BASE (INCLUDING CAPITAL EXPENDITURE)

Aurizon Network is a capital intensive business. The return on, and return of, capital relating to its regulatory asset base (RAB) is a significant component of the reference tariffs for each system in the CQCN.

Aurizon Network's RAB is growing. At the beginning of UT3, Aurizon Network's RAB was around \$3.4 billion with contracted capacity of around 184.7 million tonnes per annum (mtpa).³¹⁶ By the end of UT4, Aurizon Network estimates that its RAB will be around \$6.2 billion, with an infrastructure capacity of around 310 mtpa.³¹⁷

The major projects to be completed over the UT4 period include the Wiggins Island Rail Project (WIRP), the Goonyella Rail Expansion Project (HPX 3) and the Rolleston Rail electrification. Renewals expenditure will also become more significant during UT4, with around \$512 million to be spent over the period.

Aurizon Network's prudent capital expenditure is included in the RAB on an ex post basis. The ex post process means that when determining the RAB for Aurizon Network for the 2014 DAU, we will approve a 'capital indicator' with our assessment on the reasonableness of the projects and expenditure included in the capital indicator. The capital indicator is, in essence, the forecast capital expenditure that is to be included in reference tariffs for the 2014 DAU.

8.1 Proposed forecast capital expenditure (the capital indicator)

8.1.1 Aurizon Network proposal

Forecast capital expenditure – April 2013

Aurizon Network originally proposed a forecast capital expenditure of \$1.95 billion over the four years for its rail systems in the CQCN.³¹⁸ This reflects:

- an 84% increase in forecast capital expenditure to \$1.95 billion, compared to the \$1.06 billion we approved for the 2010 undertaking
- a significant increase in asset renewal expenditure, from an average approved spending of \$17 million per year from 2007 to 2011 to a forecast average of \$120 million per annum for the 2014 DAU
- a change to the approach used to calculate interest during construction.

Aurizon Network's original forecast capital expenditure is included in **Appendix G, Table 109**.

³¹⁶ All dollars in this chapter are nominal unless otherwise indicated.

³¹⁷ Aurizon Network, 2013 DAU, sub. no. 3: 13

³¹⁸ Aurizon Network, 2013 DAU, sub. no. 3: 151

Revised capital expenditure forecast – December 2013

In December 2013, Aurizon Network provided us with an updated capital indicator forecast, as outlined in **Table 68**.

Table 68 Revised capital indicator by system as at December 2013 (\$ million, nominal)

| <i>Non-electric</i> | 2013–14 | 2014–15 | 2015–16 | 2016–17 | Total UT4 |
|---------------------|----------------|----------------|-----------------|----------------|------------------|
| Blackwater | 97.74 | 56.09 | 76.24 | 54.36 | 284.43 |
| Goonyella | 193.97 | 54.08 | 70.36 | 50.28 | 368.68 |
| Moura | 12.85 | 8.35 | 891.02 | 8.40 | 920.61 |
| Newlands | 10.64 | 6.92 | 9.74 | 6.96 | 34.26 |
| GAPE | 18.40 | – | – | – | 18.4 |
| Total | 333.60 | 125.43 | 1,047.34 | 120.00 | 1,626.37 |

| <i>Electric</i> | 2013–14 | 2014–15 | 2015–16 | 2016–17 | Total UT4 |
|-----------------|----------------|----------------|----------------|----------------|------------------|
| Blackwater | 3.73 | 205.63 | 23.71 | 17.00 | 52.42 |
| Goonyella | 4.90 | 59.90 | 33.63 | 22.00 | 120.42 |
| WIRP | – | – | 70.42 | – | 70.42 |
| GAPE | 2.20 | – | – | – | 2.20 |
| Total | 10.83 | 265.53 | 127.76 | 39.00 | 443.12 |

Source: Aurizon Network December 2013 Financial Model. Note: Numbers may not sum due to rounding. These are mid-year values and therefore, do not include return on capital adjustments. These adjustments will be included in the modelling for pricing purposes.

The main change in Aurizon Network's revised capital expenditure forecast was a deferment of the WIRP capital expenditure commissioning date from 2014–15 to 2015–16.

2014 DAU Major projects

Aurizon Network's original proposed major items of capital expenditures are outlined in the **Table 69**.

Table 69 Aurizon Network major capital expenditure projects as at April 2013, (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 | Total UT4 |
|------------------------------------|----------------|-----------------|----------------|----------------|------------------|
| WIRP Stage 1 | – | 907.08 | – | 2.92 | 910.00 |
| Electrical replacements | – | 208.87 | 0.96 | – | 209.83 |
| Power systems upgrades | – | 2.10 | 50.77 | 39.00 | 91.87 |
| System enhancement and reliability | 110.04 | 57.81 | 43.10 | – | 210.95 |
| Total | 110.04 | 1,175.87 | 94.83 | 41.92 | 1,422.66 |

Source: Aurizon Network unpublished information. Note: Numbers may not sum due to rounding. These are mid-year values and therefore, do not include return on capital adjustments. These adjustments will be included in the modelling for pricing purposes.

Asset renewals for the 2014 DAU period

In addition to its significant capital expenditure on major projects, Aurizon Network's 2014 DAU proposal includes a significant increase in forecast asset renewal expenditure, to an average of \$128 million per year. Asset renewal activities involve capital works to replace life expired assets with like for like, rather than to enhance the network capacity.³¹⁹

Aurizon Network's original proposed 2014 DAU renewals expenditure is set out in **Table 70**.

Table 70 Aurizon Network proposed 2014 DAU renewals expenditure as at April 2013 (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|-------------------------|---------------|---------------|---------------|--------------|
| Asset Renewals | 150.30 | 84.2 | 91.5 | 120.0 |
| Telecoms | 0.02 | 0.02 | 0.02 | – |
| Network Control Systems | 31.20 | 15.9 | 18.9 | – |
| Total | 181.52 | 100.12 | 110.42 | 120.0 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 177

In comparison, the amount of asset renewal expenditure approved from 2006–7 to 2010–11 was an average of \$17 million per year, although Aurizon Network submitted a claim for \$85.6 million of asset renewal expenditure in 2011–12.

Aurizon Network said a material increase in asset renewals activity in the 2014 DAU period, compared to previous undertakings, should not be unexpected, given the original asset valuations and remaining asset lives. Aurizon Network said:

*these same track quantities have seen a material increase in tonnages since the original asset valuation and substantially more than was envisaged when the remaining asset lives were initially determined.*³²⁰

Aurizon Network said based on a 30 to 35 year physical asset life, the capital replenishment rate would be in the order of 3% of gross replacement value per annum. Aurizon Network stated the annual renewals rate from 2005–06 to 2011–12 was below 1% per annum. Aurizon Network says the forecast asset renewals for UT4 represent around 2.7% of the opening RAB and is comparable to an average annual depreciation of \$311 million.³²¹

Given a large pool of assets are reaching the end of their original design lives, Aurizon Network considers renewals expenditure will need to increase and may substantially exceed a steady-state capital replenishment rate in the short run, but considers this should translate into longer-term savings in maintenance costs.³²² However, this does not necessarily indicate that there will be an offsetting reduction in maintenance costs in the short run.³²³

In line with this approach, Aurizon Network noted that it is proposing a change in its asset renewal strategy, towards a more constant or smoother expenditure profile, modelled on the practices adopted by US Class 1 railroads.³²⁴ Aurizon Network notes, since adoption of these

³¹⁹ Evans and Peak, December 2013:89

³²⁰ Aurizon Network, 2013 DAU, sub. no. 3: 161

³²¹ Aurizon Network, 2013 DAU, sub. no. 3: 177

³²² Aurizon Network, 2013 DAU, sub. no. 3: 162–163

³²³ Aurizon Network, 2013 DAU, sub. no. 3: 163

³²⁴ Aurizon Network, 2013 DAU, sub. no. 3: 160

practices, US Class 1 railroads have increased their capital expenditure and now spend a relatively consistent amount over time that is more in line with depreciation.³²⁵

Against this background Aurizon Network noted that because it cannot forecast the precise nature, amount and timing of renewals expenditure over the regulatory period, it has used a top-down approach by benchmarking US Class 1 railroads, having regard to the network size, traffic task and renewal requirements in each asset class.³²⁶

Interest during construction

Aurizon Network has proposed changing the type of WACC used in the interest during construction (IDC) calculation for capital expenditure projects. Specifically, Aurizon Network has proposed moving:

- from a post-tax nominal vanilla WACC; to
- a (lower) post-tax nominal classic WACC.

Aurizon Network has proposed that the change deals with the complexity associated with the use of a post-tax nominal vanilla WACC for IDC, because a post-tax nominal vanilla WACC requires the tax deductibility of interest to be reflected in the cash flows.

Aurizon Network says that the complexity arises with the recognition of the tax deductibility of capitalised interest, particularly as recent tax changes allow the tax deductions for capitalised interest to be recognised when incurred.

Aurizon Network says the recognition of this tax deductibility may be difficult where:

- the capitalised interest relates to a project that will have separately identified allowable revenue and tariff components, requiring the carry forward of tax losses for periods prior to its conclusion in the RAB
- a user funder may obtain a tax advantage over Aurizon Network because Aurizon Network does not have the information relevant to the tax deductibility of any financing costs incurred by the user funder. Aurizon Network considered a change to the WACC calculation would solve this issue.³²⁷

8.1.2 Legislative framework

In the context of assessing the capital expenditure and asset renewals of Aurizon Network's RAB, we must have regard to the factors listed in section 138(2) and give them an appropriate level of weighting, as identified in Section 2.1.2 of this Draft Decision.

Against this background, we consider:

- sections 138(2)(a), (b), (d), (e), (g) and (h) should be given more weight, as identified below
- section 138(2)(g) refers to the pricing principles mentioned in section 168A of the QCA Act, of which we consider sections 168A(a), (c) and (d) should be given more weight
- sections 138(2)(c), 138(2) (f) and 168A(b), should be given less weight, as they are not practically relevant to our assessment of Aurizon Network's existing RAB.

³²⁵ Aurizon Network, 2013 DAU, sub. no. 3: 167

³²⁶ Aurizon Network, 2013 DAU, sub. no. 3: 177

³²⁷ Aurizon Network, 2013 DAU, sub. no. 3: 183–184

Prudent and efficiently incurred infrastructure investment

Sections 69E and 138(2)(a) of the QCA Act require that we have regard to the object of Part 5 of the QCA Act, namely to promote the economically efficient operation, use of and investment in the CQCN, as the significant infrastructure by which the declared service are provided.

Sections 138(2)(g) and 168A(a) require that we have regard to certain pricing principles, including that the price for access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and including a return on investment commensurate with regulatory and commercial risks involved.

To meet these objectives, the return on, and of, capital must reflect prudent and efficiently incurred infrastructure investment in the CQCN. In broad terms, we consider, pursuant to section 138(2)(b) of the QCA Act, that the legitimate interests of Aurizon Network will be met if it is permitted to recover at least a regulated return on capital and the depreciation allowance associated with prudently and efficiently incurred infrastructure investment in the CQCN that meets its legal obligations.

Conversely, sections 138(2)(e) and (d) require us to have regard to the interests of access seekers and the public interest. We also consider that the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already 'access seekers' under section 138(2)(e). As identified earlier, consideration of all of these interests leads to a conclusion that Aurizon Network should be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the objective of Part 5 specified in section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its downstream operations—which could otherwise raise concerns under section 168A(c). The need for costs to be minimised is also particularly important in light of the current adverse economic climate in Queensland mining industry, so is in the public interest under clause 138(d).

A further additional factor relevant to our assessment of Aurizon Network's existing RAB is that, where possible, an approach should be adopted which provides for regulatory certainty. We have had regard to this factor pursuant to section 138(2)(h) of the QCA Act. We support a stable and predictable regulatory environment for Aurizon Network; an environment in which there are changes to methodology only where there is a clear case for such changes.

Allocation of costs

When considering cost allocation, in addition to section 138(b) of the QCA Act we have also had regard to section 137(1A)(b) as well as section 168A(c). Section 137(1A)(b) applies to Aurizon Network as a 'related access provider', namely an access provider that not only owns or operates the declared service, but also provides, or proposes to provide, access to the service to itself or a related body corporate. Section 137(1A)(b) requires that an access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the service.

Our assessment of Aurizon Network's proposed capital expenditure and return of capital is set out below.

8.1.3 Consultant's assessment

We engaged Jacobs Sinclair Knight Merz (SKM) and RSM Bird Cameron (RSMBC) to provide independent technical advice on certain aspects of the capital indicator. SKM reviewed the proposed asset renewals, while RSMBC reviewed Aurizon Network's proposed methodology to calculate the capital cost build-up and its links to the investment framework and risk contingency measures. RSMBC also reviewed Aurizon Network's proposed approach for calculating IDC.

Assessment of capital cost build up methodology

To assess the reasonableness of the proposed capital cost build-up methodology, RSMBC reviewed the components of the projects listed in **Table 71**. These projects total approximately \$1,186 million, and account for 60% of the capital indicator proposed in April 2013.

Table 71 Projects reviewed by RSMBC (\$ million)

| <i>Project</i> | <i>Amount included in the capital indicator</i> |
|--|---|
| Goonyella Rail Expansion Project (HPX 3) | 132.8 |
| Turnout replacement program | 143.2 |
| WIRP stage 1 | 910.0 |
| Total | 1,186.0 |

Source: RSMBC, 2013 DAU, 2013: 148

Following a review of Aurizon Network's investment manual framework and approach to estimating costs, RSMBC concluded the policies adopted by Aurizon Network are reasonable and consistent with industry practice.³²⁸ However, RSMBC noted the approach for computing the contingency for each discipline and overall project risk is not explained in detail in the cost estimating procedures.

Assessment of IDC calculation approach

RSMBC's tax specialists reviewed the proposed change from a post-tax nominal vanilla WACC to a (lower) post-tax nominal classic WACC for the calculation of IDC, and concluded the change appears reasonable.

RSMBC considered the use of the lower post-tax nominal classic WACC reduces the IDC charge throughout the period of construction of the asset until it is commissioned and included in the RAB. RSMBC considered Aurizon Network would be compensated for the reduction in asset values via the tax deductions on the capitalised interest.³²⁹

Assessment of asset renewals

SKM reviewed the renewals program proposed by Aurizon Network. A summary of its findings is included in **Table 72**

³²⁸ RSMBC, 2013 DAU, 2014(b): 151

³²⁹ RSMBC, 2013 DAU, 2014(b): 145

Table 72 Summary of SKM's findings on asset renewals

| <i>Issue</i> | <i>Summary of SKM conclusions</i> |
|---------------------------------|--|
| Level of asset renewals | <ul style="list-style-type: none"> The typical renewal quantities per annum as a function of the total asset amount in the network appear low (for instance a 5km/year formation renewal only represents 0.2% of the total asset and 15 turnouts/year only represent 1.5% of all turnouts).³³⁰ At this level of renewal expenditure, the trade-off between maintenance and renewals would not be significant.³³¹ |
| Information on asset capability | <ul style="list-style-type: none"> Aurizon Network has determined its forecast renewals expenditure as a function of the RAB (i.e. using a top-down method) because detailed asset capability was not available (which would have enabled a bottom-up approach). Aurizon Network has not demonstrated the capability of its assets (i.e. the remaining life of its assets) in support of the adjustment to asset lives |
| Improved reporting | <p>SKM suggested Aurizon Network begin by reporting the locations of its:</p> <ul style="list-style-type: none"> planned preventative maintenance activities for the coming year (i.e. those areas where condition-based projections have identified the need for intervention) unplanned preventative maintenance activities for the past year (i.e. those areas, different from the planned preventative maintenance locations, where condition-based assessments have identified an unexpected need for intervention) and corrective maintenance activities for the past year. This would provide transparency on the efficiency of Aurizon Network's annual forecast and actual maintenance activities.³³² |
| Stage Gate Process | <ul style="list-style-type: none"> The Stage Gate Process provides a reasonable mechanism for assessing the trade-off between maintenance and renewals.³³³ However, it is not apparent how projects are identified to be progressed through the Stage Gate Process, and whether they were identified in terms of allocating the expenditure to highest and best use.³³⁴ The Stage Gate process would not ensure forecast maintenance costs are efficient, as specific renewals projects are determined after the asset life has expired.³³⁵ |

Overall, SKM found that the proposed top-down approach will provide an approximate forecast of requirements, and the proposed top-down approach is therefore a reasonable approach to forecasting a potential level of renewals for the 2014 DAU period.³³⁶

SKM said there is a risk that capital investment may not be allocated to the highest and best use on the network because Aurizon Network does not have an accurate picture of the network, and the renewals program only comprises a very small portion of the total assets.³³⁷

However, SKM noted that Aurizon Network proposes to implement the Network Asset Management System (NAMS), which would be a significant step on the journey to achieve enhanced asset management capabilities.³³⁸

³³⁰ SKM, 2013 DAU, 2014(a): Attachment F: 11

³³¹ SKM, 2013 DAU, 2014(a): Attachment E: 15

³³² SKM, 2013 DAU, 2014(c): 43

³³³ SKM, 2013 DAU, 2014(a): Attachment E: 13

³³⁴ SKM, 2013 DAU, 2014(a): Attachment E: 12

³³⁵ SKM, 2013 DAU, 2014(a): Attachment E: 13

³³⁶ SKM, 2013 DAU, 2014(a): Attachment F: 12

³³⁷ SKM, 2013 DAU, 2014(a): Attachment E: 17

³³⁸ SKM, 2013 DAU, 2014(a): Attachment E: 11

SKM also suggested NAMS should target the provision of objective data to support the asset replacement activities.³³⁹ SKM recommended that Aurizon Network submit a detailed asset renewal plan on an annual basis for consideration. This would provide a greater level of transparency around the trade-off between asset renewals and maintenance.³⁴⁰

8.1.4 Stakeholders' comments

No stakeholders explicitly commented on Aurizon Network's proposals for IDC. However, Vale was concerned about the increase in asset renewals, and the simultaneous increase in maintenance costs. According to Vale:

*...asset renewals should be based on a trade-off between the capital costs of replacement of the asset versus the continuing maintenance cost, and therefore, this cost benefit should be reflected in the maintenance costs.*³⁴¹

Glencore also expressed concerns over the increase in costs, but did not specifically comment on the proposed capital indicator or its magnitude.³⁴² Stakeholders, however, suggested a change in the setting of reference tariffs, recommending a move to an annual price-setting approach.³⁴³

Stakeholders were concerned with the thoroughness of SKM's analysis and the lack of details provided by Aurizon Network.³⁴⁴ The QRC considered SKM's report provided a useful summary of Aurizon Network's asset renewal processes but little insight into how and when maintenance costs (and efficiency) are taken into account in the asset renewal decision-making process.³⁴⁵

The QRC suggested we ask Aurizon Network to provide a timetable for the introduction of the more planned approach to asset renewals noted by SKM and replace the indicative allowance for 2013–14 with a specific estimate of projects actually being completed.³⁴⁶

Vale expressed its support for the development of the NAMS by Aurizon Network.³⁴⁷

8.1.5 QCA analysis and Draft Decision

Our Draft Decision is considered in the following sections:

- Aurizon Network's approach to IDC
- Aurizon Network's capital indicator
- WIRP Stage 1
- asset renewals
- re-railing as renewals
- renewals expenditure and the annual maintenance report.

³³⁹ SKM, 2013 DAU, 2014(a): Attachment F: 12

³⁴⁰ SKM, 2013 DAU, 2014(a): Attachment E: 18

³⁴¹ Vale, 2013 DAU, sub. no. 42: 4.

³⁴² Glencore, 2013 DAU, sub. no. 74: 4

³⁴³ QRC, 2013 DAU, sub. no. 69: 1; BMA and BMC, 2013 DAU, sub. no. 41: 10

³⁴⁴ QRC, 2013 DAU, sub. no. 111: 21; Asciano, 2013 DAU, sub. no. 112: 2

³⁴⁵ QRC, 2013 DAU, sub. no. 111: 22

³⁴⁶ QRC, 2013 DAU, sub. no. 111: 22

³⁴⁷ Vale, 2013 DAU, sub. no. 113: 2

Aurizon Network's approach to IDC

As identified above, when assessing Aurizon Network's proposed IDC, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to Aurizon Network's proposed capital expenditure.

We have reviewed Aurizon Network's proposal, including a financial model provided to the QCA showing the estimated differences between the two WACC approaches for estimating IDC.

As a general guide, our preference is not to have multiple WACC values being used to estimate the overall cost build up. Our view is the case for adding this level of complexity to the regulatory process would need to be strong and has not been established based on the evidence before us to date.

We are also presently unconvinced that there is sufficient complexity, or materiality, to justify moving from the standard post tax nominal vanilla WACC to the post-tax nominal classic WACC for the purpose of calculating IDC.

Our Draft Decision is to refuse to approve a change in the WACC methodology used for calculating IDC. In the interests of convenience, for the purpose of estimating MAR a proposed MAR for this Draft Decision only, we have continued to use Aurizon Network's IDC calculation approach and hence used the post-tax nominal classic WACC provided by Aurizon Network. However, we request that Aurizon Network provides a revised capital indicator for the Final Decision that adopts the post-tax nominal vanilla WACC when calculating IDC. We note that, to date stakeholders, have not made significant comment on this issue and we would welcome submissions on it.

Approval of Aurizon Network's capital indicator

Based on the regulatory approach of assessing the prudence and efficiency of capital expenditure on an ex-post basis, we propose to use the revised December 2013 capital indicator (**Table 73**) in the build-up of MAR and the calculation of reference tariffs for UT4. This is subject to the calculation of IDC using the post-tax nominal vanilla WACC in the Final Decision.

In coming to this decision, we have had regard to the advice provided by RSMBC. Notwithstanding the calculation of IDC, we consider Aurizon Network's proposed capital cost build-up methodology, and its link to investment framework and risk contingency measures to be reasonable.³⁴⁸ We do, however, share RSMBC's concerns regarding the lack of transparency in the cost estimation process with respect to estimating risk contingencies.

Table 73 2014 DAU capital indicator by system as at December 2013 (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 | Total UT4 |
|-----------------------------------|---------|---------|----------|---------|-----------|
| 2014 DAU Capital Indicator | 344.43 | 390.96 | 1,175.10 | 159.00 | 2,069.49 |

Source: Aurizon Network December 2013 Financial Model. Note: These are mid-year values and therefore, do not include return on capital adjustments. These adjustments will be included in the modelling for pricing purposes.

WIRP Stage 1

We have included the WIRP Stage 1 in the capital indicator for the purpose of developing the MAR for the 2014 DAU. Our Draft Decision reflects WIRP Stage 1 being commissioned in 2015–

³⁴⁸ RSMBC, 2013 DAU, 2014: 149–152.

16, which is a year later than the commissioning date in the original April 2013 MAR submission, but reflected in the December 2013 financial model update. We note that the actual date for commissioning for WIRP Stage 1 is still to be finalised, although we understand 201516 is the most likely date.

We also emphasise that although we have included the WIRP Stage 1 for the purpose of showing Aurizon Network's MAR, we have still to consider the tariff arrangements for the WIRP project.

Clause 6.2.4 of Aurizon Network's 2014 DAU includes new criterion for the establishment of access charges for coal carrying train services associated with network expansions. Clause 6.2.4 is being considered separately as part of the review of the remainder of the 2014 DAU. The outcome of this will have implications with respect to whether WIRP Stage 1 is 'socialised' in the Blackwater and Moura system tariffs, or the subject to a separate tariff.

Aurizon Network has provided a separate guidance note which indicates its view that WIRP Stage 1 is likely to meet its proposed approach to a socialisation test.³⁴⁹

Asset renewals

Based on our Draft Decision to use Aurizon Network's December 2013 capital indicator, we are also presently accepting Aurizon Network's asset renewals expenditure. We note that this position implicitly accepts Aurizon Network's proposed policy change with respect to its approach to asset renewals.

In making this Decision we have been very mindful of the significant increase in asset renewals expenditure proposed by Aurizon Network and the need to provide Aurizon Network's customers assurance of the prudence of the standard and scope of the renewal program. Against this background, we note Aurizon Network uses a draft Asset Maintenance and Renewal Policy as the basis for estimating its future renewals program. SKM undertook a high level review of Aurizon Network's policy and generally considered the engineering intervention levels for asset renewals to be sound.

However, SKM does not consider that this policy alone will ensure prudence of standard and scope.³⁵⁰ As part of its engineering assessment of Aurizon Network's 2011–12 capital expenditure claim, SKM suggested Aurizon Network should consider submitting its Asset Management and Renewal Policy to us to obtain pre-approval of prudence of scope for asset renewals projects.³⁵¹

We consider there is merit in this approach. Such an approach would provide Aurizon Network and its customers with increased certainty around the future assessment of prudence, as well as providing the potential to streamline the capital assessment program. However, we note that Aurizon Network has reservations about us approving its Asset Maintenance and Renewal Policy because this forms part of its overall Safety Management System, which is subject to approval and review by other regulators.

Overall, we do not consider there is any conflict in the QCA providing pre-approval of Aurizon Network's Asset Management and Renewals Policy, given that Aurizon Network's proposals should have been developed to ensure prudence of scope and standard regardless of who approves and reviews aspects of its Asset Management and Renewals Policy or Safety

³⁴⁹ Aurizon Network, sub. no. 5

³⁵⁰ SKM, 2013 DAU, 2014(a): Attachment E: 18.

³⁵¹ SKM, Aurizon Network Pty Ltd Capital Expenditure 2011-12 Engineering Assessment, July 2013: 29

Management System. We would also be seeking evidence that Aurizon Network had in place procurement or other measures which ensured renewals expenditure was occurring on an efficient basis.

In the absence of pre-approval of Aurizon Network's Asset Management and Renewals Policy, our Draft Decision to accept Aurizon Network's asset renewal expenditure within the UT4 capital indicator will still be subject to a full *ex post* review of the prudence of the actual capital expenditure.

Treatment of re-railing as asset renewals

As discussed in more detail in chapters 5 and 6, SKM provided us with advice that re-railing, and potentially ballast cleaning, would appear to meet the criteria to be a renewal activity.

Against this background, our Draft Decision is that Aurizon Network's proposed re-railing allowance should be treated as renewals expenditure, as opposed to maintenance.

Whether ballast undercutting should also be treated as renewals expenditure is less clear-cut and based on the evidence before us at this time, we are presently considering it should continue to be as maintenance. We note, however, that the 2014 DAU renewals expenditure forecasts already include an element of ballast undercutting. The 2014 DAU renewals program includes a civil and track assets renewal program in the Blackwater, Moura and Goonyella systems.³⁵² This is an issue we propose to revisit again in UT5.

Table 74 QCA proposed addition to the capital indicator for re-railing task (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|--------------------|---------|---------|---------|---------|
| QCA Draft Decision | 14.93 | 15.20 | 16.26 | 17.12 |

Source: Aurizon Network December 2013 Financial Model; QCA analysis. Note: These figures are 'start-of-year' values.

Inclusion of renewals expenditure in the annual maintenance report

We understand that, with a better knowledge of its asset capability and the introduction of the NAMS system, Aurizon Network is now moving to a more 'bottom up' approach to developing its renewals maintenance program.

Given the increasing significance of the renewals expenditure program in Aurizon Network's proposals, our Draft Decision is that Aurizon Network should submit its planned renewals program (including proposed scope and cost) to the QCA prior to the commencement of each financial year, with the renewals program to be included as part of the annual maintenance report.

³⁵² Aurizon Network, 2013 DAU, sub. no. 3: 170

Draft Decision

- 8.1 We refuse to approve Aurizon Network's proposal to change the methodology for calculating interest during construction to a post-tax nominal classic WACC.**
- 8.2 We refuse to approve Aurizon Network's proposed capital indicator, as at December 2013, as set out in Table 73, above. We consider it appropriate for Aurizon Network to amend the 2014 DAU to reflect the interest during construction WACC calculation to be a post-tax nominal WACC.**
- 8.3 We propose to treat Aurizon Network's proposed re-railing maintenance costs as renewals expenditure, as set out in Table 74.**
- 8.4 We consider it appropriate for Aurizon Network to provide an annual forecast of asset renewal costs and scope to the QCA prior to the commencement of each financial year, with renewals activities to be included as part of the reporting arrangements for the annual maintenance report.**

8.2 Capital expenditure carryover account

The capital expenditure carryover account reflects the net present value of the difference between revenues Aurizon Network was entitled to earn from the capital indicator, against its revenue entitlements for actual capital expenditure incurred.

The balance in this account will be included in the MAR for pricing related purposes at the end of the regulatory period and the start of a new one. Clause 4 of Schedule A (2010 AU) requires Aurizon Network to maintain and record a capital expenditure carryover account.

8.2.1 Aurizon Network proposal

In deriving the capital indicator, Aurizon Network's approach in for the 2014 DAU is the same as UT3, where the capital expenditure carryover account is maintained to reflect differences between actual and forecast expenditure.

In its proposal, Aurizon Network said it has taken account of the approved capital indicator inclusive of additional amounts proposed for GAPE, including final capital expenditure amounts to be claimed for the UT3 period, and that the UT4 revenues are adjusted to reflect the forecast balance of the capital expenditure carryover account.

Aurizon Network also said it had included appropriate provision in its proposed MAR to allow for adjustment of revenues to reflect the difference between the forecast balance and the final balance approved by the QCA.³⁵³

Aurizon Network's forecast capital expenditure carryover account balance as at 1 July 2013 is included in **Table 75**.

Table 75 Aurizon Network's forecast capital expenditure carryover account balance as at 1 July 2013 (\$'000, nominal)

| <i>System</i> | <i>Non-Electric</i> | <i>Electric</i> | <i>Total</i> |
|---------------------------------------|---------------------|-----------------|--------------|
| Blackwater (incl Rolleston & Minerva) | (9,123) | (26,660) | (35,783) |
| Goonyella (incl Hail Creek & Vermont) | (45,771) | (12,589) | (58,360) |
| Moura | (3,060) | – | (3,060) |
| Newlands | (232) | – | (232) |

³⁵³ Aurizon Network, 2013 DAU, sub. no. 3: 71

| <i>System</i> | <i>Non-Electric</i> | <i>Electric</i> | <i>Total</i> |
|-----------------|---------------------|-----------------|------------------|
| GAPE (incl GSE) | (13,212) | – | (13,212) |
| Total | (71,398) | (39,249) | (110,647) |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 73

8.2.2 Stakeholders' comments

Stakeholders did not comment specifically on the treatment of the capital expenditure carryover account.

8.2.3 QCA assessment and Draft Decision

As identified above, when assessing Aurizon Network's capital carry over account, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to Aurizon Network's capital carry over account.

We note there is no material difference between the proposed carryover account balance in Aurizon Network's April 2013 submission and the updated accounts. This is mainly due to the difference in the timing of the capital expenditure which on its latest capital expenditure carryover account does not take into account the latest approved 2012–13 capital expenditure amounts.³⁵⁴

Regardless, we propose to treat any over- or under-recovery of revenue associated with the capital expenditure carryover account, through a smoothing process for the 2014 DAU.

Table 76 Updated Aurizon Network capital expenditure carryover account, end of year dollars (\$'000, 2012-13)

| <i>System</i> | <i>Non-Electric</i> | <i>Electric</i> | <i>Total</i> |
|---------------------------------------|---------------------|-----------------|------------------|
| Blackwater (incl Rolleston & Minerva) | (8,926) | (27,980) | (36,906) |
| Goonyella (incl Hail Creek & Vermont) | (46,680) | (11,803) | (58,483) |
| Moura | (2,982) | – | (2,982) |
| Newlands | 1,049 | – | 1,049 |
| GAPE (incl GSE) | (16,303) | – | (16,303) |
| Total | (73,842) | (39,783) | (113,625) |

Source: Aurizon Network December 2013 Financial Model

Draft Decision

8.5 We propose to smooth the return of over-recovery of the capital indicator from the UT3 across the 2014 DAU period.

³⁵⁴ The 2012–13 asset base roll forward including the 2012–13 capital expenditure amounts were approved by the QCA in August 2014.

9 RETURN OF CAPITAL (NET DEPRECIATION)

In the building blocks model, the return of capital is included in the build-up of maximum allowable revenue, so that asset owners are able to recover their initial investment in the regulated asset. Regulatory depreciation is a function of:

- *the cost to purchase and place the asset into service (as capitalised into the regulatory asset base)*
- *the depreciation and indexation methodology*
- *an estimate of the remaining useful life of the relevant asset.*

Under the RAB building blocks approach, regulators typically apply a 'straight-line' approach to calculate the return of capital. However, there are a range of other depreciation methodologies, which are equivalent in terms of the present value of expected capital charges for an asset over its economic life, equal to the initial asset value or purchase cost.³⁵⁵

9.1 2014 DAU depreciation allowance – overview

Aurizon Network originally proposed a depreciation charge of \$269.69 million in 2013–14 increasing to \$348.59 million by 2016–17.³⁵⁶ Aurizon Network revised this proposal in December 2013 to \$265.05 million in 2013–14 increasing to \$357.94 million by 2016–17.

Table 77 Aurizon Network proposed depreciation allowance (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|--|---------------|---------------|---------------|---------------|
| Aurizon Network proposed depreciation (original) | 269.69 | 291.12 | 346.46 | 348.59 |
| Aurizon Network proposed depreciation (revised) | 265.05 | 288.12 | 313.37 | 357.94 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 101; Aurizon Network December 2013 Financial Model. Notes: Aurizon Network revised depreciation reflects changes to timing in the capital indicator, including commissioning of the WIRP project

In assessing its depreciation proposal, Aurizon Network said we should have regard to the following matters:

- (a) uncertainty has increased in UT4 and that the depreciation approach should be applying probabilities in assessing remaining economic lives. Aurizon Network said:

... the uncertainty associated with the assumption that it will continue to be economic to develop replacement coal mines for the next 50 years has increased.³⁵⁷

- (b) ensuring Aurizon Network has the confidence to invest. Aurizon Network said:

Investors will not only consider the regulatory arrangements that will apply to ensure confidence in the recovery of future investments, but will also consider how effectively the regulatory compact has applied to past investments.

³⁵⁵ QCA, Pricing Principles research papers published: February 2014, Financial Capital Maintenance and Price Smoothing; QCA, February 2014 Issues in the Application of Annuities

³⁵⁶ Aurizon Network, 2013 DAU, sub. no. 3: 101

³⁵⁷ Aurizon Network, 2013 DAU, sub. no. 3: 90

*The risks associated with long term demand outlook remains a critical issue and has been significantly exacerbated by the decline in the Queensland coal industry's global competitiveness over recent years.*³⁵⁸

- (c) establishing the economically efficient price. Aurizon Network said:

*Economically efficient pricing should consider not only price differentiation between current users of the declared service but temporal differentiation between current and future users of the network based on longer term expectations of capacity to pay.*³⁵⁹

Depreciation methodology changes proposed for UT4

Aurizon Network's proposed depreciation allowance for the 2014 DAU reflects proposed changes to:

- (1) **Asset lives**—to change the depreciation allowance for all assets:
 - (a) from the rolling 20-year lives for assets included in the RAB post 1 July 2009 and physical lives for assets included prior to 1 July 2009 (UT3 approach); to
 - (b) asset lives which match Aurizon Network's estimate of weighted average mine life (25 years) for all assets (UT4).
- (2) **Timing**—to change when the depreciation allowance starts for a new asset:
 - (a) from the year of commissioning (UT3); to
 - (b) the year after commissioning (2014 DAU).

Our assessment of Aurizon Network's proposed changes to determining the depreciation allowance for the 2014 DAU is discussed below.

9.2 Legal Framework

We are required to assess Aurizon Network's depreciation proposal having regard to the factors in section 138(2) of the QCA Act as set out in the 'Role of the QCA' section at the start of this Draft Decision.

In the context of assessing Aurizon Network's proposed depreciation allowance, we must have regard to the factors listed in section 138(2) and give them an appropriate level of weighting, as identified in Section 2.1.2 of this Draft Decision. Against this background, we consider:

- sections 138(2)(a), (b), (d), (e), (g) and (h) should be given more weight
- section 138(2)(g) refers to the pricing principles mentioned in section 168A of the QCA Act, of which we consider sections 168A(a), (c) and (d) should be given more weight; and
- sections 138(2)(c), 138(2)(f) and 168A(b) should be given less weight, as they are not practically relevant to our assessment of Aurizon Network's proposed depreciation allowance.

An additional factor relevant to our assessment of Aurizon Network's depreciation allowance is that, where possible, an approach should be adopted which provides for regulatory certainty. We have had regard to this factor pursuant to section 138(2)(h) of the QCA Act. We support a

³⁵⁸ Aurizon Network, 2013 DAU, sub. no. 3: 93

³⁵⁹ Aurizon Network, 2013 DAU, sub. no. 3: 93

stable and predictable regulatory environment for Aurizon Network; an environment in which there are changes to methodology only where there is a clear case for such changes.

Efficient investment in infrastructure

Sections 69E and 138(2)(a) of the QCA Act require that we have regard to the object of Part 5 of the QCA Act, namely to promote the economically efficient operation, use of and investment in the CQCN, as the significant infrastructure by which the declared service are provided. Sections 138(2)(g) and 168A(a) require that we have regard to certain pricing principles, including that the price for access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and including a return on investment commensurate with regulatory and commercial risks involved. In this context, the depreciation allowance should provide Aurizon Network with the confidence it will be able to recover its investment in the network.

To meet these objectives, the return on, and of, capital must reflect prudent and efficiently incurred infrastructure investment in the CQCN. In broad terms, we consider, pursuant to section 138(2)(b) of the QCA Act, that Aurizon Network's legitimate business interests will be met if it is permitted to recover at least the depreciation allowance associated with prudently and efficiently incurred infrastructure investment in the CQCN that meets its legal obligations..

Conversely, sections 138(2)(e) and (d) of the QCA Act require us to have regard to the interests of access seekers and the broader public. We also consider that the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already 'access seekers' under section 138(2)(e). As identified earlier, consideration of all of these interests leads to a conclusion that Aurizon Network should also be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted, as contemplated by the objective of Part 5 specified in section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its downstream operations - which could otherwise raise concerns under section 168A(c). The need for costs to be minimised is also particularly important in light of the current adverse economic climate in Queensland mining industry, so is in the public interest under clause 138(d).

A further additional factor relevant to our assessment of Aurizon Network's existing RAB is that, where possible, an approach should be adopted which provides for regulatory certainty. We have had regard to this factor pursuant to section 138(2)(h) of the QCA Act. We support a stable and predictable regulatory environment for Aurizon Network; an environment in which there are changes to methodology only where there is a clear case for such changes.

Allocation of costs

When considering cost allocation, in addition to section 138(b) of the QCA Act we have also had regard to section 137(1A)(b) as well as section 168A(c). Section 137(1A)(b) applies to Aurizon Network as a 'related access provider', namely an access provider that not only owns or operates the declared service, but also provides, or proposes to provide, access to the service to itself or a related body corporate. Section 137(1A)(b) requires that Aurizon Network's access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the service.

Our assessment of Aurizon Network's depreciation allowance proposal is set out below. This includes a description of our assessment approach, and its linkages to the legislative framework.

9.3 Previous consideration of depreciation by the QCA

Asset lives for the CQCN were estimated for UT1 based on the physical lives of infrastructure, capped at 50 years. For UT3, QR Network, proposed a new list of asset lives to be applied to past and future capital expenditure to mitigate its investment risk. Specifically, it proposed assets with a remaining life:

- greater than 20 years—be effectively capped and written off over 20 years from 1 July 2009
- less than 20 years—be depreciated in accordance with revised asset lives.

QR Network said it would review this treatment in future regulatory periods if there was a material reduction in risk. Stakeholders did not support QR Network's proposals to change the depreciation approach.

We accepted, in part, QR Network's proposal to accelerate depreciation on new investments over the term of the 2009 regulatory period, accepting:

- a 20-year rolling asset life to depreciate capital expenditure for assets included in the RAB after 1 July 2009
- a revised list of economic asset lives be used from 1 July 2009 to depreciate capital expenditure accepted into its RAB during UT3.

We did not consider it appropriate to re-open the depreciation rates applied to capital expenditure under the previous undertakings and required QR Network continue to use the pre-existing asset lives to depreciate these assets.

At the time, we indicated accelerated depreciation would provide QR Network with cash flows earlier in the life of the asset than would otherwise be the case, but will ensure that, in the event asset stranding does not eventuate, users of the network in 20 years' time and beyond will make a contribution to the assets installed today but still in use at the time.

QR Network accepted this approach for UT3, while the QRC said the proposed rolling cap should not necessarily apply to all capital expenditure or necessarily be restricted to 20 years.

9.4 Asset lives — weighted average mine life

9.4.1 Aurizon Network proposal

Aurizon Network has proposed a change to the period over which assets are depreciated:

- from the rolling 20-year lives for assets included in the RAB post 1 July 2009 and physical lives for assets included prior to 1 July 2009 (UT3 approach); to
- assets lives which match Aurizon Network's estimate of weighted average mine life (25 years) for all assets (proposed for the 2014 DAU).

Aurizon Network has raised a number of issues that it considers should be taken into account in estimating the economic lives of CQCN assets, primarily to address stranding risk. In particular, Aurizon Network has indicated concerns about:

- the impact of new developments on future coal reserves. Aurizon Network is concerned new port developments will occur prior to the expiry of the vast majority of current operating mines. It said:

Even though incremental expansion may generate sufficient cash flow for the project to be economically viable when assessed in isolation, a proper and robust economic evaluation... requires consideration of the impact of that expansion on the stranding risk of network capacity. ... accordingly each expansion would need to consider what impact that expansion would have on the expected recovery of capital for the existing facility.³⁶⁰

- the global competitiveness of Queensland coal mines. Aurizon Network is concerned increasing costs and risks could impact the viability of planned investments in mines and mine-related infrastructure
- matching the depreciation profile to the economic characteristics of extractive industries. Specifically, Aurizon Network said:

Accelerating the depreciation charge applied to Aurizon Network's assets will increase their value to the Queensland economy by partially offsetting the expected increase in marginal extraction costs over time. This will foster more efficient outcomes by i) increasing the likelihood of life extension at depleted mines; and ii) increasing the likelihood of new mines that face higher development and extraction costs.³⁶¹

Aurizon Network's weighted average mine life proposal

Reflecting its preferred option, Aurizon Network has proposed applying a 25-year weighted average mine life (WAML) cap to depreciate its assets over the UT4 regulatory period.³⁶²

In developing the methodology, Aurizon Network said it made an assessment of the CQCR mines' marketable reserves (based on estimates provided by Wood Mackenzie) and production rates, and placed equal weights on those factors, to determine the WAML.³⁶³

Aurizon Network proposed the 25-year WAML cap is periodically reviewed, having regard to marketable reserves of existing mines, the UT4 volume forecast and the expected renewal of contract volumes until resource depletion.³⁶⁴

Aurizon Network said its proposal substantially reduces its asset stranding risk, with resulting impact on maximum allowable revenues (MAR) less than one percent over the UT4 regulatory period. Aurizon Network also considers its proposal is more compatible with the market environment, and consistent with the objectives of the QCA Act.³⁶⁵

9.4.2 Consultant's assessment

RSMBC reviewed Aurizon Network's 25-year WAML proposal, and concluded it does not appear unreasonable on the basis that:

- there is regulatory precedent in adopting WAML. RSMBC noted the NSW Rail Access Undertaking requires IPART to conduct a periodic review of remaining coal mine lives within Rail Corp rail sectors of the HVCN in order to estimate depreciation³⁶⁶
- Aurizon Network is not compensated for risks associated with undiscovered marketable reserves and asset stranding

³⁶⁰ Aurizon Network, 2013 DAU, sub. no. 3: 86

³⁶¹ Aurizon Network, 2013 DAU, sub. no. 3: 89

³⁶² Aurizon Network, 2013 DAU, sub. no. 3: 79

³⁶³ Aurizon Network, 2013 DAU, sub. no. 3: 95–99

³⁶⁴ Aurizon Network, 2013 DAU, sub. no. 3: 99

³⁶⁵ Aurizon Network, 2013 DAU, sub. no. 3: 79

³⁶⁶ RSMBC, 2013 DAU, 2014: 78

- Aurizon Network's proposal includes a periodic review of WAML, which addresses the issue of (possible) changes to marketable reserves in the CQCR.³⁶⁷

RSMBC suggested separate WAMLs for different economic regions, as the 25-year proposal is inconsistent with the WAMLs for the Northern Bowen Basin (NBB) (comprising GAPE, Goonyella and Newlands) and Moura. RSMBC proposed an adoption of the following WAMLs (as determined from its analysis): 27 years for NBB; 25 years for Blackwater; and 27 years for Moura.³⁶⁸

9.4.3 Stakeholders' Comments

The QRC said Aurizon Network's WAML proposal raises a number of significant concerns, as outlined in **Table 78**.

Table 78 QRC's concerns on Aurizon Network's UT4 depreciation proposal

| <i>Concern</i> | <i>Explanation</i> |
|---|--|
| Does not provide regulatory certainty | Aurizon Network has not demonstrated any real need for the latest proposed change, with the depreciation method already amended in UT3. The QRC queried the need for a change, given Aurizon Network claims its proposal contains minimal financial impact. |
| Unrealistic assumptions | Limiting depreciation to the average life of existing mines is based on a number of unrealistic assumptions, including that: <ul style="list-style-type: none"> • a new mine will never replace a mine which exhausts its reserves – the systems remain fully contracted despite numerous examples of mine closures in central Queensland over the past decade • existing mines will never increase their marketable reserves, noting it is not uncommon to convert additional resources to reserves during the life of a mine, although this process can be costly and miners will do this at an appropriate time • mine lives should be determined based on production rates which are 90% of contract—an assumption which is inconsistent with Aurizon Network's UT4 volume forecasts. |
| Underestimates Queensland's coal reserves | The QRC is concerned Aurizon Network has significantly underestimated coal reserves, indicating that the Queensland Exploration Council's Queensland Exploration Scorecard 2013 concludes Queensland has 64 years of proved and probable coal reserves at current production rates. ³⁶⁹ |
| Raises intergenerational considerations | The QRC is concerned accelerated depreciation may ultimately result in a low value RAB, such that Aurizon Network is being asked to run a significant business (in terms of operations) while earning very little return through the return of and on capital. |

Source: QRC, sub. no. OP Costs 7 March 2014: 16–17

The QRC requested we assess the revenue impact of a change in asset life against the existing approved depreciation methodology.³⁷⁰

9.4.4 QCA analysis and Draft Decision

When assessing Aurizon Network's proposal for asset lives, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our

³⁶⁷ RSMBC, 2013 DAU, 2014: 75–83

³⁶⁸ RSMBC, 2013 DAU, 2014: 83

³⁶⁹ Queensland Exploration Council, Queensland Exploration Scorecard 2013:37

³⁷⁰ QRC, 2013 DAU, sub. no. 84: 42

decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to Aurizon Network's proposal for asset lives.

Our Draft Decision is to refuse to approve Aurizon Network's proposal to change the approach for setting asset lives for depreciation for the 2014 DAU. Specifically, we are unconvinced by Aurizon Network's case that there has been a material change of risk from UT3 which would support changing the depreciation approach again.

Our assessment of Aurizon Network's reasons for moving to a WAML depreciation approach is outlined below.

Issue 1: the impact of new developments on future coal reserves

Aurizon Network has indicated its concerns that:

even though the incremental expansion may generate sufficient cash flow for the project to be economically viable when assessed in isolation, a proper and robust economic evaluation (which underpins the regulator's zero NPV assumption) requires consideration of that expansion on the stranding risk of existing network capacity (to the extent that the demand underpinning that expansion displaces replacement demand for existing access rights).³⁷¹

Aurizon Network's concern regarding asset stranding risk appears to be based on there being too much demand, rather than too little, for new infrastructure and that it will be required to make investments in new (presumably costly) expansion assets, increasing asset stranding risk.

However, given the current oversupply of coal in international markets, the demand for expansion of the CQCN appears to have subsided since UT3, with miners increasingly focused on increasing the productivity of existing assets. We also note that a number of port expansion projects identified by Aurizon Network (including Dudgeon Point³⁷² and T4-T9 at Abbot Point³⁷³) are no longer being considered for development.

Having regard to the economic conditions surrounding coal mining in the CQCN, we are unconvinced that the asset standing risk, particularly for existing assets, is materially greater for the 2014 DAU than it was for UT3. Indeed, in terms of demand for increased investment, and given the mining sectors' focus on cost reduction, this risk may well have decreased.

Further, we consider the depreciation changes included in UT3 already acknowledged the asset stranding risk through the rolling 20-year depreciation for new assets.

We also consider there are a range of other measures Aurizon Network can pursue to maximise the efficient use of and investment in infrastructure, which could provide cost-effective alternatives to providing additional capacity in the CQCN to avoid stranding risk. These include:

- working more actively with other supply chain participants to optimise the use of the existing infrastructure assets, which could include changes in operational approaches to identify opportunity to improve the productivity of the network

³⁷¹ Aurizon Network, 2013 DAU, sub. no. 3: 86

³⁷² NQBP Media release: www.nqbp.com.au/news/updates 20 July 2014: Dudgeon Point 'Coordinated project' declaration cancelled by Coordinator-General

³⁷³ Abbot Point T4-T9 proposal discontinued on 4 December 2012. The Queensland Government subsequently commenced a staged program for Abbot Point expansion AP-X. In October 2013 Anglo American relinquished its Preferred Proponent status for AP-X and on 28 February 2014, Lend Lease withdrew from NorthHub (joint venture between Land Lease and Aurizon). Aurizon is still in discussions with the Queensland Government for AP-X.

- capacity trading to allow unused capacity to move to higher value uses, where infrastructure constraints allow
- working more actively with other supply chain participants to optimise the use of the existing infrastructure assets. We note the ARTC in the HVCN develops new infrastructure proposals in consultation with a Rail Capacity Group, representing its customers.

In this regard we would need to see evidence that Aurizon Network had actively considered incremental capital or operational changes as alternatives to major new capital expansion to meet new capacity before we would be convinced that Aurizon Network was being required to expand its network at a rate that was increasing the level of its asset stranding risk.

Issue 2: The global competitiveness of Queensland coal mines

Aurizon Network has indicated increasing costs, combined with increasing global competition, have resulted in a reduction in the cost competitiveness of Queensland coal producers in the global market. In this context Aurizon Network indicated a concern that even its WAML approach might not sufficiently alleviate its longer-term asset stranding risk.³⁷⁴

We are very aware Queensland's coal producers are facing more challenging conditions now than in some previous years. Both metallurgical and thermal coal producers are dealing with challenging conditions. In September 2014, the Bureau of Resource and Energy Economics (BREE) noted in its quarterly update that:

*'High costs, a strong Australian dollar and lower coal prices have affected the profitability of Australian (thermal coal) producers, increasing pressure on the industry to make further cost cuts and mine closures. While this may result in short term pain...the industry is expected to adapt.'*³⁷⁵

The issues faced by Queensland producers are not limited to the CQCN. BREE said:

*(For metallurgical coal) 'Lower prices and high operating costs have removed the incentive to invest heavily in developing new capacity around the world. As such, there is unlikely to be any significant additions to supply from emerging producers and growth in exports from existing producers is projected to remain subdued. ... Most of the growth in world metallurgical coal exports is expected to come from Australia.'*³⁷⁶

We note that while the existing conditions for Queensland producers is challenging, the profitability of coal production is cyclical and we do not consider that the cyclical features of coal mining in Queensland have changed materially from UT3 to the 2014 DAU period. BREE also noted:

*'Global supply has grown significantly over recent years with the prospect of further increases in supply over the next few years. This has placed pressure on commodity prices in the medium term. Producers will need to focus on managing cost pressures and improving their competitiveness. However, it is important to note that this is not a new phenomenon for the Australian industry which has shown considerable resilience over time in the face of commodity price cycles in the past. Commodity price cycles and changing economic conditions both domestically and globally have always been a part of the energy and resource sectors.'*³⁷⁷

Despite the challenging market conditions, we consider that the future forecasts continue to indicate increasing, rather than declining demand for metallurgical and thermal coal from the CQCN.

³⁷⁴ Aurizon Network, 2013 DAU, sub. no. 3: 87

³⁷⁵ BREE September 2014, 54

³⁷⁶ BREE September 2014, 42-43

³⁷⁷ BREE September 2014, 3

We also consider Aurizon Network can influence, to some extent, the global competitiveness of Queensland's mining sector in the CQCN. This includes providing access to the declared service at an efficient cost and pursuing opportunities with all supply chain participants to improve the productivity of the rail infrastructure service.

We do not consider Aurizon Network's asset stranding risk has changed materially from UT3 to the 2014 DAU due to changes in costs.

Issue 3: Matching the depreciation profile to the economic characteristics of extractive industries

We are unconvinced by Aurizon Network's view a WAML depreciation approach is in the economic interests of Queensland on the basis that:

the economic value of Queensland's coal resources is maximised if depreciation of sunk supply chain assets, including Aurizon Network's rail assets, is inversely related to the incremental extraction costs from the CQCR as a whole.³⁷⁸

In particular, we are unconvinced by Aurizon Network's arguments that it should provide a cost advantage for future access seekers, at the expense of current access seekers in order to maximise the extraction value of Queensland resources.

We consider that unless there is a clear case to do so, the regulatory depreciation should not give rise to intergenerational equity issues with current access seekers paying more than future access seekers, unless there is a compelling need to do so.

Overall assessment of proposed move to a weighted average mine life depreciation approach

Given the conclusions above, we consider that Aurizon Network's proposal does not achieve an appropriate balancing of the factors set out in section 138(2) of the QCA Act as it is biased in favour of the interests of Aurizon Network as the access provider, to the detriment of access seekers and the public interest.

Moreover, the case for introducing a WAML presented by Aurizon Network appears to have been developed to address concerns that:

- it will be required to make investments in new expansion assets which could be considered to be in excess of the level of infrastructure efficient to provide services for the CQCN, increasing the stranding risk of existing and new assets; and
- current mines, rather than future mines, should meet the more significant proportion of the costs of return of capital.

Our Draft Decision is to reject Aurizon Network's proposal to adopt the WAML approach for setting asset lives for depreciation for the 2014 DAU because we do not consider that there has been a material change in the risk level of asset stranding, which would support a change to the regulatory framework. As noted above, a factor relevant to our broader assessment of Aurizon Network's depreciation allowance is that, where possible, an approach should be adopted which provides for regulatory certainty. We have had regard to this factor pursuant to section 138(2)(h) of the QCA Act. Having decided to reject Aurizon Network's case for a change in methodology for estimating the useful lives of the CQCR assets, we do not consider there to be merit in providing an assessment of the particular features of Aurizon Network's proposed WAML methodology.

³⁷⁸ Aurizon Network, 2013 DAU, sub. no. 3: 89

Draft Decision

9.1 We refuse to approve Aurizon Network's proposal to change to a Weighted Average Mine Life approach for the depreciation of assets.

9.5 Accelerated depreciation – continuation of 20-year rolling asset lives

9.5.1 Aurizon Network proposal

Aurizon Network has not proposed applying the UT3 depreciation approach for the 2014 DAU. Aurizon Network considers there are a number of issues with the continued application of the UT3 depreciation approach, particularly:

- the differential rate of depreciation between new and existing users. Aurizon Network said it is unreasonable to potentially require new or expanding producers to bear higher prices relative to other users of common user infrastructure because:
 - they entered the market at a time when the cost of expansions is high
 - if there is no replacement demand they will also be required to bear the risk of prices increasing further in the future³⁷⁹.

Aurizon Network said this may cause price differentiation between existing and new users solely attributable to differences in depreciation rates and may adversely impact on an access seekers ability to compete in downstream markets. Aurizon Network also said the UT3 approach:

- does not adequately address the long term replacement demand risk for installed capacity, given future expansions may occur within the next 10 years.
- may result in prices that are not efficient nor consistent with the requirements of section 168A of the QCA Act.

9.5.2 Stakeholders' comments

The QRC disagreed with the need to further accelerate Aurizon Network's return of capital (using the WAML proposal), and preferred stability in approach, unless there is demonstrated need to further accelerate Aurizon Network's cash flows (following the UT3 acceleration).³⁸⁰

Overall, the QRC was of the view:

- The rolling 20-year life cap should be retained.
- No further acceleration is required as genuine asset stranding concerns are substantially mitigated through a range of existing mechanisms within the undertaking.
- Any further acceleration only serves to 'front-end' Aurizon Network's revenues, with potential adverse long term consequences.³⁸¹

9.5.3 QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in

³⁷⁹ Aurizon Network, 2013 DAU, sub. no. 3: 94

³⁸⁰ QRC, 2013 DAU, sub. no. 110: 5

³⁸¹ QRC, 2013 DAU, sub. no. 110: 18

our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to Aurizon Network's proposal.

Our Draft Decision is to refuse to approve Aurizon Network's proposal to amend the existing depreciation arrangements for the 2014 DAU. The existing depreciation arrangements for Aurizon Network are:

- a 20-year rolling depreciation approach for assets constructed post 1 July 2009
- physical asset lives for assets commissioned prior to 1 July 2009.

In forming this view, we have considered a range of issues, including:

- We are unconvinced that there has been a material change in asset stranding risk from UT3 to the 2014 DAU, which would require a further change to the depreciation approach.
- We consider a stable and predictable regulatory environment to be an important feature of Queensland's economic regulatory environment, (a factor to which we have had regard to in accordance with section 138(2)(h) of the QCA Act). This approach is also in the interests of Aurizon Network's stakeholders, who support no further change to the depreciation approach for the 2014 DAU.
- We consider that the existing depreciation approach adequately deals with the level of asset stranding risk, and satisfies the legitimate business interests of Aurizon Network (a factor to which we have had regard in accordance with section 138(2)(b) of the QCA Act), and will allow Aurizon Network to price for access in a manner that is consistent with the requirements of section 168(A)(a) of the QCA Act.
- We regard the existing depreciation approach, which deals with asset stranding risk, as a stable approach which will provide confidence for investment. This is in the interests of Aurizon Network, as well as access seekers and holders, and is consistent with section 69E of the QCA Act.
- We consider that, since Aurizon Network (like its predecessor) has invested in infrastructure on the basis of the depreciation assumptions that existed at the time, that would have been a factor in their decision making.
- We do not agree with Aurizon Network's view that the existing depreciation approach leads to a materially higher level of price differentiation which reduces competition in downstream markets. Indeed, there are a range of pricing differences included in Aurizon Network's 2014 DAU, including:
 - different take-or-pay arrangements; and
 - Aurizon Network's proposal for an expansion tariff between undertaking periods.

Draft Decision

9.2 We refuse to approve Aurizon Network's proposal to amend the existing depreciation approach for the 2014 DAU—i.e. a 20-year rolling depreciation approach will be used for assets included in the RAB post 1 July 2009, and depreciation based on physical asset lives will be used for assets included in the RAB prior to 1 July 2009. We consider it appropriate that Aurizon Network amend its 2014 DAU to retain the existing depreciation approach.

9.6 Timing and asset lives

9.6.1 Aurizon Network proposal

Aurizon Network's proposed Post Tax Revenue Model (PTRM) commences depreciation of new assets in the year after an asset is commissioned. This is different to the depreciation approach for prior undertakings, when depreciation commenced in the year the asset was commissioned.

9.6.2 Consultant's assessment

Aurizon Network provided a schedule of asset lives to SKM, who conducted an engineering technical assessment of maintenance, operating and capital expenditure forecasts. After reviewing asset lives, SKM recommended Aurizon Network reinstate a useful life of 40 years (instead of 35) for power distribution assets, since power distribution assets are not impacted by tonnage and 40 years is a normal lifespan for power distribution infrastructure.³⁸²

9.6.3 Stakeholders' comments

Stakeholders did not comment on the timing of depreciation being included in the PTRM.

Freightliner sought a review of Aurizon Network's rationale behind the depreciation policy assumptions used in the 2013 DAU, compared to the depreciation policies in Aurizon Network's financial statements.³⁸³

9.6.4 QCA analysis and Draft Decision

When assessing Aurizon Network's proposed PRTM, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach to Aurizon Network's proposal.

Our Draft Decision to refuse to approve Aurizon Network's proposal to change the timing of the commencement of regulatory depreciation in its PTRM to the year after an asset is commissioned. In our view, the reduction in the economic value of rail assets should commence in the year the assets start being used, and there is no reason why access holders using the asset in the year of commissioning should not pay depreciation in that year.

Delaying the regulatory depreciation for a year allows Aurizon Network an additional return on the asset. On the other hand, we consider that delaying the commencement of regulatory depreciation for a twelve-month period could give rise to cash-flow issues for Aurizon Network, particular as large infrastructure projects are commissioned.

Given the conclusions above, we consider that Aurizon Network's proposal does not achieve an appropriate balancing of the factors set out in section 138(2) of the QCA Act as it is biased in favour of the interests of Aurizon Network as the access provider, to the detriment of access seekers and the public interest.

We consider commencing depreciation in the year of commissioning to be in Aurizon Network's legitimate business interests, as well as the interests of access seekers and holders (to which we have had regard in accordance with the factors listed in section 138(2) of the QCA Act). It is also consistent with the pricing principles set out in section 168(A)(a) of the QCA Act, to which we have had regard in accordance with section 138(2)(g).

³⁸² SKM, 2013 DAU, January 2014(a) Attachment E: 11.

³⁸³ Freightliner, 2013 DAU, sub. no. 75: 3

We note SKM's recommendation to reinstate the useful lives of power distribution assets from 35 to 40 years, but also note these lives were previously endorsed by GHD for UT3. Consistent with our view on taking a predictable approach to regulation, with changes only where there is a compelling case for change, we do not propose to require Aurizon Network to amend these physical lives for the UT4 period.

In respect of Freightliner's comments regarding the different lives for accounting and economic depreciation, we note that this often a feature of the regulatory framework given that the purpose for which the depreciation approaches are developed is different.

Draft Decision

9.3 We refuse to approve Aurizon Network's proposal to commence regulatory depreciation, in its Post Tax Revenue Model, the year after an asset is commissioned. We consider it is appropriate for Aurizon Network to amend its Post Tax Revenue Model to ensure that regulatory depreciation commences in the year in which an asset is commissioned

9.7 Summary

Taking account of Aurizon Network's proposed depreciation approach for the 2014 DAU, our Draft Decision for the depreciation allowance for the 2014 DAU is set out in **Table 79**.

Table 79 QCA proposed depreciation charge (\$ million, nominal)

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|----------------|----------------|----------------|----------------|
| Aurizon Network proposed depreciation (revised) | 265.05 | 288.12 | 313.37 | 357.94 |
| QCA proposed adjustments | 5.64 | 12.33 | 38.58 | 17.83 |
| QCA proposed depreciation allowance | 270.69 | 300.46 | 351.95 | 375.77 |

Note: Numbers may not sum due to rounding

10 RETURN ON INVESTMENT

Background

The regulated rate of return on the CQCN is a key input into determining the MAR for Aurizon Network in the UT4 period.

The regulated rate of return is calculated using a regulatory weighted average cost of capital (WACC) for Aurizon Network.

The regulatory WACC for Aurizon Network comprises three primary components:

- cost of equity – typically estimated with reference to the Capital Asset Pricing Model (CAPM)
- cost of debt – observed or estimated from the current debt rate
- capital structure – appropriate debt-to-equity ratio of Aurizon Network, typically determined by benchmarking.

While some elements of the WACC are firm-specific (e.g. the asset beta and debt/equity ratio), other components are more general in nature and are unlikely to differ from business to business - such as the approach to determining the risk-free rate, market risk premium and value of dividend imputation credits (i.e. gamma). These 'market parameters' are key drivers of the WACC.

Separately, the QCA has been undertaking a review of the WACC parameters as they apply to services regulated under the QCA Act in Queensland (the QCA cost of capital methodology review). That review identified the methodology that we will generally apply in determining the WACC parameters, consistent with the requirements of the QCA Act. That review has also provided guidance on the components of the WACC that are more general in nature and are unlikely to differ from business to business. Our analysis in the 'Cost of capital: market parameters' final decision of August 2014 (the Market Parameters Decision) therefore comprises an important component of our reasoning underpinning this Draft Decision. We have drawn on that review, and the stakeholders' submissions to it, to the extent these are relevant to our consideration of Aurizon Network's proposal. However, our full consideration of the matters raised by Aurizon Network and its stakeholders, and the statutory factors in section 138(2) of the QCA Act, is set out in this Draft Decision.

10.1 Aurizon Network proposal

In UT3, Aurizon Network had a nominal 'vanilla' WACC of 9.96%. Given the risk-free rate of 5.19% set at the commencement of the 2010 regulatory period, these returns provided Aurizon Network with equity and debt margins of 4.80% and 4.75% respectively.

For the 2014 DAU, Aurizon Network has proposed a range for its WACC of 7.27–8.18% (see **Table 80**), with its preferred point estimate of 8.18% being the upper bound of the range.³⁸⁴

³⁸⁴ Aurizon Network, sub 3: 149–150

Table 80 Aurizon Network's Proposed WACC Range (as at 30 November 2012)

| <i>Parameter</i> | <i>QR 2010 (UT3)</i> | <i>Aurizon Network lower bound</i> | <i>Aurizon Network upper bound</i> |
|---------------------------|--------------------------|--|--|
| Credit rating | BBB+ | BBB+ | BBB+ |
| Risk-free rate | 5.19% | 3.15 ³⁸⁵ % | 3.15% |
| Market risk premium (MRP) | 6.00% | 6.00% | 7.00% |
| Asset beta | 0.45 | 0.5 | 0.6 |
| Debt to value | 55% | 55% | 55% |
| Equity beta | 0.8 | 0.9 | 1.0 |
| Gamma | 0.5 | 0.25 | 0.25 |
| Equity margin | 4.80% | 5.40% | 7.00% |
| Cost of equity | 9.99% | 8.55% | 10.15% |
| Debt margin | 4.625% | 2.94% | 3.28% |
| Debt transaction costs | 0.125% | 0.125% | 0.125% |
| Total debt margin | 4.750% | 3.065% | 3.405% |
| Cost of debt | 9.94% | 6.22% | 6.56% |
| WACC margin | 4.77% | 4.12% | 5.03% |
| WACC | 9.96% | 7.27% | 8.18% |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 149; QCA analysis.

Aurizon Network outlined a range of issues for us to consider as we estimate the WACC for UT4, including:

- 'framework issues' including commercial and regulatory risks, estimation error and financial market conditions
- concern that the 'mechanistic' application of the approach we used in UT3 would result in a cost of equity that is the lowest on record³⁸⁶
- concern about our UT3 decision to base the risk-free rate and debt margin on a five-year term to maturity (except for the purpose of estimating the market risk premium).³⁸⁷

10.2 Legislative requirements

In assessing Aurizon Network's WACC proposal, we have had regard to all the factors in section 138(2) of the QCA Act, as set out in the 'Role of the QCA' section at the start of this Draft Decision.

In the context of assessing Aurizon Network's proposal, we must have regard to the factors listed in section 138(2) and give them an appropriate level of weighting, as identified in section 2.1.2 of this Draft Decision.

³⁸⁵ Based on the 20-day averaging period preceding 30 November 2012

³⁸⁶ Aurizon Network, sub. no. 3: 102, 147–148

³⁸⁷ Aurizon Network, sub. no. 3: 102, 149

Against this background, we consider:

- sections 138(2)(a), (b), (d), (e), (g) and (h) should be given more weight, as identified below
- section 138(2)(g) refers to the pricing principles mentioned in section 168A, of which we consider sections 168A(a), (c) and (d) should be given more weight, as identified below
- sections 138(2)(c), 138(2)(f) and 168A(b) should be given less weight, as they are less practically relevant to our assessment.

Efficient costs

Sections 69E and 138(2)(a) of the QCA Act require that we have regard to the object of Part 5 of the QCA Act, namely to promote the economically efficient operation, use of and investment in the CQCN, as the significant infrastructure by which the declared service are provided. Sections 138(2)(g) and 168A(a) require that we have regard to certain pricing principles, including that the price for access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved.

In broad terms, we consider, pursuant to section 138(2)(b) of the QCA Act, that the legitimate business interests of Aurizon Network will be met if the WACC is determined so as to ensure Aurizon Network can earn a return on capital enabling it to attract efficient debt and equity investment. While commercial and regulatory risk is discussed in detail in section 10.3.3 below, we note here that the theory behind the CAPM is that firms should be compensated for systematic risk, but not non-systematic risk, as the latter can be diversified by investors holding a prudent investment portfolio.

Conversely, sections 138(2)(e) and (d) require us to have regard to the interests of access seekers and the public interest. We also consider that the rights of existing access holders are relevant under section 138(2)(h), to the extent they are not already 'access seekers' under section 138(2)(e). As identified earlier, consideration of all of these interests leads to a conclusion that Aurizon Network should be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the objective of Part 5 specified in section 69E of the QCA Act.

Moreover, if Aurizon Network is permitted to recover no more than its efficient costs and return on investment as identified in section 168A(a), it will have incentives to incur costs efficiently for the purposes of section 168A(d) and will have less scope to discriminate in favour of its downstream operations - which could otherwise raise concerns under section 168A(c). The need for costs to be minimised is also particularly important in light of the current adverse economic climate in the Queensland mining industry, so is in the public interest under section 138(2)(d).

A further additional factor relevant to our assessment of Aurizon Network's proposal is that, where possible, an approach should be adopted which provides for regulatory certainty. We have had regard to this factor pursuant to section 138(2)(h) of the QCA Act. We support a stable and predictable regulatory environment for Aurizon Network; an environment in which there are changes to methodology only where there is a clear case for such changes.

Allocation of costs

When considering cost allocation, in addition to section 138(2)(b) of the QCA Act we have also had regard to section 137(1A)(b), as well as section 168A(c). Section 137(1A)(b) applies to Aurizon Network as a 'related access provider', namely an access provider that not only owns or

operates the declared service, but also provides, or proposes to provide, access to the service to itself or a related body corporate. Section 137(1A)(b) requires that Aurizon Network's access undertaking must include provisions for preventing Aurizon Network from recovering, via the access price, costs that are not reasonably attributable to the provision of the service.

10.3 Framework issues

10.3.1 Aurizon Network Proposal

Aurizon Network identified five specific rate of return issues that it said should be considered in the context of the pricing principles in the QCA Act as 'framework issues', in addition to the legislative requirements identified above. These matters include:

- the investor's perspective
- Aurizon Network's commercial and regulatory risks
- estimation error
- application of the Net Present Value (NPV) = 0 Principle
- the financial market environment.

We have addressed each of these matters in detail below.

10.3.2 Investor's perspective

Aurizon Network proposal

Aurizon Network considered our estimation of the WACC should include the investor's perspective, because whether or not the return is commensurate (or 'at least' commensurate) with the relevant risks can only be answered by investors.³⁸⁸ In Aurizon Network's view, an investor's perspective includes:

- the extent to which the proposed return will deliver an adequate return to shareholders and enable the business to raise additional capital to fund new investments³⁸⁹
- a broad perspective in assessing alternatives and identifying an appropriate asset class for comparison, including comparing with firms in the transportation sector (including US Class 1 railways), and potentially energy, water, communications and even social infrastructure (such as education and health care).³⁹⁰

Stakeholders' comments

The QRC said a balance must be struck between Aurizon Network's legitimate business interests, the interests of network users, and the public interest. This is particularly important in the current market as the risks of overestimating WACC (from under-investment by network users in complementary facilities, and a distortion of competition in upstream or downstream markets) are at least as great as the risks of underestimation (from under-investment by Aurizon Network in the network).³⁹¹

³⁸⁸ Aurizon Network, sub. no. 3: 104–107

³⁸⁹ Aurizon Network, sub. no. 3: 104

³⁹⁰ Aurizon Network, sub. no. 3: 105

³⁹¹ QRC, sub. no. 64: 4

QCA analysis

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

We agree with Aurizon Network that assessment of its WACC proposal should involve consideration of the investor's perspective. We consider this to be consistent with the requirement for us, in deciding whether to approve a draft access undertaking, to have regard to the legitimate business interests of the owner of the relevant declared service (in accordance with section 138(2)(b) of the QCA Act). This is because the interests of debt and equity holders, or potential debt and equity holders, could be considered to normally align with the legitimate business interests of the firm.

We consider the legitimate business interests of Aurizon Network (and its investors) will be met if WACC is determined so as to ensure it can earn a return on capital enabling it to attract efficient debt and equity investment, consistent with the pricing principles in the QCA Act. Specifically, sections 138(2)(g) and 168A(a) require that the price for access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and include a return on investment commensurate with the regulatory and commercial risks involved. Our view is that the methods we have used to estimate WACC, including its parameters, provide an outcome consistent with Aurizon Network's legitimate business interests and this pricing principle. Our methods are discussed in detail in the remainder of this chapter.

We also agree with the QRC that, while the investor's perspective is important, it is not the only relevant consideration. Efficient investment does not include under-investment or over-investment. As the QRC suggested, while under-investment in the rail infrastructure has negative implications for Aurizon Network and its investors (and the coal industry through potential lack of future capacity), over-investment also has negative implications as it may lead to under-investment at other functional levels of the coal supply chain, including mine development.

Specifically, as identified above, sections 138(2)(e) and (d) require us to have regard to the interests of access seekers and the public interest. As identified earlier in this submission, consideration of all of these interests leads to a conclusion that Aurizon Network should also be permitted to recover no more than efficient costs and return on investment as identified in section 168A(a). In this manner, effective competition in markets upstream and downstream of the CQCN will be promoted as contemplated by the objective of Part 5 specified in section 69E of the QCA Act.

With regard to the specific issue of beta estimates, we consider determining a value for this parameter that is consistent with the requirements of section 168A(a) of the QCA Act necessarily involves identifying comparator firms with similar risk profiles to Aurizon Network.

For reasons discussed in section 10.8.2, we consider regulated Australian and international energy and water businesses are the closest comparators to Aurizon Network. We do not consider US Class 1 railroads or Australian-listed transportation businesses (or communications or social infrastructure businesses) are sufficiently close comparators to use in estimating betas.

10.3.3 Aurizon Network's commercial and regulatory risks

Aurizon Network proposal

Aurizon Network reiterated that section 168A(a) of the QCA Act entitles it to earn a return commensurate with its commercial and regulatory risks, and it is therefore important to identify and assess these risks and consider whether they are compensated via the WACC.³⁹²

Aurizon Network and its consultant, Synergies Economic Consulting (Synergies), examined a range of areas where it considered there to be differences in the way we apply the regulatory framework to Aurizon Network when compared to other regulators. These factors include, among other things, the imposition of an X-factor for productivity (in UT3); a more intrusive approach to forecasting operating and maintenance expenditure; the absence of merits review; exposure of revenue risk in the event of failing to make the network available due to its own breach or negligence; and optimisation risk in the event of a material reduction in demand, the possibility of actual bypass and a deterioration in asset condition.³⁹³

Aurizon Network is concerned these factors are not appropriately taken into account when we compare parameters for the CAPM-derived equity beta.

Aurizon Network (and Synergies) also outlined a number of areas where they consider regulatory risk is not adequately addressed by the return on equity model (as it deals only with systematic risk) and therefore separate allowances should be made for regulatory risk (and other non-systematic risks), as follows:

- asymmetric risk, including: a material and substantiated reduction in demand; a change in the preferred traction choice (specifically the stranding of its electric network assets); that we do not accept the full amount of capital expenditure; and that the RAB is optimised for deterioration in network condition.³⁹⁴ In this context, Aurizon Network (and Synergies) suggested it may be exposed to unexpected downside risks (such as asset stranding) but unable to benefit from unexpected upside occurrences due to the method we use to determine (and constrain) its rate of return
- regulatory risk, including changes to the regulatory framework or the risk that a parameter may be under-estimated or that some other error occurs in the regulatory process.³⁹⁵

As a consequence, Aurizon Network argued that, to the extent these risks have a systematic element, they should be considered as part of the beta assessment, especially when making comparisons against publicly listed businesses not exposed to these risks. Otherwise, recognising the measurement issues, Aurizon Network submitted these risks should be addressed via the specification of a range for WACC and the decision as to where to select the WACC from within that range.³⁹⁶

Stakeholders' comments

The QRC, Anglo American and Vale consider Aurizon Network to be a very low risk business, with a trend of risk reductions achieved through incremental changes to its regulatory arrangements, including:

³⁹² Aurizon Network, sub. no. 3: 107

³⁹³ Aurizon Network, sub. no. 3: 107-108; Aurizon Network, *A Comparator Analysis of Aurizon Network's Commercial and Regulatory Risks, January 2014*

³⁹⁴ Aurizon Network, sub. no. 3: 108-109.

³⁹⁵ Aurizon Network, sub. no. 3: 109

³⁹⁶ Aurizon Network, sub. no. 3: 112

- a revenue cap
- increased scope of take-or-pay arrangements
- capital expenditure pre-approval processes
- accelerated depreciation
- broadened scope of review events.³⁹⁷

The QRC engaged McKenzie and Partington to consider, among other things, if there were grounds to support Aurizon Network's proposed approach of adopting the upper bound of a range of estimates for each WACC parameter. McKenzie and Partington considered:

- the WACC discount rate does not incorporate the non-systematic risks identified by Aurizon Network, but considered a better way to deal with such issues is through the cash-flows, where changes in government regulation, for example, impact on costs. The advantage of adjusting cash-flows is that it makes the adjustment clearly visible and hence transparent
- as a general rule, it is bad practice to add adjustment factors to discount rates. Such discount rate adjustments add an extra risk premium to allow for risks that have not been accounted for when estimating the expected cash-flows
- adding 'fudge factors' to discount rates is bad practice because it drives a wedge between the theoretically correct discount rate and the discount rate actually used.³⁹⁸

The QRC also engaged Castalia Strategic Advisors (Castalia) to consider the risks of Aurizon Network compared to other Australian regulated entities. Castalia concluded there were no grounds for arguing the risks embedded in the regulatory framework that applies to Aurizon Network are materially higher than in the other Australian regulatory frameworks considered in its study, or Telstra.³⁹⁹

QCA analysis

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

We agree with Aurizon Network that it is important the approved WACC is consistent with section 168A(a) of the QCA Act—i.e. that it is determined so the price of access to the declared service should generate expected revenue for the service that is at least enough to meet the efficient costs of providing access to the service, and include a return on investment commensurate with the regulatory and commercial risks involved.

Aurizon Network said it should be compensated for non-systematic risks, including regulatory risks, it believes are not adequately addressed by the return on equity model. However, as Anglo American and other stakeholders have pointed out, the regulatory regime also provides a number of measures that act to reduce the regulatory and commercial risks faced by Aurizon Network. (Anglo American listed a large number of measures in its submission, some of which applied in UT3 and some of which are proposed for UT4).⁴⁰⁰

³⁹⁷ QRC, sub. no. 64: 7; Anglo American, sub. no. 93: 13-16; Vale, sub. no. 99: 2

³⁹⁸ McKenzie and Partington, Report to the QRC - October 2013: 11–12

³⁹⁹ Castalia Strategic Advisors - Report to the QRC - October 2013: 29

⁴⁰⁰ Anglo American, sub. no. 93: 13–16

We consider regulatory regimes are designed to fit the particular circumstances of the regulated entities and sectors being regulated. This means it is inevitable that the regulatory regime that applies to Aurizon Network will differ in some ways from other Australian regulatory regimes. However, we do not consider Aurizon Network necessarily faces greater non-systematic risk, including regulatory risk, than other regulated Australian businesses in comparable circumstances.

We do not accept Aurizon Network's view that non-systematic risks should be addressed via specification of a range for WACC and the decision as to where to select WACC from within that range. Rather, we consider WACC (and its parameters) should be determined by carefully assessing all available evidence and using our best judgement to calculate the point estimates that will give rise to an estimate of the WACC that best meets the pricing principles and the other factors in section 138(2) of the QCA Act.

This is the approach we have followed for the purposes of calculating Aurizon Network's WACC for the 2014 DAU period (the details of which are discussed in the remainder of this chapter).

10.3.4 Estimation error

Aurizon Network proposal

Aurizon Network considers that the estimation of many WACC parameters, including the market risk premium, is inherently imprecise and vulnerable to error. It noted that rate of return assessments are 'invariably one of the most contentious issues in regulatory processes given the inherent uncertainty in estimating the expected values for parameters that are not readily observable in the market'.⁴⁰¹

Aurizon Network identified two key sources of potential error:

- model error—while Aurizon Network is not proposing to move from the CAPM to determine the cost of equity, it said, given its known deficiencies, care is required to ensure the outcomes produced are commercially reasonable given prevailing market conditions and the relevant risks, including that it not be applied in a mechanistic way⁴⁰²
- measurement error—which can come about when historical data is used to estimate forward looking parameters, and is a particular concern where there is considerable uncertainty and historically low risk-free rates. Aurizon Network said the risk of estimation error is particularly high for the cost of equity where:
 - different beta estimates can emerge from the same dataset using different estimation techniques and time periods
 - the historical market risk premium may not reflect the expected value in difficult and uncertain market conditions
 - adjustments have not been made to the market risk premium to reflect the use of a five-year term to maturity for the risk-free rate and debt margin.⁴⁰³

Aurizon Network said it is important we have regard to the risks and consequences of potential error in estimating individual parameters and determining the overall WACC. It also said that this highlights the importance of not applying the CAPM in a mechanistic way, and of the QCA

⁴⁰¹ Aurizon Network, sub. no. 77: 38

⁴⁰² Aurizon Network, sub. no. 3: 114–115

⁴⁰³ Aurizon Network, sub. no. 3: 115–117

considering whether the outcomes produced are commercially reasonable, given prevailing market conditions and the relevant risks.

Stakeholders' comments

The QRC acknowledged there may be scope for estimation error, but said there is no reason to expect estimation errors for particular parameters will be skewed in one direction or another:

*While it is possible that one particular parameter may be under-estimated, it is equally possible that other parameters may be over-estimated such that the overall WACC is reasonably commensurate with the risks involved in providing access – in short, any errors in estimation may be expected to be roughly equally distributed in either direction and thus ‘balance out’.*⁴⁰⁴

The QRC considered the risks of overestimating the WACC are just as great (if not greater) than the risks of underestimation. The QRC did not support an approach that seeks to account for estimation error by adopting upper bound values for WACC parameters, but supported determining WACC based on the best estimate of the various parameters.⁴⁰⁵

QCA analysis

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

We agree with Aurizon Network that the estimation of WACC, and its parameters, can be subject to estimation error. This is particularly the case where key parameters are unobservable, and must be estimated through careful assessment of empirical evidence combined with good judgement.

However, our approach is to apply the best estimate for each WACC parameter, rather than err on the high side. We consider that this approach best achieves a weighting of the factors set out in section 138(2) of the QCA Act that achieves an appropriate balance between the competing interests of the various stakeholders, as identified earlier in this chapter. An approach, for example, that sought to account for estimation error by adopting upper bound values for WACC parameters would necessarily lead to a weighting of the WACC in favour of the interests of the access provider, to the detriment of access seekers, competition and the public interest.

With regard to model error, we accept the CAPM can be subject to some estimation error and is sensitive to the assumptions underpinning it. However, it remains the model most widely used by regulators (and the corporate sector) for estimating the equity return investors require to make it worth investing in a business. It is also simpler to understand and requires estimates of only a small number of parameters relative to competing asset pricing models.

Our consideration of the issues raised by Aurizon Network on the estimation of specific WACC parameters is included in **Table 81**:

⁴⁰⁴ QRC, sub. no. 64: 5

⁴⁰⁵ QRC, sub. no. 64: 5, 8; 65: 13

Table 81 Estimation of parameters

| <i>Issue</i> | <i>QCA consideration</i> |
|---|--|
| Different beta estimates can emerge from the same dataset using different estimation techniques and time periods | <p>It is true different beta estimates can emerge from the same dataset, depending on estimation methods and time periods, but the implication of this is that we must exercise our judgement in determining these factors based on the evidence before us.</p> <p>In the absence of Australian publicly-listed rail networks, we have estimated betas by applying empirical assessment to a large sample of Australian and international regulated energy and water businesses, which we believe are the best available comparators for the Aurizon Network business. We have then used our best judgement to determine final estimates for the asset and equity betas.</p> <p>Detailed discussion of our estimation of the betas is contained in section 10.8.</p> |
| The historical market risk premium may not reflect the expected value in particular market conditions | <p>As the market risk premium is unobservable and there is no single perfect method for estimating it, a series of methods, both historical and forward-looking, should be used. We discussed this issue in detail in our Market Parameters Decision of August 2014 and also pointed to judicial comment that supports this approach. We have estimated the market risk premium by assessing several methods and applying our judgement to determine a final best estimate.</p> <p>Detailed discussion of our estimation of the market risk premium is contained in section 10.7.</p> |
| Adjustments have not been made to the market risk premium to reflect the use of a five-year term to maturity for the risk-free rate and debt margin | <p>Our practice of estimating the market risk premium using several different methods (historical and forward-looking) and application of our judgement, provides a carefully assessed estimate of the market risk premium, reflecting prevailing market conditions.</p> <p>Use of the 10-year risk-free rate in the market risk premium in the past has been a consequence of data limitations that arise from applying historical methods to estimate the market risk premium.</p> <p>However, as part of our cost of capital methodology review, we examined the historical difference between the 10-year rate and five-year rate as applied to estimate the market risk premium.⁴⁰⁶ This analysis reinforced the conclusion discussed in section 10.7.1 of this chapter that a reasonable estimate of the market risk premium at this time is 6.5%.</p> <p>This matter is discussed in detail in section 10.4.1.</p> |

10.3.5 Application of the NPV = 0 Principle and term to maturity

Aurizon Network raised a number of issues with our application of the NPV = 0 Principle:⁴⁰⁷

- it has no specific legislative foundation
- it constrains our ability to set Aurizon Network's prices so as to give Aurizon Network a return on its investment to compensate for its commercial and regulatory risks
- the Productivity Commission has recognised that, while expected economic profit is constrained to be zero (in NPV terms), the presence of risk can mean actual economic profit is not zero —high actual economic profit can be consistent with competitive behaviour
- even if the NPV = 0 Principle is accepted, its application does not require alignment of the term of the risk-free rate with the length of the regulatory cycle - the AER uses a term of 10 years and considers this still satisfies the NPV = 0 Principle.

⁴⁰⁶ QCA, August 2014: 23

⁴⁰⁷ Aurizon Network, sub. no. 3: 112–113

Stakeholders' comments

The QRC and RTCA supported the NPV = 0 Principle (and a term for the risk-free rate matching the term of the regulatory period), on the basis it ensures NPV neutrality.⁴⁰⁸

QCA analysis

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

We have applied the NPV = 0 Principle, either implicitly or explicitly, in setting regulatory prices in recent decisions. We consider that the NPV=0 principle achieves an appropriate balancing of the factors set out in section 138(2) of the QCA Act, as identified earlier in this chapter. On the one hand, it results in Aurizon Network achieving expected revenue for the service that is at least enough to meet the efficient cost of providing access to the service and include a return on investment commensurate with regulatory and commercial risks involved. On the other hand, it also results in Aurizon Network being permitted to recover no more than such efficient costs and return on investment.

This matter is discussed in detail in the QCA's Market Parameters Decision of August 2014.⁴⁰⁹ We point to the detailed comments we made on the NPV = 0 issue in that decision (see section 2.3 of the decision) which, in turn, referenced our detailed comments in relation to the Statement of Regulatory Pricing Principles ("Pricing Principles Statement"). We adopt our earlier analysis on this issue for the purposes of this Draft Decision.

⁴⁰⁸ QRC, sub. no. 64: 9–10; QRC sub. no. 106: 3; Rio Tinto, sub. 73: 92

⁴⁰⁹ QCA, August 2014 - particularly see Appendix B: 41-46

NPV = 0 Principle and the appropriate term of the risk-free rate

The Net Present Value Principle (NPV = 0 Principle) states that the present value of the regulated firm's expected net cash flows should equal investors' initial investment.⁴¹⁰ In general terms, the present value of a regulated firm's revenue stream should equal the present value of its efficient costs, including a risk-adjusted opportunity cost of capital.⁴¹¹

More specifically, the NPV = 0 Principle means the expected present value of the future cash-flows of the regulated firm should equal the value of the initial investment, using a discount rate that reflects the opportunity cost of the investment.

If allowed revenues are less than the revenues expected to satisfy the NPV = 0 Principle, then investors will not have an incentive to invest. If allowed revenues are more than the revenues expected to satisfy this principle, then the incremental revenue reflects the excess profit regulation seeks to prevent in the first place.

Schmalensee⁴¹² showed that, in order to satisfy the NPV = 0 Principle, the period of the risk-free rate should match the term of the regulatory cycle, but assumes the only source of risk is over future interest rates and the firm is financed only by equity.

Lally⁴¹³ extended Schmalensee's research by considering additional sources of risk. Assuming a finite life of the regulated assets and an annual reset of the regulated output price, Lally showed that Schmalensee's 'term-matching' result still holds, even in the presence of operating cost risk (which includes taxes) and demand risk. Lally also showed that, even in the presence of the risk of revaluations to the firm's RAB, the possibility of such risk should be dealt with through a risk allowance rather than by changing the term of the risk-free rate. The correct term for the risk-free rate is still a term matching the term of the regulatory cycle.

Lally further extended this work and considered the implications for the firm of (at least) partial debt financing and the possibility the firm chooses a duration for its debt that deviates from the length of the regulatory cycle.⁴¹⁴

In both papers, Lally demonstrated that the term of the risk-free rate should match the term of the regulatory cycle.

Our response to specific issues raised by Aurizon Network in respect of the application of the NPV = 0 Principle is included in **Table 82**.

Table 82 NPV = 0 principle

| <i>Issue</i> | <i>QCA consideration</i> |
|------------------------------|---|
| Consistency with the QCA Act | <p>As identified above, we consider the application of the NPV = 0 Principle achieves an appropriate balancing of the factors set out in section 138(2) of the QCA Act. We also point to our earlier comments in the Market Parameters Decision and Pricing Principles Statement.</p> <p>We agree risk affects investors' expectations of profits. However, the regulatory cost of capital includes a premium for relevant risk. When the firm's risk-adjusted cash-flows are discounted at the relevant risk-adjusted cost of capital, the NPV of the investment</p> |

⁴¹⁰ Marshall, et al., 1981

⁴¹¹ The formulation also takes into account any adjustment for efficiency rewards or penalties.

⁴¹² Schmalensee 1989

⁴¹³ Lally 2004b

⁴¹⁴ Lally 2007a

| <i>Issue</i> | <i>QCA consideration</i> |
|---|--|
| | should be zero. |
| Compensation for regulatory and commercial risks | <p>Regulators in Australia (including the QCA) typically use the building blocks model to satisfy the NPV = 0 principle. A discounted cash-flow (DCF) method is used to set the NPV of the expected net cash-flows (inflows minus outflows) to zero. The discount rate (or rate of return) used in this calculation is an estimate of the opportunity cost of capital to debt and equity investors consistent with the systematic risk of the entity's cash flows.</p> <p>We consider the building blocks model, and the NPV = 0 Principle, provide appropriate compensation for relevant commercial and regulatory risks that achieves an appropriate balancing of the factors set out in section 138(2) of the QCA Act, including by providing a return calculated using the WACC.</p> <p>We note our comments in the Market Parameters Decision on this issue, in which we stated:</p> <p>'In terms of SFG Consulting's concerns about appropriate compensation for commercial and regulatory risks, the Building Blocks Model - and the NPV = 0 Principle that underlies its use - do not preclude such compensation for relevant risks. There is nothing inherent in applying the NPV = 0 Principle that prevents these risks, to the extent they exist, from being identified, quantified and incorporated into the regulated firm's prices.'</p> |
| Estimated economic profit versus actual economic profit | The Productivity Commission noted the presence of risk means actual economic profit might not be zero, but this is not inconsistent with expected economic profit being zero. ⁴¹⁵ The latter is based on an expected rate of return, but the actual rate of return might deviate from what is expected, through actions taken by the firm that raise its revenues or reduce its costs or by chance (e.g. weather). |
| Alignment with the length of the regulatory cycle | <p>Aurizon Network said that, even if the NPV = 0 Principle is accepted, its application does not require alignment of the term of the risk-free rate with the length of the regulatory cycle, noting the AER uses a term of 10 years and considers this still satisfies the NPV = 0 Principle.</p> <p>We note that, while the AER considers that a 10-year term satisfies the NPV = 0 Principle, it has said there are compelling arguments both for a five-year term and a 10-year term. The AER adopted a 10-year term primarily on the basis that: (a) a survey of market practitioners found they use a 10-year rate to value regulated infrastructure assets subject to a five-year regulatory period; and (b) long-term (e.g. 10-year) bond rates, in general, will lead to a more stable return on equity than short-term (e.g. five-year) rates.⁴¹⁶</p> <p>We discussed the issue of term matching in detail in the Market Parameters Decision. We concluded that matching the term of the risk-free rate in the cost of equity to the term of the regulatory cycle (e.g. five years) best achieves the QCA's regulatory objectives. We concluded that term matching will ensure that the regulated business does not systematically over- or under-recover its efficient costs. We refer to our analysis of this issue in the Market Parameters Decision.</p> |
| Previous QCA decision | <p>Aurizon Network suggested our approval of the DBCT Management agreement with its users (which included a 10-year term risk-free rate) indicated we have not consistently applied the NPV = 0 approach.⁴¹⁷</p> <p>However, our consideration of DBCT Management's calculation of revenues and prices for its 2010 undertaking occurred in the context where DBCT Management and the terminal's existing users agreed to rolling forward existing cost parameters and the resultant revenues and tariffs.</p> <p>The QCA did not seek to assess the reasonableness, or otherwise, of the cost components. We did note that DBCT Management proposed to estimate the risk-free</p> |

⁴¹⁵ Productivity Commission, 2004: 103

⁴¹⁶ AER, 2013c: 184

⁴¹⁷ Aurizon Network, sub. no. 3: 113

| <i>Issue</i> | <i>QCA consideration</i> |
|--------------|---|
| | <p>rate with reference to the yields on 10-year nominal Commonwealth Government bonds whereas, in other recent regulatory decisions, we have assessed the risk-free rate with reference to the length of the regulatory period. We did not believe those two positions to be contradictory.</p> <p>The users of DBCT Indicated they accepted that, as a package, the proposed terms and conditions of access were reasonable, without accepting the merits of each and every aspect of those arrangements. The focus of the QCA's assessment was on whether the proposed arrangements discriminated against future users of the terminal and whether DBCT Management had accurately described its calculation of proposed revenues and tariffs.</p> <p>Consequently, our approval of the 2010 DBCT undertaking did not imply we accepted any particular WACC methodology underlying it.</p> |

10.3.6 Financial market environment

Aurizon Network said conditions in financial markets have a significant impact on its MAR and reference tariffs via the WACC. In particular, Aurizon Network indicated that, in considering the requirements of section 168A(a) of the QCA Act, we should have regard to the following:

- the actual rates of return differ from the assumptions used in the regulated WACC over the course of the regulatory period, and what is unknown is whether rates will move higher or lower and by how much
- the application of the 'mechanistic approach' to setting WACC could result in a historically low cost of equity, which is not reflective of investors' actual return expectations.⁴¹⁸

Aurizon Network said this may lead to investment distortions, including in its own supply chain, where it considers it is competing for capital with DBCT.⁴¹⁹

To address these issues, Aurizon Network proposed we consider a range of options, including:

- aligning the measurement period for the risk-free rate and the market risk premium
- estimating WACC at the upper end of a range (as has been applied by the Independent Pricing and Regulatory Tribunal (IPART))
- annually adjusting the risk-free rate and the debt margin
- cross-checking the reasonableness of the WACC estimate against alternative models and/or market estimates and adjust the WACC accordingly.⁴²⁰

Stakeholders' comments

The QRC did not agree with Aurizon Network's proposed upward adjustment to the WACC to account for estimation error and considered that, to the extent estimation error may be 'exacerbated' by uncertainty around the financial and economic outlook, this cannot justify any further upward adjustment to the overall WACC estimate.⁴²¹

⁴¹⁸ Aurizon Network, sub. no. 3: 123

⁴¹⁹ Aurizon Network, sub. no. 3: 121–122

⁴²⁰ Aurizon Network, sub. no. 3: 124–125

⁴²¹ QRC, sub. no. 64: 6

McKenzie and Partington also did not recommend making the types of arbitrary adjustments proposed by Aurizon Network to account for either potential estimation error or uncertainty in the financial market outlook.

McKenzie and Partington also questioned Aurizon Network's conclusion that financial markets are generating unusually low cost of equity outcomes, with the view the nominal interest rate on 10-year government bonds is reasonably close to the long-run average, excluding the recent period, and is not a long way below the long-run average using all data.⁴²²

QCA analysis

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

The key issue Aurizon Network has posed for us is whether current financial market conditions are sufficiently different from previous financial market conditions to suggest we should significantly alter the approach we use to estimate the regulated rate of return. The approach we use must give rise to an estimated rate of return which appropriately balances the factors set out in section 138(2) of the QCA Act, as we have previously identified. We consider that the key issue is whether the current financial market conditions could lead to our approach giving an estimate of the rate of return that does not achieve an appropriate balance.

We note that we considered this same issue in the context of the Market Parameters Decision and our analysis also applies to this Draft Decision. In that decision, we agreed with stakeholders that there is merit in considering a broader range of information in coming to a view on the reasonableness of the return on equity. We have adopted the approach of considering a broader range of information in the context of this Draft Decision.

We, and other Australian regulators, have generally used the risk-free rate as the best estimator of the rates likely to prevail over the term of the relevant regulatory period. There are solid analytical reasons for this approach, primarily based on the view the prevailing risk-free rate will reflect market expectations of future rates.

Whether current rates are at historical lows is a matter of considering the reference point being used. While Aurizon Network and its advisor, SFG Consulting, have observed rates are at historical lows, a number of analysts have concluded risk-free rates in the recent past have been abnormally high. Dimson et al. consider low rates may be the new normal:

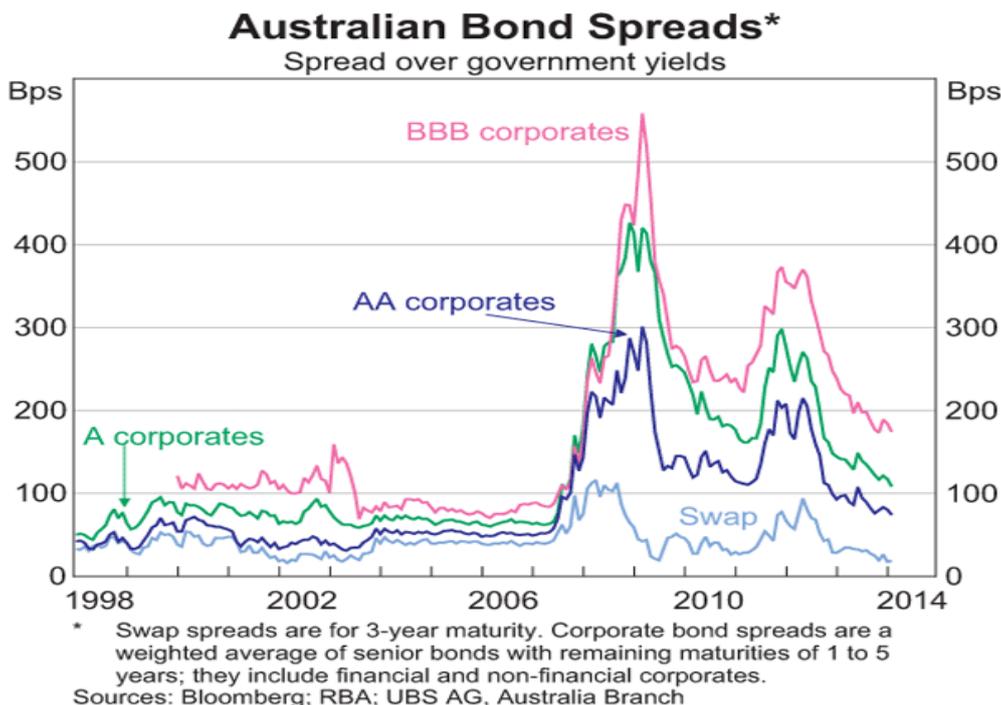
From 1981 until the financial crisis in 2008, real interest rates were high, averaging 2.2% in the USA, 3.9% in the UK, and 3.3% across all Yearbook countries. Rates were much lower before this, from 1900 to 1980, when the average annual rate was 0.7% for the USA, 0.4% for the UK, and – 0.6% when averaged across all countries, including those impacted by episodes of high inflation. Viewed through this prism, it is the high real rates from 1981 to 2008 that are the anomaly. However, today's real rates have fallen even below the 1900–80 average, implying a corresponding lowering of expected real equity returns.⁴²³

It appears debt premiums have been falling. **Figure 28** shows the increase in the premium in Australia during the GFC, and another increase in 2012 when the Australian economy faltered, which is consistent with the notion that default risk drives the spreads. However, although not yet back to the pre-GFC level, the spreads have been falling.

⁴²² McKenzie and Partington: 16

⁴²³ Dimson, Marsh and Staunton 2013: 8

Figure 28 Australian Corporate Bond Spreads 1998-2014



In addition, Lally⁴²⁴ identified a number of concerns with the SFG Consulting analysis (which suggests foreign investors can earn a higher return on debt than equity). In particular, Lally suggested the SFG Consulting analysis ignored the potential equity return from capital gains for foreign investors. (Capital gains have been a feature for Aurizon Network's investors in recent years.) These issues are discussed in detail in the QCA's final decision on market parameters.⁴²⁵

Given this, our view is that it is far from clear that current market conditions are sufficiently different from previous market conditions to warrant significant alteration to the approach we use to estimate the WACC and its parameters. That said, as discussed elsewhere in this chapter, we have exercised our judgement to estimate each WACC parameter on the basis of the evidence before us at this time, and we have adjusted our approaches to the estimation task where warranted.

We note Aurizon Network's comment that actual rates of return will differ from the assumptions used in the regulated WACC over the course of the regulatory period, but that it is unknown whether rates will move higher or lower and by how much. We agree with this comment but, as direction of movement is uncertain and some movement during a regulatory period will always be likely, we do not consider this adds weight to the rationale for taking any different approach to estimating WACC and its parameters. In addition, the appropriate rate of return is an *ex ante*, or expected, return given the assumed level of systematic risk. Variations in market conditions during the regulatory period that cause the firm's actual returns to deviate from this expectation can be considered part of the normal business landscape.

We have also noted Aurizon Network's view that applying a 'mechanistic approach' to setting WACC could result in a historically low cost of equity, which is not reflective of investors' actual return expectations. While accepting the cost of equity estimate in this Draft Decision is significantly lower than the cost of equity estimate included in the WACC build-up applied in

⁴²⁴ Lally 2013

⁴²⁵ QCA, August 2014: see particularly discussion in Appendix A: 33–34

UT3, our view is it is properly reflective of existing market conditions and is reasonably consistent with recent estimates made by other Australian regulators. Issues surrounding the reasonableness of WACC parameters estimated using the QCA's approach are discussed in detail in the Market Parameters Decision.⁴²⁶ As indicated above, our response to Aurizon Network's concerns regarding a 'mechanistic approach' has been for us to consider a broader range of information in coming to our view.

With regard to the specific options that Aurizon Network proposed we should consider to address the current financial market environment, our response is summarised in **Table 83**.

Table 83 Aurizon Network's proposals to address the current financial market environment

| <i>Option</i> | <i>QCA Analysis</i> |
|---|--|
| Aligning the measurement period for the risk-free rate and the market risk premium | <p>As discussed in section 10.3.4, our view is the term of the risk-free rate should match the term of the regulatory period, in order to satisfy the NPV = 0 Principle.</p> <p>With regard to estimating the market risk premium, as this parameter is unobservable, we have used a series of different methods to estimate it, both historical and forward-looking, and used our best judgement to determine a final value for the current market risk premium.</p> <p>However, as noted earlier, the QCA's cost of capital methodology review examined the historical difference between the 10-year rate and five-year rate as applied to estimate the market risk premium (see Market Parameters Decision). In the present context, we also examined the historical difference between the 10-year rate and the four-year rate. This analysis reinforced the conclusion discussed in section 10.7.1 of this chapter that a reasonable estimate of the market risk premium at this time is 6.5%.⁴²⁷</p> <p>This issue is discussed further in section 10.4.1.</p> |
| Estimating WACC at the upper end of a range | <p>We do not consider it appropriate to estimate WACC at the upper end of a range. As noted earlier, our approach is to apply the best estimate for each WACC parameter, rather than err on the high side. We consider this approach best achieves a weighting of the factors set out in section 138(2) of the QCA Act that achieves an appropriate balance between the competing interests of the various stakeholders. This is discussed further in section 10.3.4.</p> |
| Annually adjusting the risk-free rate and the debt margin | <p>We do not consider annual adjustment of the risk-free rate and debt margin to be appropriate for Aurizon Network's UT4 framework. Our view is these parameters should be set at the start of the regulatory period and the values maintained through the period, to provide certainty to both Aurizon Network and its stakeholders. We note this is the common practice among regulators in Australia.</p> |
| Cross-checking the reasonableness of the WACC estimate against alternative models and/or market estimates and adjust the WACC accordingly | <p>Our view is it is important to cross-check the reasonableness of the WACC estimate against alternative models and/or market estimates, including to assist us to ensure that our estimate takes into account and appropriately balances the various factors under section 138(2) of the QCA Act.</p> <p>We have determined our estimate of WACC and its parameters based on the evidence before us at this time in light of our previous analysis regarding the most appropriate methodology for that estimation, as set out in the Market Parameters Decision. We consider that our methodology and estimates take into account and appropriately balance the various factors under section 138(2) of the QCA Act. We have also taken into account independent advice, provided by Incenta Economic Consulting, as to the consistency of our WACC estimates with current market conditions and the expectations of market participants.⁴²⁸</p> |

⁴²⁶ QCA, August 2014: see particularly 7–9

⁴²⁷ QCA, August 2014: 23

⁴²⁸ Confidential advice from Incenta (unpublished).

Given the above, we consider that the application of our approach to estimating the WACC takes into account and appropriately balances the various factors under section 138(2) of the QCA Act.

10.4 Risk-free rate

The risk-free rate is the rate of return on an asset with zero risk. In the past, our approach to estimating the risk-free rate has involved:

- using Commonwealth Government bonds as proxies for the risk-free asset
- applying an 'on-the-day' rate, proxied by an average of the 20 days immediately preceding the start of the regulatory cycle
- setting the term of the risk-free rate equal to the term of the regulatory cycle.⁴²⁹

This approach has been applied since 2009, including in our decisions on Aurizon Network and the south east Queensland water and wastewater retail/distribution entities. Similar approaches have also been applied in recent decisions made by the Economic Regulation Authority (ERA) of Western Australia (for gas) and the New Zealand Commerce Commission (for all industry sectors).⁴³⁰

Aurizon Network proposal

Aurizon Network proposed an indicative 10-year risk-free rate of 3.15%, based on an averaging period of the 20 days ending 30 November 2012. The proposal was indicative as the actual averaging period was to be determined.

In respect of setting the risk-free rate, Aurizon Network identified two main concerns:

- our practice of aligning the term of the risk-free rate with the term of the regulatory cycle (for the purpose of satisfying the NPV = 0 Principle)
- estimating the risk-free rate in current financial market conditions, where Commonwealth Government bond yields are near historical lows (though we note they have risen since Aurizon Network's submission of UT4).⁴³¹ This issue is addressed in section 10.3.6.

Term of the risk free rate

Aurizon Network does not agree with aligning the term of the risk-free rate with the term of the regulatory cycle (i.e. four years) and supports an alternative 10-year term. Aurizon Network said:

*As is market practice, the rate should be based upon the 10-year government bond yield. This is supported by current and substantial regulatory evidence...Regulators have identified that for longer term equity, the NPV = 0 principle would seem to require the utilisation of risk-free rates of longer duration.*⁴³²

Aurizon Network and SFG Consulting, raised the following concerns:

⁴²⁹ The term of the risk-free rate in the following discussion is relevant to estimating the cost of equity.

⁴³⁰ See, for example, ERA, *Explanatory Statement for the Rate of Return Guidelines*, December 2013 : 84–85 and New Zealand Commerce Commission, *Input Methodologies (Electricity Distribution and Gas Pipeline Services)*, December 2010: 138

⁴³¹ Aurizon Network, sub. no. 3: 127

⁴³² Aurizon Network, sub. no. 102: 8

- term-matching is not required to satisfy the NPV = 0 Principle. Term-matching only holds under the assumption the term structure of interest rates today provides a set of unbiased expectations of future interest rates (i.e. the expectations hypothesis is valid). It is contended that several implications follow from the term-matching result, that suggest term-matching does not make sense:⁴³³
 - as the five-year rate is typically less than the 10-year rate, term matching leads to the perverse outcome that the length of the regulatory period can be reduced in order to reduce the cost of capital and prices to consumers⁴³⁴
 - the estimate of the market risk premium must rise—unless the regulator has changed its view on the required return on equity in the Australian market, the market risk premium must be increased⁴³⁵
 - since a regulator is attempting to estimate the price that would prevail in a competitive market, using term-matching results in a regulated price that is inconsistent with this competitive market outcome⁴³⁶
- setting the term of the risk-free rate should take into account practical considerations, consistent with the recent approaches of other regulators, such as the AER and IPART.⁴³⁷

Selection of the averaging period

Aurizon Network did not nominate an averaging period for the risk-free rate in its UT4 submission. However, Aurizon Network estimated a risk-free rate of 3.15% based on an indicative averaging period of November 2012 and the yields of 10-year nominal Commonwealth Government bonds.⁴³⁸

Following lodgement of its UT4 submission, Aurizon Network proposed a confidential averaging period of 4–31 October 2013, which is around four months later than the averaging period we would typically apply (i.e. the 20-day period immediately preceding the start of the regulatory cycle).

In proposing the October 2013 period, Aurizon Network submitted it:

- occurred after Aurizon Holding's debt refinancing and restructuring
- was consistent with recent regulatory decisions regarding duration of the averaging period
- avoided the times usually associated with low debt market liquidity
- allowed an efficient implementation of its debt hedging plan, particularly given the amount of debt involved.⁴³⁹

Stakeholders' comments

The QRC supported the approach of seeking to match the term of the risk-free rate to the length of the regulatory cycle.⁴⁴⁰

⁴³³ Aurizon Network, sub. no. 3: 112-113; Aurizon Network, sub. no. 7

⁴³⁴ Aurizon Network, sub. no. 7: 3

⁴³⁵ Aurizon Network, sub. no. 7: 3–4; SFG Consulting, 2013b and 2013d: 7–9

⁴³⁶ Aurizon Network, sub. no. 7: 4–5

⁴³⁷ Aurizon Network, sub. no. 104: 8–10

⁴³⁸ Aurizon Network, sub. no. 3: 127–128

⁴³⁹ Aurizon Network, sub. no. 102: 25

⁴⁴⁰ QRC. sub no 64: 9–10

Anglo American did not support the term of the proxy being extended to 10 years, noting Lally clearly demonstrated in his paper, *The Risk Free Rate and Market Risk Premium* (November 2012), that the proposal to increase the term to 10 years would breach the NPV = 0 Principle. Further, Lally identified that a term of the proxy of 10 years will provide Aurizon Network with unjustified compensation in its allowed cost of equity.⁴⁴¹

The QRC estimated an indicative five-year risk-free rate of 2.76% over the same period (i.e. November 2012).⁴⁴² The QRC's estimate is 39 basis points less than Aurizon Network's estimate of 3.15%, due to the different term of bond.⁴⁴³

The QRC noted it is not standard regulatory practice for a regulated firm to be permitted to delay nominating the averaging period, and noted standard practice is an averaging period close to, and preferably preceding, the commencement of the regulatory cycle.⁴⁴⁴ Anglo American considered the period should be nominated in advance to preclude the regulated firm from choosing an averaging period that produces an outcome that favours the firm.⁴⁴⁵

QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

Our Draft Decision for the 2014 DAU period is to estimate the risk-free rate, as follows:

- Commonwealth Government nominal bond yields as the proxy for the risk-free rate
- a 20-day averaging period
- a term to maturity consistent with the term of the regulatory cycle (i.e. four years).

In forming this view, we have taken into account the matters raised by the various stakeholders, with discussion of these issues outlined below.

We also note the approach proposed is consistent with the approach taken in UT3, including matching the term to maturity of the risk-free rate with the term of the regulatory period. The positions are also consistent with those outlined in the QCA's Market Parameters Decision.⁴⁴⁶

NPV = 0 and the expectations hypothesis

The expectations hypothesis means current long-term interest rates reflect current short-term interest rates and forecasts of movements in the latter rates over the life of the long-term interest rates.⁴⁴⁷

Aurizon Network and SFG Consulting do not agree that, in order to satisfy the NPV = 0 Principle, it is necessary for the term of the risk-free rate used to set the allowed rate of return for a

⁴⁴¹ Anglo American, sub no. 93: 4

⁴⁴² We assume the QRC applied a five-year term as a proxy for the four-year regulatory term.

⁴⁴³ QRC, sub. no. 64: 10

⁴⁴⁴ QRC, sub. no. 64: 9

⁴⁴⁵ Anglo American, sub. no. 93: 4

⁴⁴⁶ QCA, August 2014: 13–14

⁴⁴⁷ For example, if the one-year rate now (r_{01}) is .03 and the one-year rate in one year with certainty (r_{12}) is .10, then if the expectations hypothesis is correct, the two-year rate now (r_{02}) is determined by solving $(1+r_{02})^2 = (1+r_{01})(1+r_{12}) = (1.03)(1.10)$. Therefore, $r_{02} = .064$.

regulated business to match the regulatory term. SFG Consulting said this result only holds if the expectations hypothesis characterises the term structure of interest rates.⁴⁴⁸

We have reviewed and considered relevant material in the Aurizon Network submissions, Lally's responses and the related journal articles.⁴⁴⁹ These issues are discussed in detail in the Market Parameters Decision, which also includes a worked example.⁴⁵⁰ As discussed in that decision, we consider the view that the expectations hypothesis is a necessary condition for term-matching to satisfy the NPV = 0 Principle is not correct. It is our view term-matching is a requirement to satisfy the principle regardless of how interest rates are determined.⁴⁵¹

In addition to the formal worked example cited above, Lally also demonstrated that, if you compare the regulator's consideration of the appropriate term for the risk-free rate to the way a floating rate bond works, the inconsistency inherent in using a term of the risk-free rate different to the term of the regulatory period becomes more apparent.⁴⁵²

A floating rate bond with a one-year interest rate reset date will have the one-year rate attached to it. If the value of the bond is \$100, and the one-year interest rate is 5%, the return at the end of year one will be \$5. For year two, if we then assume the one-year interest rate increases to (say) 6%, the return will be \$6 – i.e. a total return of \$11 over the two years.

If the \$100 floating rate bond (still with a one-year interest rate reset date) instead had a two-year interest rate attached to it, the outcome would be different. With an upward sloping yield curve, which is the most common circumstance, we might assume a two-year interest rate for year one of 6%, giving a return at the end of year one of \$6. The two-year interest rate would then be reset at the end of year one. If we again assume an interest rate increase to (say) 7%, the return for year two will be \$7 – i.e. a total return of \$13 over the two years. The outcome is not NPV neutral (NPV = 0) – i.e. the use of the two-year interest rate with a floating rate bond with a one-year interest rate reset date will return \$13 cash to the bond-holder instead of \$11.

This example is analogous to the circumstance where a regulator uses a term for the risk-free rate longer than the term of the regulatory period – i.e., with an upward sloping yield curve, the longer-term risk-free rate (say 10 years) will be higher than the risk-free rate for a term matching the regulatory period (say four years), which will produce a higher return for the regulated business.

This would be fine if the risk-free rate was not reset until the end of 10 years, as the outcome would reflect prevailing market conditions as they apply to 10-year bond rates now. However, the outcome does not satisfy the NPV=0 Principle when a regulatory reset after four years includes a reset of the risk-free rate (as is the case under Aurizon Network's regulatory arrangements).

The key point here is that the 10-year risk-free rate applies to 10-year bonds that do not have a rate reset in the interim. The risk-free rate we use to estimate Aurizon Network's WACC will be reset after four years, in accordance with the regulatory arrangements.

Accordingly, we have maintained our view that the NPV = 0 Principle requires that the term of the risk-free rate should be the same as the term of the regulatory period. Again, we note this is consistent with the approach taken in UT3, which was determined on the basis of the same

⁴⁴⁸ Aurizon Network, sub. no. 3: 112; Aurizon Network, sub. no. 7: 6-9

⁴⁴⁹ The journal articles are Lally (2007a), Hall (2007) and Lally (2007b).

⁴⁵⁰ QCA, August 2014: see particularly: 41–45

⁴⁵¹ Also see Lally (2013a: 45-50) for further details.

⁴⁵² Lally 2013a: 48-50

principles considered here. Our review of the expert material considered in our assessment of the UT4 proposal has not altered our previous view. Further details regarding our consideration of this issue can be found in the Market Parameters Decision and we affirm and adopt that analysis on this issue for the purpose of this Draft Decision.⁴⁵³

Potential inconsistency with the term of the market risk premium

Aurizon Network and SFG Consulting have indicated concerns about our practice of applying a term matching the regulatory period (e.g. five years for UT3) to estimate the risk-free rate (in the first term of the CAPM), while continuing to estimate the market risk premium using methods that assume a 10-year term for that rate. Aurizon Network considered:

- it is not appropriate to justify the inconsistency on the basis of the statistical imprecision between the five-year and 10-year market risk premium estimates
- even setting aside this argument, the five-year estimate should be used as our median estimate as the Ibbotson estimate is moving close to 6.5% — as a result, several basis points difference could matter
- the 'consistency principle' and the Australian Competition Tribunal's decision on GasNet require the same estimate should be used in both places.⁴⁵⁴

SFG Consulting also noted that IPART has recently decided one of the reasons to adopt a 10-year term is to preserve consistency between the risk-free rate used to calculate the cost of debt and the risk-free rate used to compute the cost of equity.⁴⁵⁵

We consider the relevant term for the market risk premium is one corresponding to the across-investor holding period between successive portfolio reassessments. This term could be as short as one year or as long as 10 years (or even possibly longer). As this period is uncertain, pragmatic considerations with respect to data availability have previously supported using a 10-year rate to estimate the market risk premium, as this term is consistent with longer available time series data.

We appreciate Aurizon Network's concerns about not making certain adjustments on the basis of statistical imprecision. However, we also note that, at the time of the UT3 decision, even if we had made the adjustment (about 0.20%), the adjustment would not have affected our final (rounded) estimate of the market risk premium of 6.0%.

We note that Aurizon Network has referred to the Australian Competition Tribunal's decision on "GasNet" in support of its argument that the same estimate should be used for both the risk-free rate of return and the market risk premium. However, a more recent decision of the Tribunal makes it clear that the selection of a five year term for the risk-free rate in alignment with the term of the regulatory cycle can be appropriate.⁴⁵⁶ Prior to that, the Tribunal had suggested that it could be open to the possibility of moving away from a 10 year term for the risk-free rate if material were provided to support such an outcome.⁴⁵⁷

Setting aside this point, we have taken into account the arguments regarding consistency. We consider the apparent inconsistency arises from applying the CAPM to satisfy the $NPV = 0$

⁴⁵³ QCA, August 2014: see particularly: 12–14 and Appendix B: 39–49

⁴⁵⁴ Aurizon Network, sub. no. 104: 13

⁴⁵⁵ SFG (2014): 9

⁴⁵⁶ Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14

⁴⁵⁷ Application by Telstra Corporation Limited ABN 33 051 775 556 (2010) ACompT 1

Principle. This requires the first term in the cost of equity to be the risk-free rate with a term corresponding to the regulatory cycle.

Nevertheless, as part of our cost of capital methodology review, we examined the historical difference between the 10-year rate and five-year rate as applied to estimate the market risk premium. In the present context, we also examined the historical difference between the 10-year rate and the four-year rate. This analysis reinforced the conclusion discussed in section 10.7.1 of this chapter that a reasonable estimate of the market risk premium at this time is 6.5%. We affirm and adopt our analysis from the Market Parameters Decision on this issue for the purposes of this Draft Decision.

Potential inconsistency with competitive market outcomes

We do not consider an upward-sloping term structure would lead to a 'free lunch' for consumers in the form of lower regulated prices, simply by reducing the length of the regulatory cycle. We consider the issue is much broader than indicated by SFG Consulting and involves considering a range of trade-offs.

Regulatory cycles are generally not set at short periods for a number of reasons. A shorter term reduces the time over which the firm retains efficiency gains and affects the firm's incentives.⁴⁵⁸ In addition, frequent regulatory resets result in higher administrative costs and could also lead to greater price volatility due to resetting of the time-variant WACC parameters. This volatility might not be desirable.

Economic regulation necessarily involves choosing a form of regulation and ancillary mechanisms, for example cost pass-throughs, review triggers, and the frequency of resets, that helps to achieve economic efficiency and meet specific regulatory objectives. The package of regulatory arrangements affects risk and the cost of capital and is designed to compensate the firm to support efficient investment.

Benchmarking a competitive market outcome is one of the tools we apply in forming a view on what is an economically efficient outcome. However, we do not consider we must select a 10-year term for the risk-free rate simply because this is the more common approach used for non-regulated entities.

We also must consider what is efficient for regulated entities to do. We are aware that regulated entities typically match their exposure to the risk-free rate to the regulatory period. In this respect, we do not consider our approach to setting the risk-free rate is necessarily inconsistent with the practice of a regulated firm.

Practical considerations

We agree practical considerations should play an important role in considering WACC parameters. We note Aurizon Network's view that practical considerations have been a key consideration for the AER and IPART in applying a 10-year risk-free rate.

While we have a different view to the AER and IPART on the specific practical considerations raised by Aurizon Network in relation to the risk-free rate, our views are shared by some of the other Australasian regulators, as shown in **Table 84** below.

⁴⁵⁸ Lally, 2013a: 43–44

Table 84 Recent consideration by some other regulators

| <i>Regulator</i> | <i>Term of risk-free rate</i> | <i>Analysis</i> |
|------------------|-------------------------------|--|
| AER | 10 years | <p>In its 2013 Rate of Return Guideline, the AER decided it will use a 10-year term for the risk-free rate as it concluded this would be more consistent with the term of 10 years it had established for the return on equity. The AER said practitioners' use of the 10-year rate and stability in the cost of equity were key considerations in reaching its position.</p> <p>A key consideration of the AER was its view the five-year term is only valid if, after five years, the asset owners can walk away with full compensation. We are not persuaded by this argument.</p> <p>We recognise investors may perceive that recovery of the RAB could entail some residual regulatory risk. However, to the extent such risk is systematic, it will be reflected in an appropriate estimate of the regulated firm's asset beta. If such risks are non-systematic and material and cannot be diversified away by investors, they can be dealt with through other mechanisms. These include the extent to which the regulatory arrangements provide good assurance of the return of capital (in the form of depreciation allowances), take-or-pay contracts and aspects of the regulatory arrangements that reduce risk.</p> <p>Furthermore, using a 10-year rather than a five-year rate does not adequately address the alleged problem where the assets have an economic life longer than 10 years, as is the case for most of the Aurizon Network assets. The difference in these rates reflects expectations of future interest rates and compensation of risk related to possible changes in these future rates. Therefore, if a premium is required for committing funds for a term longer than 10 years, this issue is not solved by lengthening the term of the risk-free rate from five to 10 years.</p> |
| IPART | 10 years | <p>IPART has adopted a 10-year term on the basis that this term is more consistent with long-term averages applied in setting a WACC. IPART also considered achieving NPV neutrality is not its most important regulatory objective.</p> <p>We have a different view to IPART on the importance of the NPV = 0 Principle. We consider that achieving NPV neutrality is more important in the context of the QCA Act to ensure an appropriate balance of the factors set out in section 138(2), as discussed earlier in this chapter.</p> |

| Regulator | Term of risk-free rate | Analysis |
|---------------------------------|--|---|
| New Zealand Commerce Commission | Five years (term matching) | <p>In recent decisions for all industry sectors, the New Zealand Commerce Commission has set the risk-free rate using 'for notional benchmark New Zealand government New Zealand dollar denominated nominal bonds, the wholesale market linearly interpolated bid yield to maturity for a residual period to maturity equal to 5 years.'⁴⁵⁹</p> <p>It has said that, to ensure the cost of capital is consistent with the period of application of the regulatory instrument in which it will be applied, the term of the risk-free rate must be the same as the regulatory period:</p> <p style="text-align: center;"><i>The term of the risk-free rate should match the regulatory period because if the term of the risk-free rate is longer than the regulatory period and there is a positive yield curve, regulated suppliers will be compensated for risks they do not bear. Conversely, if there is an inverse yield curve, regulated suppliers will be under-compensated if the term of the risk-free rate is longer than the regulatory period.</i></p> <p>We agree with this analysis. We also agree with the Commerce Commission's view that term matching is supported by reference to the ability of service providers to:</p> <ul style="list-style-type: none"> • reset their prices at the end of each regulatory period, to reflect changes in the risk-free rate. The Commerce Commission considered the regular resetting of prices means uncertainty over long-term interest rates is borne by users, rather than suppliers - meaning suppliers' prices should not reflect a premium for the uncertainty of risk-free rates beyond the length of the pricing period • use interest rate swaps to match interest rate re-pricing periods to the regulatory period, irrespective of the actual term of debt held. |
| ERA (WA) | Term matching (gas) 10 years (rail) | <p>In its December 2013 Rate of Return Guideline for gas, the Economic Regulation Authority (ERA) in Western Australia adopted a five-year term for the risk-free rate (matching the regulatory period).</p> <p>However, in its June 2014 draft determination on its review of the method for estimating the WACC for freight and urban railway networks, the ERA proposed to adopt a 10-year term for setting the risk-free rate.</p> <p>The ERA justified these different positions by noting different emphases in the respective codes that apply to these two sectors in Western Australia - i.e. the rail code requires estimation of a 'long-term' WACC, whereas the gas code does not.</p> <p>In its Rate of Return Guideline for gas, the ERA specifically commented that it is of the view that the present value principle requires that the term of a risk-free rate of return should be equal to the length of a regulatory control period, to ensure that regulated businesses are not over or under compensated. We agree with this view.</p> |

While accepting that other regulators have commonly used a 10-year term for the risk-free rate in recent times, some of these differences appear to result from differences of emphasis flowing from differences in underlying statutory factors to which the different regulators must have

⁴⁵⁹ New Zealand Commerce Commission, *Decision No.710 (Input methodologies determination applicable to electricity distribution services pursuant to Part 4 of the Commerce Act 1986)*, 22 December 2010: 59

regard. We are required to adopt an approach in Queensland that has regard to the factors set out in section 138(2) of the QCA Act and appropriately balances those factors.

We remain of the view that a 10-year term for the risk-free rate is inconsistent with the NPV = 0 Principle (where the term of the regulatory period is less than 10 years). As identified above, we consider that satisfying the NPV = 0 Principle takes into account and appropriately balances the various factors under section 138(2) of the QCA Act. The importance of the NPV = 0 Principle is discussed further in the Market Parameters Decision and we adopt and affirm our analysis on that issue for the purpose of this Draft Decision.⁴⁶⁰

Table 85 below provides a response to other matters raised in respect of the selection of the term to maturity for the risk-free rate.

Table 85 Term of the risk-free rate

| <i>Aurizon Network Issue</i> | <i>QCA Response</i> |
|--|---|
| The QCA's approach assumes investors are limiting their investment decisions and return expectations to the length of the regulatory cycle, but investors generally view these assets as 'long-term'. ⁴⁶¹ | We refer to our analysis of this issue set out in the Market Parameters Decision. However, we note here that the QCA's approach does not make this assumption. Even if investors view these assets as 'long-term', this view has no bearing on the term for the risk-free rate. If that term is not set equal to the term of the regulatory period then, in general, the allowed revenues will either under- or over-compensate investors. |
| Market practice by independent experts and valuation professionals is to set the term to 10 years, on the basis it is the longest observable term for Australian bonds. ⁴⁶² | We agree valuers could be conducting discounted cash-flow analysis for firms with cash-flows well beyond a four to five-year period and would be interested in the prevailing term structure of risk-free rates for these longer terms. ⁴⁶³ However, market practitioners are likely to be conducting valuation exercises for non-regulatory purposes. In contrast, we are estimating the efficient cost of providing a service over a regulatory period and must estimate the risk-free rate relevant to the period. We consider matching the term of the risk-free rate to the term of the regulatory period best estimates the returns relevant to that period. |
| A 10-year risk-free rate should be used for the cost of equity to be consistent with the risk-free rate in the cost of debt. With respect to the cost of debt, Incenta Economic Consulting (2013) has recommended a term of debt of 10 years. ⁴⁶⁴ | We refer to our analysis of this issue set out in the Market Parameters Decision. The term of the risk-free rate in the cost of equity should match the term of the regulatory cycle. Incenta's recommendation applies to the benchmark efficient term of debt, not to the term of the risk-free rate in the cost of debt. We do not consider it necessary for the benchmark efficient term of debt to match the term of the risk-free rate. However, the term of the risk-free rate for the cost of debt should also match the term of the regulatory cycle. |

Selection of the averaging period for Aurizon Network

Stakeholders raised three key concerns about Aurizon Network's proposed averaging period:

⁴⁶⁰ QCA, August 2014: see particularly: 12–14 and Appendix B: 39–49

⁴⁶¹ Aurizon Network, sub. no. 3: 114

⁴⁶² Aurizon Network, sub. no. 104: 7–8

⁴⁶³ Lally, 2013a: 24

⁴⁶⁴ Aurizon Network, sub. no. 104: 8–9

- nomination of the averaging period being delayed until well into the review process
- the period should immediately precede, or be as close as possible to, the start of the regulatory cycle
- the proposed period should not rely on past data.

We consider that the averaging period should occur around the start of the regulatory cycle, ideally immediately preceding a new regulatory period.

In our Market Parameters Decision, we considered:

QCA believes that the current practice of averaging the risk-free rate over a 20-day period prior to the start of the regulatory cycle remains appropriate in normal circumstances.

However, we did also note in the Market Parameters Decision:

...in certain circumstances, the QCA might adopt an averaging period that does not immediately precede the start of the regulatory period.

In this manner, our default position is for averaging to occur before the start of the regulatory cycle, but we recognise that there may be additional considerations that make this inappropriate in certain circumstances.

In the instance of the current Draft Decision, completion of a debt refinancing task represented a further legitimate business interest of Aurizon Network and we had regard to that consideration under section 138(2)(b) of the QCA Act. Given the significance of the debt refinancing task, we considered that a delay was acceptable and did not unduly prejudice the other considerations to which we are required to have regard under section 138(2) of the QCA Act, noting that we ensured the delay was as short as practicable.

More specifically, Aurizon Network approached us sufficiently early in the review process (i.e. prior to the lodgement of UT4) proposing to delay the averaging period until beyond the 1 July 2014 start of the regulatory period and advising its reasons. We considered that the reasons were legitimate. While it is the case that Aurizon Network did not nominate its specific proposed averaging period until three months after its lodgement of UT4, we understand this was driven by the timing, and expected completion, of the debt refinancing task. We do not consider Aurizon Network unduly delayed its proposal.

We agree with the QRC that the averaging period should be nominated in advance in order to prevent the business from nominating an historical averaging period that deliberately produces a favourable outcome for the firm. However, we note Aurizon Network proposed the specific averaging period two months in advance of the period itself. We consider Aurizon Network was not able to deliberately 'game' the choice of averaging period in this way. We are not aware of any evidence that gaming actually occurred. For these reasons, while the delay in the averaging period was not ideal, in the circumstances we do not consider the proposed averaging period unreasonable.

Our acceptance of an averaging period post the start of the regulatory period should not be seen as precedent this will become normal practice in the future.

Aurizon Network should have been aware in advance of the timing of submission and assessment of UT4, and how this might impact on its debt refinancing task. However, we accept, in this instance, there were some mitigating circumstances.

Conclusion

Based on the accepted averaging period, our estimate of the risk-free rate is 3.21%.⁴⁶⁵

As identified above, we have determined this estimate with regard to the factors set out in section 138(2) of the QCA Act. We consider that this estimate weights those factors appropriately in the manner we have identified in this Draft Decision, thereby achieving an appropriate balance between the competing interests of the various stakeholders.

Our view is the estimate meets these criteria as it is based on:

- Commonwealth Government nominal bond yields as the proxy for the risk-free rate. This is the commonly accepted proxy for the risk-free rate used in Australia, and we consider it provides an estimate of the risk-free rate that has regard to the factors set out in section 138(2) of the QCA Act. We also refer to our analysis in the Market Parameters Decision
- an averaging period of the 20 business days ending 31 October 2013. While this period is delayed relative to our usual practice, this delay has been to reflect the legitimate business interests of Aurizon Network, given the importance of a debt refinancing task
- a term to maturity that matches the term of the regulatory period. As discussed earlier, we consider this is necessary in order to give effect to the NPV = 0 Principle, so as to achieve an appropriate weighting of the factors to which we are required to have regard as set out in section 138(2) of the QCA Act.

QCA Draft Decision

10.1 We refuse to approve the indicative estimate of the 10-year risk-free rate proposed by Aurizon Network of 3.15%.

10.2 We propose to estimate the risk-free rate as:

- (a) Commonwealth Government nominal bond yields as the proxy for the risk-free rate**
- (b) a 20-day averaging period of 20 business days to 31 October 2013**
- (c) a term to maturity consistent with the regulatory cycle (i.e. four years)**

10.3 We consider it appropriate that Aurizon Network amend its draft access undertaking based on Aurizon Network's averaging period, to reflect our estimate of the risk-free rate at 3.21%.

10.5 Capital Structure and Credit Rating

10.5.1 Capital structure and credit rating

Capital structure and credit rating are two related inputs to the assessment of WACC.

We adopt a notional capital structure which determines the relative weights to attach to the debt and equity components. In doing so, we seek to ensure the notional capital structure is efficient, but still allows the business to vary its actual capital structure if it believes there are benefits in doing so.

Our assessment of the credit rating is based on the notional capital structure. Companies that face less risk in their operating environment are generally able to sustain higher levels of

⁴⁶⁵ The estimate is based on interpolation of relevant Commonwealth Government bond yields to obtain a four-year rate.

gearing for a given rating category. Although the rating itself is not a direct input into the WACC calculation, it is used to determine the debt risk premium.

The WACC for Aurizon Network's 2010 undertaking was based on a 55% debt and 45% equity structure and a BBB+ credit rating.

Aurizon Network proposal

Aurizon Network submitted that a capital structure of 55% debt and 45% equity remains appropriate, as there is no evidence it could support a higher level of debt over the long term. Given a gearing of 55%, Aurizon Network said it should also maintain its BBB+ credit rating.⁴⁶⁶

Stakeholders' comments

Stakeholders did not propose any changes to either the current capital structure, or the credit rating of Aurizon Network.

Consultant's assessment

Incenta Economic Consulting (Incenta) concluded that an appropriate benchmark capital structure for Aurizon Network was 55% debt and 45% equity.

In reviewing this benchmark for the UT4 period, Incenta considered a range of comparator groups, including rail, coal, transport, regulated energy firms and regulated water businesses. Incenta assessed the earnings volatility of these businesses in comparison to Aurizon Network.

Its analysis suggested that, despite the possibility of some earnings volatility, Aurizon Network is in a position to take on more debt than the average firm, and could potentially support more than 55% debt. However, Incenta added that Aurizon Network is also potentially subject to more earnings volatility than Australian energy networks, which have a benchmark gearing level of 60%.⁴⁶⁷

Incenta concluded there is no compelling evidence to move away from Aurizon Network's previously benchmarked capital structure of 55% debt and 45% equity, noting Aurizon Network's announcement that its gearing level will be broadly consistent with the regulator's assumption of 55% debt/RAB.⁴⁶⁸

Given this capital structure, the key credit metrics of Aurizon Network and comparisons with other regulated businesses, Incenta considered a move away from a BBB+ credit rating for Aurizon Network is not warranted at this time.⁴⁶⁹

QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our Draft Decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

In determining the benchmark capital structure for UT4, we note Incenta's view that, on balance, there is no compelling evidence to move away from Aurizon Network's previously

⁴⁶⁶ Aurizon Network, sub. no. 3: 128

⁴⁶⁷ Incenta said Aurizon Network has experienced some EBIT volatility in recent years, while noting that: 'even if Aurizon Network's EBIT was to dip unexpectedly, as it did in 2011 due to the disruption of the Queensland floods, market investors (and banks in particular) know that most users are committed to take-or-pay contracts, and that the revenue cap will restore earnings within two years' (Incenta, April 2014: 17).

⁴⁶⁸ Incenta, Dec 2013, 14–15

⁴⁶⁹ Incenta, April 2014: 23

benchmarked capital structure of 55% debt and 45% equity. We have assessed the relevant material and consider the weight of evidence is not sufficient to justify a change in gearing.

Similarly, we have assessed the evidence regarding the benchmark credit rating for Aurizon Network, and consider there is no compelling evidence to support a move away from the previously approved BBB+ credit rating.

We consider that maintaining a benchmark capital structure of 55% debt and 45% equity is consistent with the application and weighting of the factors set out in section 138(2) of the QCA Act, that we identified earlier in this chapter, and appropriately balances the various competing interests.

QCA Draft Decision

10.4 We approve Aurizon Network's proposals for a benchmarked:

- (a) capital structure of 55% debt and 45% equity
- (b) BBB+ credit rating.

10.6 Cost of Debt

10.6.1 Cost of debt

Along with the cost of equity and the capital structure, the cost of debt is one of the three key components comprising the total WACC.

Previous consideration by QCA

For UT3, we considered a reasonable cost of debt for Aurizon Network was 9.94%, which comprised:

- 5.19% for the five-year risk-free rate
- 3.62% for the five-year debt margin
- 0.125% for periodic debt refinancing costs
- 0.175% for interest rate swap costs
- 0.83% proxy for credit default swap costs.

That decision was based on the methodological advice of Dr Lally, key aspects of which, as briefly summarised in Incenta's report, are:⁴⁷⁰

- *A firm would issue debt with a term consistent with prudent financial management and incur transaction costs associated with issuing this debt.*
- *Where the WACC is reset for regulatory purposes at the spot rate at the time of the price review, a rational regulated entity would use interest rate swaps to convert the base interest rate element of its cost of debt from the raw term to a term that matches the length of the regulatory period, which would ordinarily reduce its cost of debt. Transaction costs would be incurred to enter these swap contracts.*
- *Providing the market for credit default swaps is sufficiently deep, a rational regulated entity would use these derivative instruments to convert the margin component of its*

⁴⁷⁰ Lally, M. (April 2010), *The Appropriate Term of the Risk Free rate and the Debt Margin*; Incenta, April 2014: 5

cost of debt from the raw term to the term matching the length of the regulatory period. Transaction costs would be incurred to buy and sell the required credit default swaps.

- *The regulatory allowance for the cost of debt would include compensation to reflect the costs of the above approach.*

When we finalised our view on the pricing aspects of UT3, we determined that an efficient term of debt was 10 years, taking into account refinancing risk. In addition, we considered it would be an efficient debt policy for a firm with 10-year fixed rate debt to undertake credit default and interest rate swaps to convert that 10-year debt (i.e. the debt risk premium and base rate components respectively) to five-year debt, consistent with the term of the regulatory cycle (i.e. five years).

As we accepted the advice that credit default swaps were not available at that time to hedge the credit risk, we allowed Aurizon Network a 10-year debt risk premium as a second best alternative, which was estimated at 4.45%.⁴⁷¹ In addition to the 4.45%, we also added transaction cost allowances for interest rate swaps (0.175%) and periodic debt refinancing (0.125%). The total debt risk premium, including transaction costs, was then 4.75%.⁴⁷²

We have used this approach in subsequent regulatory decisions, including, for example, on indicative prices for the south east Queensland water and wastewater retail and distribution entities.⁴⁷³

2014 DAU period

For the 2014 DAU period, neither Aurizon Network nor other stakeholders made submissions on appropriate allowances for credit default or interest rate swaps. Rather, submissions have focused principally on:

- the appropriate term of debt, including the term of the risk-free rate and the term of the debt risk premium
- the methodology for estimating the debt risk premium
- an allowance for debt refinancing costs.

These aspects are considered below.

10.6.2 Risk-free rate

The risk-free rate is a term that appears in both the cost of equity and cost of debt elements of the overall WACC. Discussion of our views on the methodology and estimation of the risk-free-rate is contained in section 10.4 of this Draft Decision. Based on our preferred methodology, and Aurizon Network's proposed averaging period, our estimate of the risk-free-rate is 3.21%.

10.6.3 Debt risk premium

The debt risk premium is the amount above the risk-free rate that a business has to pay to acquire debt funding from financial markets and is related to, among other things, a firm's

⁴⁷¹ Note, this was characterised as a five-year debt risk premium (3.62%) plus a *proxy* allowance for the transaction costs of credit default swaps (0.83%), which were not available. The proxy allowance was set equal to the difference between the five-year debt risk premium and the 10-year debt risk premium.

⁴⁷² QCA, June 2010: 37, 56. For a five-year regulatory term, if credit default swap contracts *were* available, then the appropriate (total) cost of debt would have been: the five-year risk-free rate, the five-year debt risk premium, a transaction cost allowance for credit default swaps, a transaction cost allowance for interest rate swaps, and a transaction cost allowance for debt refinancing costs.

⁴⁷³ QCA, 2011, 247–251

credit rating. The debt risk premium increases in line with the riskiness of businesses, and varies over time in line with market circumstances.

Aurizon Network proposal

Aurizon Network proposed a 10-year debt risk premium estimate of 3.28%⁴⁷⁴, which is lower than the comparable UT3 debt risk premium of 4.45% (both exclude transaction costs). Nevertheless, Aurizon Network's UT4 estimate is from the top of its estimated range of 2.94–3.28%, calculated with technical support of its consultants. Aurizon Network said this range was based on the following assumptions:

- 10-year term of debt
- BBB-rated debt
- Bloomberg fair value estimates.

Aurizon Network submitted that the Bloomberg BBB fair value yields were only available for seven years, which made it difficult to determine a 10-year BBB estimate. As a result, Aurizon Network's consultant (Value Advisor Associates) applied two extrapolation methods that are the two end points of its reasonable range (i.e. 2.94% and 3.28%). These two extrapolation methods were based on:

- (d) a 'matched pairs' approach—extrapolates the BBB seven-year estimate by adding an increment based on observing the difference in debt risk premiums between two bonds of different terms issued by the same firm⁴⁷⁵
- (a) the premium between seven-year and 10-year debt from other rating classes, in particular AAA-rated corporate bonds.

Aurizon Network accepted both of these approaches have drawbacks. In particular, (a) was data-intensive, and the results could be subject to considerable variation depending on the matched pairs included in the analysis. In addition, it could also be vulnerable to the idiosyncratic features of the individual issuers included in the sample.

For (b), Bloomberg ceased publishing its seven-year and 10-year AAA corporate bond yields in 2010; meaning the data is now four years old. Therefore, Aurizon Network considered the most appropriate position is to estimate a range for the debt risk premium, and it then proposed an estimate from the top of the range.⁴⁷⁶

Stakeholders' comments

The QRC proposed a debt risk premium estimate of 2.6% based on a five-year term to maturity and an averaging period of the 20 business days to 30 June 2013. The QRC submitted that this approach would align the assumptions regarding debt financing practices with the term of the regulatory period and would be more consistent with Aurizon Network's recent actual debt

⁴⁷⁴ Aurizon Network has now proposed a risk-free rate and debt risk premium averaging period over the 20 business days prior to 31 October 2013 (i.e. 3.98% estimate for a risk-free rate and 2.51–2.72% estimate for the debt risk premium). As UT4 was submitted six months earlier, it included an indicative debt risk premium of 3.28% based on a 20-day averaging period ending 30 November 2012.

⁴⁷⁵ The logic is that the difference in observed margins is fully explained by the difference in the terms to maturity rather than other risk factors, since the bonds have the same issuer.

⁴⁷⁶ Aurizon Network, sub. no. 102: 22

financing practices, as well as practices of other regulated businesses – i.e. firms regulated by IPART.⁴⁷⁷

The QRC rejected Aurizon Network's proposed approach to extrapolating the debt risk premium, based on AAA spreads, given the drawbacks documented in Aurizon Network's submission.⁴⁷⁸

Consultant's assessment

Incenta provided technical advice on the estimates of the cost of debt, based on applying our approach to date using Bloomberg estimates and on an alternative methodology developed for us by PricewaterhouseCoopers (PwC), known as the 'simple portfolio' approach (based on econometric estimates).

To reach these estimates, Incenta first undertook two benchmarking tasks and concluded:

- an efficient term of debt is 10 years
- a BBB+ benchmark credit rating is appropriate on the basis of examining Aurizon Network's cash-flow volatility and key credit metrics.

On the basis of these benchmarks, Incenta estimated the debt risk premium for Aurizon Network for UT4 to be within the range of 2.51–2.72%. Incenta's lower bound estimate was based on the extrapolated Bloomberg (paired bonds) methodology, and the upper bound estimate was based on an econometrics 'simple portfolio' approach. This range sits below that initially proposed by Aurizon Network (the bottom end of Aurizon Network's range was 2.94%).⁴⁷⁹

Incenta noted Aurizon Network's upper bound estimate was very close to the figures obtained in the PwC report on the cost of debt methodology prepared for us.⁴⁸⁰ The difference between this estimate and Incenta's estimate would be explained by movements in market rates over time. As to Aurizon Network's second estimate, it was based on a different methodology, which has drawbacks as it used data that is too old.⁴⁸¹

Both PwC's and Incenta's reports on the cost of debt were published on our website, presented at the WACC Forum, and stakeholders were invited to make submissions on these reports by 20 January 2014.

Aurizon Network position post-WACC Forum

The two key cost of debt issues discussed at the WACC Forum and in the subsequent submissions were the:⁴⁸²

- term of debt
- estimation methodology (Bloomberg versus simple portfolio approach based on econometric estimates).

In its 20 January 2014 submission, Aurizon Network maintained its view that a 10-year term of debt was valid and consistent with the factors contained in section 138(2) of the QCA Act.

⁴⁷⁷ QRC, sub. no. 64: 10–11

⁴⁷⁸ QRC, sub. no. 64: 11

⁴⁷⁹ Noting Incenta's range was based on an averaging period covering the 20 business days to 31 October 2013.

⁴⁸⁰ PwC, 2013, *A Cost of Debt Estimation Methodology for Businesses Regulated by the Queensland Competition Authority*.

⁴⁸¹ Incenta, November 2013: 31

⁴⁸² The WACC Forum was held at the QCA on 13 December 2013.

Aurizon Network also linked the cost of debt methodological issues (i.e. Bloomberg versus 'simple portfolio' approach) to its proposed 10-year term of debt, in particular:

- if we were to approve Aurizon Network's proposed 10-year fixed term yield, then the lower (i.e. Bloomberg) estimate should be utilised
- if we approve our usual Lally approach to the term of debt, then the higher (i.e. 'simple portfolio') estimate should be utilised.

Aurizon Network said that, irrespective of which estimate is employed, we should also have regard to the comparable WACC and the cost of debt estimates that would prevail under the AER and IPART approaches, based on a 10-year term.

For instance, Aurizon Network estimated a cost of debt of 6.14% and a WACC of 6.86% that would arise from applying all of our advisors' recommendations. For comparison, Aurizon Network estimated a cost of debt of 6.8% and a WACC of 7.43% based on the AER's methodology, depending on the values of the other parameters.⁴⁸³

Stakeholders' position post-WACC Forum

In its 20 January 2014 submission, the QRC maintained that a five-year term should be employed, on the basis it was likely to better represent efficient financing practice. This position was supported by Anglo.⁴⁸⁴

The QRC also considered that, given the trade-offs between the different approaches for estimating the cost of debt, the relative merits of each methodology should be considered on a case-by-case basis. The QRC said there was no compelling reason to depart from the Bloomberg methodology based on fair value estimates. Indeed, given Aurizon Network's proposed averaging period ending October 2013, Bloomberg's fair value estimates appear to be highly accurate and almost precisely match the yield on the seven-year bond recently issued by Aurizon Network.

However, the QRC also noted that, if the simple portfolio approach is to be used in determining the cost of debt, the QRC would prefer taking an average of the estimates from the two methodologies.⁴⁸⁵ In this respect, Anglo noted that, in the cases of lack of market activity, when Bloomberg fair value estimates do not provide accurate estimates, the simple portfolio approach could be more reliable.⁴⁸⁶

QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

We accept Incenta's benchmarking analysis and conclude that an efficient term of debt is 10 years. Incenta has also advised credit default swaps are not available to convert the debt

⁴⁸³ Aurizon Network, sub. no. 102: 23–24

⁴⁸⁴ Anglo American, sub. no. 93: 3

⁴⁸⁵ QRC, sub.no. 106: 4

⁴⁸⁶ Anglo American, sub. no. 93: 3

premium component. As a consequence, we consider a 10-year term is reasonable in this instance.⁴⁸⁷

This term of debt is consistent with the term proposed by Aurizon Network. In addition, we agree that Incenta's analysis supports a credit rating of BBB+.

Methodologies for estimating the debt risk premium

On the basis of these benchmarks, we have considered the appropriate value for the debt risk premium for Aurizon Network for the UT4 period, including assessing the merits of the two approaches proposed by Incenta.

For the relevant benchmarks, and based on an averaging period ending on 31 October 2013, Incenta's debt risk premium estimates are shown in **Table 86** below.

Table 86 Debt risk premium estimates

| <i>Bloomberg paired bonds approach</i> | <i>Econometric simple portfolio approach</i> |
|--|--|
| <p>Gives a debt risk premium of 2.51%.</p> <p>We note the Bloomberg paired bonds approach estimate is consistent with the available market evidence based on Aurizon Network's 2013 bond issue, and is also consistent with our past practice in considering debt risk premium proposals. In addition, the estimate of 2.51% appears close to Aurizon Network's top range estimate (when updated for movements in market rates due to the change in the averaging period).</p> | <p>Gives a debt risk premium of 2.72%.</p> <p>The alternative econometrics simple portfolio approach has been estimated using the detailed methodology developed for us by PwC. The estimate generated is relatively close to the estimate generated using the Bloomberg approach, but is some 21 basis points higher.</p> |

We note the QRC's view that the (lower) Bloomberg estimate should be used as the basis for calculating the cost of debt because of its closer parallel to Aurizon Network's recent bond issue:

For this averaging period, the Bloomberg fair value estimation at seven years almost precisely matches the yield on the seven-year bond recently issued by Aurizon Network. By contrast, the estimate produced by the simple portfolio approach for this period is significantly higher than the yield on the Aurizon Network bond.

However, we also note Incenta's advice that the fact the seven-year Bloomberg estimation was almost the same value as the newly issued Aurizon Network bond on 31 October 2013 does not, of itself, demonstrate that the Bloomberg approach provides a more accurate estimate of the benchmark fixed yield for a BBB+ rated bond at seven years. It is just one observation, and it is not possible to conclude on this basis that the Bloomberg approach produces more accurate estimates than the econometric simple portfolio approach.

Incenta also advised that, while the econometric approach produced a higher estimate than the Bloomberg approach for the averaging period ending on 31 October 2013, earlier evidence from PwC showed the Bloomberg estimate had regularly exceeded the econometric estimate (albeit by relatively small amounts) over the period May 2010 to November 2012. Incenta concluded that, for several years, the Bloomberg and econometric methodologies have provided similar

⁴⁸⁷ For a four-year regulatory term, if credit default swap contracts *were* available, then the appropriate (total) cost of debt would be: the four-year risk-free rate, the four-year debt risk premium, a transaction cost allowance for credit default swaps, a transaction cost allowance for interest rate swaps, and a transaction cost allowance for debt refinancing costs.

estimates of the 10-year BBB+ yield, suggesting they are both providing reasonable estimates of the debt risk premium.

Incenta did not recommend one specific approach. Instead, it said the decision as to whether to adopt the Bloomberg estimate or the econometric estimate, or an average of the two, is a decision for us.

QCA cost of capital methodology review – consideration of cost of debt methodology

The QCA has recently reviewed its cost of debt estimation approach, as part of its wider review of its overall cost of capital methodology. As part of the review, we considered whether to continue with our previous practice of using fair value yield curves estimated by third-party data providers (e.g.. Bloomberg) or to move to an alternative approach such as the simple portfolio econometric approach developed by PwC.

Our decision was to use the PwC simple portfolio econometric approach. We affirm and adopt our analysis on this issue for the purposes of this Draft Decision, as set out in our final decision titled 'Cost of debt estimation methodology' of August 2014 ('Cost of Debt Decision').

Our Cost of Debt Decision outlined the advantages and disadvantages of these two methodologies.⁴⁸⁸ These are summarised in **Table 87** below:

Table 87 Comparison of estimation methodologies

| <i>Estimation approaches</i> | <i>Advantages</i> | <i>Disadvantages</i> |
|--|--|---|
| Extrapolated Bloomberg approach. | <ul style="list-style-type: none"> • Relatively low cost and easy to apply • Produced by credible organisation (traditionally used by regulators) that is independent of the regulatory process. | <ul style="list-style-type: none"> • Lack of transparency associated with a proprietary algorithm • Available data series limited to combinations of broad credit rating bands (i.e. BBB, A, AA and AAA) by a single specified debt term • Requires extrapolation due to lack of data series for a 10-year term of debt • Discontinuation of the series from December 2013, with Bloomberg fair value yield curves replaced by new BVAL data series (not yet used in a regulatory context). |
| PwC simple portfolio econometric approach. | <ul style="list-style-type: none"> • Transparent method with data sources and estimation approach clearly outlined • Can be applied to a range of debt terms and benchmark credit ratings • This approach has been shown to be practicable and capable of producing comparable results to extrapolated Bloomberg estimates. | <ul style="list-style-type: none"> • More complex to implement than using index published by a third-party data provider • New approach that has so far had limited use in regulatory reviews by Australian regulators. |

The final decision on the methodology concluded that, while the Bloomberg approach has benefits in terms of costs, simplicity, credibility and regulatory precedence, there are also key issues associated with its ongoing use in regulatory reviews. In particular:

⁴⁸⁸ QCA, August 2014, *Final Decision: Cost of debt estimation methodology*

- the lack of transparency around the proprietary approach means estimates, however credible, can be criticised as being 'black box' in nature
- the extrapolation techniques required to account for lack of data for specific debt (e.g. 10-year BBB+) also reduce simplicity
- more pressingly, the discontinuation of the fair value yield curves raises questions as to the applicability of the approach to future processes.

For these reasons, and as the PwC simple portfolio econometric approach is considered transparent, robust and replicable, the final decision on the methodology was that we will use the econometric approach as the primary method for estimating the debt risk premium in future regulatory reviews. We will continue to use the Bloomberg or similar approaches (e.g. the new BVAL data series in future) as a 'cross-check' to the econometric approach, but not as the main method of estimation.⁴⁸⁹

Application to Aurizon Network

Given this, we intend to use the simple portfolio econometric approach as the main method for estimating the debt risk premium for Aurizon Network in UT4. As noted earlier, the approach indicates a debt risk premium of 2.72% for the relevant averaging period.

We have also considered the Bloomberg estimate as a 'cross-check' to the econometric estimate. While noting the Bloomberg estimate is somewhat (21 basis points) lower than the econometric estimate for the relevant averaging period, we do not consider this difference is sufficiently material to suggest the econometric approach is inappropriate to use for determining the debt risk premium for UT4.

Thus, we propose to use a debt risk premium of 2.72% for calculating the cost of debt for Aurizon Network in UT4. We note the proposed debt risk premium is a relatively small amount higher than the QRC's proposal of 2.6%, which was based on a five-year term to maturity and an averaging period of the 20 business days ending 30 June 2013 (immediately prior to the start of the UT4 regulatory period).

Consideration of QCA Act requirements

We consider the proposed debt risk premium takes into account and appropriately balances the various factors under section 138(2) of the QCA Act, as identified earlier in this chapter. In forming this view, we have noted:

- the averaging period is as proposed by Aurizon Network, which suggests it considers it to be in its legitimate business interests (section 138(2)(b)), and, as noted earlier, we do not consider this period to be unreasonable
- the econometrics simple portfolio approach utilises a detailed methodology developed for us by PwC. We consider use of this approach is most likely to provide an estimate of the current debt risk premium that has regard to the factors set out in section 138(2) of the QCA Act, and most appropriately balances them. We also refer to our detailed analysis of this issue set out in our Cost of Debt Decision.

⁴⁸⁹ QCA, August 2014, *Final Decision: Cost of debt estimation methodology*: 9–10

QCA Draft Decision

10.5 We refuse to approve Aurizon Network's indicative proposed debt risk premium estimate of 3.28%.

10.6 We consider it appropriate that Aurizon Network amend its draft access undertaking to apply a debt risk premium of 2.72%

10.6.4 Debt-raising transaction costs

In the past, in line with widely adopted regulatory practice, we have applied a 12.5 basis points per annum allowance for Aurizon Network's debt-raising transaction costs.

Aurizon Network proposal

Consistent with its past practice, Aurizon Network initially proposed an estimate for debt-raising transaction costs of 12.5 basis points per annum.⁴⁹⁰

However, in its 20 January 2014 submission, Aurizon Network appeared to support a 9.9 basis points debt-raising transaction costs allowance, by stating that:

*...the debt raising costs are broadly consistent with recent capital raisings.*⁴⁹¹

Stakeholders' comments

The QRC did not agree with the proposed debt-raising transaction costs allowance and noted there was no evidence presented that 12.5 basis points accurately reflects the debt-raising costs that a prudent and efficient service provider would incur. The QRC noted the AER methodology for calculating this type of cost and suggested that, if any allowance for debt-raising transaction costs is to be provided, it should not exceed the 9-10 basis points estimated by the AER.⁴⁹²

Consultant's assessment

Incenta provided advice on the debt-raising transaction costs estimate, based on a methodology developed for the QCA by PwC. In its original report, Incenta identified a range of 9.9 basis points to 10.8 basis points per annum, depending on the overall debt level, comprising:⁴⁹³

- 8.51 basis points per annum for arrangement/fees paid to investment banks, as compensation for management of the debt-raising process
- 1.39 to 2.29 additional basis points per annum for other costs, such as lawyers' fees and credit rating agency fees.⁴⁹⁴

In its April 2014 report, Incenta found no reason to change its initial debt-raising transaction costs estimate of a range of 9.9 basis points to 10.8 basis points per annum. Incenta's range was also consistent with the range identified earlier for the QCA by PwC.⁴⁹⁵

QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in

⁴⁹⁰ Aurizon Network, sub. no. 3: 132

⁴⁹¹ Aurizon Network, sub. no. 102: 24

⁴⁹² QRC, sub. no. 64: 11

⁴⁹³ The allowance is based on a 10-year term of debt and would be higher if the term was substantially less.

⁴⁹⁴ Incenta, April 2014: 39

⁴⁹⁵ PwC, June 2013: 84

our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

Our Draft Decision is to propose debt-raising transaction costs of 10.8 basis points per annum for Aurizon Network in the UT4 regulatory period.

We considered the issue of an appropriate regulatory allowance for debt-raising transaction costs in detail in our Cost of Debt Decision. We affirm and adopt our analysis on this issue for the purposes of this Draft Decision, as set out in our Cost of Debt Decision.

The cost of capital methodology review indicated that it would be appropriate for the QCA intends to adopt a single estimate of benchmark debt-raising transaction costs of 10.8 basis points per annum for all regulated firms (i.e. the top of the range identified by PwC and Incenta).⁴⁹⁶ This is consistent with past practice by the QCA, in which the same allowance has been provided to all regulated firms. The QCA's view is that providing a single allowance will ensure sufficient debt-raising transaction costs are provided for, and avoid complexities with a specific estimate based on a benchmark debt balance, while not resulting in a material difference in the allowance.

In light of the above, we propose to accept the high-end of Incenta's recommended range for debt-raising transaction costs of 10.8 basis points per annum for Aurizon Network for UT4. We consider this estimate takes into account and appropriately balances the various factors under section 138(2) of the QCA Act, as identified earlier in this chapter.

Draft Decision

10.7 We refuse to approve Aurizon Network's proposed debt-raising transaction costs of 12.5 basis points per annum.

10.8 We consider it appropriate that Aurizon Network amend its draft access undertaking to set debt-raising transaction costs of 10.8 basis points per annum.

10.6.5 Swap cost allowances

As discussed earlier, we consider a 10-year term of debt is efficient, given refinancing risks.

In addition, Incenta has determined credit default swaps are not available to convert the debt premium component of the 10-year debt to a term matching the term of the regulatory cycle. On this basis, we have accepted a 10-year term of debt and benchmarked an appropriate 10-year debt risk premium.

We consider it reasonable that an allowance should be made for the costs associated with interest rate swap contracts to convert the base rate component of the 10-year debt to four years.

Accordingly, we asked Incenta to estimate the swap transaction costs required to swap the base interest rate component of a BBB+ rated fixed rate 10-year bond yield into a four-year fixed rate yield. Incenta obtained a market quotation of 11.3 basis points to undertake the swap transactions required.⁴⁹⁷

Given the nature of their proposals, the interest rate swaps were not estimated by either Aurizon Network or other stakeholders. However, Aurizon Network noted Incenta's allowance

⁴⁹⁶ QCA, August 2014, *Final Decision: Cost of debt estimation methodology*: 13

⁴⁹⁷ Incenta, April 2014: 41

was at the lower end of a reasonable range due to higher costs from changes in banking regulation. As a result, Aurizon Network considered this should give further weight to using the econometric 'simple portfolio' methodology for calculating the debt risk premium.⁴⁹⁸

QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

We consider the interest rate swap allowance of 11.3 basis points recommended by Incenta is appropriate for Aurizon Network for UT4. We are satisfied this allowance is sufficient to meet the legitimate business interests of Aurizon Network, including the need for revenue adequacy. The allowance we have proposed takes into account and appropriately balances the various factors under section 138(2) of the QCA Act, as identified earlier in this chapter.

We note Aurizon Network's view this estimate should be considered a factor in favour of choosing the debt risk premium estimate from the econometric 'simple portfolio' approach over the Bloomberg method. For the reasons set out earlier, we consider an estimate based on the simple portfolio approach for the chosen averaging period is appropriate.

QCA Draft Decision

10.9 We consider it appropriate that Aurizon Network amend its draft access undertaking to set the interest rate swap costs at 11.3 basis points.

Conclusion

Our estimate for the total cost of debt is 6.15%, which compares to Aurizon Network's (upper bound) indicative proposal of 6.56%. Our estimate is based on:

- a risk-free rate of 3.21% (Aurizon Network indicatively proposed 3.15%, based on an averaging period in November 2012)
- a debt risk premium of 2.72% (Aurizon Network indicatively proposed 3.28%)
- debt-raising transaction costs of 0.108% (Aurizon Network proposed 0.125%)
- interest rate swap costs of 0.113% (Aurizon Network's proposal did not include these costs).

For the reasons discussed in this section, we consider that this estimate takes into account and appropriately balances the various factors under section 138(2) of the QCA Act, as identified earlier in this chapter. We have also referred to the analysis we recently undertook in the Cost of Debt Decision to support these conclusions.

⁴⁹⁸ Aurizon Network, sub. no. 102: 24

QCA Draft Decision

10.10 In summary, we consider it appropriate that Aurizon Network amend its draft access undertaking to set the cost of debt at 6.15%, comprised of:

- (a) 3.21% for the four-year risk-free rate**
- (b) 2.72% for the debt risk premium for a 10-year term of debt**
- (c) 0.108% for debt-raising transaction costs**
- (d) 0.113% for interest rate swap costs.**

10.7 Market risk premium

Background

The market risk premium is the expected rate of return on the market portfolio of risky assets less the rate of return on the risk-free asset. The market risk premium reflects the rate of return that investors require to accept the risk associated with investment, relative to the rate of return provided by a risk-free asset.⁴⁹⁹ The market risk premium is a key component of the cost of equity and, in turn, the WACC.

The market risk premium is unobservable, and there is no consensus on the best methodology to estimate it.

In the decision *Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14* (26 July 2012), the Australian Competition Tribunal relevantly commented:

It is a forward-looking concept and thus its value has to be predicted. The Tribunal recently noted in Envestra (No 2) that, as with any variable whose values have to be forecast, there is unlikely to ever be a single "right" value of the MRP, and so considerable debate generally occurs as to how this parameter can best be calculated at any given point of time.⁵⁰⁰

We have set out a more detailed overview of the market risk premium in our Market Parameters Decision.

Previous consideration by QCA

In estimating the market risk premium for UT3, we used four principal estimation methods, specifically:

- *Ibbotson historical averaging* – an historical averaging method that measures the nominal, historical (excess) market rate of return above the risk-free rate, including applicable adjustments for any dividend imputation credits⁵⁰¹
- *Siegel historical averaging* – an historical averaging method where the market risk premium estimated from the Ibbotson method is adjusted for the effects of unanticipated inflation⁵⁰²

⁴⁹⁹ The definition of the market risk premium depends on the particular version of the CAPM applied.

Australian regulators typically employ the Officer variant of the standard CAPM. See QCA, August 2014: Appendix A.

⁵⁰⁰ Australian Competition Tribunal, 2012(c)

⁵⁰¹ The Ibbotson average is taken over *ex post* market outcomes, where the annual premium is calculated as the simple difference between the nominal equity rate of return and the nominal risk-free rate.

⁵⁰² The Siegel method is based on the premise (based on empirical evidence) that, historically, unexpected inflation has artificially reduced the real returns on bonds but not the real returns on equities.

- *survey evidence* – a forward-looking method that seeks an estimate of the market risk premium from academics, financial analysts, company managers, and other market practitioners
- *Cornell method* – a forward-looking method that applies a variant of the dividend growth model, where the market return is the rate of return that reconciles the current value of the market portfolio with the present value of the expected future stream of dividends.⁵⁰³

Each method has advantages and disadvantages and provides information from a slightly different perspective.

In recent decisions, we have reported both the mean and the median estimates resulting from applying these methods. When reporting the mean estimate, we have in the past rounded to the nearest whole per cent. In our UT3 decision, the mean and median estimates from these methods were both slightly below 6%, and we found no reason to change our previous estimate of 6%.

Aurizon Network's 2014 DAU

Aurizon Network has proposed that a reasonable range for the market risk premium is 6.0%–7.0% under 'normal' market conditions, but said this range is likely to be conservative as forward-looking estimates are above the upper bound of 7.0%.

For the 2014 DAU period, Aurizon Network said we should:

- address known limitations of the methods, update data, and correct alleged errors identified
- consider additional information, for example the Wright method and independent expert reports
- develop a range for the market risk premium to recognise post-GFC uncertainty and market conditions.

Aurizon Network's view is that a market risk premium range of 6.0%–7.0% is conservative and making any one of a number of recommended changes to our methodology would result in a market risk premium of 7.0%.

Individual estimation methods

Aurizon Network's concerns with aspects of the individual estimation methods can be summarised as follows:

- *Ibbotson method* – the method produces an estimate reflective of the average market conditions over the historical period, but not of the prevailing conditions in the market for funds, and that it is slow to change over time. In addition, there is a material error alleged in a subset of the historical time series data we rely on, and correcting it results in a materially higher estimate⁵⁰⁴

⁵⁰³ The QCA's detailed consideration of the merits of methods used to estimate the market risk premium is contained in the paper *Final Decision - Cost of capital: market parameters* (August 2014) (the Market Parameters Decision), which was developed as part of the QCA's review of its cost of capital methodology. See particularly Appendix C of that decision.

⁵⁰⁴ Aurizon Network, sub. no. 104: 34; Gray, 2009: 9

- *Siegel method* — there is no economic basis for this approach, other regulators do not use it, and a negligible number of survey respondents identified it as a method for estimating the market risk premium⁵⁰⁵
- *survey evidence* — our survey evidence does not meet criteria set by the Australian Competition Tribunal; if a particular survey is to be used, it should reflect the most recent results⁵⁰⁶
- *Cornell method* — the method should be updated with a 'better' version of the dividend growth model, consistent with more current research.⁵⁰⁷

Averaging and rounding procedures

Aurizon Network also raised several concerns with our use of the estimates from these four methods to arrive at an overall estimate for the market risk premium, particularly:

- three of the four methods (i.e. Ibbotson historical averaging, Siegel historical averaging and survey evidence) produce very stable estimates that do not necessarily reflect current market conditions
- given we have rounded to the nearest whole percent, prevailing conditions must be extreme in order for the final estimate to change from 6.0%⁵⁰⁸
- a 'mechanical update' of our approach from UT3 would lead us to adopt a market risk premium of 6.0%. However, while such an estimate would be consistent with a long-term average, given low levels of the risk-free rate, the approach would produce a return on equity that is the lowest on record, and therefore the approach must be incorrect.⁵⁰⁹

Stakeholders' comments

The QRC proposed a range of 5.0–6.0% for the market risk premium.⁵¹⁰ The QRC broadly endorsed our previous set of estimation methods, although with qualifications. The QRC submitted that for:

- *historical estimates*: the historical long-run average of excess returns is 4.9–6.1% based on arithmetic averaging, or 3.0–4.7% based on geometric averaging, but in either case these ranges are likely to be too high due to 'survivorship' bias⁵¹¹
- *survey evidence*: updated survey evidence from the Fernandez annual survey supports a mean of 5.9% and a median of 6.0% for Australia
- *dividend growth model estimates*: recent evidence indicates a range of 5.9% to 8.4%, but this range represents an upper bound on the market risk premium, and results should be interpreted with caution due to the sensitivity of input assumptions

⁵⁰⁵ Gray, 2009: 9

⁵⁰⁶ Aurizon Network, sub. no. 5: 20–21; Gray, 2013: 9

⁵⁰⁷ Gray, 2009: 9; Aurizon Network, sub. no. 5: 24; Aurizon Network sub. no. 104: 40, 46

⁵⁰⁸ For example, based on the indicative estimates in our discussion paper, *The Risk-free Rate and Market Risk Premium* (November 2012), SFG Consulting estimated the Cornell estimate would have to be more than 10.0% in order for the mean estimate to exceed 6.5% (and therefore not be rounded down to 6.0%) (SFG Consulting, 2013a: 8).

⁵⁰⁹ Aurizon Network, sub. no. 5

⁵¹⁰ QRC, sub. no. 106: 6

⁵¹¹ The QRC reports these estimates are based on a recent report for the AER by Associate Professor John Handley (QRC, sub.no. 64: 13)

- *regulatory and Tribunal decisions*: the Australian Competition Tribunal recently upheld a regulatory estimate of 6.0% in its decision on APA GasNet, and most regulators have consistently adopted a market risk premium of 6.0%.⁵¹²

The QRC noted the AER has moved from an estimate of 6.0% to 6.5%, but argued the better interpretation of the evidence before the AER supported an estimate of 6.0%. In particular, the QRC considered that the only apparent support for an estimate higher than 6.0% came from dividend growth model estimates.⁵¹³

The QRC raised several points concerning our overall methodology. The first is that, in reaching a final estimate, we should have regard to the relative strengths and weaknesses of the methods. Specifically, some of the methods are biased upward.

Vale commented that, to the extent mechanisms are available to correct for any upward bias, we should apply them. In particular, as the Cornell estimate is an upper bound on the true premium, it should not receive any weight.⁵¹⁴

Anglo said we should base our estimate on only the Ibbotson, Siegel and survey approaches, using the Cornell estimate as a cross-check to ensure the final estimate is not too high.⁵¹⁵ In addition, Anglo said the market risk premium estimates from foreign countries should be considered, and doing so reduces the Australian estimate to 5.9%.⁵¹⁶

The second methodological issue raised by the QRC relates to the 1.0% rounding margin. While the QRC acknowledged the statistical imprecision of measuring the premium, it considered that a 1.0% rounding margin is too wide. The effect could be that a small change in one of the estimates could result in a large swing in the premium (e.g. from 6.0% to 5.0% or from 6.0% to 7.0%). The QRC pointed out such an outcome could actually increase disputes, as the amount at stake would be considerably higher. The QRC recommended the unit of rounding be no higher than 0.5% and preferably 0.25%.⁵¹⁷

The QRC also noted Aurizon Network sought to raise a number of new issues at the WACC Forum (December 2013). The QRC did not agree with any of Aurizon Network's proposed adjustments to any method or estimate.⁵¹⁸

As a way forward, the QRC said we should:

- apply relevant adjustments (to the extent possible) to methods with known biases
- consider additional methods and reference points, recent regulatory and Tribunal decisions, and triangulation across surveys
- consider a range of 5.0–6.0% for the market risk premium and adopt a lower unit of rounding, preferably 0.25%, to avoid wide fluctuations in the premium.⁵¹⁹

⁵¹² QRC, sub. no. 64: 13–16

⁵¹³ QRC, sub. no. 106: 6

⁵¹⁴ Vale, sub. no. 42: 3

⁵¹⁵ McKenzie and Partington consider dividend growth estimates to be too sensitive to the selection of a model and to the input values required to warrant further consideration of this approach (QRC, sub. no. 65: 21). The QRC said removing the Cornell estimate results in a mean of 5.4% and a median of 5.8%, based on the indicative estimates from our discussion paper (QRC, sub.no. 106: 5)

⁵¹⁶ Anglo American, sub. no. 93: 6

⁵¹⁷ QRC, sub. no. 106: 6–7

⁵¹⁸ QRC, sub. no. 106: 7–9

⁵¹⁹ QRC, sub. no. 106: 6–7

The QRC said a market risk premium of 7.0% is not supported by the weight of evidence available and would reflect a significant departure from regulatory precedent. Rather, the QRC submitted that a balanced view of the evidence supports a range for the market risk premium of 5.0–6.0%, with a point estimate being no more than 6.0%.

QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

Our Draft Decision is to apply a market risk premium of 6.5% for Aurizon Network for UT4. This figure is within the range proposed by Aurizon Network.

In arriving at this view, we have considered all of the arguments made by the parties in reaching our decision on the appropriate estimate for the market risk premium. We have also considered advice provided to us by Dr Lally, who was engaged to conduct an independent analysis of many of the arguments raised by Aurizon Network and in the submissions from other stakeholders.

We have considered the arguments Aurizon Network, its consultants and other stakeholders have made regarding the various methods we have used in the past to inform our estimate of the market risk premium and regarding our application of them.

As identified in our Market Parameters Decision, our view is that there is no single correct method for estimating this parameter. All potential methods have their advantages and disadvantages. All potential methods are subject to some degree of estimation error. Unlike the risk-free rate, the market risk premium is not observable. As a result, we (and other regulators) must estimate it. In the past, we have used four methods to inform our estimate, as using a combination of valid methods can be expected to minimise the mean square error of the final estimate (i.e. reduce any combination of bias and variance).⁵²⁰

Our approach to assessing the market risk premium for the 2014 DAU period

We have reviewed our use of each of our previous approaches to consider whether they continue to be suitable for estimating the market risk premium.⁵²¹ We propose to again use a variety of different methods to inform our final estimate of the market risk premium, including:

- (a) the Ibbotson method
- (b) the Siegel method
- (c) survey evidence
- (d) the Cornell method.

Our assessment of these methodologies is set out below.

We also undertook a detailed analysis of these methodologies in our Market Parameters Decision. We affirm and adopt our analysis on this issue for the purposes of this Draft Decision, as set out in the Market Parameters Decision. We note that, in applying our analytical approach, the Aurizon Network averaging period of October 2013 differs from the example averaging period of December 2013 used in the Market Parameters Decision. Accordingly, we

⁵²⁰ To be precise, the mean square error is the sum of the variance and the *square* of the bias.

⁵²¹ See Market Parameters Decision, particularly Appendix A - QCA (August 2014).

have taken into account this timing difference in updating the relevant estimates in applying our approach in the context of Aurizon Network's proposal.

In applying our approach in the context of Aurizon Network's proposal, we have taken account of matters raised by stakeholders. As a result, we have adjusted the application of some of these methods, and we also considered additional methods proposed by stakeholders, as well as our own research, to inform our final estimate of the market risk premium.

For the reasons set out below, we consider that our estimate of the market risk premium takes into account and appropriately balances the various factors under section 138(2) of the QCA Act, as identified earlier in this chapter.

lbbotson method

The lbbotson method is an historical averaging method that measures the nominal historical (excess) market rate of return above the risk-free rate, including applicable adjustments for dividend imputation credits. We consider this method to be relatively simple, replicable and easy to understand, and note it has relatively broad support as a basis for estimating the market risk premium.

We have noted Aurizon Network's (and its consultants') concerns about the lbbotson method, namely that:

- (a) it produces an estimate reflective of the average market conditions over the historical period, but not necessarily of the prevailing conditions in the market for funds, and that it is slow to change over time
- (b) a sub-set of the time-series data used by us and other regulators to calculate the lbbotson estimate contains an alleged error. Specifically, SFG Consulting said downward adjustments made to dividend yield data for the period 1883 to 1957, to account for sources of upward bias, were excessive (based on analysis conducted by NERA).⁵²²

With regard to (a), we accept the long-term nature of the data underpinning the lbbotson method means it produces an estimate of the market risk premium likely to be relatively stable over time. It is also true the lbbotson method, because it reflects a long-term historical average, may not be completely reflective of market conditions at any particular point in time.

However, this point is essentially one about the statistical trade-off between the bias and variance in an estimator. For example, reliance on more recent data is likely to reduce bias, but given the limited number of observations, increase the variance of the estimate. To address this limitation, we consider a range of information across a number of time periods.⁵²³

We also consider the simplicity and transparency of the lbbotson method means it is appropriate to continue to use it to inform our final estimate of the market risk premium. This is with the knowledge it is one of a number of methods we use to assist with estimation of the final value for the parameter.

With regard to the claimed data error (b), we consider older data is inevitably likely to be subject to the potential for greater bias, particularly when consideration is given to structural shocks or 'breaks' caused to the data series by particular historical events. The older data is also likely to reflect substantial deficiencies in data quality prior to 1958. As discussed in the QCA's final decision on market parameters, as part of the review of the cost of capital methodology,

⁵²² SFG Consulting, sub. no. 104: 34

⁵²³ See QCA, 2014: Appendix C

we considered excess return estimates for five different sampling periods.⁵²⁴ While we have given consideration to each sampling period, the preferred sampling period is 1958 to 2013. This series is the longest series of high quality data and is free from the claim of material error to which the earlier data is subject.

We have also noted the QRC's view that historical estimates of the market risk premium, such as those produced using the Ibbotson method, may be too high due to 'survivorship' bias. While we accept that survivorship may lead to some upward bias in the Ibbotson estimates of the market risk premium, as discussed in the Market Parameters Decision, we consider any such bias is likely to be modest, at least for Australia.⁵²⁵

Our analysis indicates the Ibbotson historical estimate for the market risk premium ranges from 5.8% to 6.6%, depending on the particular historical series chosen. Our preferred time series of 1958 to 2013, which is the longest period of high quality data, produces an estimate of 6.5%.

Siegel method

The second method we have used to inform our final estimate of the market risk premium is the Siegel method. This method is a variant of the Ibbotson method, based on the premise that, historically, unexpected inflation has reduced the observed real return on bonds but not the real return on equities. To take account of this effect, the Siegel method replaces the historical average real bond yield implicit in the Ibbotson estimate with an estimate of the expected long-run real bond yield.

SFG Consulting said it is not clear that adjusting the Ibbotson estimate of the market risk premium for the effects of unexpected inflation is warranted. It said it is better to use the historical data 'as it is' rather than adjust the data to reflect what would have been if certain events or phenomena had not occurred:

*The whole reason for using a long-term historical average is that there are some surprises that cause stock prices to go up and others that cause stock prices to go down. Over a long period these surprises average out.*⁵²⁶

However, we consider this 'averaging out' claim does not apply to the effects of unexpected inflation in the context of Australia. In particular, Lally has shown that, for Australia, inflation has been a material factor in terms of its persistent and unanticipated impacts on real bond yields over a substantial period of the historical time series underpinning the Ibbotson estimate. Lally demonstrated that, for a high-inflation sub-period (1940 to 1990), the average real yield is substantially below the real yield from the previous sub-period, which suggests inflation forecasts were too low during the high inflation sub-period.⁵²⁷

Some stakeholders said the Siegel method should not be used, as it is not used by other regulators (apart from the New Zealand Commerce Commission) and over 99% of survey respondents have said they do not use it to inform their market risk premium estimates.

While accepting the Siegel method is not widely used, we do not consider this to be decisive, in and of itself, in any consideration of whether the method can inform our final estimate of the market risk premium. Instead, our view is the method has valid explanatory power. This is because it has been shown that the impact of inflation in Australia, which is a significant

⁵²⁴ QCA, August 2014: 20

⁵²⁵ QCA, August 2014: 20

⁵²⁶ SFG Consulting, 2013b: 19

⁵²⁷ Lally, November 2013: 28–30

macroeconomic variable, was persistent over a substantial period of time, and the unanticipated effects did not 'average out.'

In addition, it appears logical that, as we are estimating an *expected* return, consideration should be given to unexpected inflation, particularly given its unanticipated and significant impact on *actual* returns. That said, we note again the importance in estimating the market risk premium of considering a number of different methods, of which the Siegel method is just one.

Determining the Siegel estimate of the market risk premium requires adjusting the Ibbotson estimate for the effects of unexpected inflation. As discussed in the QCA's Market Parameters Decision, the Siegel method supports a market risk premium estimate ranging from 4.1% to 6.4% for all sample periods.⁵²⁸ Our preferred time series of 1958 to 2013 which is the longest period of high quality data available (as with the Ibbotson estimate) produces an estimate of 5.5%.

Survey evidence / independent expert reports

The third method we have used to inform our final estimate of the market risk premium is survey evidence. This approach attempts to estimate the future market risk premium on the basis of survey responses from relevant participants. These can include individual and institutional investors, valuation experts, financial analysts, company managers and academics. We have also accepted SFG Consulting's advice to supplement the survey evidence with the findings of relevant independent expert reports.

Aurizon Network (and SFG Consulting) raised a number of concerns with the use of survey evidence to inform the estimate of the market risk premium. In particular, these related to:

- survey design
- stability of survey responses
- adjustments for dividend imputation credits.

SFG Consulting was concerned that we rely on a single survey (i.e. the annual Fernandez et al. survey) which it suggested does not meet criteria for relevant surveys set out recently by the Australian Competition Tribunal. These criteria are that a survey should be:

- timely — i.e. reflect market conditions at the time it is being relied on
- clear — with respect to questions asked, so there is no ambiguity in interpreting responses
- properly reflective of the views of the market - i.e. including a sample of respondents that is not small, unrepresentative or without relevant expertise.

We consider the underpinnings of the Fernandez surveys suggest they are reasonably reflective of these criteria. Firstly, surveys were conducted by the relevant authors in 2011, 2012 and 2013, as well as in previous years. Secondly, our judgement is that the surveys are well-established, consistent and comprehensive. Thirdly, we note the Fernandez surveys have involved a significant number of participants, including market professionals and academics, and cover a wide range of countries. The latter allows for triangulation of estimates across markets and therefore provides other reference points for assessing reasonableness.⁵²⁹

⁵²⁸ QCA, August 2014: 20

⁵²⁹ Another advantage of including estimates from surveys of the market risk premium in other markets is that using those results contributes to reducing the mean square error of the estimate, as most of the cross-

With regard to the stability of survey responses, SFG Consulting's concern is that survey results tend to be 'slow-moving' and very stable over time. SFG Consulting suggests this is because participants often base their responses on the Ibbotson approach, or similar consideration of historical data. We note, however, the recent evidence suggests the responses to the Fernandez surveys have in fact varied modestly over time (with the median estimate fluctuating between 5.0% and 6.0%). This suggests the characterisation of the survey method as being 'too' stable, and not forward-looking, is not correct.

As for dividend imputation credits, the suggestion is that estimates informed by survey responses should be adjusted upwards to reflect the likelihood participants will not have factored the value of dividend imputation credits into their estimate of the market risk premium. However, it is not clear this is the case. In fact, as participants can be considered sophisticated investors and/or market observers (including academics) it seems as likely they would have taken account of all factors, including the need to implicitly adjust for dividend imputation credits.

Nonetheless, as this matter is not clear, we have considered the evidence from the Fernandez surveys with and without an imputation adjustment. Without an adjustment, the survey evidence supports a median market risk premium estimate of 6.0%. With an adjustment, the survey evidence supports an estimate of 6.8%. In making this adjustment, we do not agree with SFG Consulting's proposed adjustment method and have applied the approach consistent with Lally.⁵³⁰

However, we note that SFG Consulting recently identified an error in our Market Parameters Decision, where the estimate with imputation credits was stated as 6.2%. That estimate should have been presented as 6.8%.⁵³¹ We have made this correction in this Draft Decision. We have considered the effect of this adjustment and, overall, it does not affect our final estimate of the market risk premium.

As noted above, we agree with SFG Consulting's suggestion the survey evidence be supplemented by reference to independent expert reports. We consider such reports are likely to be relevant, as they are prepared as part of processes regulated by ASIC and form the basis of numerous transactions involving material amounts of equity capital. On request, SFG Consulting provided us with copies of 29 independent expert reports considered relevant. Our assessment of these reports suggests they support a base mean market risk premium of 6.4% (as contended by SFG Consulting) and a median estimate of 6.0% (excluding imputation credits). However, we consider that the more appropriate statistic is the median, to eliminate the influence of outliers in this small sample.

Overall, our analysis shows that both surveys and independent expert reports support a median market risk premium estimate of 6.0% (excluding imputation credits) and a median estimate of 6.8% (including imputation credits).

country variation in market risk premium estimates appears to constitute estimation error rather than cross-country variation in true market risk premia (Lally, 2013c: 61-62; Lally and Randal, 2012).

⁵³⁰ The SFG Consulting adjustment is only appropriate under very unrealistic circumstances. In particular, it assumes there is no inflation and that firms distribute all net cash flows as dividends rather than retaining such cash flows.

⁵³¹ The estimate is based on QCA, August 2014: Appendix C, Technical Annexe, equation (29). Applying that equation and estimates of the market risk premium of 6.0% (excluding imputation credits), a risk-free rate of 4.06%, cash dividend yield of 4.48%, utilisation rate of 0.56%, and proportion of dividends fully franked of 0.75 gives an estimate of 6.8% for the market risk premium (including imputation credits).

Dividend growth models

The fourth method we have used to inform our final estimate of the market risk premium is the Cornell approach. This is a forward-looking method that applies a variant of the dividend growth model, where the market return is the rate of return that reconciles the current value of the market portfolio with the present value of the expected future stream of dividends.

We agree with Aurizon Network's view that dividend growth models provide relevant estimates of the market risk premium. However, we note a number of concerns Lally identified with Aurizon Network's preferred Nelson-Ferraroni-McGuire multi-stage model.⁵³² In particular, this model, which produced a market risk premium estimate of 8.5%: does not make a deduction from the long-run expected growth rate for the creation of new companies and issuance of new equity by existing companies; and the adjustment for dividend imputation credits assumes no expected capital gains. This means the model's estimate of the market risk premium is likely to be materially too high.

The QRC and Anglo American shared the view that dividend growth models can produce market risk premium estimates that are too high. They said these models need to be interpreted with care, as they are very sensitive to changes in inputs and assumptions. We agree with this point, but still consider dividend growth models have some explanatory power when it comes to considering the final estimate for the market risk premium, provided they are used in conjunction with a number of other methods. In particular, these models are based on well-established finance theory and invoke current information and/or forecasts.

We have applied our preferred Cornell variant of the dividend growth model, based on Lally.⁵³³ Our application of the Cornell method incorporates:

- convergence of short-run forecast dividend growth rates to the long-run growth rate of the economy over periods of 10 and 20 years (reflecting the fact dividend growth rates cannot be higher than the growth rate of the overall economy on an indefinite basis)
- as suggested above, a deduction from the long-run expected growth rate for the creation of new companies and issuance of new equity by existing companies (the adjustment range is 0.5% to 1.5%)
- a term structure for the return on equity, by assuming a market value of equity after 10 years that corresponds to the long-run average of 11.8%, based on a long-run average risk-free rate of 5.8% and market risk premium of 6.0%—this addresses concerns that interest rates are materially lower than historical rates
- recognising that dividends are received with an average term of receipt of six months, reflecting a realistic time-profile of dividends
- input data as of October 2013 (corresponding to Aurizon Network's proposed UT4 WACC averaging period)—including: a cash dividend yield of 4.48%; expected dividend growth rate of 7.49% for one and two years forward; 10-year bond yield of 4.06%; range for long-run nominal growth in dividends per share of 4.0% to 5.1%; expected inflation of 2.5%; and expected real GDP growth rate of 3.0%.

Based on these assumptions, the Cornell method produces a range of estimates for the market risk premium of 5.6% to 8.3% (the range is 5.6% to 7.3% assuming a 10-year convergence

⁵³² Lally, 2013c: 14

⁵³³ Lally, November 2012: 23–24

period, and 7.0% to 8.3% assuming a 20-year convergence period). The median of the entire range is 7.1%.

Current conditions - conditional information on the market risk premium

Stakeholders have variously submitted that the QCA should take into account current conditions to a greater extent than previously. While we consider that our previous methodology for estimating the market risk premium has adequately reflected relevant perspectives on current conditions (e.g. estimates from the Cornell and survey methods), this section seeks to consider stakeholder submissions further. Specifically, estimates can be derived on the basis of specifying a particular relationship between the market risk premium and current information, such as market volatility, debt premiums and the relationship between the risk-free rate and market risk premium.⁵³⁴

Volatility measures

Volatility approaches reflect the view that the market risk premium should be higher in times of greater market volatility. Value Adviser Associates, on behalf of Aurizon Network, proposed a volatility-based measure of the market risk premium on the basis that this approach better reflects current conditions and is an appropriate method to apply when market conditions are unusual, such as in the aftermath of the GFC. Value Adviser Associates proposed a volatility-based estimate of 7.4% over the regulatory period (Aurizon Network, sub. no. 9: 30-32).⁵³⁵

We consider there are several significant problems with the proposed volatility-based model for estimating the market risk premium. For instance, there are inconsistencies in the way that Value Adviser Associates has implemented the approach, and these are documented in the Market Parameters Decision.⁵³⁶ In addition, Lally has pointed out that volatility-based estimates are subject to very low statistical precision, making them highly unreliable.⁵³⁷ Further, the AER has raised concerns with Value Adviser Associates specific implementation of the approach to estimating the market risk premium.⁵³⁸

In any case, empirical evidence indicates that, while market volatility did rise at the time of, and immediately after, the GFC, it has subsided rapidly since that time. For example, pre-GFC volatility averaged 13.8% but average volatility more than doubled to 27.4% during the GFC.⁵³⁹ Volatility then subsided quickly and has trended downward since then. For instance, from January 2010 to October 2013, volatility has averaged 17.0%, but since January 2013 (to October 2013), volatility has averaged 13.1%, which is below the pre-GFC level.⁵⁴⁰

While volatility measures can be informative of the market risk premium, we consider that the specific approach presented does not warrant material weight at this time.

Corporate debt premiums

Corporate debt premiums represent the difference between the yield on a coupon-paying corporate bond on debt and the yield on a coupon-paying government bond of the same maturity.

⁵³⁴ A detailed consideration of aspects of these issues is in our Market Parameters Decision.

⁵³⁵ Aurizon Network, sub. no.9: 30-32. The approach is based on Merton (1973).

⁵³⁶ QCA, August 2014: 73-74

⁵³⁷ Lally, 2013c: 34-35

⁵³⁸ AER, 2013e: 98-99

⁵³⁹ The GFC is considered to span from July 2007 (the collapse of Lehman Brothers) to December 2009.

⁵⁴⁰ Volatility estimates are based on ASX200 Index implied three-month volatility. See the Market Parameters Decision, Appendix C for further details.

Aurizon Network's consultants said increases in debt premiums during and post-GFC were attributable to higher systematic risk rather than to an increase in default risk. As a result, Value Adviser Associates specifically argued that, as debt betas are unlikely to have risen during this time, the increase in debt premiums is likely to be attributable to a higher market risk premium. As the systematic risk components of debt and equity should move together, the implication is that equity markets should have been affected by a higher market risk premium as well.

While this conclusion is plausible, we consider that specific arguments for this relationship are problematic. In particular, Lally observed that Value Adviser Associates' argument likely understated the role of default risk in debt premiums and failed to consider that a heightened premium may be associated with illiquidity.⁵⁴¹

Nonetheless, if the increase in debt risk premiums was the result of an increase in (non-systematic) default risk and illiquidity (rather than due to an increase in debt betas), these changes are likely to be positively related to changes in the market risk premium. This is because the market risk premium is compensation for bearing equity risk, equity risk seems to be higher in depressed economic conditions, and default and illiquidity also tend to rise in these conditions.

However, the question is whether these effects remain in markets at present—debt premiums have been trending downward since the GFC, including in Australia. In any case, even if a definitive link could be established, it is not clear how (quantitatively) an appropriate adjustment would be made. However, we have had some regard to this evidence in forming a view on the market risk premium. We also note that the AER has previously reached a similar conclusion on the explanatory power of such evidence.⁵⁴²

[Relationship between the risk-free rate and the market risk premium](#)

Aurizon Network and its consultants raised the concern that, due to current financial market conditions, the risk-free rate is unusually low and argued that the market risk premium is likely to have risen as a result. SFG Consulting noted that risk-free rates have recently been at historically low levels relative to the average yield over the last 40 years.⁵⁴³

To address this possibility, Aurizon Network and SFG Consulting supported including the Wright method in our current set of estimation methods.

The Wright method assumes that the risk-free rate and the market risk premium are perfectly, negatively correlated, resulting in a stable return on equity. In other words, when the (observable) risk-free rate decreases (increases), the market risk premium increases (decreases) by an offsetting amount.

SFG Consulting said the Wright method will produce similar estimates to the Ibbotson method when market conditions are average, but different estimates when conditions are not average - i.e. the Wright method will produce higher (lower) market risk premium estimates during economic crises (expansions), consistent with a view that risk rises during crises and falls during expansions.

In contrast, the QRC did not support use of the Wright method, as it considered the relationship between the risk-free rate and the market risk premium is not sufficiently well established. It

⁵⁴¹ Lally, 2013c: 37-38

⁵⁴² AER, 2013e: 95-97

⁵⁴³ Aurizon Network, sub. no. 104: 17-20

said it would only be appropriate to include the Wright method in the suite of estimation techniques if it could be clearly shown that the overall return on equity is more stable over time than the market risk premium.

Whether unusually low government bond yields have affected the market risk premium cannot be answered definitively, as the market risk premium is unobservable. As outlined in the Market Parameters Decision, there are a number of plausible hypotheses.⁵⁴⁴ Based on submissions from stakeholders and our own research, the relationship between the risk-free rate and the market risk premium remains a matter of considerable contention.

We consider that, in the context of the Wright method, this issue is ultimately an empirical matter. In the Market Parameters Decision, we replicated an analysis by Lally and concluded that the historical evidence supports the view the market risk premium is considerably more stable over time than the real equity return, which is not consistent with the premise on which the Wright method is based.⁵⁴⁵

Rather, the evidence supports more weight being attributed to the Ibbotson and Siegel estimates than to the Wright estimates. However, the QCA will have regard to the Wright estimates in forming a view on an appropriate estimate of the market risk premium. This position is consistent with the position of the AER in its Rate of Return Guideline.⁵⁴⁶

Other regulators

In our assessment of the market risk premium for UT4, we have also given some consideration to the positions taken by other Australian regulators in recent decisions and publications.

In its recent Rate of Return Guideline, the AER has determined a point estimate for the market risk premium of 6.5%. This was based on its judgement of the estimates provided by application of a number of different estimation methods, including several of the methods described above. The 6.5% estimate differs from the 6.0% estimate principally applied by the AER in the past.

Most other Australian regulators have continued to use a market risk premium of 6.0% in their recent decisions, noting that most of these regulators also continue to use a 10-year term to maturity for estimating the risk-free rate. Recent examples include:

- ESCV (for rail and water)⁵⁴⁷
- ESCOSA (water)⁵⁴⁸
- ACCC (fixed line telecommunications services)⁵⁴⁹
- IPART (noting IPART uses a methodology for determining WACC that involves calculating current and long-term ranges and mid-points for each parameter).⁵⁵⁰

⁵⁴⁴ See the discussion in QCA, August 2014: 78-81

⁵⁴⁵ QCA, August 2014: 86-88

⁵⁴⁶ AER, 2013e: 26

⁵⁴⁷ See for example Essential Services Commission (Victoria), *Price Review 2013: Greater Metropolitan Water Businesses - Final Decision* (June 2013): 110

⁵⁴⁸ Essential Services Commission (SA), *SA Water's Water and Sewerage Revenues 2013/14 - 2015/16 - Final Determination, Statement of Reasons* (May 2013): 140

⁵⁴⁹ ACCC, *Inquiry to make final access determinations for the declared fixed line services - Final Report* (July 2011): 59

⁵⁵⁰ IPART, *Essential Energy's water and sewerage services in Broken Hill - Final Report* (June 2014): 96

The Economic Regulation Authority (ERA of WA), in its recent review of the method for estimating the WACC for freight and urban rail networks, considered that a range of 5.0% to 7.5% is appropriate for estimating the forward-looking market risk premium, and said it will exercise regulatory judgement to estimate the appropriate point estimate within this range at any given time.⁵⁵¹

Conclusions

As the market risk premium is not observable, and as all methods that can be used for estimating it can be prone to some degree of estimation error, we consider it is prudent to consider a range of estimates from a number of different methods before determining a final point estimate. We considered this issue in detail in our Market Parameters Decision.

Based on our analysis, we have developed a range of 5.0% to 7.5% for the market risk premium at this time:

- the lower bound of 5.0% is based on the Siegel estimates—the lower bound is 50 basis points below 5.5%, which is the estimate from the time series of 1958-2013, the longest series of high quality data
- the upper bound is based on the Cornell estimate—the upper bound of 7.5% is 40 basis points above the median estimate of 7.1%.

Based on this range, we consider that the most appropriate estimate of the market risk premium at this time is 6.5%, based on our analysis of:

- Ibbotson estimates—the Ibbotson estimates provide a range of 5.8%–6.6% over all sample periods, with an estimate of 6.5% for the period 1958–2013
- Siegel estimates—the range for the Siegel estimates is 4.1%–6.4%, with an estimate of 5.5% for the period 1958–2013
- survey evidence / independent expert report estimates—survey data and independent experts' reports support an estimate of 6.0% (excluding imputation credits) and 6.8% (including imputation credits)
- Cornell dividend growth estimates—the Cornell range is 5.6%–8.3%, with a median estimate of 7.1%
- conditional information—additional sources of information include volatility measures and corporate debt premiums. We also considered the relationship between the risk-free rate and the market risk premium.

As discussed and explained in detail in the Market Parameters Decision, we consider it is no longer appropriate to base estimates of the market risk premium on a mechanically rounded average of equally weighted estimates produced by the various methods we have considered in our assessment.⁵⁵² Instead, we have used a number of valid methods and current information to form a range and then applied our best judgement to determine a final point estimate, based on a broader consideration of the evidence at hand. On this basis, we consider a reasonable estimate of the market risk premium for the 2014 DAU period is 6.5%.

⁵⁵¹ ERA (WA), *Review of the material for estimating the Weighted Average Cost of Capital for the Freight and Urban Railway Networks - Draft Determination* (June 2014): 86

⁵⁵² QCA, August 2014: 22

We consider this estimate of the market risk premium takes into account and appropriately balances the various factors under section 138(2) of the QCA Act, as identified earlier in this chapter.

In that regard, we note our estimate of the market risk premium represents our best judgement using a variety of different estimation methods, both historical and forward-looking.

As discussed in more detail in section 10.4 of this chapter, we have also taken into account arguments by Aurizon Network (and SFG Consulting) regarding potential inconsistency between the term of the risk-free rate and the term of the market risk premium. We consider the apparent inconsistency arises from applying the CAPM to satisfy the NPV = 0 Principle. This requires the first term in the cost of equity to be the risk-free rate with a term corresponding to the regulatory cycle.

Nevertheless, as noted earlier, as part of our cost of capital methodology review, we examined the historical difference between the 10-year rate and five-year rate as applied to estimate the market risk premium. In the present context, we also examined the historical difference between the 10-year rate and the four-year rate. This analysis reinforced the conclusion that a reasonable estimate of the market risk premium is 6.5%.⁵⁵³

On the issue of rounding, it has been common practice by us, and other regulators, to round final estimates of the market risk premium to the nearest whole percent, with the knowledge the unobservable nature of the parameter means estimating it with great precision can be difficult. However, as discussed in the Market Parameters Decision,⁵⁵⁴ we consider the approach of using sound analysis to determine a range for the market risk premium and selecting a final estimate from that range by applying our judgement, supports setting aside the whole number rounding rule from the past approach.

With regard to Aurizon Network's (and SFG Consulting's) suggestion that our methods for estimating the market risk premium lead to estimates that are 'too' stable, we accept the historical-based methods (Ibbotson and Siegel) are likely to lead to relatively stable estimates, due to the long time periods used for input data. However, the forward-looking methods (survey evidence and dividend growth models) produce estimates that are more variable. This reinforces the importance of considering a number of different methods when using our best judgement to determine a final market risk premium, which we have done in determining a value of 6.5%.

As noted earlier, we have estimated a range for the market risk premium of 5.0% to 7.5%. We consider that, in using our best judgement to assess a variety of different estimation methods, we have then determined a point estimate value for the market risk premium of 6.5% that takes into account and appropriately balances the various factors under section 138(2) of the QCA Act.

⁵⁵³ QCA, August 2014: 13; 23

⁵⁵⁴ QCA, August 2014: 81

Draft Decision

10.11 We consider it appropriate that Aurizon Network amend its draft access undertaking to set the market risk premium at 6.5%.

10.8 Beta

10.8.1 Debt beta

In past regulatory decisions, we have used the Conine de-levering/re-levering formula to convert equity betas to asset betas and vice versa. The Conine formula requires an estimate of the debt beta. The debt beta reflects the systematic risk of a firm's debt.

Estimating the debt beta is empirically difficult and prone to uncertainties. In past regulatory decisions, including UT3, we have used a debt beta of 0.12. This estimate was based on the mid-point between a range of values where the lower bound was zero and the upper bound was the debt margin divided by the market risk premium (at the time of the approval of UT2).

For UT3, we did not accept Aurizon Network's proposal to apply a zero debt beta, as we considered empirical research had demonstrated the debt margin includes a positive and non-diversifiable component.⁵⁵⁵ Nonetheless, we accepted its consultant Synergies' point that, as long as the same value of the debt beta is applied consistently in the de-levering and re-levering process, the effect on the equity beta should not be material.

Aurizon Network proposal

For the purposes of our consideration of the 2014DAU, we understand Aurizon Network has proposed a value for the debt beta of 0.12.

In its UT4 supporting submission, Aurizon Network said:

While Aurizon Network continues to be of the view that the most appropriate value of the debt beta is zero (given the absence of any robust accepted method to estimate it), it has no new evidence to submit on this in UT4. It has therefore applied the UT3 value of 0.12.

Stakeholders' comments

No other stakeholders commented on the proposed value of the debt beta for UT4.

We note that in the UT3 assessment process, Aurizon Network (and Synergies) submitted that our approach was likely to materially overstate the actual debt beta as the size of the debt margin had increased significantly and the margin includes a non-trivial component for non-systematic default risk. Therefore, to the extent the debt beta is overestimated, the equity beta would be underestimated.

Synergies said we should rely on a zero debt beta (as is commonly done by other regulators). However, Synergies acknowledged the value attributed to the debt beta would have no material impact, provided the same value was used when de-levering and re-levering the beta estimates (and the calculations were conducted correctly).

QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in

⁵⁵⁵ For example, see Davis (2005).

our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

We propose to again adopt a debt beta of 0.12 for the 2014 DAU period. This value is only slightly higher than the value of 0.10 used by the UK Competition Commission and the value of 0.08 determined by PwC for Transpower New Zealand for a BBB+ rated utility. Importantly, we note again that the precise value of the debt beta is unlikely to have a material impact, as long as the same value is used in both the beta de-levering and re-levering processes.⁵⁵⁶

While the method used to determine the value is an approximation with known limitations, we consider the resulting 0.12 value to be a reasonable estimate in the circumstances. We have therefore maintained that value in this decision. We consider this value has regard to the factors set out in section 138(2) of the QCA Act and weights them appropriately in the manner previously identified in this chapter, thereby achieving an appropriate balance between the competing interests of the various stakeholders.

Draft Decision

10.12 We approve Aurizon Network's proposed debt beta of 0.12.

10.8.2 Asset/equity beta

Background

For UT3, we considered that an asset beta of 0.45 would be appropriate for the Aurizon Network business. At the benchmarking gearing of 55% debt, with a debt beta of 0.12, the asset beta of 0.45 gave an equity beta of 0.8.

Aurizon Network proposal

For the 2014 DAU period, Aurizon Network proposed an asset beta range of 0.5 to 0.6, which converts to an equity beta range of 0.9 to 1.0, at 55% gearing and with a 0.12 debt beta.

Aurizon Network noted it had also proposed an asset beta range of 0.5 to 0.6 for UT3, based primarily on comparison with US class 1 railroads, US coal firms and a listed Canadian coal export port (Westshore Terminals).⁵⁵⁷

In its UT4 submission, Aurizon Network said it continues to have fundamental concerns with our UT3 assessment of beta. It noted two key concerns, namely the:

- decision to align Aurizon Network's beta with energy network businesses, and to reject firms in the transportation sector, including US class 1 railroads, as comparators. It said these firms are consistently referred to by market analysts as a peer group of Aurizon Holdings Limited and argued that, while Aurizon Holdings Limited and US class 1 railroads are vertically integrated businesses, if Aurizon Network was a stand-alone coal network business it would remain in this peer group. However, it did not provide evidence to support this view

⁵⁵⁶ The exception is when there are very substantial differences between the capital structures of the benchmark firms in the set of comparators and the capital structure of the firm of interest. This is typically not the case for regulated utilities.

⁵⁵⁷ We did not accept Aurizon Network's UT3 proposal, largely on the basis we considered energy network businesses better comparators for the business risk profile of Aurizon Network.

- the need to give more appropriate regard to estimation error. It said beta estimation is particularly imprecise, meaning it is important to specify beta in terms of a range rather than a point estimate.

Aurizon Network's UT4 proposal was supported by two independent expert reports:

- SFG Consulting's empirical analysis of Aurizon Network's systematic risk
- Synergies' assessment of Aurizon Network's commercial and regulatory risks, which Aurizon Network acknowledged extends beyond the scope of beta. Synergies' report suggests these risks are primarily non-systematic in nature and the report is not discussed in detail in the beta section of Aurizon Network's submission (we discuss Synergies' report in section 10.3.3 of this paper).

SFG Consulting analysis

SFG Consulting said that, ideally, its analysis of Aurizon Network's systematic risk would use data for a large sample of Australian-listed rail networks. However, it noted there are no 'pure-play' Australian-listed rail networks, and instead assessed beta with reference to three classes of businesses: Australian-listed industrial transportation firms (including Aurizon Holdings Limited); US class 1 railroads; and Australian-listed energy network businesses. SFG Consulting commented that:

*QR Network shares a characteristic of the energy network businesses, in that it is a single operator of a network business subject to a similar regulatory regime. But revenue for these comparator firms is driven by an entirely different customer segment. It also shares a characteristic of the transportation firms, namely a **broadly** similar customer base and product, but is not exposed to the risks associated with the unregulated segments of the listed businesses. The substantially different capital structures of these industry sectors suggests that their underlying risks are, in fact different. What is unclear is just how similar the systematic risk of QR Network is to either sector.⁵⁵⁸*

Aurizon Network pointed to fundamental differences between it and regulated electricity network businesses, relating to the nature of the service provided and the underlying customer base. Aurizon Network considered limiting the beta comparators to this type of business ignores how an investor might assess Aurizon Network's expected return relative to its risk profile—i.e. an investor would be likely to consider both regulated and unregulated businesses, including other rail transport providers.

The submission also presented a first principles analysis that Aurizon Network said supported the inclusion of US class 1 railroads as comparators. Aurizon Network said assessment of a number of key factors influencing systematic risk shows its below-rail business is similar to US class 1 railroads. Aurizon Network's views, and our consultant's responses, are summarised in Table 89 in the analysis section.

SFG Consulting assessed betas for the firms in its chosen comparator categories by applying three different estimation techniques, as follows:

- Ordinary Least Squares (OLS) regression, using different starting points for four weekly returns
- incorporating firm characteristics directly into the beta estimates (firm size and book-to-market equity ratios)

⁵⁵⁸ SFG Consulting, 2012b: 3

- fitting regression-based beta estimates according to firm characteristics (i.e. the dependent variable is the regression-based beta estimate and the independent variables are firm size, book-to-market ratios and debt-to-equity ratios).

Based on its analysis of the three business categories identified, and the three estimation techniques applied, SFG Consulting supported an asset beta of 0.55 and a re-levered equity beta of 1.0 (with 60% benchmark gearing). The basis for these estimates is outlined in **Table 88** below:

Table 88 SFG Consulting estimates

| <i>Estimation technique</i> | <i>Beta estimates</i> |
|--|--|
| 100% weight placed on OLS estimates for Australian-listed energy network businesses. | The asset beta estimate is 0.35 and the re-levered equity beta estimate is 0.59. |
| 100% weight placed on OLS estimation technique, with 50% weight within this placed on Australian-listed energy network businesses and the remaining 50% allocated equally to Australian-listed industrial transportation firms and US class 1 railroads. | The asset beta estimate is 0.54 and the re-levered equity beta estimate is 0.98. |
| 50% weight placed on OLS estimation technique and 50% on estimation techniques that give regard to firm characteristics, with 50% weight within this placed on Australian-listed energy network businesses and the remaining 50% allocated equally to Australian-listed transportation firms and US class 1 railroads. | The asset beta estimate is 0.57 and the re-levered equity beta estimate is 1.05. |

SFG Consulting, and Aurizon Network, considered it is appropriate to place some weight on the:

- Australian-listed transportation firms and US class 1 railroads, as they consider both to be reasonable comparators for Aurizon Network
- estimation techniques that give regard to firm characteristics, as SFG Consulting's estimates indicate the coefficients on the relevant variables are not zero, meaning they have some role in informing assessment of systematic risk.

Thus, SFG Consulting proposed a range for beta values based on its second and third methodologies (as outlined above)—i.e. an asset beta range of 0.54 to 0.57, and a re-levered equity beta range of 0.98 to 1.05 (at 60% gearing). SFG rounded this to an average asset beta estimate of 0.55 (which implies an equity beta of 1.0 at 60% gearing).

Stakeholders' comments

Of the original submissions received on Aurizon Network's proposed UT4, six commented specifically on the proposed betas or the level of systematic risk faced by Aurizon Network.

The QRC proposed an equity beta range for Aurizon Network of 0.4 to 0.6, based on its view that Aurizon Network's business is very low risk in nature and the exposure to risk has been significantly reduced in recent years through introduction of various risk protection mechanisms into the regulatory framework. The QRC commented 'this implies that if anything, Aurizon Network's equity beta should be reduced for UT4, and should certainly not be increased.'⁵⁵⁹

⁵⁵⁹ QRC, sub no. 64: 2

The QRC said Aurizon Network's proposed equity beta, as supported by SFG Consulting, can only be sustained if significant weight is given to US class 1 railroads and Australian-listed transportation businesses. The QRC said these businesses are likely to have very different risk characteristics to Aurizon Network, as they:

- are not subject to revenue cap regulation and so are not protected from volume risk in the same way as Aurizon Network
- would not have the same ability as Aurizon Network to pass through unanticipated cost increases to customers (i.e. via review events, endorsed variation events, annual reference tariff reviews and periodic regulatory resets).⁵⁶⁰

The QRC noted that, if these comparators were removed from SFG Consulting's sample, the asset beta estimate would be 0.35, which implies an equity beta of 0.55 (and is within the QRC's proposed range). The QRC said the UT3 equity beta (0.8) compares favourably to other infrastructure businesses, such as energy network businesses, Telstra and the Sydney Desalination Plant.⁵⁶¹

The QRC also provided two independent expert reports to support its position:

- Castalia Strategic Advisors (Castalia) benchmarked Aurizon Network's risk profile and proposed equity beta against other infrastructure businesses
- McKenzie and Partington prepared a paper that commented on a number of Aurizon Network's proposed WACC parameters, including its proposed equity beta.

Castalia benchmarked Aurizon Network's risk profile against four other regulated Australian businesses (the Sydney Desalination Plant, Electranet, Gasnet and Aurora Energy). While it acknowledged its analysis was high level, Castalia found that each of these four businesses had greater or significantly greater risk than Aurizon Network (on the basis of an assessment of revenue, expenditure, inflation, asset stranding, regulatory, political and force majeure risks).⁵⁶²

Castalia noted that three of these businesses (Electranet, Gasnet and Aurora Energy) are regulated by the AER, and recent regulatory decisions have given them an equity beta of 0.8 (at 60% gearing). The Sydney Desalination Plant is regulated by IPART and has been given an equity beta of 0.7 (also at 60% gearing).

On this basis, Castalia said Aurizon Network's equity beta should be lower than 0.7 with 60% gearing, or lower than an equity beta of 0.6 at 55% gearing.⁵⁶³

McKenzie and Partington focused on the comparability of international railroads to Aurizon Network. Their analysis indicated a global average equity beta for railroads is estimated to be 0.68, and said this estimate triangulates reasonably well with SFG Consulting's estimate for Aurizon Holdings Limited (while acknowledging the relevance of SFG Consulting's comment that this estimate 'should be given little weight in isolation, as there is substantial estimation error for an individual stock').⁵⁶⁴

However, McKenzie and Partington noted the average equity beta for railroads outside the US ranged from 0.33 to 0.86, which was substantially different to the average for US railroads of

⁵⁶⁰ QRC, sub no. 64: 17

⁵⁶¹ QRC, sub no. 64: 17–18

⁵⁶² Castalia, sub no. 66: 29

⁵⁶³ Castalia, sub no. 66: 29

⁵⁶⁴ McKenzie & Partington, sub no. 65: 27

1.32. They said the substantially higher equity betas for US railroads, compared to those in other jurisdictions, suggests 'there is clearly something about American railways that makes them different to the rest of the world.'⁵⁶⁵

McKenzie and Partington considered this last point to be supported by evidence that US railroads have much lower gearing than railroads in other jurisdictions (they found average gearing of 23.5% for a sample of US railroads). They said the big difference between the gearing ratios for US railroads and the assumed gearing ratios for Australian railroads suggests they are different in some fundamental respect, rendering a comparison inappropriate.

McKenzie and Partington also questioned SFG Consulting's choice of estimation techniques. They said SFG Consulting had chosen three models out of many, each with its own idiosyncrasies and biases, and commented that 'it is not immediately clear whether they are even comparable in the sense that averaging across them makes any sense.'⁵⁶⁶ In addition, they said there was no clear link between the estimation equations, including additional explanatory variables included in them, and the underlying theory of the CAPM.

McKenzie and Partington concluded they see no evidence to support a proposal to adjust Aurizon Network's equity beta to a value of 1.0.

On the basis of its own analysis, and the work of Castalia and McKenzie and Partington, the QRC said a reasonable range for the equity beta of Aurizon Network is 0.4 to 0.6, with a midpoint value of 0.5.

RTCA supported the QRC's proposed range for Aurizon Network's equity beta of 0.4 to 0.6, with a midpoint value of 0.5.⁵⁶⁷ This was on the basis that, given the very low risk of Aurizon Network's business and the trend of risk reduction achieved, a reduction in the equity beta is justified, not an increase as proposed by Aurizon Network. Similarly, Glencore said the risk profile of Aurizon Network is substantially lower than many regulated firms and should justify downward adjustment of the equity beta, not an increase.⁵⁶⁸

Anglo said the UT3 beta did not reflect the fact that the revenue cap form of regulation, with an 'overs and unders account', protects Aurizon Network from volume risk. It added that Aurizon Network's total risk under UT3 was further reduced by a number of ancillary mechanisms (14 of which it listed in its submission). In addition, it said a series of further ancillary mechanisms proposed for UT4 would reduce Aurizon Network's risk still further (and listed another 16 mechanisms it said were in this category).⁵⁶⁹

For these reasons, Anglo said it did not support the QRC's submissions in respect of beta. Instead, it said Aurizon Network is a very low risk business, and an equity beta in the range of 0.2 to 0.3 is appropriate. It suggested this would be consistent with 50% of the beta being weighted at zero (reflecting lack of risk and guaranteed revenue) and 50% at an average benchmark beta of the firms set out by SFG Consulting.

Vale said it has had concerns for some time regarding Aurizon Network transferring risk to customers without any apparent recognition this reduces the non-diversifiable risk of the business.⁵⁷⁰ As with Anglo, it listed a number of mechanisms by which it considers Aurizon

⁵⁶⁵ McKenzie & Partington, sub no. 65: 27

⁵⁶⁶ McKenzie & Partington, sub no. 65: 31

⁵⁶⁷ RTCA, sub no. 73: 94

⁵⁶⁸ Glencore, sub no. 74: 4

⁵⁶⁹ Anglo American, sub. no.39: 7–9

⁵⁷⁰ Vale, sub. no. 42: 3–4

Network has reduced its risk, or proposes to reduce its risk in UT4. It said this means Aurizon Network is likely to face substantially lower non-diversifiable risk than the comparators on which its beta proposals were based. Even in the absence of these risk reduction mechanisms, Vale considered the degree of non-diversifiable risk faced by Aurizon Network to be lower than faced by other regulated utilities, given its more limited exposure to domestic market factors.

Peabody said the overall WACC sought by Aurizon Network was excessive and not aligned to the risk profile of the business operations.⁵⁷¹ Specifically, it said there is minimal funding risk to operations backed up by long-term contracts across a multitude of companies, with many of those companies being of significant size, which would reduce risk around default or creditworthiness. As well, it said there is minimal evidence the apparent volatility of global markets would place negative impacts on the ability of Aurizon Network to raise funds to support existing obligations.

Consultant's assessment

To assist with our analysis of Aurizon Network's proposal, and stakeholders' comments, we engaged Incenta Economic Consulting (Incenta) to provide us with expert advice. Specifically, Incenta was asked to:

- provide an assessment of Aurizon Network's beta proposal
- advise on an appropriate benchmark capital structure (discussed in section 10.5.1)
- recommend an appropriate equity beta for Aurizon Network.

Incenta provided us with an initial report prior to the WACC Forum that was held on 13 December 2013. The initial report was published and comments from stakeholders sought by 20 January 2014. We subsequently asked Incenta to provide a revised version of its report, taking account of the comments received from stakeholders. Incenta's analysis is discussed in the remainder of this section.

Selection of comparator firms

Incenta agreed with SFG Consulting that, ideally, analysis of Aurizon Network's beta would use data for a large sample of Australian-listed rail networks. However, as stakeholders have identified, there are no directly comparable listed businesses to the Aurizon Network business (i.e. there are no 'pure-play' Australian-listed rail networks). This means appropriate comparator businesses must be identified.

Incenta conducted a first principles analysis of Aurizon Network's systematic risk to determine appropriate comparators. It noted SFG Consulting did not provide a first-principles analysis as part of its material, but considered the first principles analysis included in Aurizon Network's 2014 DAU submission (which concluded Aurizon Network exhibits risk characteristics similar to those of US class 1 railroads).

Incenta's first principles analysis noted several key features of Aurizon Network's business, namely it has:

- a regulatory framework that aligns revenue with cost at periodic intervals and minimises revenue risk during a regulatory period
- underlying economics implying recovery of regulated revenues (i.e. surety of demand and long-term take-or-pay contracts)

⁵⁷¹ Peabody, sub. no. 37: 3

- low asset stranding risk, due to the regulatory framework.

Comparison to US class 1 railroads

Incenta's first principles analysis concluded Aurizon Network's systematic risk would be materially lower than US class 1 railroads and would, instead, share many of the systematic risk characteristics of regulated energy and water businesses.

In particular, Incenta said that, of the business categories considered as potential comparators for Aurizon Network, only the energy and water networks are regulated in a manner comparable to Aurizon Network (i.e. cost-based regulation with periodic price reviews). This is a similar conclusion to that reached by us in previous regulatory processes.

With regard to the specific matters listed by Aurizon Network as factors it believes make it comparable to a US class 1 railroad, Incenta's observations are summarised in **Table 89**

Table 89 Comparison to US class 1 railroads

| | <i>Aurizon Network view</i> | <i>Incenta's advice</i> |
|---|--|--|
| Pricing structure | It is difficult to make any direct comparisons between its pricing structures and US class 1 railroads (as the latter are not known) but, as US class 1 railroads are only subject to light-handed regulation, they have more flexibility on the pricing of services. | US class 1 railroads are subject to regulatory oversight of their rates, with the regulator normally assessing rate challenges from customers based on 'constrained market pricing' principles. These principles limit the pricing flexibility of US class 1 railroads, typically through application of a stand-alone-cost test. |
| Nature of the product or service/nature of the customer | US class 1 railroads provide the most similar type of service to it (of the three business categories identified by SFG Consulting) but US class 1 railroads have more diversified traffic. | US class 1 railroads have much more diversified customers and commodity traffic than Aurizon Network. Aurizon Network's regulatory arrangements, characterised by a revenue cap with periodic cost reviews, mean variations in demand from its customers does not translate into variations in economic returns. Aurizon Network's demand does not co-vary with movements in the Australian economy, suggesting these factors are not important indicators of systematic risk. |
| Duration of contracts | Aurizon Network said it typically chooses to enter into long-term contracts for access to its below-rail network, stating 'these are typically only ten years and relinquishment fees are capped at 50%.' It added it understood US class 1 railroads also enter long-term contracts, although the specific duration is not known. | Aurizon Network has a significant proportion (around 70%) of contracted capacity covered by long-term take-or-pay contracts, with terms typically of 10-15 years. US class 1 railroads typically have contracts for one to three years, with coal traffic contracts for up to five years. |
| Market power | Both it and US class 1 railroads have market power. It said in its case the existence of prescriptive regulation (compared to light-handed regulation for US class 1 railroads) and countervailing buyer power constrains its ability to use its market power. | Aurizon Network has significantly more market power than US class 1 railroads. This is because Aurizon Network operates a natural monopoly rail network that is not subject to road competition for coal, whereas US class 1 railroads face competition from road haulage for many commodities on shorter routes, and parallel rail lines operated by competitors. |
| Nature of regulation | In theory, US class 1 railroads are exposed to more volume risk because they are only subject to light-handed regulation. However, this assumes regulation reduces rather than increases risk, which might not be true if heavy-handed regulation constrains a firm's flexibility to respond to changes in market circumstances. | Aurizon Network's regulatory arrangements do not increase risk by constraining its flexibility to respond to changes in market circumstances. Aurizon Network does not require a high degree of commercial (i.e. pricing) flexibility as it is subject to revenue-cap regulation with regular reviews, and is thereby largely shielded from changes in finance costs. In addition, it is subject to several cost pass-through mechanisms, and application of the MCI to maintenance costs. |
| Growth options | Aurizon Network noted both it and US class 1 railroads have growth options arising from expansion plans, but the scale of expansions contemplated in the CQCR suggests Aurizon Network's growth options could be more sensitive to changes in economic conditions. | Compared to US class 1 railroads, the returns from Aurizon Network's growth options are constrained by regulation, as are its risks (by regulation and contracting). Hence, the same growth options will have much less influence on Aurizon Network's beta. If uncertainty of revenue recovery is minimal, there is no justification to compensate for the value of growth options. |
| Operating leverage | Aurizon Network said that, typical of a rail infrastructure provider, it has high operating leverage. It provided a proxy measure suggesting this is also likely to be true of US class 1 railroads. | Incenta demonstrated that, on several measures calculated, Aurizon Network has lower operating leverage than US class 1 railroads. In any case, the cash-flow buffering provided to Aurizon Network by the revenue cap form of regulation is likely to neutralise any impact of operating leverage on systematic risk. |

Considering the above, Incenta concluded that US class 1 railroads are not comparators for Aurizon Network. Incenta also considered Australian-listed industrial transportation firms to be inappropriate comparators. This is because this firm classification includes vertically integrated transport service providers, including Aurizon Holdings Limited and Asciano, with significant unregulated business operations, as well as airports that are characterised by light-handed regulation.

Chosen comparator firms

Instead, Incenta's view was that regulated energy and water businesses represent the closest comparators to the Aurizon Network business, as these businesses:

- are subject to similar regulation—i.e. cost-based regulation with regular periodic reviews
- have their revenue risk buffered by the regulatory framework and, in any event, their revenue appears to be largely unrelated to the state of the economy
- have relatively low operational cost risk, as this component is a relatively low proportion of total asset value and cost triggers apply
- are generally subject to low stranding risk (over the life of their current assets).

Incenta noted SFG Consulting's criticism that restricting the comparator firms to Australian energy network businesses, as has occurred in the past, would result in a very small sample of comparator firms being used to assess beta. For this reason, Incenta included in its analysis a much larger sample of Australian and international regulated energy and water businesses.

In this context, Castalia said the use of betas from international markets is not appropriate, as the institutional and regulatory arrangements for these firms are likely to differ significantly from those of Australian firms. Castalia particularly cited some US energy businesses it said should not be used as comparators for Aurizon Network. However, Incenta found the average proportion of regulated activities for these businesses is 80% and their betas are not related to the extent of their regulated activities – meaning they represent appropriate comparators for Aurizon Network.

Thus, Incenta concluded that its large sample of international and Australian regulated energy and water businesses is an appropriate comparator group for the Aurizon Network business.

Estimation methodology

Incenta included 70 regulated energy and water businesses in its sample. It applied the standard OLS regression approach to daily share price data to provide an estimate that reflects the average of the betas that would be estimated from using each day of the month as the end date for measuring monthly returns. It rejected SFG Consulting's alternative methodologies, incorporating firm characteristics into the regression, as its analysis showed the firm characteristics added complexity to the estimation without providing significant additional explanatory power - i.e. essentially the same result would be obtained by calculating the average or median of the appropriately defined comparator group.

Incenta took account of SFG Consulting's concern that selecting the last day of the month is arbitrary and beta should be estimated by reference to more than one definition of a month. This is so as to avoid the 'turn of the month' effect — which empirical evidence has suggested can bias beta estimates downwards based on the last day of the calendar month. For this reason, Incenta randomised the choice of the number of days in the months during its estimation period, based on the frequency distribution of actual trading days observed over

time (this generated 4995 beta estimations using 'simulated' months). It noted, however, that estimates obtained were relatively close to estimates obtained using SFG Consulting's much simpler assumption (of 20-day months).

The QRC, Castalia and Anglo all said the 'simulated' month approach introduces persistent bias (as it produces beta estimates for the energy and water businesses that are on average 14% higher than conventional methods). However, Incenta considered the approach eliminates the problem of bias introduced by the random decision made when estimating betas over the day within each month to which returns are measured. It also noted that, while its results were beta estimates higher than it would have obtained if it had (randomly) measured returns to the end of the month, they were lower than if it had (randomly) measured returns to a date within the month (e.g. the 15th).

Application of Incenta's methodology, based on OLS regression and the 'simulated' month approach, to its sample of international and Australian regulated energy and water businesses produced an average point estimate for the asset beta of these businesses of 0.42 (applying the Conine formula and a debt beta of 0.12). At 55% gearing, this gave an equity beta point estimate of 0.73.

Other benchmarks

Incenta noted Aurizon Network's view that beta estimation can be imprecise, particularly where no direct comparable listed businesses exist, and beta should therefore be specified as a range rather than a point estimate.

In this context, Incenta identified other potential comparators that could be used to place a lower and upper bound on the beta estimates for Aurizon Network (see **Table 90** below).

Table 90 Lower and upper bound beta estimates

| | <i>Incenta's view</i> | <i>Stakeholders' comments</i> | <i>Incenta's response</i> |
|---|---|--|--|
| Dalrymple Bay Coal Terminal (DBCT) (lower bound). | <p>Incenta cited Grant Samuel's 2010 asset beta estimate for DBCT of 0.35 as the lower bound of a reasonable range.</p> <p>Incenta said this estimate represents an indirect form of market evidence, as it was an expert opinion that informed an actual transaction involving a regulated infrastructure asset in the same coal chain as Aurizon Network.</p> | <p>Aurizon Network questioned the inclusion of DBCT as a comparator, and exclusion of other transport assets including Aurizon Holdings Limited, the Hunter Valley Coal Network (HVCN), Westshore Terminals, the Wiggins Island Coal Export Terminal (WICET), Port Waratah Coal Services (PWCS) and Gladstone Ports Corporation (GPC).</p> | <p>Incenta said these potential comparators cannot provide direct or indirect market evidence with respect to the beta of port and rail infrastructure assets, as they are either:</p> <ul style="list-style-type: none"> • characterised by too few observations (Aurizon Holdings Limited, Westshore Terminals), or • based on a regulatory decision (HVCN), or • represent accounting information or gross market transaction data which would not allow estimation of beta (WICET, PWCS), or • are associated with a lack of public information (GPC). |
| Toll-roads (upper bound). | <p>Incenta cited its sample of international and Australian toll-roads, which had a median asset beta estimate of 0.49, as the upper bound of a reasonable range.</p> <p>Incenta said toll-roads can be expected to be exposed to greater systematic risk than regulated energy and water businesses (and Aurizon Network) as they are either not regulated or subject to light-handed regulation, more subject to cyclical economic activity and likely to be subject to greater asset stranding risk.</p> | <p>Aurizon Network raised several concerns with the use of toll-roads as an upper bound, including: the most significant risks to investors occur at the beginning of new projects and risk is significantly reduced once operations have commenced and stabilised; there is a large spread between the highest and lowest beta estimates for toll-roads and significant gearing differences (which reduce the rigour with which beta can be estimated); and regulation of toll-roads means they should at worst have similar systematic risk to Aurizon Network.</p> <p>The QRC and Castalia were concerned Incenta did not conduct a full first principles analysis of toll-roads.</p> | <p>Incenta said the most important factor that differentiates toll-roads and Aurizon Network is the nature of regulation — with the former not generally subject to the periodic cost reviews that characterise regulation of the latter. It added its empirical analysis applied an average net gearing level and the asset betas of the sample toll-roads generally lay within a relatively narrow band.</p> <p>Incenta indicated it did give consideration to a number of key factors from a first principles perspective, including the nature of regulation, nature of traffic, degree of pricing flexibility, duration of contracts, market power, growth options and operating leverage. Its conclusion was toll-roads represent an appropriate upper bound beta estimate as they share similarities to the systematic risk profile of Aurizon Network, but it is unlikely the asset beta of the latter would exceed the former. The key reason for this conclusion is that mature toll-road operations have relatively stable revenues but, as noted above, their regulation does not generally incorporate periodic cost reviews.</p> |

Regulation and systematic risk

With regard to Anglo's view that the equity beta should be in a range between 0.2 and 0.3, based on risk reduction mechanisms incorporated in UT3 and proposed for UT4 (which were also referred to by Vale), we asked Incenta to investigate whether the form of regulation (i.e. the applicable regulatory mechanisms) is likely to affect the asset beta of a regulated firm.

To test this matter, Incenta classified each of the 70 firms in its regulated international and Australian energy and water businesses sample into one of a number of regulatory forms (i.e. price-cap, revenue cap, cost-of-service, decoupled cost-of-service and incentive-based cost-of-service). Castalia, the QRC and Anglo all questioned this approach, on the basis that: complexity of regulatory forms means it is inappropriate to categorise them into such a small number; and international businesses should not be included because they are subject to very different regulatory frameworks. However, Incenta noted that: if the number of gradations of regulatory approaches were increased, it would not be possible to obtain a reasonable number of firms in any group to allow meaningful conclusions; and its empirical work demonstrated the betas of firms operating under alternative regulatory frameworks could not be distinguished, meaning it is valid to include all these firms, including international firms, in the sample.

Incenta's empirical work found no discernible difference between the asset betas of the alternative regulatory forms in North America. For Australia, New Zealand and the UK, a much smaller sample of firms (nine) showed lower asset betas overall (than for the North American firms), but little difference between form of regulation (price cap or revenue cap). Incenta said its results imply the asset beta of regulated businesses would not be expected to be materially affected by the extent of volatility in cash-flows (e.g. as may be associated with the choice between a price cap and revenue cap) but is more affected by the extent of excess return risk that is borne (i.e. the tendency for movements in the risk premium element of the discount rate applied by investors to be inversely related to market cycles, and thereby generate a pro-cyclical movement in asset values).

SFG Consulting submitted that Incenta's overall conclusions were not consistent, in that Incenta rejected US class 1 railroads as appropriate comparators for Aurizon Network on the grounds that the latter's cost-based regulation is a distinguishing feature, but found alternative forms of regulation do not have a discernible impact on beta. Incenta responded that:

- the nature of regulation was a factor in its recommendation US class 1 railroads be rejected as appropriate comparators for Aurizon Network, but this needs to be viewed in combination with the underlying economics of the businesses. Aurizon Network's underlying economics are characterised by its natural monopoly network, lack of competition, surety of demand and long-term take-or-pay contracts. US class 1 railroads are characterised by greater competition (from both road and other railroads), more fluctuation in demand due to diversified traffic, greater exposure to domestic economic conditions and shorter-term contracts
- weaker business fundamentals of US class 1 railroads, in comparison to Aurizon Network, leave them more susceptible to movements in the economy. The fact cost-based regulation is not generally applied to US class 1 railroads reflects their weaker fundamentals and, if it were to be applied, the weaker fundamentals imply their systematic risk would remain materially different to Aurizon Network
- with regard to regulation, the primary factor it drew attention to was the presence (or not) of cost-based regulation. However, this does not imply particular differences in the form of cost-based regulation must be found to create empirically distinguishable levels of

systematic risk. Rather, it is the periodic resetting of prices in line with actual cost that would be expected to have the most significant effect on risk (and this is a common feature of all forms of cost-based regulation)

- while alternative forms of regulation might be expected to be associated with small differences in systematic risk exposure, given that empirical estimation of betas is subject to wide estimation error, it is inherently difficult to discern these differences with empirical analysis. Incenta's analysis could not find statistically significant differences between the asset betas of firms subject to alternative forms of cost-based regulation.

QCA Analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

Our Draft Decision is to maintain an asset beta for Aurizon Network of 0.45, which, using the Conine formula, results in an equity beta of 0.8 (with 55% gearing and a debt beta of 0.12).

We consider Incenta has correctly identified a large sample of international energy and water businesses as appropriate comparators for Aurizon Network. For the reasons discussed earlier, we do not consider that US class 1 railroads or Australian-listed industrial transportation firms are appropriate comparators for Aurizon Network.

We consider Incenta's estimation approach, including its use of the 'simulated month' approach to address the 'turn of the month' effect, is valid.

We also accept that the empirical evidence, as provided by Incenta, suggests that, while cost-based regulation will reduce a firm's systematic risk, variations in the specific form of cost-based regulation, including additional regulatory mechanisms, are unlikely to be reflected in observed measures of systematic risk.

We consider Incenta has correctly identified a reasonable range for the asset beta of Aurizon Network as falling between:

- a lower bound of 0.35 (DBCT), and
- an upper bound of 0.49 (toll-roads).

We note the mid-point of this range is 0.42.

However, we also note Incenta has said the fact this mid-point is the same as the point estimate asset beta it estimated for international and Australian regulated energy and water businesses is a coincidence. That is, the 0.42 estimate is based on analysis of a large sample of businesses identified as comparators. The fact this estimate falls within the reasonable range determined by the lower and upper bounds merely provides additional confidence it is a reasonable estimate.

Incenta's recommended point estimate asset beta of 0.42 and equity beta of 0.73 (at 55% gearing) compares to the UT3 asset beta of 0.45 and equity beta of 0.8 (at 55% gearing).

In our consideration of UT3, we concluded that these were appropriate values for the asset and equity betas of Aurizon Network as they:

- were consistent with the observed betas for a relevant comparator group of energy businesses (noting we rejected coal companies and railroads as appropriate comparators)

- reflected the limited exposure of Aurizon Network to risks related to short-term coal demand shocks, given the revenue cap mechanism's ability to correct for volume volatility
- would provide an environment conducive to investment in new infrastructure, when considered in conjunction with the package of other arrangements approved in UT3 (e.g. accelerated depreciation)
- represented an appropriate reduction to the asset and equity betas approved in UT2 (0.5 and 0.9 respectively). In the UT2 decision, we accepted that an asset beta of 0.45 would be reasonable, within a range of 0.35 to 0.5. However, we settled on an asset beta of 0.5 to ensure there was sufficient incentive for timely investment in major new infrastructure. In approving UT3, we considered an uplift to the asset beta was no longer appropriate, as the regulatory arrangements had subsequently changed (including through introduction of the revenue cap arrangements).

We consider Incenta's recommended point estimate for the UT4 asset beta of 0.42 (within its identified reasonable range of 0.35 to 0.49) is justifiable.

However, as with other WACC parameters, we have used our judgement to assess a final estimate based on the evidence before us at this time. In doing so, we have determined to maintain the UT3 asset beta of 0.45, translating to an equity beta of 0.8 at 55% gearing, for UT4. This position is based on the following points:

- estimating betas with a high degree of precision is inherently difficult - suggesting: (a) some caution should be shown in making significant changes to previous estimates; and (b) selecting an equity beta point estimate as precise as 0.73 may represent an attempt to be over-precise
- consideration of the need for regulatory certainty, particularly noting the UT4 approval process is Aurizon Network's first regulatory reset since the privatisation of its parent company. We consider that, in the context of WACC, section 138(2)(h) of the QCA Act (which requires us to have regard to any other issues we consider relevant) includes the need to ensure the WACC framework is stable and predictable. This means changes to predetermined parameters require solid justification
- our proposed asset beta of 0.45 is well within the reasonable range of 0.35 to 0.49 identified by Incenta - also noting this range is very close to the 0.35 to 0.5 range identified in previous decisions
- key changes to earlier regulatory arrangements, such as the introduction of the revenue cap and accelerated depreciation, were already considered as part of the UT3 decision
- our intent to maintain an environment conducive to investment in new infrastructure, including user-funded investment (for which regulated returns are likely to apply, in accordance with any approved standard user funding agreement (SUFA)).

We are permitted to take all these factors into account when having regard to the factors set out in section 138(2) of the QCA Act.

At the same time, we note the weight of evidence, as presented by Incenta and stakeholders, suggests our asset and equity beta estimates can be considered conservative, and future consideration of the betas for Aurizon Network may well lead to further reductions.

Conclusion

Taking account of all the above factors, we propose to maintain an asset beta for Aurizon Network of 0.45, and an equity beta of 0.8 (with 55% gearing).

We note that strict application of the Conine formula to the asset beta of 0.45, with 55% gearing, a debt beta of 0.12 and our proposed gamma of 0.47, produces an equity beta value of approximately 0.79. However, in the interests of maintaining regulatory certainty, we consider it is reasonable to round our estimate of the equity beta to 0.8, which is the value that was approved for UT3.

We consider that this value has regard to the factors set out in section 138(2) of the QCA Act, taking into consideration the specific points we have identified above, and weights them appropriately in the manner previously indicated in this chapter, achieving an appropriate balance between the competing interests of the various stakeholders.

Draft Decision

10.13 We refuse to accept Aurizon Network's proposed equity beta range of 0.9 to 1.0.

10.14 We consider it appropriate that Aurizon Network amend its draft access undertaking to reflect our estimate of an equity beta of 0.8.

10.9 Gamma

Background

The Australian tax system allows companies to provide their shareholders with credits to reflect company taxes paid on profits that are distributed as dividends. Shareholders then use these 'imputation credits' to reduce their own tax liabilities. A rational investor who is eligible to receive and use imputation credits issued by a company will take into account the value of the credits along with expected dividends and capital gains when deciding whether to purchase shares. Thus, imputation credits effectively reduce a company's cost of capital.

Officer (1994) has developed several formulations of the cost of capital to reflect the impact of imputation credits. The formulations differ from each other depending on the definition of the firm's after-tax net cash-flows. Under the approach commonly applied by Australian regulators, the after-tax net cash-flows take into account the tax deductibility of debt and the tax credits available under the imputation system.⁵⁷²

The value of the dividend imputation credits are captured by a parameter called gamma (γ), which is the product of: i) the ratio of distributed imputation credits to company tax paid (the distribution rate); and ii) the rate at which shareholders actually end up using the credits (the utilisation rate) when they file their own taxes.⁵⁷³

While it seems that determining the distribution and utilisation rates should be a simple matter, both conceptual and measurement issues must be addressed to arrive at an appropriate estimate of gamma. Our practice in the past has been to apply a gamma of 0.5, based on a distribution rate of 0.8 and a utilisation rate of 0.625.

⁵⁷² The corresponding WACC formula is known as the Officer 'vanilla' WACC or 'WACC(3)'. See Officer (1994: 6–7).

⁵⁷³ The utilisation rate is a weighted average across investors in the defined market, with the weights reflecting both their investment in risky assets and their degree of risk aversion (Lally and van Zijl, 2003).

Aurizon Network proposal

Aurizon Network submitted that the most recent empirical evidence indicates that gamma lies between 0.0 and 0.25, based on a distribution rate of 0.70 and a range for the utilisation rate of between 0.0 and 0.35. Aurizon Network's proposed distribution rate is based on the results of two studies that use Australian Taxation Office (ATO) data, while the range for the utilisation rate is based on econometric studies of stock market price changes that follow dividend distributions.

Aurizon Network's consultant, SFG Consulting, submitted that new evidence and analysis shows that our estimate of 0.80 for the distribution rate is 'aggressive relative to the available evidence'⁵⁷⁴ and the estimate of 0.625 for the utilisation rate is both internally inconsistent with our asset pricing model (i.e. the CAPM)⁵⁷⁵ and outdated.⁵⁷⁶

Stakeholders' submissions

The QRC disagreed with Aurizon Network's proposed value of gamma because the estimate of the utilisation rate is based on only a single study.⁵⁷⁷ Its consultants, McKenzie and Partington, said evidence from a range of other studies does not support reducing gamma from our prior estimate to Aurizon Network's preferred estimate.⁵⁷⁸ The QRC instead proposed a gamma estimate of 0.50, comprising an estimate of 0.70 for the distribution rate and 0.70 for the utilisation rate.⁵⁷⁹

QCA analysis and Draft Decision

As identified above, when assessing Aurizon Network's proposal, we are required to have regard to the factors set out in section 138(2) of the QCA Act and weight them appropriately in our decision. We identified our approach to the application and weighting of these factors earlier in this chapter and we have applied this approach.

Estimating the distribution rate and the utilisation rate requires both a conceptual framework and an estimation approach. These issues are not straightforward, and there is considerable controversy over an appropriate value for gamma. In arriving at our preferred estimate of gamma, we have considered a range of information, including the:

- (a) stakeholder submissions and supporting research provided in our review of UT4 and views expressed at the Cost of Capital Forum held at the QCA on 13 December 2013
- (b) evidence and arguments presented by the AER in its Rate of Return Guideline⁵⁸⁰
- (c) views expressed by the Tribunal and supporting evidence in its recent decisions on gamma⁵⁸¹
- (d) papers prepared by Lally.⁵⁸²

Further background information on our views regarding the estimation of gamma is contained in the Market Parameters Decision, which was released as part of our cost of capital

⁵⁷⁴ Aurizon Network, sub. no. 8: 21

⁵⁷⁵ Aurizon Network, sub. no. 8: 18–20

⁵⁷⁶ Aurizon Network, sub. no. 8: 22–23

⁵⁷⁷ QRC, sub. no. 64: 20–21

⁵⁷⁸ QRC, sub. no. 65: 33–35

⁵⁷⁹ QRC, sub. no. 64: 20

⁵⁸⁰ AER, 2013d; 2013e

⁵⁸¹ ACT, 2010a; 2010b; 2011

⁵⁸² Lally, 2012c; 2013d; 2014a

methodology review.⁵⁸³ We affirm and adopt our analysis in the Market Parameters Decision on these issues for the purposes of this Draft Decision.

Distribution rate

We have used a distribution rate of 0.80 in prior determinations.

We are not persuaded by Aurizon Network's 0.70 distribution rate estimate, as it is based on studies relying on ATO data, which contain major unresolved discrepancies that are likely to be the result of double-counting and aggregation problems.⁵⁸⁴ The ATO data allows for two approaches to estimating the distribution rate — if the data is correct and is processed correctly by the ATO, then the two approaches should give the same result.⁵⁸⁵ However, they do not — NERA has demonstrated that there are significant variations in results that arise from these approaches when using the ATO data.⁵⁸⁶ NERA also identifies other specific deficiencies in the relevant data.⁵⁸⁷ Further, other researchers have expressed concern with the ATO data.⁵⁸⁸

Given the problems identified with the ATO data, we do not prefer the estimate of 0.70 submitted by stakeholders. The basis of these submissions are the ATO data, and if that data is wrong, then studies utilising that data will produce an estimate (of 0.70) that is consistently wrong.

Moreover, ATO data include payouts for both listed and unlisted companies. However, as the other CAPM-related parameters have been estimated with respect to listed companies, it is preferable to obtain an estimate of the distribution rate that is also based on listed companies.

Given significant concerns with the ATO data, Lally applied a different approach to estimating the distribution rate. He computed the average distribution rate of the 20 largest ASX companies (by market capitalisation) directly from their financial statements from 2000 through 2013. He determined the distribution rate for these firms is 0.84.⁵⁸⁹

Lally's approach has several advantages relative to approaches using the ATO data.

The 20 firms account for 62% of the value of the ASX200 and obviously relate to listed companies. As the distribution rate is estimated as a market-wide parameter, the significant feature of this sample is its aggregate weight in the relevant market. The proportion of company taxes paid to the ATO that come from these firms will be highly related to their market weight.

In addition, Lally's estimate is based on data sourced from firms' financial statements, and these have three important advantages relative to the ATO's tax statistics' data:

⁵⁸³ QCA, August 2014: see particularly: 24–28 and Appendix D

⁵⁸⁴ Lally, 2014: 29

⁵⁸⁵ The first approach is the 'tax measure', in which the distribution rate is the net company taxes paid to the ATO, net of the increase in the franking account balance as a proportion of the net company taxes paid to the ATO. The second approach is the 'dividend measure', in which the distribution rate is the net imputation credits attached to dividends as a proportion of the company taxes paid to the ATO.

⁵⁸⁶ NERA, 2013c

⁵⁸⁷ For example, with respect to the 'tax measure', when firms fail to report their franking account balance or declare bankruptcy (and therefore cease reporting this data to the ATO), the aggregate franking account balance will be understated.

⁵⁸⁸ For example, see Hathaway, 2013: 22-39.

⁵⁸⁹ See QCA, August 2014: Appendix D for more details.

- (a) the financial statements are subject to annual, independent audit
- (b) the researcher is able to personally identify the *source* data — rather than having to rely upon the ATO's aggregation exercises — this feature protects against possible double-counting and other aggregation problems
- (c) financial statement data is internally consistent, in that there are no unexplained discrepancies.

In considering Lally's method, we note SFG Consulting's concern that the sample used by Lally would be more likely to have high distribution rates because the companies are large, and therefore more likely to have foreign-sourced profits. These foreign-sourced profits would reduce tax payments to the ATO and therefore raise their distribution rates.⁵⁹⁰ However, this claim is testable by increasing the sample size, and Lally doubles his sample size from 10 to 20 firms by market capitalisation. The distribution rate fell only marginally from his previous estimate of 0.85 to 0.84.⁵⁹¹

We believe that these reasons provide strong support for Lally's approach and that the estimate of 0.84 arising from it is the best estimate of the distribution rate currently available. Our more detailed analysis regarding the distribution rate is set out in the Market Parameters Decision and is affirmed and adopted for the purposes of this Draft Decision.⁵⁹²

Utilisation rate

Several approaches have been used in the past by various regulators and regulated firms to estimate the utilisation rate. These include dividend drop-off studies, the redemption approach, the equity ownership approach, the Lally conceptual test and the use of other supporting evidence.

We analysed each of these approaches in the Market Parameters Decision, including a detailed analysis set out in Appendix D to the Market Parameters Decision.

We affirm and adopt that analysis for the purposes of this Draft Decision, but also consider that analysis below in light of the submissions we have received and the specific circumstances of Aurizon Network.

Dividend drop off studies

Aurizon Network's utilisation rate of 0.35 is based on a dividend drop-off study prepared by SFG Consulting for the Australian Competition Tribunal (the Tribunal).⁵⁹³

Aurizon Network has referred to a recent decision of the Tribunal in *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9* in support of this approach. We are aware that the Tribunal considered the SFG Consulting dividend drop-off study in 2011 to be 'the best dividend drop-off study currently available for the purposes of estimating gamma in terms of the Rules' (ACT 2011: para. 29).

We undertook a detailed analysis of that decision in the context of our Market Parameters Decision (including in a separate Annex to the Market Parameters Decision). We also considered the AER's views on the Tribunal decision. We identified, based on this analysis, that we considered that the decision by the Tribunal depended on the information that it had before

⁵⁹⁰ Aurizon Network, sub. no. 103: 16

⁵⁹¹ Lally, 2014a: 30

⁵⁹² QCA, August 2014: see particularly discussion in Appendix D: 90-91

⁵⁹³ SFG Consulting, 2011

it at the time and that the Tribunal recognised that there was scope for further conceptual and empirical work to clarify the interpretation of gamma and provide better estimates of gamma. This view is consistent with the position subsequently adopted by the AER following its comprehensive review and preparation of its Rate of Return Guideline.

We affirm and adopt that analysis from our Market Parameters Decision in relation to the relevance of the Tribunal's decision in this Draft Decision. In essence, we believe that the Tribunal's view does not require us to give overriding weight to dividend drop-off studies in our determination of the utilisation rate.

In our Market Parameters Decision, we concluded that dividend drop-off studies do not produce robust statistical results. They suffer from a number of well-documented methodological and econometric problems. Given the concerns identified in our Market Parameters Decision, expert opinion and our analysis, we concluded that dividend drop-off estimates of the utilisation rate are of limited relevance. We rather considered that the value of the utilisation rate should be informed by assessing the merits of other evidence on the basis of their congruency with the relevant concept.

More specifically, dividend drop-off studies compare stock prices before and after dividends are distributed to shareholders. Econometric analysis is used to infer the value of the imputation credits from the stock price changes following dividend distributions.

There are two key problems with dividend drop off studies:

- (a) they attempt to infer a market value of imputation credits based on share trading over a short period. (The value to investors of imputation credits is not directly observable in dividend drop-off studies.)

However, as discussed above, we consider that, for the purpose of assessing the impact of imputation credits on the WACC, the change in stock market value after dividends are distributed is not the relevant concept.

What is relevant is the actual return investors derive from holding the stock, and that number is related to the actual imputation credits that can be utilised to reduce income taxes. This in turn is a function of the relative proportion of domestic and foreign investors. The former are able to fully utilise the credits (if they complete a tax return), while utilisation by the latter shareholders will depend on how foreign tax systems recognise company tax paid in Australia (and is likely to be small)

- (b) they do not produce robust statistical results due to a number of well documented methodological and econometric problems.

In this regard, we engaged Lally to undertake a review of the SFG Consulting (2011) study. He raised both conceptual and empirical concerns with the study.⁵⁹⁴ Handley (2008) has raised a number of similar concerns about the reliability and interpretation of dividend drop-off studies. The AER has also raised similar concerns.⁵⁹⁵

Given the concerns identified, we do not agree with Aurizon Network's proposed estimate of 0.35 for the utilisation rate. This estimate is the outcome of only one study from one class of evidence, and this class of evidence suffers from conceptual and empirical limitations. Therefore, we have assessed a number of alternative approaches to estimating the utilisation

⁵⁹⁴ Lally 2012c, 2013d

⁵⁹⁵ AER, *Better Regulation: Explanatory Statement Rate of Return Guideline (Appendices)* (Dec 2013): 160

rate. In this respect, we share the view of McKenzie and Partington (2010) that a range of evidence should be considered:

It is clear that a precise and unambiguous valuation of theta is unlikely to be derived from traditional ex-dividend studies. It would be unwise, therefore, to rely on one ex-dividend study to determine theta. Equally, it would be unwise to just rely on combining results across several ex-dividend studies; triangulation with other evidence is desirable.⁵⁹⁶

Given that Aurizon Network has referred to a recent decision of the Tribunal in support of the use of dividend drop-off studies, we have separately considered that decision in more detail below.

In summary, as identified in the Market Parameters Decision, we consider that the dividend drop-off studies are of limited relevance, as they do not necessarily produce estimates that are conceptually correct and statistically robust or reliable.

Redemption approach

An alternative estimation approach involves using taxation statistics to estimate the proportion of imputation credits redeemed by all investors with the ATO. This method is often referred to as the redemption approach. There are two relevant studies for the post-2000 period, specifically, Hathaway (2013) and Handley and Maheswaran (2008). We have explained the redemption approach in detail in our Market Parameters Decision.

These studies estimate utilisation rates of 0.44 and 0.62. Based on our assessment of these studies, as set out in the Market Parameters Decision, we consider the average of these estimates of 0.53 provides a relevant estimate of the utilisation rate based on the most recent ATO data. However, we have concerns with the ATO data underlying this approach, and these are documented in our Market Parameters Decision.⁵⁹⁷ Further, the average utilisation rate from this approach relates to listed and unlisted firms. It would be preferable to use an estimate of an average utilisation rate solely for listed firms.

In summary, as identified in the Market Parameters Decision, the redemption studies provide more conceptually relevant estimates of an average utilisation rate across companies, but still raise material data concerns. In addition, estimates from this approach are based on credits redeemed by investors in both listed and unlisted companies.

Equity ownership approach

An alternative estimation approach that does produce an average utilisation rate for listed firms is the equity ownership approach. The equity ownership approach calculates the shares of domestic and foreign equity ownership and assumes utilisation rates for these two classes of investors of 1.0 and zero respectively. Using an estimate of 44% as the foreign ownership share of listed equities, and assuming a utilisation rate of 1.0 for domestic resident investors (and zero for foreign investors), implies an average utilisation rate for listed Australian domestic market equities of 0.56. This estimate is very similar to the average estimate from Hathaway's two approaches (0.53).

In addition, we note Lally's view that the estimate of 0.56 is considered a conservative lower bound estimate for the equity ownership approach because it excludes the impact of unlisted equities. However, it can be argued that unlisted equity is still relevant despite illiquidity

⁵⁹⁶ McKenzie and Partington, 2010: 11

⁵⁹⁷ QCA, August 2014: 96-98

concerns. If unlisted equity is included, it would lead to a utilisation rate estimate of around 0.70.⁵⁹⁸

In summary, as identified in the Market Parameters Decision, the equity ownership approach is based on the correct conceptual concept—a weighted average of utilisation rates across investors with weights reflecting ownership shares in Australian listed companies. It is also transparent, based on reliable data and relatively easy to estimate. The equity ownership approach provides the most robust and reliable estimate of the utilisation rate of the methods we considered in the Market Parameters Decision, albeit as a conservative (reasonable lower bound) estimate.

Conceptual test

Lally⁵⁹⁹ proposed a conceptual test that can be used to evaluate the reasonableness of using a particular utilisation rate. This test estimates the Australian cost of equity under complete segmentation (i.e. no international investors) and complete integration of national equity and world equity markets. Applying this test, estimates of the cost of equity that lie outside estimates from the two extreme scenarios would be unreasonable. Lally concluded that a utilisation rate of 1.0 (or close to 1.0) is reasonable (i.e. produces a result that satisfies the conceptual test).

SFG Consulting challenged the assumptions used by Lally. However, in our view, the Lally test is conceptually correct and of relevance. We also consider the test provides useful information about the market risk premium, and more importantly highlights the relevance of expected returns in international equity markets and their implications for an expected return in the Australian domestic market. However, we accept there is some uncertainty about what the precise bounds for the test should be.

In summary, as identified in the Market Parameters Decision, the Lally conceptual test is relevant but given the uncertainty about the bounds of the test, we have given the test less weight in establishing a final estimate of the utilisation rate.

Financial market practices

We also considered evidence from financial market practices that can inform an estimate of the utilisation rate. The extent to which analysts and valuers recognise the value of imputation credits, government tax policy, and the existence of imputation equity funds were considered. For example, a KPMG (2013) survey of Australian practice found 53% of practitioners explicitly adjust for imputation credits when valuing businesses other than infrastructure. This figure rises to 94% for infrastructure investments. Furthermore, where imputation credits were included in cash-flows at a specified utilisation rate, this rate averaged 75%.⁶⁰⁰

We believe these indicators provide some evidence that the utilisation rate is higher than estimates from the dividend drop-off studies, redemption estimates and equity ownership estimates and within the bounds of the conceptual test proposed by Lally.

In summary, as identified in the Market Parameters Decision, the other supporting evidence is consistent with imputation credits having substantial value. The most useful evidence in this category is the recent survey by KPMG, which suggests a utilisation rate of 0.75 for

⁵⁹⁸ Lally, 2014a: 34–35

⁵⁹⁹ Lally 2013d

⁶⁰⁰ Lally, 2013: 24

infrastructure investments. This evidence is considered to imply that the utilisation rate of 0.56 from the equity ownership approach is conservative.

Conclusion (utilisation rate)

In summary, of the various approaches for estimating the utilisation rate, we consider the equity ownership approach should receive the most weight. As identified above and in our Market Parameters Decision, the equity ownership approach is based on the correct conceptual concept—a weighted average of utilisation rates across investors with weights reflecting ownership shares in Australian listed companies. It is also transparent, based on reliable data and relatively easy to estimate. We consider the equity ownership approach provides the best available estimate of the utilisation rate and represents a conservative estimate. The current estimate of 0.56 from this approach is lower than the estimate of 0.625 adopted by us in previous decisions.

Further discussion of the QCA's views regarding the utilisation rate can be found in the Market Parameters Decision.⁶⁰¹

Overall assessment of gamma

Combining the preferred (conservative) estimate of the utilisation rate of 0.56 with an estimate of 0.84 for the distribution rate gives a conservative (reasonable lower bound) estimate of 0.47 for gamma. This result is marginally lower than our previous estimate of 0.5.

We consider this estimate of gamma has regard to the factors set out in section 138(2) of the QCA Act and weights them appropriately in the manner previously indicated in this chapter, thereby achieving an appropriate balance between the competing interests of the various stakeholders.

In making that assessment, we note our estimate of gamma of 0.47 is based on:

- a distribution rate of 0.84, determined using the best available, independently audited, original source data for ASX-listed companies, that make up a significant proportion of the value of the ASX200
- a utilisation rate of 0.56, determined using the equity ownership approach, which we consider to be the best available method for estimating the utilisation rate.

Draft Decision

10.15 We refuse to approve Aurizon Network's proposed gamma between 0.0 and 0.25.

10.16 We consider it appropriate for Aurizon Network to amend its draft access undertaking to set a gamma of 0.47.

10.10 Conclusion – WACC

Based on the parameter estimates discussed in this chapter, we consider an appropriate post-tax nominal (vanilla) WACC for Aurizon Network is 7.17%. This incorporates a cost of debt of 6.15% and a cost of equity of 8.41%, and is based on 55% gearing.

Values for all parameter estimates, as compared to the UT3 outcome, Aurizon Network's proposal (lower and upper bound) and the QRC's position, are contained in **Table 91**.

⁶⁰¹ QCA, August 2014: see particularly discussion in Appendix D: 91–100

Table 91 WACC parameter estimates

| <i>Parameter</i> | <i>UT3</i> | <i>Aurizon Network (lower bound)</i> | <i>Aurizon Network (upper bound)</i> | <i>QRC</i> | <i>QCA's preliminary view</i> |
|---------------------------|------------------------------------|--|--|--------------------|-------------------------------|
| Credit rating | BBB+ | BBB+ | BBB+ | BBB+ | BBB+ |
| Risk-free rate | 5.19% | 3.15% ¹ | 3.15% ¹ | 2.98% ² | 3.21% ³ |
| Market risk premium | 6.0% | 6.0% | 7.0% | 5.0%-6.0% | 6.5% |
| Asset beta | 0.45 | 0.5 | 0.6 | NA | 0.45 |
| Debt beta | 0.12 | 0.12 | 0.12 | NA | 0.12 |
| Debt to value | 55% | 55% | 55% | 55% | 55% |
| Equity beta | 0.8 | 0.9 | 1.0 | 0.4-0.6 | 0.8 |
| Gamma | 0.5 | 0.25 | 0.25 | 0.5 | 0.47 |
| Equity margin | 4.8% | 5.4% | 7.0% | 2.75% | 5.2% |
| Cost of equity | 9.99% | 8.55% | 10.15% | 5.73% | 8.41% |
| Debt risk premium (raw) | 4.45% (incl. credit default swaps) | 2.94% | 3.28% | 2.6% | 2.72% |
| Debt transaction costs | 0.125% | 0.125% | 0.125% | 0.0% | 0.108% |
| Interest rate swap costs | 0.175% | NA | NA | NA | 0.113% |
| Debt risk premium (total) | 4.75% | 3.065% | 3.405% | 2.6% | 2.94% |
| Cost of debt | 9.94% | 6.22% | 6.56% | 5.58% | 6.15% |
| WACC margin | 4.77% | 4.12% | 5.03% | 2.67% | 3.96% |
| WACC | 9.96% | 7.27% | 8.18% | 5.65% | 7.17% |

Note (1) Based on a 10-year term to maturity and a 20 business day averaging period to 30 November 2012. (2) Based on a fiveyear terms to maturity and a 20 business day average period to 30 November 2012. (3) Based on a fouryear term to maturity and a 20 business day average to 31 October 2013.

Draft Decision

10.17 We consider it appropriate that Aurizon Network amend its draft access undertaking to set a post-tax nominal (vanilla) WACC for UT4 of 7.17%, incorporating:

- (a) a cost of equity of 8.41%**
- (b) a cost of debt of 6.15%**
- (c) benchmark gearing of 55%.**

GLOSSARY

| | |
|----------|---|
| 2010 AU | Aurizon Network's current Access Undertaking, approved by the QCA on 1 October 2010, together with any subsequent changes approved by the QCA |
| 2013 DAU | Aurizon Network's 2013 Draft Access Undertaking, submitted on 30 April 2013, withdrawn on 11 August 2014 |
| 2014 DAU | Aurizon Network's 2014 Draft Access Undertaking submitted on 11 August 2014 and replacing the 2013 DAU |

A

| | |
|-------------------------------|---|
| ABS | Australian Bureau of Statistics |
| AER | Australian Energy Regulator |
| Alternative Form of Agreement | Alternative Form of Standard Access Agreement, which collectively includes the two stapled agreements – the EUAA and the TOA |
| ARTC | Australian Rail Track Corporation |
| ATO | Australian Taxation Office |
| Aurizon Group | The Group of Companies held by Aurizon Holdings Limited, which includes Aurizon Network Pty Ltd |
| Aurizon Holdings | Aurizon Holdings Limited |
| Aurizon Network | The below-rail infrastructure business (formerly known as QR Network Pty Ltd) that will provide access services to the declared service |
| AWOTE | Average Weekly Ordinary Time Earnings |

B

| | |
|------|----------------------------------|
| BMA | BHP Billiton Mitsubishi Alliance |
| BRTT | Below rail transit times |

C

| | |
|-------|--------------------------------------|
| CAPEX | Capital Expenditure |
| CAPM | Capital Asset Pricing Model |
| CPI | Consumer Price Index |
| CQCN | Central Queensland Coal Network |
| CQCR | Central Queensland Coal Region |
| CRIMP | Coal Rail Infrastructure Master Plan |

D

| | |
|------|--|
| DAAU | Draft Amending Access Undertaking |
| DBCT | Dalrymple Bay Coal Terminal |
| DORC | Depreciated Optimised Replacement Cost |

E

| | |
|-----|--|
| Egk | Electric gross tonne kilometres |
| ERA | Economic Regulation Authority of Western Australia |

ESC Essential Services Commission of Victoria

F

FTE Full-time equivalent

G

GPC Gladstone Ports Corporation

GRV Gross Replacement Value

GTK Gross tonne kilometre

H

HVCCC Hunter Valley Coal Chain Coordinator

HVCN Hunter Valley Coal Network

I

IAP Indicative Access Proposal

IDC Interest During Construction

IPART Independent Pricing and Regulatory Tribunal

J

K

L

M

MAR Maximum Allowable Revenue

MCI Maintenance Cost Index

Mt Million tonnes

MTP Master Train Plan

Mtpa Million tonnes per annum

N

NAMS Network Asset Management System

Nt Net tonnes

Ntk Net tonne kilometres

NPV Net Present Value

O

OLS Ordinary Least Squares

OTCI Overall Track Condition Index

P

PTRM Post Tax Revenue Model

PWCS Port Waratah Coal Services

Q

| | |
|------------|--|
| QCA Act | <i>Queensland Competition Authority Act 1997</i> |
| QR | Queensland Rail Limited |
| QR Network | the subsidiary of QR which was established in 2008 to own and manage CQCN, now Aurizon Network |
| QRC | Queensland Resources Council |

R

| | |
|-------|--------------------------|
| RAB | Regulatory Asset Base |
| RFP | Request For Proposals |
| RSMBC | RSM Bird Cameron |
| RTCA | Rio Tinto Coal Australia |
| Rtp | Reference train path |

S

| | |
|------|--|
| SAA | Standard Access Agreement, which collectively encompasses the three different forms of standard access agreements – the access holder access agreement , operator access agreement and alternative form of agreement |
| SAR | System Allowable Revenue |
| SKM | Jacob SKM |
| SRCA | Standard Rail Connection Agreement |
| SUFA | Standard User Funding Agreement |

T

| | |
|-----|---------------------------|
| TAR | Total Access Revenue |
| TSE | Train Service Entitlement |

U

| | |
|-----|--|
| UT1 | the period from 2001 to 2006, being the term of QR's first access undertaking |
| UT2 | the period from 2006 to 2010, being the term of QR's second access undertaking covering the CQCR |
| UT3 | the period from 2010 to 2014, being the term of the 2010 Access Undertaking, being the third access undertaking covering the CQCR |
| UT4 | the four year period commencing 1 July 2013, being the proposed term of the 2014 Access Undertaking, which will be the fourth access undertaking covering the CQCN |
| UT5 | the undertaking period following the conclusion of UT4, noting UT5 has yet to be proposed by Aurizon Network |

V**W**

| | |
|-------|-------------------------------------|
| WACC | Weighted Average Cost of Capital |
| WAML | Weighted Average Mine Lives |
| WICET | Wiggins Island Coal Export Terminal |
| WPI | Wage Price Index |

X

Y

Z

APPENDIX A: STAKEHOLDER CONSULTATION

2014 DAU Process

In August 2014, we published Aurizon Network's 2014 DAU and its supporting material on our website.

Consultation Process

The QCA has invited stakeholders to comment on this MAR paper by 12 December 2014. The consultation process on Aurizon Network's 2014 DAU is still in progress, with stakeholder submissions due by 3 October 2014.

The table below shows a list of submissions received on the 2014 DAU to date.

Table 92 Submissions and reports received on the 2014 DAU

| <i>Organisation/individual</i> | <i>Submission number</i> |
|--------------------------------|--------------------------|
| Aurizon Network | 2014DAU 1 – 5 |

Submissions Listing

Aurizon Network's Submissions

The 2014 Access Undertaking: Explanatory Material – Letter UT4 Resubmission August 2014. (sub. no. 1)

The 2014 Access Undertaking: Explanatory Material – Summary Table of Key Changes (App B) August 2014. (sub. no. 2)

The 2014 Access Undertaking: Explanatory Material – Detailed Table of Changes (App A1) August 2014. (sub. no. 3)

The 2014 Access Undertaking: Explanatory Material – Detailed Table of Changes – Agreements (App A2) August 2014. (sub. no. 4)

The 2014 Access Undertaking Explanatory Material – Wiggins Island Rail Project Proposed Revenue and Pricing Treatment, August 2014. (sub. no. 5)

2013 DAU Process

In April 2013, we published Aurizon Network's 2013 DAU and the majority of its supporting submission and associated documents on our website. We did not publish material Aurizon Network claimed is confidential.

QCA Consultation Paper

In August 2013, we released a consultation paper to assist interested parties in making submissions on the 2013 DAU.

The consultation paper summarised some elements of the 2013 DAU, and sought to focus stakeholders' attention on some of the likely key areas of concern.⁶⁰² In addition, we engaged Energy Economics to

⁶⁰² The consultation paper focused on where Aurizon Network had proposed new approaches or where it appeared to have sought to alter existing rights, obligations and responsibilities, compared with the 2010 access undertaking.

provide an independent assessment of the central Queensland coal railings forecasts for the proposed 2013 DAU regulatory period. The findings were also included in the consultation paper.

Submissions on the 2013 DAU (incorporating comments made in our consultation paper) were initially due by 9 July 2013, but we agreed to extend the due date to 10 October 2013, at the request of a number of stakeholders. We agreed to a relatively lengthy public consultation period on the 2013 DAU on the understanding this would provide sufficient time for Aurizon Network, the QRC and other stakeholders to engage with each other in an attempt to identify common ground.

In October 2013 we received submissions from 11 interested parties in response to the 2013 DAU. These are on our website. In these, stakeholders identified a significant number of issues where there are substantive differences from the position of Aurizon Network as outlined in the 2013 DAU.

Submissions in Response to Aurizon Network's Revised Submission

In November 2013, Aurizon Network provided its response to stakeholders' submissions on its 2013 DAU (updated proposal). The updated proposal sort to address a number of concerns and issues raised in the stakeholder submissions. It also provided an indication of where Aurizon Network was willing to move from its original 2013 DAU proposal in response to its ongoing consultations with stakeholders.

In January 2014, we received submissions from eight interested parties in response to Aurizon Network's updated proposal. These are published on our website. In these, stakeholders still considered there are substantive differences from the position of Aurizon Network outlined in the 2013 DAU.

WACC Forum

In December 2013, we hosted a WACC Forum (forum) in our office that focused on two issues, namely:

- aspects of our methodological review of our approach to setting the WACC for regulatory decisions
- our assessment of Aurizon Network's 2013 DAU.

We engaged consultants, Dr Martin Lally (Victoria University of Wellington) and Dr Michael Lawriwsky (Incenta Economic Consulting) to assist in both matters. At the forum, Dr Lally and Dr Lawriwsky presented technical papers, which can be found on our website.

We received submissions from five interested parties in response to the forum and the associated papers.

Consultants' Reports

As part of our assessment of the 2013 DAU, we engaged consultants Sinclair Knight Merz and RSM Bird Cameron to review Aurizon Network's operating and maintenance cost claims for the proposed 2013 DAU regulatory period.

On 29 January 2014, we published the two consultants' reports, relating to these cost elements of the UT4 proposal, on our website.

Submissions on the consultants' reports were initially due by 17 February 2014, but we agreed to extend the due date to 7 March 2014, after receiving a request from the QRC to extend the deadline.

In April 2014, we received submissions from five interested parties in response to the consultants' reports. These will be published on our website at the time this Position Paper is released.

Submissions and Reports Received

Table 93 shows a list of submissions and reports received on the 2013 DAU, that has been referred to in our position paper.

Table 93 Submissions and reports received on the 2013 DAU

| <i>Organisation/individual</i> | <i>Submission number</i> |
|---|---|
| Aurizon Network* | 2013DAU 1 – 37*, 77**, 100-105, 109, 115-116, 118-119 |
| Anglo American | 2013DAU 39, 78-81, 93 |
| Asciano Limited (Asciano) | 2013DAU 43-45, 82, 112 |
| BHP Billiton Mitsubishi Alliance (BMA) and BHP Billiton Mitsui Coal (BMC) | 2013DAU 40-41, 108, 114 |
| Freightliner Australia Pty Ltd (Freightliner) | 2013DAU 75 |
| Glencore Xstrata (Glencore) | 2013DAU 74, 83 |
| Peabody Energy Incorporated (Peabody) | 2013DAU 37 |
| Queensland Resources Council (QRC) | 2013DAU 46 – 71, 84-89, 106-107, 110-111, 117 |
| Queensland Treasury Corporation (QTC) | 2013DAU 96, 97 |
| Rio Tinto Coal Australia (Rio Tinto) (RTCA) | 2013DAU 72 – 73, 90 |
| Stanwell Corporation Limited (Stanwell) | 2013DAU 38 |
| Vale | 2013DAU 42, 91, 113 |
| Wesfarmers Curragh Pty Ltd (Wesfarmers) | 2013DAU 76, 92 |
| Unitywater | 2013DAU 98 |
| DBCT Management (DBCTM) | 2013DAU 95 |
| Asia Pacific Strategy | 2013DAU 94 |

**Claims of confidentiality have been made for part or all of these submissions. **Response to stakeholders' submissions.*

Submissions Listing

Aurizon Network's Submissions

Aurizon Network

The 2013 Access Undertaking Explanatory Material: Volume 1 - Overview and Summary. April 2013. (sub. no. 1).

The 2013 Access Undertaking Explanatory Material: Volume 2 - The 2013 Access Undertaking Proposal. April 2013. (sub. no. 2).

The 2013 Access Undertaking Explanatory Material: Volume 3 - MAR and Reference Tariffs. April 2013. (sub. no. 3).

The 2013 Access Undertaking Explanatory Material: Volume 4 - Maintenance. April 2013. (sub. no. 4).

The 2013 Access Undertaking Explanatory Material: Volume 4 - Maintenance. April 2013. [CONFIDENTIAL] (sub. no. 37).

The 2013 Access Undertaking Explanatory Material: Annex A SFG Consulting – Testing the Reasonableness of the Regulatory Allowance for the Return on Equity, 11 March 2013 (sub. no. 5).

The 2013 Access Undertaking Explanatory Material: Annex B SFG Consulting – Systemic risk of QR Network, 31 August 2012 (sub. no. 6).

The 2013 Access Undertaking Explanatory Material: Annex C SFG Consulting – Term to Maturity of the Risk Free Rate Estimate in the Regulated Return, 29 August 2012 (sub. no. 7).

The 2013 Access Undertaking Explanatory Material: Annex D SFG Consulting – Estimating Gamma, 25 January 2012 (sub. no. 8).

The 2013 Access Undertaking Explanatory Material: Annex E Value Adviser Associates – Review of Debt Risk Premium and Market Risk Premium, February 2013 (sub. no. 9).

The 2013 Access Undertaking Explanatory Material: Annex F Synergies – Aurizon Network's Commercial and Regulatory Risks, April 2013 (sub. no. 10).

The 2013 Access Undertaking Explanatory Material: Annex G Ernst & Young – Benchmarking Corporate Overhead Costs for QR Network Pty Ltd, July 2012 (sub. no. 11).

The 2013 Access Undertaking Explanatory Material: Annex H [CONFIDENTIAL] Finity – Review of Self Insurance Risk Premium – Access Undertaking UT4, March 2013 (sub. no. 12).

The 2013 Access Undertaking Explanatory Material: Annex I Willis – Expert Opinion on the Cost of Insurance Premiums for Purposes of the Aurizon Network Access Undertaking 2013 (sub. no. 13).

The 2013 Access Undertaking Explanatory Material: Annex J Deloitte – Aurizon Network: Proposed Standard User Funding Agreement Risk Assessment, April 2013 (sub. no. 14).

The 2013 Access Undertaking Explanatory Material: Annex K Evans & Peck – Aurizon Network's Ballast Contamination Scoping Study, March 2013 (sub. no. 15).

The 2013 Access Undertaking Explanatory Material: Annex L Sapere Research Group – Review of Cost Allocation Methodology and Treatment of Mine Specific Infrastructure, 11 January 2013 (sub. no. 16).

The 2013 Access Undertaking Explanatory Material: Annex M Sapere – Economic Analysis of Revised Aurizon DAAU for Electric Infrastructure (sub. no. 17).

The 2013 Access Undertaking Explanatory Material: Annex N Evans and Peck - Operating and Maintenance Costs: Investigation and Benchmarking – Final Report, October 2012 (sub. no. 18).

The 2013 Access Undertaking Explanatory Material: Annex O [CONFIDENTIAL] QR National Central Queensland Coal Network: Tonnage Profile, 4 March 2013 (sub. no. 19).

The 2013 Access Undertaking Explanatory Material: Annex P Worley Parsons and Transportation Technology Centre - UT3 Parallel Comparison Exercise – Consultant's Report, 18 August 2008 (sub. no. 20).

The 2013 Access Undertaking Explanatory Material: Annex Q Worley Parsons - Life Asset Register Benchmark, 18 August 2008 (sub. no. 21).

The 2013 Access Undertaking Explanatory Material: Annex R Worley Parsons - Marginal Costs Variabilities - Contemporary and Accepted Theorems, 18 August 2008 (sub. no. 22).

The 2013 Access Undertaking Explanatory Material: Annex S Worley Parsons - Queensland Railways Maintenance Variability: Coal Network Cost Variability with Traffic Density, 18 August 2008 (sub. no. 23).

The 2013 Access Undertaking Explanatory Material: Annex T Worley Parsons - Optimising Locations of Maintenance Depots: for the Queensland Rail Network, 18 August 2008 (sub. no. 24).

The 2013 Access Undertaking Explanatory Material: Annex U Worley Parsons - Comments on Service Level Specifications for Rail Infrastructure Maintenance: Central Queensland Coal Region, 18 August 2008 (sub. no. 25).

The 2013 Access Undertaking Explanatory Material: Annex V Worley Parsons - Benchmark Heavy Haul Lines: International and National Comparison, 18 August 2008 (sub. no. 26).

The 2013 Access Undertaking Explanatory Material: Annex W Worley Parsons - Northern Queensland Coal Network Systems: Site Visit Record: May 2008, 18 August 2008 (sub. no. 27).

The 2013 Access Undertaking Explanatory Material: Annex X [CONFIDENTIAL] QR National - Key Personnel, 4 March 2013 (sub. no. 28).

The 2013 Access Undertaking Explanatory Material: Annex Y QR National - Central Queensland Coal Network and System Maps, 9 October 2012 (sub. no. 29).

The 2013 Access Undertaking Explanatory Material: Annex Z QR National - Legislation Affecting QR Network, 4 March 2013 (sub. no. 30).

The 2013 Access Undertaking Explanatory Material: Annex AA QR National Network Services - Safety Alert Examples, various 2012 (sub. no. 31).

The 2013 Access Undertaking Explanatory Material: Annex AB Aurizon - Critical Asset Calendar, February 2013 (sub. no. 32).

The 2013 Access Undertaking Explanatory Material: Annex AC [FOR PUBLICATION] QR National - Ballast Fouling, 4 March 2013 (sub. no. 33).

The 2013 Access Undertaking Explanatory Material: Annex AD QR National Networks – UT4 Maintenance – 2012 Assessment Survey to Ports and Mines – Results, 12 June 2012 (sub. no. 34).

The 2013 Access Undertaking Explanatory Material: Annex AE [FOR PUBLICATION] Deloitte Access Economics – Estimate of QR Network Maintenance Services Overheads, 1 November 2012 (sub. no. 35).

The 2013 Access Undertaking Explanatory Material: Annex AF [FOR PUBLICATION] BIS Shrapnel - Maintenance Cost Escalation Forecasts to 2017- Draft Report, September 2012 (sub. no. 36).

The 2013 Access Undertaking Explanatory Material: UT4 'Coal System Aggregate' Model – December 2013

The 2013 Access Undertaking Explanatory Material: Aurizon Network Letter – Replacement Annex G – October 2013

The 2013 Access Undertaking: Response to Stakeholders' Submissions, November 2013 (sub. no. 77).

Supplementary Report to the QCA - Maintenance Cost Index, March 2014 (sub. no. 116).

June 2014, Aurizon Network Assets Information Sharing Management of Ballast and Asset Matters, 11 March. (sub. no. 119)

Stakeholders' Submissions

Anglo American

Submission to Queensland Competition Authority: Aurizon Network's 2013 Draft Amending Access Undertaking (UT4), October 2013 (sub. no. 39).

Asciano Limited (Asciano)

Submission to the Queensland Competition Authority in Relation to the 2013 Aurizon Network Draft Access Undertaking, October 2013 (sub. no. 43).

Attachment 2: Major Changes in Wording or Concept Between the 2010 AU and the 2013 DAU Including Asciano Comment on These Changes, October 2013 (sub. no. 44).

Attachment 3: Major Changes in Wording or Concept Between the 2013 QCA Approved TOA and the TOA Attached to the 2013 DAU Including Asciano Comment on These Changes, October 2013 (sub. no. 45).

BHP Billiton Mitsubishi Alliance (BMA) and BHP Billiton Mitsui Coal (BMC)

Letter to the QCA, October 2013 (sub. no. 40).

Issues and Concerns with Aurizon Network's (AN's) 2013 Draft Amending Undertaking (DAU), October 2013 (sub. no. 41).

Freightliner Australia Pty Ltd (Freightliner)

Aurizon Network 2013 DAU, October 2013 (sub. no. 75).

Glencore Xstrata (Glencore)

Aurizon Network's 2013 Draft Access Undertaking (UT4), October 2013 (sub. no. 74).

Peabody Energy Incorporated (Peabody)

Submission to the QCA - Aurizon Network 2013 Draft Access Undertaking, October 2013 (sub. no. 37).

Queensland Resources Council (QRC)

Main Submission, October 2013 (sub. no. 46).

Intent and Scope, Industry Mark-up, October 2013 (sub. no. 47).

Ringfencing, Industry Mark-up, October 2013 (sub. no. 48).

Ultimate Holding Company Deed, Industry Mark-up, October 2013 (sub. no. 49).

Confidentiality Deed, Template, October 2013 (sub. no. 50).

Negotiation Framework, Industry Mark-up, October 2013 (sub. no. 51).

Access Agreement: Coal, Industry Mark-up, October 2013 (sub. no. 52).

Pricing Principles, Industry Mark-up, October 2013 (sub. no. 53).

Available Capacity Allocation and Management, Industry Mark-up, October 2013 (sub. no. 54).

Network Development and Expansions, Industry Mark-up, October 2013 (sub. no. 55).

Study Funding Agreement, August 2013 (sub. no. 56).

Tax Ruling, October 2013 (sub. no. 57).

Network Development and Expansions, Comparison to Submission Version, October 2013 (sub. no. 58).

Connecting Private Infrastructure, Industry Mark-up, October 2013 (sub. no. 59).

Reporting, Industry Mark-up, October 2013 (sub. no. 60).

Dispute Resolution and Decision Making, Industry Mark-up, October 2013 (sub. no. 61).

Schedule E: Regulatory Asset Base, Industry Mark-up, October 2013 (sub. no. 62).

Schedule F: Reference Tariff, Industry Mark-up, October 2013 (sub. no. 63).

WACC Submission, October 2013 (sub. no. 64).

McKenzie, M and Partington, G, Report to Queensland Resources Council, Review of Aurizon Network's Draft Access Undertaking, October 2013 (sub. no. 65).

Castalia, Report to Queensland Resources Council, Aurizon Access Undertaking: Risk Allocation Analysis, October 2013 (sub. no. 66).

Operating Expenditure, October 2013 (sub. no. 67).

Maintenance, October 2013 (sub. no. 68).

Capital Indicator, October 2013 (sub. no. 69).

Ballast Fouling, October 2013 (sub. no. 70).

Depreciation Methodology, October 2013 (sub. no. 71).

Rio Tinto Coal Australia (Rio Tinto) (RTCA)

Letter to the QCA, October 2013 (sub. no. 72).

Submission to the Queensland Competition Authority in Response to Aurizon Network Proposed 2013 Draft Access Undertaking (UT4), October 2013 (sub. no. 73).

Stanwell Corporation Limited (Stanwell)

Aurizon Network - 2013 Draft Access Undertaking, October 2013 (sub. no. 38).

Vale

Aurizon Network's 2013 Draft Access Undertaking (UT4), October 2013 (sub. no. 42).

Wesfarmers Curragh Pty Ltd (Wesfarmers)

Submission in Response to UT4, October 2013 (sub. no. 76).

Response to Aurizon Network's Response to Stakeholders' Submissions**Anglo American**

Submission to Queensland Competition Authority: Aurizon Network's Reply Submission on the 2013 Draft Amending Access Undertaking (UT4), January 2014 (sub. no. 78).

Schedule 1: Proposed drafting of Part 6, Part 7 and Schedule H, January 2014 (sub. no. 79).

Schedule 2: Proposed drafting of Part 8, January 2014 (sub. no. 80).

Schedule 3: Explanatory Notes on Network Management Principles, January 2014 (sub. no. 81).

Asciano Limited (Asciano)

Submission to the QCA Regarding the Aurizon Network November 2013 Response to Stakeholder Submissions to the QCA in Relation to the Aurizon Network 2013 Draft Access Undertaking, January 2014 (sub. no. 82).

Glencore Xstrata (Glencore)

Submission on Aurizon Network's Response to Stakeholders' Submissions, January 2014 (sub. no. 83).

Queensland Resources Council (QRC)

Submission on Aurizon Network's Response to Industry, January 2014 (sub. no. 84).

Annexure A – Detailed Response to Undertaking and Schedules (volume 1), January 2014 (sub. no. 85).

Annexure B – Detailed Response on Standard Agreements, January 2014 (sub. no. 86).

Annexure C – QRC's Response to Aurizon Network's Partial Update of Part 8, January 2014 (sub. no. 87).

Annexure D – QRC Mark-Up of Aurizon Network's Revised Part 8 Drafting, January 2014 (sub. no. 88).

Annexure E – QRC's Table of Omissions, January 2014 (sub. no. 89).

Letter to QCA – Revised Part 11 Response – January 2014

Revised Response Part 11 – January 2014

Rio Tinto Coal Australia (Rio Tinto) (RTCA)

Supplementary Submission to UT4, January 2014 (sub. no. 90).

Vale

Aurizon Network Pty Ltd – 2013 Draft Access Undertaking (UT4): Response to Stakeholder Submissions, January 2014 (sub. no. 91).

Wesfarmers Curragh Pty Ltd (Wesfarmers)

Submission in Response to Aurizon Network's Response to Industry (UT4), January 2014 (sub. no. 92).

BHP Billiton Mitsubishi Alliance (BMA) and BHP Billiton Mitsui Coal (BMC)

Aurizon Network's Response to Stakeholder Submissions on the 2013 Draft Access Undertaking, January 2014 (sub. no. 108).

WACC Submissions**Anglo American**

Submission in Relation to the WACC Consultation Papers and WACC Forum, January 2014 (sub. no. 93).

Asia Pacific Strategy

Royalty, Powerpoint Presentation, January 2014 (sub. no. 94).

DBCT Management (DBCTM)

Aurizon Network: Regulatory Capital Structure, January 2014 (sub. no. 95).

Queensland Treasury Corporation (QTC)

Risk Free Rate and MRP Submission, with Letter, January 2014 (sub. no. 96).

Cost of Debt Submission, with Letter, January 2014 (sub. no. 97).

Unitywater

Response to QCA's WACC Report, January 2014 (sub. no. 98).

Vale

QCA Cost of Capital Discussion Papers, January 2014 (sub. no. 99).

Aurizon Network

Cover Letter, January 2014 (sub. no. 100).

A Comparative Analysis of Aurizon Network's Commercial and Regulatory Risks, January 2014 (sub. no. 101).

Return on Capital Response – Summary Paper, January 2014 (sub. no. 102).

An Appropriate Regulatory Estimate of Gamma: Report for Aurizon Ltd., January 2014 (sub. no. 103).

An Appropriate Regulatory Estimate of the Market Risk Premium: Report for Aurizon Ltd., January 2014 (sub. no. 104).

Systematic Risk of Aurizon Network: Response to Reports and Submissions to the Queensland Competition Authority, January 2014 (sub. no. 105).

SFG Consulting Report - Estimating Gamma, March 2014 (sub. no. 115).

SFG Consulting Report – Justification for cost of equity parameters, June 2014 (sub. no. 118).

Queensland Resources Council (QRC)

Further WACC Submission, January 2014 (sub. no. 106).

QCA Cost of Capital Consultation, Equity Beta Issues: Further Supplementary Report to the Queensland Resources Council, January 2014 (sub. no. 107).

Consultants' Reports Regarding Operating and Maintenance Costs**RSM Bird Cameron (RSMBC)**

Aurizon Network's 2013 Draft Access Undertaking: Financial Assessment of Operating Expenditure, January 2014.

RSM Bird Cameron's (RSMBC) Addenda to the Report

Aurizon Network's 2013 Draft Access Undertaking - Financial Assessment of Operating Expenditure - Response to Aurizon Network's Submission Dated 7 March 2014, Addendum Report, April 2014 (a).

Aurizon Network's 2013 Draft Access Undertaking - Financial Assessment of Operating Expenditure - Response to QRC's Submission Dated 7 March 2014, Addendum Report, April 2014 (b).

Sinclair Knight Merz (SKM)

Aurizon Network's 2013 Draft Access Undertaking: Engineering Technical Assessment of Maintenance, Operating and Capital Expenditure Forecasts, January 2014 (a).

Engineering Technical Assessment of Maintenance, Operating and Capital Expenditure Forecast: Addenda 1, February 2014 (b).

Engineering Technical Assessment of Maintenance, Operating and Capital Expenditure Forecast in Aurizon Network's Draft 2013 Access Undertaking – Updated benchmarking analysis and summary of maintenance cost findings, April 2014 (c)

Review of Aurizon Network's proposed Maintenance Cost Index for the UT4 period, September 2014 (f).

Jacobs SKM (formerly Sinclair Knight Merz) Response to Stakeholder Comments

Engineering Technical Assessment of Maintenance, Operating and Capital Expenditure Forecast: Response to Stakeholder Comments, April 2014 (d).

Ballast Cleaning and Re Railing, May 2014 (e).

Consultants' Reports

Energy Economics Pty Ltd (Energy Economics)

Central Queensland Coal Railing Forecast – Abridged Version, July 2013

Coal Railings Forecast for Central Queensland, April 2014.

Incenta Economic Consulting

Aurizon Network: Review of Benchmark Credit Rating and Cost of Debt, November 2013.

Review of Regulatory Capital Structure and Asset/Equity Beta for Aurizon Network, December 2013.

Aurizon Network: Review of Benchmark Credit Rating and Cost of Debt – Response to stakeholder comments, April 2014

Review of Regulatory Capital Structure and Asset/Equity Beta for Aurizon Network – Response to stakeholder comments, April 2014

Submissions on Consultant Reports Regarding Operating and Maintenance Costs

Asciano Limited (Asciano)

Submission on QCA Cost Consultants' Reports Regarding the Aurizon Network 2013 Draft Access Undertaking, March 2014 (sub. no. 112).

Aurizon Network

2013 Draft Access Undertaking - Response to QCA Consultants' Cost Report, March 2014 (sub. no. 109).

BHP Billiton Mitsubishi Alliance (BMA) and BHP Billiton Mitsui Coal (BMC)

Submission on QCA Cost Consultants' Reports Regarding the Proposed Maintenance, Overhead and Asset Renewal Costs in Aurizon Network's 2013 Draft Access Undertaking, April 2014 (sub. no. 114).

Queensland Resources Council (QRC)

RSM Bird Cameron Review of UT4 Operating Expenditure, March 2014 (sub. no. 110).

UT4 Submission on Maintenance, March 2014 (sub. no. 111).

UT4 Update – Discussion of Consultants' Reports on Aurizon UT4 Costs, April 2014 (sub. no. 117).

Vale

2013 Draft Access Undertaking (UT4): Consultants' Reports - Forecast Expenditure, February 2014 (sub. no. 113).

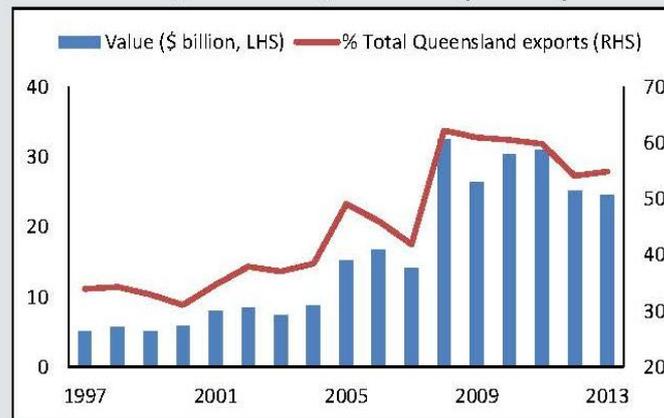
APPENDIX B: QUEENSLAND TREASURY AND TRADE

Queensland Treasury and Trade

Queensland Coal Industry

- The value of Queensland's overseas coal exports was \$24.6 billion in 2013, accounting for 55% of the total value of overseas merchandise exports from the State. In the decade to 2007, coal exports averaged around 40% of the total value of Queensland's overseas exports. This portion rose to around 61% between 2008 and 2011 (in large part due to high coal prices in these years) before falling back to around 55% in 2012 and 2013 (see Chart 1).

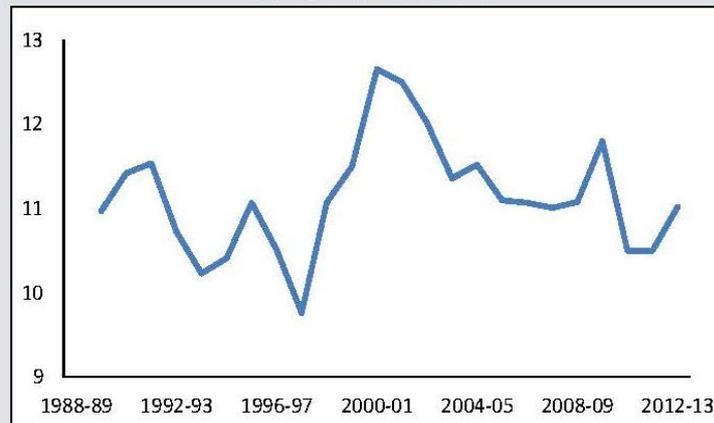
Chart 1: Queensland coal, coke and briquettes exports



Source: ABS unpublished trade data, Queensland Treasury and Trade

- By volume, 195.8 million tonnes (mt) of coal was exported from Queensland in 2013. Of this total, 97.5mt (49.8%) was hard coking coal, 52.7mt (26.9%) was thermal coal and 45.7mt (23.3%) was semi-soft/PCI coal.
- Queensland coal is exported through five ports; Abbot Point Coal Terminal (with nominal capacity of 50mtpa), Dalrymple Bay Coal Terminal (85mtpa), Hay Point Services Coal Terminal (44mtpa), Port of Gladstone (78mtpa) and the Port of Brisbane (10mtpa). Additional capacity is currently under construction at the Hay Point terminal (additional capacity 11mtpa) and Wiggins Island Coal Export Terminal at the Port of Gladstone (27mtpa).
- The majority of Queensland's coal exports are transported from mines to port via five rail systems run by Aurizon; the Blackwater Rail Corridor (which transported 50.3mt in 2012-13), the Goonyella Rail Corridor (67.9mt), the Moura Rail Corridor (10.8mt), the Newlands Rail Corridor (17.0mt) and the South-West Rail Corridor (8.8mt). The Mount Isa Rail Corridor also transports some coal from the Newlands mine.
- Coal is also used in domestic industries, especially electricity generation, non-ferrous metal production and the manufacture of concrete. Data from the Department of Natural Resources and Mines (DNRM) show that around 26.7mt, or 13% of Queensland's coal production, was used domestically in 2012-13.
- The mining industry as a whole contributed 11% of Queensland's real economic output (measured by gross value added or GVA) in 2012-13. With few exceptions, the mining industry has contributed between 10% and 12% of Queensland's real GVA per year over the past 24 years, for which data are available (see Chart 2). Disaggregated GVA data for the coal mining industry are not available.

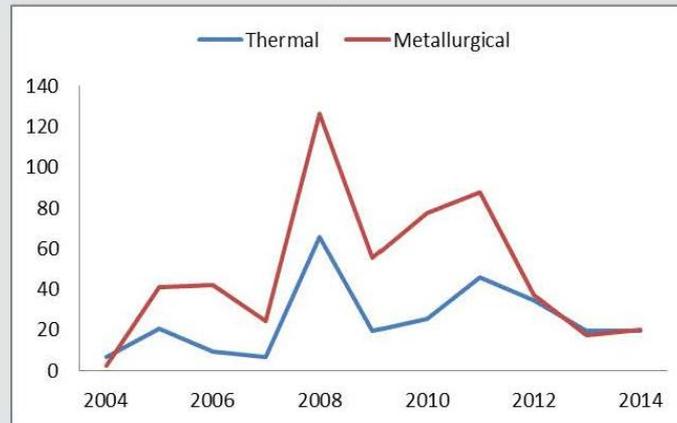
Chart 2: Contribution to Queensland's real economic output
(% of gross value added)



Source: ABS 5220.0

- Given the capital-intensive nature of the industry, mining accounts for a smaller share of employment than economic output. Mining employment accounted for 3.3% of total employment in 2013, of which 36.5%, or 28,000 persons, were employed in coal mining. However, this does not account for all employment associated with the coal industry, such as mining support services and rail and port transport services. Over the past decade, coal mining employment has averaged 38.8% of total mining employment.
- Data from DNRM show that labour productivity in the coal mining sector improved in 2012-13, partially reversing falls in previous years. Average yearly output of saleable coal per employee was 8,848 tonnes in 2008-09 but fell to 5,330 tonnes in 2011-12 before rising 19% to 6,365 tonnes in 2012-13.
- Profitability has been a significant issue in parts of the Queensland coal mining industry since 2012, with large price falls outpacing cost cutting and putting pressure on margins. AME data show that on average in Queensland the cash margin in 2013 was US\$17.29/t for metallurgical coal and US\$19.59/t for thermal coal (see Chart 3). Despite positive cash margins on average, due to variations in competitiveness between mines 30.7mt of metallurgical coal and 6.0mt of thermal coal had negative cash margins in 2013. However, it is AME's view that margins will improve due to vigorous cost-cutting campaigns by mine owners.

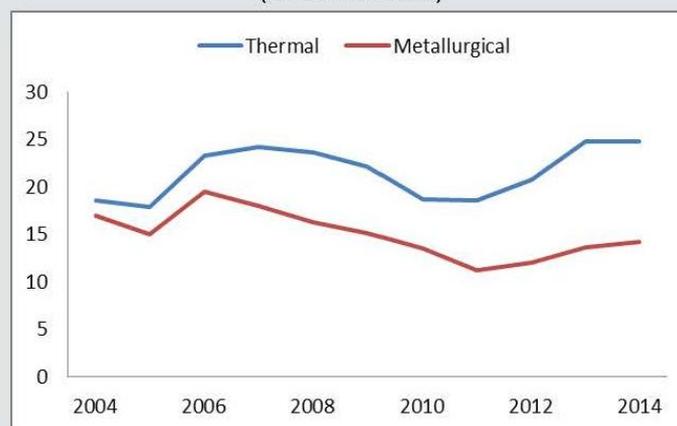
**Chart 3: Average Queensland cash margins
(US\$/mt)**



Source: AME group

- AME data also show that on average in Queensland metallurgical coal mines in 2013, mining costs accounted for 64% of total FOB cash costs, processing costs accounted for 6%, administration and support costs for 7%, royalties for 9% and freight costs for 14%.
- For Queensland thermal coal mines in 2013, mining costs accounted for 55% of total FOB cash costs, processing costs accounted for 5%, administration and support for 6%, royalties for 10% and freight for 25%.
- On average, FOB freight costs per unit are higher for thermal coal (US\$18.26/mt in 2013) than metallurgical coal (US\$14.76/mt in 2013). Note that FOB freight costs include rail and port charges within Queensland only, not transportation to the importing country. Given lower total cash costs for thermal coal, it follows that freight costs are a larger portion of total cost for thermal coal producers (see Chart 4).

**Chart 4: Average Queensland freight costs
(% FOB cash costs)**



Source: AME group

APPENDIX C: POST TAX REVENUE MODEL (PTRM)

Model Framework

A model framework outlines the structure used to support the construction of a model.

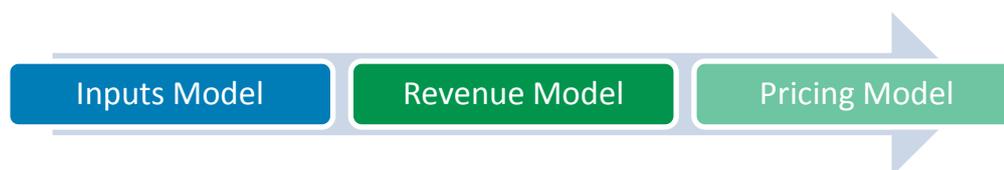
Aurizon Network proposal

Aurizon Network stated that it had used the Australian Energy Regulator's (AER) PTRM as the basis from which to derive its 2014 DAU MAR. Aurizon Network said it adopted this because it is publicly available and is widely accepted among stakeholders involved in Australian electricity regulation.⁶⁰³ It said the PTRM, is open and transparent and would facilitate wider distribution of its revenue model as it does not contain any confidential information.⁶⁰⁴

Besides incorporating the core elements of the PTRM into its 2014 DAU financial models, Aurizon Network made other modifications to accommodate its needs and the existing regulatory arrangements. The modifications comprise three parts – a separation of models (from a single PTRM), amendments to general modelling assumptions and inclusion of revenue allocation and alternative pricing methods.

Figure 29 shows the structure of Aurizon Network's UT4 financial models.

Figure 29 Flow-chart of Aurizon Network's UT4 Models



Source: QCA

Inputs Model

Aurizon Network proposed an inputs model to collate the inputs and assumptions required to calculate MAR.

Among other things, Aurizon Network proposed to largely retain its regulatory asset base (RAB) roll forward approach from previous regulatory periods. The roll forward approach is unchanged in structure and includes opening asset values⁶⁰⁵, indexation, depreciation and closing asset values for each regulatory year. The value of these components is derived from the value of assets; assets are categorised into 'initial assets' and 'capital expenditure'.

Initial assets form Aurizon Network's RAB prior to Aurizon Network being regulated.

Capital expenditure enters the RAB in the year it is commissioned⁶⁰⁶ and such inclusion is assumed to occur in the middle of a regulatory year. Although Aurizon Network applied a mid-year capital expenditure assumption, the roll forward calculation for capital expenditure in the first year varies across regulatory periods. **Table 94** summarises the differences.

⁶⁰³ Aurizon Network, sub. no. 3: 274

⁶⁰⁴ Aurizon Network, sub. no. 3: 274

⁶⁰⁵ Part of the RAB roll forward is performed in the RAB roll forward model. In particular, assets prior to 2013–14 are rolled forward to form the 2013–14 opening asset values that enter the inputs model.

⁶⁰⁶ 'Commissioned' refers to below-rail assets that have been declared for use.

Table 94 First year capital expenditure roll forward calculations

| <i>Component</i> | <i>Pre-2014 DAU</i> | <i>2014 DAU</i> |
|------------------------------------|---|---|
| Capital Expenditure (CAPEX) | Entered as mid-year value | Entered as start-of-year value by discounting mid-year value using WACC |
| Indexation | 50% of (CAPEX x inflation rate) | 100% of (CAPEX x inflation rate) |
| Depreciation | 50% of [(CAPEX + Indexation) / QCA endorsed asset life] | No depreciation |

Source: Aurizon Network's 2014 DAU inputs model

Aurizon Network said it proposed this arrangement because it:

- is compatible with user funding to the extent this requires the payment of revenues in the same year the asset is commissioned
- is consistent with establishing a new reference tariff, which requires an identified revenue stream in the year of operational commissioning
- is likely to generate revenues proportional to a mid-year write in date as applicable in UT3
- provides a greater degree of flexibility than the AER's PTRM in that it is possible to capitalise a proportion of the first year return on assets into the opening RAB value for the following year to achieve a required target revenue if the first year revenue is too high relative to the timing of the commencement of the applicable train services and the volume profile.⁶⁰⁷

Excluding the difference in first year capital expenditure roll forward calculations, Aurizon Network has left the roll forward calculations for assets (i.e. initial assets and capital expenditure from the second year of commissioning) unchanged from UT3. That is, the closing asset value equals the sum of opening asset value and full year indexation less full year depreciation.

Opening asset values, indexation and depreciation from the inputs model are fed into the revenue model. Notwithstanding this, other inputs such as operating and maintenance costs and weighted average cost of capital (WACC) parameters are also fed (from the inputs model) into the revenue model.

Revenue Model

Aurizon Network proposed a revenue model to derive its MAR, which is a combination of systems' and spurs' annual revenue requirements (ARR). The ARRs are derived using a building blocks approach.

An ARR depends on a number of variables (or cost building blocks) identified in **Table 95**. The RAB roll-forward values in the inputs model (i.e. opening asset values, depreciation and indexation) form the bases for return on and return of capital, and indexation. Operating and maintenance expenditure are pass-through costs. Tax payable and value of imputation credits are determined using WACC parameters and cost building blocks.

⁶⁰⁷ Aurizon Network, sub. no. 3: 276–277

Table 95 2014 DAU cost building block calculations

| Cost Building Block | Derivation |
|--|--|
| <i>Return on Capital</i> | (RAB Opening Asset Value x WACC) + (CAPEX x WACC) |
| <i>Return of Capital (Depreciation)</i> | Extracted from inputs model |
| <i>Less: Indexation</i> | Extracted from inputs model |
| <i>Operating and Maintenance Expenditure (O&M Expenditure)</i> | Extracted from inputs model |
| <i>Tax Payable¹</i> | $[(\text{Return on Capital} + \text{Return of Capital} - \text{Indexation} + \text{O\&M Expenditure}) - (\text{O\&M Expenditure} + \text{Tax Depreciation} + \text{Interest on Debt}) + \text{Tax Loss Carried Forward}] \times \text{Corporate Tax Rate} / [1 - (1 - \text{Gamma}) \times \text{Corporate Tax Rate}]$ |
| <i>Less: Value of Imputation Credits (Gamma)</i> | Tax Payable x Gamma |
| <i>Annual Revenue Requirement (ARR)</i> | Sum of Cost Building Blocks |

Source: Aurizon Network's 2014 DAU revenue model. Note: (1) Tax is not payable if value is less than or equal to 0. Instead, a tax loss is carried forward to the next year.

Once the ARR for the 2014 DAU are determined, smoothing⁶⁰⁸ is applied to the ARRs, and the smoothed ARRs are fed into the pricing model. Prices are the subject of our next Draft Decision.

Assumptions

Aurizon Network also included some variations to the general modelling assumptions used by the AER. These are outlined in **Table 96**.

Table 96 General modelling assumptions used by AER and Aurizon Network

| Assumption | AER | Aurizon Network |
|--|---|---|
| Timing of (commissioned) CAPEX inclusion into RAB | Middle-of-Year | Middle-of-Year (but enters inputs model as start-of-year value via discounting by WACC) |
| Forecast inflation rate | Midpoint of Reserve Bank of Australia's target inflation band (i.e. 2.5%) | Midpoint of Reserve Bank of Australia's target inflation band (i.e. 2.5%) |
| Return of capital (asset lives)¹ | Economic life | 25-year weighted average mine life (periodically reviewed) |
| Revenue requirement recognition timing | End-of-year dollars | End-of-year dollars |
| Intra-year cash flow discounting | No intra-year cash flow discounting | No intra-year cash flow discounting |
| Working capital allowance | No explicit working capital allowance | Contains working capital allowance in maintenance costs |

Source: AER Post Tax Revenue Model, Aurizon Network's 2014 DAU financial models. Note: (1) The issue of return of capital (asset lives) is discussed in Chapter 9 of this Draft Decision.

⁶⁰⁸ Smoothing shapes the profile of ARRs and is neutral in present value term. An assumption, usually a smoothing factor, is applied to determine the slope (or shape) of the ARR profile over a period.

Stakeholders' Comments

Stakeholders did not object to Aurizon Network's adoption of the PTRM model but raised concerns regarding the use of certain elements within Aurizon Network's submitted 2014 DAU financial models.

BMA said it is unclear why Aurizon Network should be provided with a revenue uplift through the PTRM's 'end-of-year' assumption given it primarily benefits Aurizon Network.⁶⁰⁹

The QRC said intra-year cash flow discounting should be retained because:

- the intra-year cash flow discount is designed to reflect the difference between the timing assumption of cash flow modelling and the actual cash flows Aurizon Network receives and pays
- its preliminary modelling suggests the exclusion of intra-year cash flow discounting increases MAR by more than 1.5%, which is materially significant in both dollar and percentage terms
- there is evidence the combination of an intra-year cash flow adjustment and a well-specified working capital allowance is technically superior from a methodological perspective
- the working capital allowance can be tailored to Aurizon Network's cash flows
- Aurizon Network's customers are better resourced to understand the complexities of the regulatory process than domestic consumers.⁶¹⁰

The QRC also said it understands Aurizon Network's proposed 2014 DAU model framework did not require a working capital allowance for operating expenses, but could not understand why maintenance costs was an exception, to the extent the proposed UT4 modelling framework deals appropriately with operating expenditure and access charge timing issues.⁶¹¹

QCA analysis, as reflected in the Draft Decision

Our Draft Decision reflects our acceptance of Aurizon Network's proposed adoption of a PTRM as a structural framework for its 2014 DAU inputs and revenue models.⁶¹²

However, there are two aspects of our Draft Decision which have been directly affected by Aurizon Network's proposed adoption of the PTRM, specifically our Draft Decisions on:

- working capital and a return on inventory for maintenance (Chapter 5)
- timing of depreciation for newly commissioned capital expenditure in UT4 (Chapter 9).

Working capital/return on inventory

Our Draft Decision is to refuse to approve Aurizon Network's proposed return on inventory and working capital.

We consider providing Aurizon Network with working capital allowance and return on inventory is inconsistent with the application of 'end-of-year' assumption. Under an 'end-of-year' assumption, Aurizon Network receives a full year's compensation for the opportunity cost of its funds used to cover the working capital movements throughout the year. Therefore, providing Aurizon Network with working capital/return on inventory under an 'end-of-year' assumption would result in additional revenues for Aurizon Network.

⁶⁰⁹ BMA, sub. no. 41: 3

⁶¹⁰ QRC, sub. no. 84: 43-44

⁶¹¹ QRC, sub. no. 110: 28

⁶¹² This draft decision excludes our consideration of revenue smoothing. We will consider the issue of smoothing in our 2014 DAU draft decision in December 2014.

Return of Capital (Depreciation) – Timing

Our Draft Decision is to refuse to approve Aurizon Network's proposal to commence depreciation for capital expenditure from its second year of commissioning (Draft Decision 9.3).

Instead, we consider it appropriate for Aurizon Network to amend its PTRM such that capital expenditure commences depreciation in its first year of commissioning. We see no reason on why access holders should not be paying return of capital in the year in which the assets commenced being used.

Summary

For the purpose of calculating MAR for this Draft Decision, we have applied the following:

Table 97 General assumptions and methodologies for calculating the MAR

| <i>Assumption/Methodology</i> | <i>QCA Draft Decision</i> |
|---|--|
| Timing of UT4 (commissioned) CAPEX inclusion in RAB | Entered as start-of-year value by discounting mid-year value using WACC |
| Timing of depreciation for UT4 (commissioned) CAPEX | Depreciation occurs in the first year |
| Return on Capital | $(\text{RAB Opening Asset Value} \times \text{WACC}) + (\text{CAPEX} \times \text{WACC})$ |
| Return of capital (asset lives) ¹ | For assets included in the RAB on or after 1 July 2009 – minimum of physical life or 20 years (rolling) For assets included in the RAB prior to 1 July – physical life |
| Tax Payable ² | $[(\text{Return on Capital} + \text{Return of Capital} - \text{Indexation} + \text{O\&M Expenditure}) - (\text{O\&M Expenditure} + \text{Tax Depreciation} + \text{Interest on Debt}) + \text{Tax Loss Carried Forward}] \times \text{Corporate Tax Rate} / [1 - (1 - \text{Gamma}) \times \text{Corporate Tax Rate}]$ |
| Value of Imputation Credits (Gamma) | Tax Payable x Gamma |
| Forecast annual inflation rate | Midpoint of Reserve Bank of Australia's target inflation band (i.e. 2.5%) |
| Revenue requirement recognition timing | End-of-year dollars |
| Intra-year cash flow discounting | No intra-year cash flow discounting |
| Working capital allowance | No working capital allowance |

Note: (1) The issue of return of capital (asset lives) is discussed in Chapter 9 of this Draft Decision. (2) Tax is not payable if value is less than or equal to 0. Instead, a tax loss is carried forward to the next year.

APPENDIX D: MAXIMUM ALLOWABLE REVENUE

This appendix provides information on our proposed MAR, disaggregated into non-electric and electric and categorised by system.

This information is based on a regulatory asset base (with related UT3 capital expenditure carryover account adjustments) that includes Aurizon Network's proposed 201213 capital expenditure values. The UT3 capital expenditure carryover account adjustment values are smoothed using a 4.5% escalation factor and applied across the 2014 DAU regulatory period.

CQCN MAR (non-electric and electric)

Table 98 QCA proposed 2014 DAU MAR for the CQCN, non-electric assets (\$'000, nominal)

| <i>Building Block</i> | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|----------------|----------------|----------------|----------------|
| Return on Capital | 316,720 | 324,694 | 401,999 | 401,171 |
| Return of Capital | 221,588 | 237,214 | 284,785 | 318,064 |
| Inflation | (110,455) | (113,236) | (140,196) | (139,907) |
| Maintenance Expenditure | 164,283 | 167,721 | 177,106 | 186,469 |
| Operating Expenditure | 107,195 | 110,445 | 116,271 | 119,876 |
| Tax | 42,467 | 42,677 | 58,216 | 68,487 |
| Value of Imputation Credits | (19,959) | (20,058) | (27,361) | (32,189) |
| Total (Unsmoothed) Revenue | 721,838 | 749,458 | 870,820 | 921,972 |
| UT3 CAPEX Carryover Account Adjustments | (20,538) | (21,462) | (22,428) | (23,437) |
| (Adjusted) Total Revenue | 701,300 | 727,995 | 848,392 | 898,535 |

Note: Numbers may not sum due to rounding.

Table 99 QCA proposed 2014 DAU MAR for the CQCN, electric assets (\$'000, nominal)

| <i>Building Block</i> | 2013–14 | 2014–15 | 2015–16 | 2016–17 |
|---|----------------|----------------|----------------|----------------|
| Return on Capital | 38,460 | 54,288 | 59,959 | 59,344 |
| Return of Capital | 49,106 | 63,241 | 67,161 | 57,701 |
| Inflation | (13,413) | (18,933) | (20,910) | (20,696) |
| Maintenance Expenditure | 10,105 | 10,406 | 10,668 | 11,022 |
| Operating Expenditure | 68,344 | 74,450 | 81,253 | 82,942 |
| Tax | 13,624 | 16,908 | 16,378 | 11,429 |
| Value of Imputation Credits | (6,403) | (7,947) | (7,698) | (5,372) |
| Total (Unsmoothed) Revenue | 159,822 | 192,414 | 206,811 | 196,371 |
| UT3 CAPEX Carryover Account Adjustments | (11,065) | (11,563) | (12,084) | (12,627) |
| (Adjusted) Total Revenue | 148,757 | 180,851 | 194,727 | 183,743 |

Note: Numbers may not sum due to rounding.

Blackwater System MAR (non–electric and electric)

Table 100QCA proposed 2014 DAU Blackwater system MAR, non–electric assets (\$'000, nominal)

| <i>Blackwater System (Non–Electric)</i> | | | | |
|---|----------------|----------------|----------------|----------------|
| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
| Return on Capital | 105,724 | 107,556 | 165,261 | 166,142 |
| Return of Capital | 73,661 | 78,321 | 104,192 | 130,297 |
| Inflation | (36,871) | (37,510) | (57,634) | (57,941) |
| Maintenance Expenditure | 65,374 | 68,630 | 74,583 | 79,388 |
| Operating Expenditure | 31,817 | 33,450 | 36,553 | 38,446 |
| Tax | 17,056 | 16,526 | 23,625 | 27,761 |
| Value of Imputation Credits | (8,016) | (7,767) | (11,104) | (13,048) |
| Total (Unsmoothed) Revenue | 248,745 | 259,206 | 335,476 | 371,046 |
| UT3 CAPEX Carryover Account Adjustments | (2,483) | (2,594) | (2,711) | (2,833) |
| Adjusted Total Revenue | 246,262 | 256,612 | 332,765 | 368,213 |

Note: Numbers may not sum due to rounding.

Table 101QCA proposed 2014 DAU Blackwater system MAR, electric assets (\$'000, nominal)

| <i>Blackwater System (Electric)</i> | | | | |
|---|----------------|----------------|----------------|----------------|
| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
| Return on Capital | 20,710 | 33,480 | 38,085 | 37,347 |
| Return of Capital | 27,722 | 38,363 | 40,001 | 28,774 |
| Inflation | (7,223) | (11,676) | (13,282) | (13,025) |
| Maintenance Expenditure | 3,696 | 3,812 | 3,909 | 4,040 |
| Operating Expenditure | 37,842 | 39,006 | 40,825 | 41,801 |
| Tax | 7,715 | 10,383 | 8,981 | 4,108 |
| Value of Imputation Credits | (3,626) | (4,880) | (4,221) | (1,931) |
| Total (Unsmoothed) Revenue | 86,837 | 108,487 | 114,299 | 101,115 |
| UT3 CAPEX Carryover Account Adjustments | (7,782) | (8,133) | (8,499) | (8,881) |
| Adjusted Total Revenue | 79,055 | 100,355 | 105,800 | 92,234 |

Note: Numbers may not sum due to rounding.

Goonyella System MAR (non–electric and electric)

Table 102 QCA proposed 2014 DAU Goonyella System MAR, non–electric assets (\$'000, nominal)

| <i>Goonyella System (Non-Electric)</i> | | | | |
|---|----------------|----------------|----------------|----------------|
| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
| Return on Capital | 111,436 | 112,619 | 114,654 | 115,370 |
| Return of Capital | 79,790 | 84,130 | 88,581 | 92,662 |
| Inflation | (38,863) | (39,276) | (39,985) | (40,235) |
| Maintenance Expenditure | 68,395 | 67,465 | 70,289 | 72,646 |
| Operating Expenditure | 51,841 | 52,494 | 54,558 | 55,152 |
| Tax | 15,962 | 14,509 | 18,101 | 21,252 |
| Value of Imputation Credits | (7,502) | (6,819) | (8,507) | (9,988) |
| Total (Unsmoothed) Revenue | 281,059 | 285,123 | 297,691 | 306,858 |
| UT3 CAPEX Carryover Account Adjustments | (12,983) | (13,568) | (14,178) | (14,816) |
| Adjusted Total Revenue | 268,075 | 271,556 | 283,512 | 292,042 |

Note: Numbers may not sum due to rounding.

Table 103 QCA proposed 2014 DAU Goonyella System MAR, electric assets (\$'000, nominal)

| <i>Goonyella System (Electric)</i> | | | | |
|---|----------------|----------------|----------------|----------------|
| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
| Return on Capital | 17,277 | 20,347 | 21,426 | 21,564 |
| Return of Capital | 21,045 | 24,532 | 26,804 | 28,564 |
| Inflation | (6,025) | (7,096) | (7,472) | (7,520) |
| Maintenance Expenditure | 6,408 | 6,595 | 6,759 | 6,981 |
| Operating Expenditure | 30,502 | 35,444 | 40,428 | 41,141 |
| Tax | 5,853 | 6,480 | 7,343 | 7,259 |
| Value of Imputation Credits | (2,751) | (3,045) | (3,451) | (3,412) |
| Total (Unsmoothed) Revenue | 72,309 | 83,256 | 91,837 | 94,576 |
| UT3 CAPEX Carryover Account Adjustments | (3,283) | (3,431) | (3,585) | (3,746) |
| Adjusted Total Revenue | 69,026 | 79,826 | 88,252 | 90,830 |

Note: Numbers may not sum due to rounding.

Moura System MAR (non-electric)

Table 104 QCA proposed 2014 DAU Moura System MAR, non-electric assets (\$'000, nominal)

| <i>Moura System</i> | | | | |
|---|----------------|----------------|----------------|----------------|
| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
| Return on Capital | 18,975 | 19,377 | 26,148 | 26,205 |
| Return of Capital | 10,739 | 11,480 | 16,825 | 17,679 |
| Inflation | (6,618) | (6,758) | (9,119) | (9,139) |
| Maintenance Expenditure | 9,702 | 9,680 | 9,501 | 10,322 |
| Operating Expenditure | 6,456 | 6,515 | 6,173 | 6,458 |
| Tax | 3,423 | 3,382 | 3,876 | 4,449 |
| Value of Imputation Credits | (1,609) | (1,589) | (1,822) | (2,091) |
| Total (Unsmoothed) Revenue | 41,070 | 42,086 | 51,582 | 53,883 |
| UT3 CAPEX Carryover Account Adjustments | (830) | (867) | (906) | (947) |
| Adjusted Total Revenue | 40,240 | 41,219 | 50,676 | 52,937 |

Note: Numbers may not sum due to rounding.

Newlands System MAR (non-electric)

Table 105 QCA proposed 2014 DAU Newlands System MAR, non-electric assets (\$'000, nominal)

| <i>Newlands System</i> | | | | |
|---|----------------|----------------|----------------|----------------|
| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
| Return on Capital | 16,226 | 22,476 | 26,378 | 26,115 |
| Return of Capital | 11,257 | 15,984 | 19,760 | 20,604 |
| Inflation | (5,659) | (7,838) | (9,199) | (9,108) |
| Maintenance Expenditure | 10,257 | 10,031 | 10,245 | 10,727 |
| Operating Expenditure | 7,143 | 7,087 | 7,207 | 7,631 |
| Tax | 3,441 | 4,024 | 5,246 | 5,844 |
| Value of Imputation Credits | (1,617) | (1,891) | (2,466) | (2,747) |
| Total (Unsmoothed) Revenue | 41,048 | 49,872 | 57,172 | 59,068 |
| UT3 CAPEX Carryover Account Adjustments | 292 | 305 | 319 | 333 |
| Adjusted Total Revenue | 41,340 | 50,177 | 57,490 | 59,401 |

Note: Numbers may not sum due to rounding.

Goonyella to Abbot Point System MAR (non-electric)

Table 106 QCA proposed 2014 DAU Goonyella to Abbot Point System MAR, non-electric assets (\$'000, nominal)

| <i>Goonyella to Abbot Point System</i> | | | | |
|---|----------------|----------------|----------------|----------------|
| <i>Building Block</i> | <i>2013–14</i> | <i>2014–15</i> | <i>2015–16</i> | <i>2016–17</i> |
| Return on Capital | 64,831 | 63,127 | 70,006 | 67,772 |
| Return of Capital | 46,479 | 47,645 | 55,781 | 57,186 |
| Inflation | (22,609) | (22,015) | (24,414) | (23,635) |
| Maintenance Expenditure | 10,555 | 11,915 | 12,488 | 13,386 |
| Operating Expenditure | 9,937 | 10,899 | 11,781 | 12,188 |
| Tax | 2,640 | 4,281 | 7,421 | 9,243 |
| Value of Imputation Credits | (1,241) | (2,012) | (3,488) | (4,344) |
| Total (Unsmoothed) Revenue | 110,592 | 113,840 | 129,574 | 131,796 |
| UT3 CAPEX Carryover Account Adjustments | (4,535) | (4,739) | (4,952) | (5,175) |
| Adjusted Total Revenue | 106,057 | 109,102 | 124,622 | 126,621 |

Note: Goonyella to Abbot Point System's revenues include GSE (GAPE) electric assets derived revenues. Numbers may not sum due to rounding.

APPENDIX E: CALCULATION OF BALLAST CLEANING COSTS

Calculation process for the Table 63 regarding ballast cleaning costs

This appendix outlines the process adopted to develop the figures provided in **Table 63**.

Step 1:

From Aurizon Network's 2014 DAU submission take its real direct costs for ballast cleaning, comprising the following product categories:

- Ballast undercutting
- Ballast undercutting – other
- Ballast undercutting – turnouts

Step 2:

Adjust the costs in stage 1 to reflect the post ground penetrating radar (GPR) intervention rate rather than the pre GPR intervention rate as follows:

$$\left[\frac{\text{Pre GPR intervention rate}}{\text{Post GPR intervention rate}} \right] \times \text{Direct costs of ballast cleaning}$$

This provides an estimate of the real ballast costs based on Aurizon Network's volume forecasts and adopting the post GPR intervention rate.

Step 3:

Adjust the ballast costs derived in step 2 for differences in the QCA volume forecasts relative to the Aurizon Network volume forecasts. The figures in **Table 63** for this adjustment were provided by SKM.

Step 4:

Adjust the real ballast cleaning costs calculated in stage 2 to account for the volume adjustments calculated in step 3. This provides the QCA's proposed real ballast cleaning costs.

Step 5:

Convert the QCA's proposed real ballast cleaning costs calculated in step 4 into nominal terms using the QCA's propose MCI as follows:

$$QCA\ MCI \times QCA\ proposed\ real\ ballast\ cleaning\ costs$$

APPENDIX F: OPENING ASSET BASE SUPPORTING TABLES

Regulatory Asset Base - RAB Roll Forward

Table 107 Roll-forward of RAB by system 2009-10 to 2012-13 (non-electric assets) (\$'000, nominal)

| | <i>UT3 Roll-forward</i> | | | | <i>Opening value UT4⁴</i> |
|----------------------------|-------------------------|----------------|----------------|----------------|--|
| | <i>2009-10</i> | <i>2010-11</i> | <i>2011-12</i> | <i>2012-13</i> | <i>2013-14</i> |
| Blackwater | | | | | |
| Opening value | 1,030,551 | 1,078,532 | 1,083,466 | 1,082,823 | 1,103,347 |
| Plus capex | 57,030 | 9,949 | 37,504 | 49,892 | |
| Plus inflation | 33,898 | 41,554 | 10,178 | 22,043 | |
| Less depreciation | (42,947) | (46,602) | (48,326) | (51,410) | |
| Closing value | 1,078,532 | 1,083,433 | 1,082,823 | 1,103,347 | |
| Rolleston | | | | | |
| Opening value | 242,769 | 238,756 | 235,676 | 225,503 | 225,339 |
| Plus capex | – | – | – | 8,068 | |
| Plus inflation | 7,772 | 9,157 | 2,176 | 4,567 | |
| Less depreciation | (11,785) | (12,237) | (12,350) | (12,799) | |
| Closing value | 238,756 | 235,676 | 225,503 | 225,339 | |
| Minerva¹ | | | | | |
| Opening value | 74,988 | 74,338 | 74,021 | 71,507 | 69,669 |
| Plus capex | – | – | – | – | |
| Plus inflation | 2,401 | 2,851 | 684 | 1,423 | |
| Less depreciation | (3,051) | (3,168) | (3,197) | (3,261) | |
| Closing value | 74,338 | 74,021 | 71,507 | 69,669 | |
| Goonyella | | | | | |
| Opening value | 1,079,477 | 1,234,808 | 1,313,591 | 1,300,032 | 1,315,228 |
| Plus capex | 166,627 | 87,743 | 36,664 | 54,692 | |
| Plus inflation | 37,205 | 49,025 | 12,299 | 26,413 | |
| Less depreciation | (48,500) | (57,896) | (62,522) | (65,909) | |
| Closing value | 1,234,808 | 1,313,681 | 1,300,032 | 1,315,228 | |
| Vermont | | | | | |
| Opening value | 45,438 | 48,132 | 47,627 | 45,320 | 43,421 |
| Plus capex | 3,684 | 354 | – | – | |
| Plus inflation | 1,513 | 1,853 | 440 | 902 | |
| Less depreciation | (2,503) | (2,712) | (2,747) | (2,801) | |
| Closing value | 48,132 | 47,627 | 45,320 | 43,421 | |

| | UT3 Roll-forward | | | | Opening value UT4⁴ |
|----------------------------------|-------------------------|-----------|-----------|-----------|--|
| GAPE² | | | | | |
| Opening value | | | | 899,598 | 984,848 |
| Plus capex | | | 892,279 | 59,178 | |
| Plus inflation | | | 8,068 | 26,073 | |
| Less depreciation | | | – | – | |
| Closing value | | | 900,346 | 984,848 | |
| Moura | | | | | |
| Opening value | 253,842 | 255,373 | 256,684 | 251,472 | 251,089 |
| Plus capex | 2,200 | 687 | 1,810 | 4,295 | |
| Plus inflation | 8,161 | 9,807 | 2,379 | 5,047 | |
| Less depreciation | (8,831) | (9,254) | (9,400) | (9,726) | |
| Closing value | 255,373 | 256,614 | 251,472 | 251,089 | |
| Newlands³ | | | | | |
| Opening value | 165,290 | 164,217 | 164,645 | 312,493 | 341,261 |
| Plus capex | 750 | 1,600 | 149,724 | 23,821 | |
| Plus inflation | 5,304 | 6,329 | 6,944 | 15,526 | |
| Less depreciation | (7,127) | (7,487) | (8,726) | (10,579) | |
| Closing value | 164,217 | 164,659 | 312,586 | 341,261 | |
| Total Non-Electric Assets | | | | | |
| Opening value | 2,892,356 | 3,094,157 | 3,175,711 | 4,188,747 | 4,334,202 |
| Plus capex | 230,292 | 100,334 | 1,117,981 | 199,947 | |
| Plus inflation | 96,253 | 120,576 | 43,166 | 101,994 | |
| Less depreciation | (124,744) | (139,356) | (147,268) | (156,485) | |
| Closing value | 3,094,157 | 3,175,711 | 4,189,589 | 4,334,202 | |

Notes:

1. Includes the entire value of the Minerva assets.
2. Includes the entire value of the GAPE assets (Goonyella System Enhancements (GSE) and Byerwen (GAPE)).
3. Newlands includes Newlands to Abbot Point Expansion (NAPE) customers and Byerwen (NAPE).
4. The opening RAB values for UT4 above will differ from Aurizon Network's submitted amounts (and the RAB for pricing purposes) as:
 - (a) adjustments for approved capital expenditure to 2012-13 and recent CPI adjustments are reflected on the above amounts but not in Aurizon Network's submitted figures
 - (b) the value used for pricing purposes is different because some of the RAB value is allocated to non-coal traffics
 - (c) the RAB value used for pricing purposes is different because some of the RAB value is deferred to 2015–16 due to the postponement of Byerwen (NAPE) service.

Table 108 Roll-forward of RAB by system 2009-10 to 2012-13 (electric assets) (\$'000, nominal)

| | <i>UT3 Roll-forward</i> | | | | <i>Opening value UT4#</i> |
|----------------------------------|-------------------------|----------------|----------------|----------------|---------------------------|
| | <i>2009-10</i> | <i>2010-11</i> | <i>2011-12</i> | <i>2012-13</i> | <i>2013-14</i> |
| Blackwater Electric | | | | | |
| Opening value | 146,067 | 140,713 | 129,351 | 291,605 | 284,040 |
| Plus capex | 6,132 | 268 | 182,008 | 13,726 | |
| Plus inflation | 4,774 | 5,402 | 2,033 | 5,939 | |
| Less depreciation | (16,259) | (17,051) | (21,787) | (27,230) | |
| Closing value | 140,713 | 129,332 | 291,605 | 284,040 | |
| Goonyella Electric | | | | | |
| Opening value | 199,788 | 236,545 | 246,554 | 233,754 | 227,084 |
| Plus capex | 45,660 | 18,921 | 3,985 | 8,369 | |
| Plus inflation | 7,121 | 9,432 | 2,295 | 4,735 | |
| Less depreciation | (16,024) | (18,325) | (19,080) | (19,773) | |
| Closing value | 236,545 | 246,573 | 233,754 | 227,084 | |
| Vermont Electric | | | | | |
| Opening value | 8,862 | 8,803 | 8,646 | 8,228 | 7,883 |
| Plus capex | 128 | – | – | – | |
| Plus inflation | 286 | 338 | 80 | 164 | |
| Less depreciation | (472) | (494) | (499) | (509) | |
| Closing value | 8,803 | 8,646 | 8,228 | 7,883 | |
| GAPE Electric¹ | | | | | |
| Opening value | | | | – | 4,421 |
| Plus capex | | | | 4,377 | |
| Plus inflation | | | | 43 | |
| Less depreciation | | | | 0 | |
| Closing value | | | | 4,421 | |
| Total Electric Assets | | | | | |
| Opening value | 354,717 | 386,061 | 384,552 | 533,587 | 523,428 |
| Plus capex | 51,920 | 19,190 | 185,994 | 26,472 | |
| Plus inflation | 12,180 | 15,171 | 4,408 | 10,881 | |
| Less depreciation | (32,756) | (35,870) | (41,366) | (47,512) | |
| Closing value | 386,061 | 384,552 | 533,587 | 523,428 | |

Notes: 1. GAPE Electric includes Goonyella System Enhancements (GSE).

APPENDIX G: CAPITAL EXPENDITURE - SUPPORTING TABLES

Aurizon Network's proposed capital indicator, original April 2013 and December 2013

Table 109 Capital indicator by system (\$ million) as at April 2013

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 | UT4 Total |
|--------------|----------------|-----------------|----------------|----------------|------------------|
| Blackwater | 97.56 | 1,070.15 | 96.09 | 71.42 | 1,335.22 |
| Goonyella | 191.20 | 109.58 | 99.98 | 69.50 | 470.26 |
| Moura | 12.35 | 61.63 | 11.30 | 8.08 | 93.36 |
| Newlands | 10.23 | 6.65 | 9.36 | 6.69 | 32.93 |
| GAPE | 19.81 | – | – | – | 19.81 |
| Total | 331.15 | 1,248.01 | 216.73 | 155.69 | 1,951.58 |

Source: Aurizon Network, 2013 DAU, sub. no. 3: 184. Note: The above figures are start-of-year values and do not include return on capital.

Table 110 Revised capital indicator by system (\$ million) as at December 2013

| | 2013–14 | 2014–15 | 2015–16 | 2016–17 | Total UT4 |
|--------------|----------------|----------------|-----------------|----------------|------------------|
| Blackwater | 101.47 | 261.72 | 99.94 | 71.36 | 534.50 |
| Goonyella | 198.87 | 113.97 | 103.98 | 72.28 | 489.10 |
| Moura | 12.85 | 8.35 | 891.02 | 8.40 | 920.61 |
| Newlands | 10.64 | 6.92 | 9.74 | 6.96 | 34.26 |
| WIRP | 0.00 | 0.00 | 70.42 | – | 70.42 |
| GAPE | 20.60 | – | – | – | 20.60 |
| Total | 344.43 | 390.96 | 1,175.10 | 159.00 | 2,069.49 |

Source: Source: Aurizon Network December 2013 Financial Model. Note: The above figures are mid-year values and do not include return on capital.

REFERENCES

Anglo American

October 2013, Submission to Queensland Competition Authority: Aurizon Network's 2013 Draft Amending Access Undertaking (UT4) (sub. no. 39).

January 2014, Submission to Queensland Competition Authority: Aurizon Network's Reply Submission on the 2013 Draft Amending Access Undertaking (UT4) (sub. no. 78).

January 2014, Schedule 1: Proposed drafting of Part 6, Part 7 and Schedule H, (sub. no. 79).

January 2014, Schedule 2: Proposed drafting of Part 8 (sub. no. 80).

January 2014, Schedule 3: Explanatory Notes on Network Management Principles (sub. no. 81).

January 2014, Submission in Relation to the WACC Consultation Papers and WACC Forum, (sub. no. 93).

Asia Pacific Strategy, January 2014, Royalty, Powerpoint Presentation, (sub. no. 94).

Asciano Limited (Asciano)

October 2013, Submission to the Queensland Competition Authority in Relation to the 2013 Aurizon Network Draft Access Undertaking. (sub. no. 43).

October 2013, Attachment 2: Major Changes in Wording or Concept Between the 2010 AU and the 2013 DAU Including Asciano Comment on These Changes. (sub. no. 44).

October 2013, Attachment 3: Major Changes in Wording or Concept Between the 2013 QCA Approved TOA and the TOA Attached to the 2013 DAU Including Asciano Comment on These Changes. (sub. no. 45).

January 2014, Submission to the QCA Regarding the Aurizon Network November 2013 Response to Stakeholder Submissions to the QCA in Relation to the Aurizon Network 2013 Draft Access Undertaking, (sub. no. 82).

March 2014, Submission on QCA Cost Consultants' Reports Regarding the Aurizon Network 2013 Draft Access Undertaking. (sub. no. 112).

Australian Competition and Consumer Commission (ACCC), December 2011, Determination – Australian Rail Track Corporation's Compliance with Pricing Principles in the Hunter Valley Rail Network Access Undertaking for July. <<https://www.accc.gov.au/system/files/ACCC%20determination%20-%20annual%20compliance%20assessment%20under%20ARTC%E2%80%99s%20HVAU%20for%20the%20period%201%20July%202011%20to%2031%20December%202011.pdf>>.

Aurizon Holdings Limited (Aurizon)

February 2014, Half Year Report Analysts Presentation.

February 2014, Half Year Report Media Release.

Aurizon Network

August 2008, The 2013 Access Undertaking Explanatory Material: Annex P Worley Parsons and Transportation Technology Centre - UT3 Parallel Comparison Exercise – Consultant's Report, 18 August. (sub. no. 20).

August 2008, The 2013 Access Undertaking Explanatory Material: Annex Q Worley Parsons - Life Asset Register Benchmark, 18 August. (sub. no. 21).

August 2008, The 2013 Access Undertaking Explanatory Material: Annex R Worley Parsons - Marginal Costs Variabilities - Contemporary and Accepted Theorems, 18 August. (sub. no. 22).

- August 2008, The 2013 Access Undertaking Explanatory Material: Annex S Worley Parsons - Queensland Railways Maintenance Variability: Coal Network Cost Variability with Traffic Density, 18 August. (sub. no. 23).
- August 2008, The 2013 Access Undertaking Explanatory Material: Annex T Worley Parsons - Optimising Locations of Maintenance Depots: for the Queensland Rail Network, 18 August. (sub. no. 24).
- August 2008, The 2013 Access Undertaking Explanatory Material: Annex U Worley Parsons - Comments on Service Level Specifications for Rail Infrastructure Maintenance: Central Queensland Coal Region, 18 August. (sub. no. 25).
- August 2008, The 2013 Access Undertaking Explanatory Material: Annex V Worley Parsons - Benchmark Heavy Haul Lines: International and National Comparison, 18 August. (sub. no. 26).
- August 2008, The 2013 Access Undertaking Explanatory Material: Annex W Worley Parsons - Northern Queensland Coal Network Systems: Site Visit Record: May 2008, 18 August. (sub. no. 27).
- October 2010, 2010 Aurizon Network's Access Undertaking (last amended May 2013).
- January 2012, The 2013 Access Undertaking Explanatory Material: Annex D SFG Consulting – Estimating Gamma, 25 January (sub. no. 8).
- June 2012, The 2013 Access Undertaking Explanatory Material: Annex AD QR National Networks – UT4 Maintenance – 2012 Assessment Survey to Ports and Mines – Results, 12 June. (sub. no. 34).
- July 2012.,The 2013 Access Undertaking Explanatory Material: Annex G Ernst & Young – Benchmarking Corporate Overhead Costs for QR Network Pty Ltd. (sub. no. 11).
- August 2012, The 2013 Access Undertaking Explanatory Material: Annex B SFG Consulting – Systemic risk of QR Network, 31 August. (sub. no. 6).
- August 2012, The 2013 Access Undertaking Explanatory Material: Annex C SFG Consulting – Term to Maturity of the Risk Free Rate Estimate in the Regulated Return, 29 August (sub. no. 7).
- September 2012, The 2013 Access Undertaking Explanatory Material: Annex AF [FOR PUBLICATION] BIS Shrapnel - Maintenance Cost Escalation Forecasts to 2017- Draft Report. (sub. no. 36).
- October 2012, The 2013 Access Undertaking Explanatory Material: Annex N Evans and Peck - Operating and Maintenance Costs: Investigation and Benchmarking – Final Report. (sub. no. 18).
- October 2012, The 2013 Access Undertaking Explanatory Material: Annex Y QR National - Central Queensland Coal Network and System Maps, 9 October. (sub. no. 29).
- November 2012, The 2013 Access Undertaking Explanatory Material: Annex AE [FOR PUBLICATION] Deloitte Access Economics – Estimate of QR Network Maintenance Services Overheads, 1 November. (sub. no. 35).
- December 2012, Below Rail Services Provided by Aurizon Network – Financial Statements for the Year Ended 30 June 2012.
- 2012, The 2013 Access Undertaking Explanatory Material: Annex AA QR National Network Services - Safety Alert Examples, various 2012 (sub. no. 31).
- January 2013, The 2013 Access Undertaking Explanatory Material: Annex L Sapere Research Group – Review of Cost Allocation Methodology and Treatment of Mine Specific Infrastructure, 11 January. (sub. no. 16).
- February 2013, The 2013 Access Undertaking Explanatory Material: Annex E Value Adviser Associates – Review of Debt Risk Premium and Market Risk Premium. (sub. no. 9).
- February 2013, The 2013 Access Undertaking Explanatory Material: Annex AB Aurizon - Critical Asset Calendar. (sub. no. 32).

- March 2013, The 2013 Access Undertaking Explanatory Material: Annex A SFG Consulting – Testing the Reasonableness of the Regulatory Allowance for the Return on Equity, 11 March (sub. no. 5).
- March 2013, The 2013 Access Undertaking Explanatory Material: Annex H [CONFIDENTIAL] Finity – Review of Self Insurance Risk Premium – Access Undertaking UT4. (sub. no. 12).
- March 2013, The 2013 Access Undertaking Explanatory Material: Annex K Evans & Peck – Aurizon Network's Ballast Contamination Scoping Study. (sub. no. 15).
- March 2013, The 2013 Access Undertaking Explanatory Material: Annex O [CONFIDENTIAL] QR National Central Queensland Coal Network: Tonnage Profile. 4 March. (sub. no. 19).
- March 2013, The 2013 Access Undertaking Explanatory Material: Annex X [CONFIDENTIAL] QR National - Key Personnel. 4 March. (sub. no. 28).
- March 2013, The 2013 Access Undertaking Explanatory Material: Annex Z QR National - Legislation Affecting QR Network, 4 March . (sub. no. 30).
- March 2013, The 2013 Access Undertaking Explanatory Material: Annex AC [FOR PUBLICATION] QR National - Ballast Fouling, 4 March. (sub. no. 33).
- April 2013 (a), Aurizon Network's Standard Rail Connection Agreement (as approved April 2013).
- April 2013 (b), Submission in support of the Draft Amending Access Undertaking For Electric Traction Pricing in Blackwater (AT5).
- April 2013, The 2013 Access Undertaking Explanatory Material: Volume 1 Overview and Summary. (sub. no. 1).
- April 2013, The 2013 Access Undertaking Explanatory Material: Volume 2 The 2013 Access Undertaking Proposal. (sub. no. 2).
- April 2013, The 2013 Access Undertaking Explanatory Material: Volume 3 MAR and Reference Tariffs. (sub. no. 3).
- April 2013, The 2013 Access Undertaking Explanatory Material: Volume 4 Maintenance. (sub. no. 4).
- April 2013, The 2013 Access Undertaking Explanatory Material: Annex F Synergies – Aurizon Network's Commercial and Regulatory Risks. (sub. no. 10).
- The 2013 Access Undertaking Explanatory Material: Annex I Willis – Expert Opinion on the Cost of Insurance Premiums for Purposes of the Aurizon Network Access Undertaking 2013 (sub. no. 13).
- April 2013, The 2013 Access Undertaking Explanatory Material: Annex J Deloitte – Aurizon Network: Proposed Standard User Funding Agreement Risk Assessment. (sub. no. 14).
- April 2013, The 2013 Access Undertaking Explanatory Material: Volume 4 - Maintenance. [CONFIDENTIAL] (sub. no. 37).
- May 2013 (a), Aurizon Network Financial Model, Excel Spreadsheets submitted by Aurizon Network to the Queensland Competition Authority.
- May 2013 (b), 2010 Extension Draft Amending Access Undertaking.
- June 2013, (Fact Sheet: Wiggins Island Rail Project,
http://www.aurizon.com.au/Downloads/WIRP_fact%20sheet%20JUN13.pdf
- October 2013, The 2013 Access Undertaking Explanatory Material: Aurizon Network Letter – Replacement Annex G.
- December 2013 (a), Aurizon Network – 2012/13 Annual Performance Report.
- December 2013 (b), Aurizon Network Financial Model, Excel Spreadsheets Submitted by Aurizon Network to the Queensland Competition Authority.

- December 2013, The 2013 Access Undertaking Explanatory Material: UT4 'Coal System Aggregate' Model.
- January 2014, Cover Letter (sub. no. 100).
- January 2014, A Comparative Analysis of Aurizon Network's Commercial and Regulatory Risks, (sub. no. 101).
- January 2014, Return on Capital Response – Summary Paper, (sub. no. 102).
- January 2014, An Appropriate Regulatory Estimate of Gamma: Report for Aurizon Ltd (sub. no. 103).
- January 2014, An Appropriate Regulatory Estimate of the Market Risk Premium: Report for Aurizon Ltd., (sub. no. 104).
- January 2014, Systematic Risk of Aurizon Network: Response to Reports and Submissions to the Queensland Competition Authority, (sub. no. 105).
- March 2014, 2013 Draft Access Undertaking - Response to QCA Consultants' Cost Report. (sub. no. 109).
- March 2014, Supplementary Report to the QCA - Maintenance Cost Index, (sub. no. 116).
- March 2014, SFG Consulting Report - Estimating Gamma, (sub. no. 115).
- June 2014, SFG Consulting Report – Justification for cost of equity parameters, (sub. no. 118).
- June 2014, Aurizon Network Assets Information Sharing Management of Ballast and Asset Matters, 11 March. (sub. no. 119)
- June 2014, Management of Ballast and Asset Matters. Presentation to the QCA.
- August 2014, The 2014 Access Undertaking: Explanatory Material – Letter UT4 Resubmission. (sub. no. 1)
- August 2014, The 2014 Access Undertaking: Explanatory Material – Summary Table of Key Changes (App B). (sub. no. 2)
- August 2014, The 2014 Access Undertaking: Explanatory Material – Detailed Table of Changes (App A1). (sub. no. 3)
- August 2014, The 2014 Access Undertaking: Explanatory Material – Detailed Table of Changes – Agreements (App A2). (sub. no. 4)
- August 2014, The 2014 Access Undertaking Explanatory Material – Wiggins Island Rail Project Proposed Revenue and Pricing Treatment. (sub. no. 5)
- Australian Bureau of Statistics 2014, Average Weekly Earnings, Australia, Quality Declaration, May, viewed September 2014, <
<http://www.abs.gov.au/Ausstats/abs@.nsf/0/14CDB5CD59F6A075CA2575BC001D6157?OpenDocument>>
- Australian Rail Track Corporation (ARTC) 2011, Hunter Valley Coal Network Access Undertaking, <
http://www.artc.com.au/library/AS_HV_Undertaking_2011.pdf>.
- BHP Billiton Mitsubishi Alliance (BMA) and BHP Billiton Mitsui Coal (BMC)
- October 2013, Letter to the QCA. (sub. no. 40).
- October 2013, Issues and Concerns with Aurizon Network's (AN's) 2013 Draft Amending Undertaking (DAU). (sub. no. 41).
- January 2014, Aurizon Network's Response to Stakeholder Submissions on the 2013 Draft Access Undertaking, (sub. no. 108).

- April 2014, Speech Presented at the CEDA Luncheon 'NSW Energy Series: Coal industry outlook' by Dean Dalla Valle (President- Coal), Sydney, NSW, 4 April.
- April 2014, Submission on QCA Cost Consultants' Reports Regarding the Proposed Maintenance, Overhead and Asset Renewal Costs in Aurizon Network's 2013 Draft Access Undertaking. (sub. no. 114).
- Bureau of Resource and Energy Economics (BREE) 2014, Resources and Energy Quarterly, September Quarter 2014. Internet
<http://www.bree.gov.au/sites/bree.gov.au/files/files//publications/req/REQ-2014-09.pdf>
- DBCT Management (DBCTM), January 2014, Aurizon Network: Regulatory Capital Structure, (sub. no. 95).
- Deloitte Access Economics 2011, Productivity measures to adjust LPI and AWOTE, Report to the Australian Energy Regulator, 8 November.
- Department of Climate Change and Energy Efficiency (Australian Government) 2012, Fact Sheet: Enhanced Renewable Energy Target. Internet:
<http://210.193.178.189/en/government/initiatives/renewable-target/fs-enhanced-ret.aspx>
- Energy Economics Pty Ltd (Energy Economics)
July 2013, Central Queensland Coal Railing Forecast – Abridged Version.
April 2014, Coal Railings Forecast for Central Queensland.
- Evans & Peck
August 2013, CQC Condition Based Assessment – Initial Assessment – Aurizon Network 2010 Access Undertaking (UT3).
March 2013, CQC Condition Based Assessment, Signal & Train Control System Preliminary Site Inspection Notes.
December 2013, CQC Independent Forecast of Asset Maintenance and Renewal Costs, FY2018–2033, Commercial-in-Confidence
- Freightliner Australia Pty Ltd (Freightliner), October 2013, Aurizon Network 2013 DAU. (sub. no. 75).
- Glencore Xstrata (Glencore)
October 2013, Aurizon Network's 2013 Draft Access Undertaking (UT4), (sub. no. 74).
January 2014, Submission on Aurizon Network's Response to Stakeholders' Submissions, (sub. no. 83).
- Incenta Economic Consulting
November 2013, Aurizon Network: Review of Benchmark Credit Rating and Cost of Debt.
December 2013, Review of Regulatory Capital Structure and Asset/Equity Beta for Aurizon Network.
April 2014, Aurizon Network: Review of Benchmark Credit Rating and Cost of Debt – Response to stakeholder comments.
April 2014, Review of Regulatory Capital Structure and Asset/Equity Beta for Aurizon Network – Response to stakeholder comments.
- Jacobs SKM (formerly Sinclair Knight Merz) Response to Stakeholder Comments
April 2014, Engineering Technical Assessment of Maintenance, Operating and Capital Expenditure Forecast: Response to Stakeholder Comments.
May 2014, Ballast Cleaning and Re Railing.

September 2014, Review of Aurizon Network's Maintenance Cost Index Proposed for the UT4 period, 25 Sep.

North Queensland Bulk Ports Corporation (NQBP) 2014, Cancellation of Declaration for Dudgeon Point Coal Terminals Project, media release, 20 June 2014, <<http://www.nqbp.com.au/media-statement-cancellation-of-declaration-for-dudgeon-point-coal-terminals-project/>>.

Peabody Energy Incorporated (Peabody), October 2013, Submission to the QCA - Aurizon Network 2013 Draft Access Undertaking. (sub. no. 37).

Pearce, DC and Geddes, RS, Statutory Interpretation in Australia (7th Ed, 2011) [12.15]

Queensland Competition Authority (QCA)

December 2000, Statement of Regulatory Pricing Principles for the Water Sector

June 2010, Draft Decision: QR Network's 2010 DAU – Tariffs and Schedule F.

September 2010, Final Decision: QR Network's 2010 DAU.

December 2009, Draft Decision: QR Network's 2009 DAU.

November 2012, Final Decision: Endorsed Variation Event 2012.

December 2012, Final Decision: Aurizon Network's Standard Rail Connection Agreement.

April 2013 (a), Final Approval: Aurizon Network Standard Rail Connection Agreement.

April 2013 (b), Final Decision: Aurizon Network Alternative Standard Access Agreements.

November 2013, Draft Decision: Aurizon Network 2013 Blackwater Electric Traction Pricing Draft Amending Access Undertaking.

November 2002, Rail Access Arbitration Guideline No. 1: Incremental Capacity Consumption Charge.

December 2005, Final Decision: QR's 2005 Draft Access Undertaking.

February 2014, Information Paper: Finance Capital Maintenance and Price Smoothing.

February 2014, Information Paper: Issues in the Application of Annuities.

June 2014, Letter to Aurizon Network regarding Approval of May 2014 Extension DAAU, 12 June.

August 2014, Final Decision, Cost of debt estimation methodology.

August 2014, Final Decision, Cost of capital: market parameters.

Queensland Exploration Council (QEC) 2013, Queensland Exploration Scorecard 2013, section 8, p. 37, <<http://www.queenslandexploration.com.au/wp-content/uploads/2013/10/6373-QEC-Exploration-Scorecard-2013-FA3-LR.pdf>>.

Queensland Resources Council (QRC)

August 2013. Study Funding Agreement. (sub. no. 56).

September 2013. Roche, M 2013, The Importance of Good Policy and Effective Regulation, State of the Sector, vol. 5, no. 3; September Quarter.

October 2013, Main Submission. (sub. no. 46).

October 2013, Intent and Scope, Industry Mark-up. (sub. no. 47).

October 2013, Ringfencing, Industry Mark-up. (sub. no. 48).

October 2013, Ultimate Holding Company Deed, Industry Mark-up. (sub. no. 49).

October 2013, Confidentiality Deed, Template. (sub. no. 50).

October 2013, Negotiation Framework, Industry Mark-up. (sub. no. 51).

- October 2013, Access Agreement: Coal, Industry Mark-up. (sub. no. 52).
- October 2013, Pricing Principles, Industry Mark-up. (sub. no. 53).
- October 2013, Available Capacity Allocation and Management, Industry Mark-up. (sub. no. 54).
- October 2013, Network Development and Expansions, Industry Mark-up. (sub. no. 55),
2013. Tax Ruling, October 2013 (sub. no. 57).
- October 2013, Network Development and Expansions, Comparison to Submission Version. (sub. no. 58).
- October 2013, Connecting Private Infrastructure, Industry Mark-up. (sub. no. 59).
- October 2013, Reporting, Industry Mark-up. (sub. no. 60).
- October 2013, Dispute Resolution and Decision Making, Industry Mark-up. (sub. no. 61).
- October 2013, Schedule E: Regulatory Asset Base, Industry Mark-up. (sub. no. 62).
- October 2013, Schedule F: Reference Tariff, Industry Mark-up. (sub. no. 63).
- October 2013, WACC Submission. (sub. no. 64).
- October 2013, McKenzie, M and Partington, G, Report to Queensland Resources Council, Review of Aurizon Network's Draft Access Undertaking. (sub. no. 65).
- October 2013, Castalia, Report to Queensland Resources Council, Aurizon Access Undertaking: Risk Allocation Analysis. (sub. no. 66).
- October 2013, Operating Expenditure. (sub. no. 67).
- October 2013, Maintenance. (sub. no. 68).
- October 2013, Capital Indicator. (sub. no. 69).
- October 2013, Ballast Fouling. (sub. no. 70).
- October 2013, Depreciation Methodology. (sub. no. 71).
- March 2014, Speech Presented at the Bowen Basin Mining Club Luncheon Event by Michael Roche (Chief Executive), Moranbah, Qld, 27 March.
- January 2014, Submission on Aurizon Network's Response to Industry, (sub. no. 84).
- January 2014, Annexure A – Detailed Response to Undertaking and Schedules (volume 1), (sub. no. 85).
- January 2014, Annexure B – Detailed Response on Standard Agreements, (sub. no. 86).
- January 2014, Annexure C – QRC's Response to Aurizon Network's Partial Update of Part 8, (sub. no. 87).
- January 2014, Annexure D – QRC Mark-Up of Aurizon Network's Revised Part 8 Drafting, (sub. no. 88).
- January 2014, Annexure E – QRC's Table of Omissions, (sub. no. 89).
- January 2014, Letter to QCA – Revised Part 11 Response.
- January 2014, Revised Response Part 11.
- January 2014, Further WACC Submission, (sub. no. 106).
- January 2014, QCA Cost of Capital Consultation, Equity Beta Issues: Further Supplementary Report to the Queensland Resources Council, (sub. no. 107).
- March 2014, RSM Bird Cameron Review of UT4 Operating Expenditure, (sub. no. 110).
- March 2014, UT4 Submission on Maintenance, (sub. no. 111).

April 2014, UT4 Update – Discussion of Consultants' Reports on Aurizon UT4 Costs, (sub. no. 117). [unpublished].

Queensland Treasury and Trade

2014, Queensland Coal Industry, Appendix B to this Draft Decision 'Aurizon Network 2014 Draft Access Undertaking – Maximum Allowable Revenue'.

Budget Paper no.2: Budget Strategy and Outlook 2014–15.

January 2014, Risk Free Rate and MRP Submission, with Letter, (sub. no. 96).

January 2014, Cost of Debt Submission, with Letter, (sub. no. 97).

Rio Tinto Coal Australia (Rio Tinto) (RTCA)

Letter to the QCA, October 2013 (sub. no. 72).

Submission to the Queensland Competition Authority in Response to Aurizon Network Proposed 2013 Draft Access Undertaking (UT4), October 2013 (sub. no. 73).

January 2014, Supplementary Submission to UT4, (sub. no. 90).

RSM Bird Cameron (RSMBC)

January 2014, Aurizon Network's 2013 Draft Access Undertaking: Financial Assessment of Operating Expenditure.

March 2014, Aurizon Network's 2013 Draft Access Undertaking - Financial Assessment of Operating Expenditure - Response to Aurizon Network's Submission, Addendum Report, April 2014 (a).

March 2014, Aurizon Network's 2013 Draft Access Undertaking - Financial Assessment of Operating Expenditure - Response to QRC's Submission, Addendum Report, April 2014 (b).

Sinclair Knight Merz (SKM)

July 2013. Aurizon Network Capital Expenditure 2011–12 Engineering Assessment.

January 2014, Aurizon Network's 2013 Draft Access Undertaking: Engineering Technical Assessment of Maintenance, Operating and Capital Expenditure Forecasts.

February 2014(a), Engineering Technical Assessment of Maintenance, Operating and Capital Expenditure Forecast: Addenda 1.

March 2014, 2013 DAU, File note 22 May.

April 2014, Engineering Technical Assessment of Maintenance, Operating and Capital Expenditure Forecast in Aurizon Network's Draft 2013 Access Undertaking –Updated benchmarking analysis and summary of maintenance cost findings.

September 2014, Review of Aurizon Network's proposed Maintenance Cost Index for the UT4 period.

Stanwell Corporation Limited (Stanwell), October 2013. Aurizon Network - 2013 Draft Access Undertaking. (sub. no. 38).

Unitywater, January 2014, Response to QCA's WACC Report, (sub. no. 98).

Vale

October 2013, Aurizon Network's 2013 Draft Access Undertaking (UT4). (sub. no. 42).

January 2014, Aurizon Network Pty Ltd – 2013 Draft Access Undertaking (UT4): Response to Stakeholder Submissions, (sub. no. 91).

January 2014, QCA Cost of Capital Discussion Papers, (sub. no. 99).

February 2014, 2013 Draft Access Undertaking (UT4): Consultants' Reports - Forecast Expenditure, (sub. no. 113)

Wesfarmers Curragh Pty Ltd (Wesfarmers)

October 2013, Submission in Response to UT4, (sub. no. 76).

January 2014, Submission in Response to Aurizon Network's Response to Industry (UT4), (sub. no. 92).

Queensland Competition Authority (QCA)**Final Decision – Cost of capital: market parameters – August 2014**

- Amihud, Y & Mendelson, H 1986, 'Asset Pricing and the Bid-Ask Spread', *Journal of Financial Economics*, vol. 17, pp. 223–249.
- Andersson, M, Krylova, E, & Vahamaa, S 2008, 'Why Does the Correlation Between Stock and Bond Returns Vary Over Time?', *Applied Financial Economics*, vol. 18, no. 2, pp. 139–151.
- Anglo American 2013, Queensland Competition Authority Pricing Papers, Submission to Queensland Competition Authority, July.
- Anglo American 2014, Anglo American Submission in Relation to the WACC Consultation Papers and WACC Forum, Submission to Queensland Competition Authority, January.
- Arnott, R & Ryan, R 2001, 'The Death of the Risk Premium', *Journal of Portfolio Management*, Spring, pp. 61–74.
- Arnott, R & Bernstein, P 2002, 'What Risk Premium Is "Normal"?', *Financial Analysts Journal*, vol. 58, no. 2, pp. 64–85.
- Asciano 2013, Letter to Queensland Competition Authority, 28 March 2013, viewed 8 February 2014, <[http://www.qca.org.au/getattachment/0e8ef2aa-dc28-4bad-91e1-a91d3535e499/Asciano-\(Apr-13\).aspx](http://www.qca.org.au/getattachment/0e8ef2aa-dc28-4bad-91e1-a91d3535e499/Asciano-(Apr-13).aspx)>.
- Asher, A 2011, 'Equity Risk Premium Survey — Results and Comments', *Actuary Australia*, July, 13–14.
- Ashton, D 1989, 'The Cost of Capital and the Imputation Tax System', *Journal of Business Finance & Accounting*, vol. 16, no. 1, pp. 75-88.
- Ashton, D 1991, 'Corporate Financial Policy: American Analytics and UK Taxation', *Journal of Business Finance & Accounting*, vol. 18, no. 4, pp. 465-482.
- Aurizon Network 2013, 2013 Draft Access Undertaking — Volume 3: Maximum Allowable Revenue and Reference Tariffs, 30 April.
- Aurizon Network 2014, 2013 Draft Access Undertaking: Return on Capital Response — Summary Paper, 20 January.
- Australian Bureau of Statistics 2010, Article – The Global Financial Crisis and Its impact on Australia, 4 June 2010, pp. 687-688, viewed 18 August 2014, <[http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/AC72C92B23B6DF6DCA257737001B2BAB/\\$File/13010_2009_10.pdf](http://www.ausstats.abs.gov.au/Ausstats/subscriber.nsf/0/AC72C92B23B6DF6DCA257737001B2BAB/$File/13010_2009_10.pdf)>.
- Australian Competition and Consumer Commission 2011, Inquiry to Make Final Access Determinations for the Declared Fixed Line Services: Final Report, Public Version, July.
- Australian Competition Tribunal 2010a, Application by Energex Limited (No 2) [2010] ACompT 7, 13 October 2010.
- Australian Competition Tribunal 2010b, Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT 9, 24 December 2010.
- Australian Competition Tribunal 2011, Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9, 12 May.
- Australian Competition Tribunal 2012a, Application by Envestra Ltd (No 2) [2012] ACompT 3, 11 January.

- Australian Competition Tribunal 2012b, Application by WA Gas Networks Pty Ltd (No 3) [2012] ACompT 12, 8 June.
- Australian Competition Tribunal 2012c, Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14, 26 July.
- Australian Energy Regulator 2008, Electricity Transmission and Distribution Network Service Providers: Review of the Weighted Average Cost of Capital (WACC) Parameters — Explanatory Statement, December.
- Australian Energy Regulator 2009, Electricity Transmission and Distribution Network Service Providers: Review of the Weighted Average Cost of Capital (WACC) Parameters — Final Decision, May.
- Australian Energy Regulator 2012, Aurora Energy Pty Ltd 2012–13 to 2016–17 — Final Distribution Determination, Appendixes, April.
- Australian Energy Regulator 2013a, Envestra Ltd 2013–17 — Access Arrangement Final Decision, Part 3: Appendixes, March.
- Australian Energy Regulator 2013b, Consultation Paper: Rate of Return Guidelines, May.
- Australian Energy Regulator 2013c, Better Regulation Explanatory Statement: Draft Rate of Return Guideline, August.
- Australian Energy Regulator 2013d, Better Regulation Explanatory Statement: Rate of Return Guideline, December.
- Australian Energy Regulator 2013e, Better Regulation Explanatory Statement: Rate of Return Guideline (Appendices), December.
- Australian Rail Track Corporation 2013, Risk & the Form of Regulation / Risk-free Rate & Market Risk Premium, ARTC Response to the Authority's Discussion Papers, 28 March.
- Australian Tax Office 2006, Refunding Imputation Credits: Overview, available at <<http://www.ato.gov.au/Business/Imputation/In-detail/Refunding-imputation-credits--Overview/>>, accessed 12 November 2013>.
- Barry, Ross 2013, The Split Cost of Capital, Report for the Queensland Competition Authority by First Principles, 7 November.
- Beggs, D & Skeels, C 2006, 'Market Arbitrage of Cash Dividends and Franking Credits', *Economic Record*, vol. 82, no. 258, pp. 239-252.
- Bernstein, W & Arnott, R 2003, 'Earnings Growth: The Two Percent Dilution', *Financial Analysts Journal*, September / October, pp. 47–55.
- Bishop, S, Fitzsimmons, M & Officer, R 2011, 'Adjusting the Market Risk Premium to Reflect the Global Financial Crisis', *JASSA The Finsia Journal of Applied Finance*, Iss. 1, pp. 8-14.
- Bishop, S & Officer, R 2013a, Review of Debt Risk Premium and Market Risk Premium, Report for Aurizon Network on behalf of Value Adviser Associates, February.
- Bishop, S & Officer, R 2013b, Options for Estimating a Weighted Average Cost of Capital for Water Utilities: A Preliminary Discussion Paper, Draft Report for Unitywater on behalf of Education & Management Consulting Services Pty Ltd, March.

- Bowman, R 2013, Submission on the Risk-free Rate and the Market Risk Premium, viewed 18 February 2014, <[http://www.qca.org.au/getattachment/f98c1894-2a68-4c53-bc11-973d11229507/Dr-Robert-Bowman-Submission-\(Apr-13\).aspx](http://www.qca.org.au/getattachment/f98c1894-2a68-4c53-bc11-973d11229507/Dr-Robert-Bowman-Submission-(Apr-13).aspx)>.
- Boyle, G 2005, 'Risk, Expected Return, and the Cost of Equity Capital', *New Zealand Economic Papers*, vol. 39, no. 2, pp. 181–194.
- Brailsford, T and Easton, S 1991, 'Seasonality in Australian Share Price Indices between 1936 and 1957', *Accounting and Finance*, vol. 31, pp. 69–85.
- Brailsford, T, Handley, J & Maheswaran, K 2008, 'Re-examination of the Historical Equity Risk Premium in Australia', *Accounting and Finance*, vol. 48, pp. 73-97.
- Brailsford, T, Handley, J & Maheswaran, K 2012, 'The Historical Equity Risk Premium in Australia: Post-GFC and 128 Years of Data', *Accounting and Finance*, vol. 52, no. 1, pp. 237-247.
- Brown, P & Clarke, A 1993, 'The Ex-Dividend Day Behaviour of Australian Share Prices Before and After Dividend Imputation', *Australian Journal of Management*, vol. 18, no. 1, pp. 1-40.
- Brown, S, Goetzmann, W & Ross, S 1995, 'Survival', *Journal of Finance*, vol. 50, no. 3, pp. 853-873.
- Cannavan, D, Finn, F & Gray, S 2004, 'The Value of Dividend Imputation Tax Credits in Australia', *Journal of Financial Economics*, vol. 73, pp. 167-197.
- Carleton, W & Lakonishok, J 1985, 'Risk and Return on Equity: The Use and Misuse of Historical Estimates', *Financial Analysts Journal*, vol. 41, no. 1, pp. 38–47, 62.
- Central Intelligence Agency United States, *The World Factbook*, <<https://www.cia.gov/library/publications/the-world-factbook/appendix/appendix-b.html>>, accessed 16 March.
- Chordia, T, Subrahmanyam, A & Anshuman, R 2001, 'Trading Activity and Expected Stock Returns', *Journal of Financial Economics*, vol. 59, pp. 3–32.
- Competition Commission 2013, Northern Ireland Electricity Limited Price Determination, A Reference under Article 15 of the Electricity (Northern Ireland) Order 1992, Provisional Determination, 8 November.
- Competition Economists Group 2012, Internal Consistency of Risk Free Rate and MRP in the CAPM, Report for Envestra, SP AusNet, Multinet, and APA, March.
- Cooper, I & Davydenko, S 2007, 'Estimating the Cost of Risky Debt', *Journal of Applied Corporate Finance*, vol. 19, no. 3, pp. 90–95.
- Cornell, B 1999, *The Equity Risk Premium: The Long Run Future of the Stock Market*, John Wiley & Sons, New York, New York, United States.
- Cowan, S 2004a, 'Utility Regulation and Risk Allocation: The Roles of Marginal Cost Pricing and Futures Markets', *Journal of Regulatory Economics*, vol. 26, no. 1, pp. 23–40.
- Cowan, S 2004b, 'Optimal Risk Allocation for Regulated Monopolies and Consumers', *Journal of Public Economics*, vol. 88, nos. 1–2, pp. 285–303.
- Cummings, J & Frino, A 2008, 'Tax Effects on the Pricing of Australian Stock Index Futures', *Australian Journal of Management*, vol. 33, no. 2, pp. 391-406.
- DBCT Management 2013, DBCTM Submission to the QCA's Cost of Capital Methodology Review, 9 April.

- Davis, K 2005, 'The Systematic Risk of Debt: Australian Evidence', *Australian Economic Papers*, vol. 44, no. 1, pp. 30–46.
- Dimson, E, Marsh, P & Staunton, M 2002, *Triumph of the Optimists*, Princeton University Press: Princeton, New Jersey, United States.
- Dimson, E, Marsh, P & Staunton, M 2003, 'Global Evidence on the Equity Risk Premium', London Business School, Institute of Finance and Accounting Working Paper No. 385, August.
- Dimson, E, Marsh, P & Staunton, M 2013a, *Credit Suisse Global Investment Returns Yearbook 2013*, February.
- Dimson, E, Marsh, P & Staunton, M 2013b, *Credit Suisse Global Investment Returns Sourcebook 2013*, February.
- Dimson, E, Marsh, P & Staunton, M 2014, *Credit Suisse Global Investment Returns Yearbook 2014*, February.
- Economic Regulation Authority Western Australia 2011, *Final Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline*, October.
- Economic Regulation Authority Western Australia 2013a, *Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, 16 December.
- Economic Regulation Authority Western Australia 2013b, *Appendices to the Explanatory Statement for the Rate of Return Guidelines — Meeting the Requirements of the National Gas Rules*, 16 December.
- Elton, E & Gruber, M 1970, 'Marginal Stockholder Tax Rates and the Clientele Effect', *The Review of Economics and Statistics*, vol. 52, no. 1, pp. 68–74.
- Elton, E, Gruber, M & Agrawal, D 2001, 'Explaining the Rate Spread on Corporate Bonds', *Journal of Finance*, vol. 56, no. 1, pp. 247–277.
- Elton, E, Gruber, M, Brown, S & Goetzmann, W 2010, *Modern Portfolio Theory and Investment Analysis*, 8th edition, John Wiley & Sons, Hoboken, New Jersey, United States.
- Ernst & Young 2012, *Market Evidence on the Cost of Equity — Victorian Gas Access Arrangement Review 2013–17*, Report for Envestra, Multinet, SP AusNet, Envestra (Albury), and APA GasNet, 8 November.
- ESQUANT Statistical Consulting 2013, *A Review of NERA's Analysis of McKenzie and Partington's EGARCH Analysis*, Report for Multinet Gas, 9 April.
- Fama, E & French, K 2002, 'The Equity Premium', *Journal of Finance*, vol. 57, no. 2, pp. 637–659.
- Fernandez, P & del Campo, J 2010, 'Market Risk Premium Used in 2010 by Analysts and Companies: A Survey with 2,400 Answers', Working Paper, IESE Business School, University of Navarra, 21 May.
- Fernandez, P, Aguirreamalloa, J, & Corres, L 2011, 'Market Risk Premium Used in 56 Countries in 2011: A Survey with 6,014 Answers', Working Paper, IESE Business School, University of Navarra, 25 April.
- Fernandez, P, Aguirreamalloa, J, & Linares, P 2013, 'Market Risk Premium and Risk Free Rate Used for 51 Countries in 2013: A Survey with 6,237 Answers', Working Paper, IESE Business School, University of Navarra, 26 June.
- Fernandez, P, Aguirreamalloa, J, & Corres, L 2013, 'Market Risk Premium Used in 82 Countries in 2012: A Survey with 7,192 Answers', Working Paper, IESE Business School, University of Navarra, 23 November.

- Feuerherdt, C, Gray, S & Hall, J 2010, 'The Value of Imputation Tax Credits on Australian Hybrid Securities', *International Review of Finance*, vol. 10, no. 3, pp. 365–401.
- French, K, Schwert, G & Stambaugh, R 1987, 'Expected Stock Returns and Volatility', *Journal of Financial Economics*, vol. 19, pp. 3–29.
- Friend, I, Blume, M 1975, 'The Demand for Risky Assets', *American Economic Review*, vol. 65, no. 5, pp. 900–922.
- Gibbard, P 2013, 'Estimating the Market Risk Premium in Regulatory Decisions: Conditional versus Unconditional Estimates', *ACCC/AER Working Paper Series*, Working Paper No. 9, September.
- Glosten, L, Jagannathan, R & Runkle, D 1993, 'On the Relation between the Expected Value and the Volatility of the Nominal Excess Return on Stocks', *Journal of Finance*, vol. 48, no. 5, pp. 1779–1801.
- Gollier, C 2004, *The Economics of Risk and Time*, MIT Press: Cambridge, Massachusetts, United States.
- Gordon, M and Shapiro, E 1956, 'Capital Equipment Analysis: The Required Rate of Profit', *Management Science*, vol. 3, pp. 102–10.
- Graham, J & Harvey, C 2010, *The Equity Risk Premium in 2010*, available <<http://ssrn.com/abstract=1654026>> or <<http://dx.doi.org/10.2139/ssrn.1654026>>.
- Graham, J & Harvey, C 2013, *The Equity Risk Premium in 2013*, NBER Working Paper, available <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2206538>.
- Gray, S 2013, *Regulatory Estimates of the Market Risk Premium*, Powerpoint presentation, WACC workshop at the Queensland Competition Authority, Brisbane, December, available <<http://www.qca.org.au/files/R-SFGC-Presentation-AurizonNetwork2013DAU-CostOfCapital-WACCForum-REMRP-1213.pdf>>.
- Gray, S & Hall, J 2006, 'Relationship between Franking Credits and the Market Risk Premium', *Accounting and Finance*, vol. 46: 405–428.
- Gray, S & Officer, R 2005, *A Review of the Market Risk Premium and Commentary on Two Recent Papers*, Report for the Energy Networks Association, 15 August.
- Gregory, A 2011, 'The Expected Cost of Equity and the Expected Risk Premium in the UK', *Review of Behavioral Finance*, vol. 3, pp. 1–26.
- Gregory, A 2012, *The AER Approach to Establishing the Cost of Equity — Analysis of the Method Used to Establish the Risk Free Rate and the Market Risk Premium*, Report for Envestra, Multinet, SP AusNet and APA GasNet, 5 November.
- Hall, J 2007, 'Comment on Regulation and the Term of the Risk Free Rate: Implications of Corporate Debt', *Accounting Research Journal*, vol. 20, no. 2, pp. 81–86.
- Handley, J 2008, *A Note on the Valuation of Imputation Credits*, Report (Final) for the Australian Energy Regulator, 12 November.
- Handley, J 2010a, *On the Estimation of Gamma*, Report for the Australian Energy Regulator, 19 March.
- Handley, J 2010b, *Further Issues Relating to the Estimation of Gamma*, Report for the Australian Energy Regulator — Final, 26 October.
- Handley, J 2012, *An Estimate of the Historical Equity Risk Premium for the Period 1883 to 2011*, Report for the Australian Energy Regulator, April.

- Handley, J & Maheswaran, K 2008, 'A Measure of the Efficiency of the Australian Imputation Tax System', *The Economic Record*, vol. 84, no. 264, pp. 82–94.
- Hathaway, N 2010, *Imputation Credit Redemption - ATO Data 1998-2008*, Report on behalf of United Energy, Citipower and Powercor, Capital Research Pty Ltd, July.
- Hathaway, N 2013, *Imputation Credit Redemption: ATO Data 1988-2011 - Where Have All the Credits Gone?*, Capital Research Pty Ltd, Report for the Energy Networks Association, September.
- Hathaway, N & Officer, R 1999, 'The Value of Imputation Tax Credits', Working Paper, Finance Research Group, Melbourne School of Business.
- Hathaway, N & Officer, R 2004, *The Value of Imputation Tax Credits - Update 2004*, Capital Research Pty Ltd, November.
- Incenta Economic Consulting 2013a, *Term of the Risk Free Rate for the Cost of Equity*, Report for the Energy Networks Association, June.
- Incenta Economic Consulting 2013b, *Aurizon Network: Review of Benchmark Credit Rating and Cost of Debt*, Report for the Queensland Competition Authority, November.
- Independent Pricing and Regulatory Tribunal 2011a, *Review of Prices for the Water Administration Ministerial Corporation: For the NSW Office of Water - from 1 July 2011*, Water – Final Report, February.
- Independent Pricing and Regulatory Tribunal 2011b, *Review of Imputation Credits (Gamma): Analysis and Policy Development - Discussion Paper*, December.
- Independent Pricing and Regulatory Tribunal 2011c, *Review of Water Prices for Sydney Desalination Plant Pty Limited, From 1 July 2012: Water - Final Report*, December.
- Independent Pricing and Regulatory Tribunal 2012, *Review of Imputation Credits (Gamma): Research — Final Decision*, March.
- Independent Pricing and Regulatory Tribunal 2013a, *WACC Methodology: Research — Draft Report*, September.
- Independent Pricing and Regulatory Tribunal 2013b, *Review of WACC Methodology: Research — Final Report*, December.
- Jorion, P & Goetzmann, W 1999, 'Global Stock Markets in the Twentieth Century', *Journal of Finance*, vol. 54, no. 3, pp. 953–980.
- Kalay, A 1982, 'The Ex-Dividend Day Behavior of Stock Prices: A Re-Examination of the Clientele Effect', *The Journal of Finance*, vol.37, no. 4, pp. 1059–1070.
- KPMG 2005, *Cost of Capital — Market Practice in Relation to Imputation Credits*, Victorian Electricity Distribution Price Review 2006–10, Report for Powercor, Citipower, SP AusNet, United Energy, and the Australian Gas Light Company, August.
- KPMG (2013). *Corporate Finance Valuation Practices Survey 2013*, available at <http://www.kpmg.com/au/en/issuesandinsights/articlespublications/valuation-practices-survey/pages/valuation-practices-survey-2013.aspx>.
- Lally, M 1992, 'The CAPM Under Dividend Imputation', *Pacific Accounting Review*, vol. 4, no. 1, pp. 31–44.

- Lally, M 2000, *The Cost of Equity Capital and Its Estimation*, McGraw-Hill Series in Advanced Finance, vol. 3, Brailsford, T and Faff, R (eds.), McGraw-Hill Book Company Australia Pty Limited: Roseville, New South Wales, Australia.
- Lally, M 2004a, *The Cost of Capital for Regulated Entities*, Report for the Queensland Competition Authority, February.
- Lally, M 2004b, 'Regulation and the Choice of the Risk Free Rate', *Accounting Research Journal*, vol. 17, no. 1, pp. 18-23.
- Lally, M 2006, 'Regulatory Revenues and the Choice of CAPM: Australia Versus New Zealand', *Australian Journal of Management*, vol.31, no. 2, pp. 313–331.
- Lally, M 2007a, 'Regulation and the Term of the Risk Free Rate: Implications of Corporate Debt', *Accounting Research Journal*, vol. 20, no. 2, pp. 73–80.
- Lally, M 2007b, 'Rejoinder: Regulation and the Term of the Risk Free Rate: Implications of Corporate Debt', *Accounting Research Journal*, vol. 20, no. 2, pp. 87–88.
- Lally, M 2008, 'Relationship between Franking Credits and the Market Risk Premium: A Comment', *Accounting and Finance*, vol. 48: 143–151.
- Lally, M 2010, *The Appropriate Term for the Risk Free Rate and the Debt Margin*, Report for the Queensland Competition Authority, 27 April.
- Lally, M 2012a, *The Cost of Equity and the Market Risk Premium*, Report for the Australian Energy Regulator, 25 July.
- Lally, M 2012b, *The Risk Free Rate and the Present Value Principle*, Report for the Australian Energy Regulator, 22 August.
- Lally, M 2012c, *The Risk Free Rate and the Market Risk Premium*, Report for the Queensland Competition Authority, 23 August.
- Lally, M 2012d, *The Estimated Utilisation Rate for Imputation Credits*, Report for the Queensland Competition Authority, 12 December.
- Lally, M 2013a, *Review of the AER's Methodology for the Risk Free Rate and the Market Risk Premium*, Report for the Australian Energy Regulator, 4 March.
- Lally, M 2013b, *The Dividend Growth Model*, Report for the Australian Energy Regulator, 4 March.
- Lally, M 2013c, *Response to Submissions on the Risk-free Rate and the MRP*, Report for the Queensland Competition Authority, 22 October.
- Lally, M 2013d, *Estimating Gamma*, Report for the Queensland Competition Authority, 25 November.
- Lally, M 2013e, *Review of the AER's Proposed Dividend Growth Model*, Report for the Australian Energy Regulator, 16 December.
- Lally, M 2014a, *Review of Submissions to the QCA on the MRP, Risk-Free Rate and Gamma*, Report for the Queensland Competition Authority, 12 March.
- Lally, M 2014b, *The Relationship Between the Cost of Equity Capital Inclusive and Exclusive of Imputation Credits*, Capital Financial Consultants, 1 April.
- Lally, M & Randal, J 2012, 'Estimating the Market Risk Premium Using Data from Multiple Markets', Working paper, Victoria University of Wellington.

- Lally, M & van Zijl, T 2003, 'Capital Gains Tax and the Capital Asset Pricing Model', *Accounting and Finance*, vol.43, pp. 187-210.
- Lamberton, D 1958, *Share Price Indices in Australia*, Law Book Company of Australasia, Sydney, New South Wales, Australia.
- Lettau, M & Ludvigson, S 2001, 'Consumption, Aggregate Wealth, and Expected Stock Returns', *Journal of Finance*, vol. 56, no. 3, pp. 815–849.
- Li, H & Xu, Y 2002, 'Survival Bias and the Equity Premium Puzzle', *Journal of Finance*, vol. 47, pp. 1981–1995.
- Marshall, W, Yawitz, J & Greenberg, E 1981, 'Optimal Regulation Under Uncertainty', *Journal of Finance*, vol. 36, no. 4, pp. 909-921.
- McKenzie, M & Partington, G 2010, *Evidence and Submissions on Gamma*, Report to the AER on behalf of the Securities Industry Research Centre of Asia-Pacific (SIRCA) Ltd, 25 March.
- McKenzie, M & Partington, G 2012, *Supplementary Report on the Equity Risk Premium*, Report to the AER on behalf of the Securities Industry Research Centre of Asia-Pacific (SIRCA) Ltd, 22 February.
- McKenzie, M & Partington, G 2013a, *Review of the AER's Overall Approach to the Risk Free Rate and Market Risk Premium*, Report to the AER on behalf of the Securities Industry Research Centre of Asia-Pacific (SIRCA) Ltd, 28 February.
- McKenzie, M & Partington, G 2013b, *Review of Aurizon Network's Draft Access Undertaking*, Report to Queensland Resources Council, 5 October.
- Mehra, R 2003, 'The Equity Premium: Why Is It a Puzzle?', *Financial Analysts Journal*, vol. 59, no. 1, pp. 54–69.
- Mendenhall, W, Scheaffer, R, & Wackerly, D 1986, *Mathematical Statistics with Applications*, 3rd edition, Duxbury Press, Boston, Massachusetts, United States.
- Merton, R 1973, 'An Intertemporal Capital Asset Pricing Model', *Econometrica*, vol. 41, no. 5, pp. 867–887.
- Merton, R 1980, 'On Estimating the Expected Return on the Market: An Exploratory Investigation', *Journal of Financial Economics*, vol. 8, pp. 323–361.
- Michaely, R & Vila, J-L 1995, 'Investors' Heterogeneity, Prices and Volume Around the Ex-Dividend Day', *Journal of Financial and Quantitative Analysis*, vol. 30, no. 2, pp. 171–198.
- Monkhouse, P 1993, 'The Cost of Equity Under the Australian Dividend Imputation System', *Accounting and Finance*, vol. 33, no. 2, pp. 1-18.
- Mossin, J 1966, 'Equilibrium in a Capital Asset Market', *Econometrica*, vol. 34, no. 4, pp. 768-783.
- Nelson, N, Ferrarone, C & McGuire, J 2012, 'Implied Equity Risk Premium', UBS Global Investment Strategy, October.
- NERA 2007, *Absolute Bias in (Nominal) Commonwealth Government Securities*, 7 June.
- NERA 2013a, *The Cost of Equity for a Regulated Energy Utility: A Response to the QCA Discussion Paper on the Risk-Free Rate and the MRP*, Report for United Energy and Multinet Gas, March.
- NERA 2013b, *The Market Size and Value Premiums*, Report for the Energy Networks Association, June.
- NERA 2013c, *The Payout Ratio*, Report for the Energy Networks Association, June.

- NERA 2013d, Imputation Credits and Equity Prices and Returns, Report for the Energy Networks Association, October.
- Officer, R 1994, 'The Cost of Capital of a Company Under an Imputation Tax System', *Accounting and Finance*, vol. 34, pp. 1-17.
- Officer, R & Bishop, S 2008, Term of Risk Free Rate - Commentary, Report for Energy Networks Association, Australian Pipeline Industry Association and Grid Australia, September.
- Ofwat 2014, Setting Price Controls for 2015–20 — Risk and Reward Guidance, January.
- Origin Energy Retail Ltd 2013, Submission on Discussion Paper: The Risk Free Rate and the Market Risk Premium, 28 March.
- Pastor, L & Stambaugh, R 2001, 'The Equity Premium and Structural Breaks', *Journal of Finance*, vol. 56, no. 4, pp. 1207–1239.
- Patterson, C 1995, *The Cost of Capital: Theory and Estimation*, Quorum Books, Westport, Connecticut.
- Pindyck, R & Rubinfeld, D 1991, *Econometric Models and Economic Forecasts*, 3rd edition, McGraw-Hill, Inc., New York, New York, United States.
- PricewaterhouseCoopers Australia 2013, A Cost of Debt Estimation Methodology for Businesses Regulated by the Queensland Competition Authority, Report for the Queensland Competition Authority, June.
- Productivity Commission 2004, Review of the Gas Access Regime, Productivity Commission Inquiry Report No. 31, Canberra, 11 June.
- Queensland Competition Authority 2000, Draft Decision on QR's Draft Undertaking, Volume 3 – Reference Tariffs, December.
- Queensland Competition Authority 2004, Dalrymple Bay Coal Terminal Draft Access Undertaking: Draft Decision, October.
- Queensland Competition Authority 2005, QR's 2005 Draft Access Undertaking: Draft Decision, July.
- Queensland Competition Authority 2010a, QR Network's 2010 DAU - Tariffs and Schedule F: Draft Decision, June.
- Queensland Competition Authority 2010b, Dalrymple Bay Coal Terminal 2010 Draft Access Undertaking — Final Decision, September.
- Queensland Competition Authority 2011, SEQ Interim Price Monitoring for 2010/11, Part B – Detailed Assessment, March.
- Queensland Competition Authority 2012a, SunWater Irrigation Price Review: 2012-17, Volume 1 - Final Report, May.
- Queensland Competition Authority 2012b, The Risk-free Rate and the Market Risk Premium - Discussion Paper, November.
- Queensland Competition Authority 2012c, Risk and the Form of Regulation - Discussion Paper, November.
- Queensland Competition Authority 2013a, 'UT4 WACC Averaging Period', Letter to Aurizon Network, 23 August 2013, viewed 19 December 2013, <<http://www.qca.org.au/files/R-QCA-letter-AurizonNetworkReUT4AveragingPeriod-1113.pdf>>.

- Queensland Competition Authority 2013b, Statement of Regulatory Pricing Principles, Final Report, August.
- Queensland Competition Authority 2014a, The Split Cost of Capital Concept: Information Paper, February.
- Queensland Competition Authority 2014b, Financial Capital Maintenance and Price Smoothing: Information Paper, February.
- Queensland Competition Authority 2014c, Issues in the Application of Annuities: Information Paper, February.
- Queensland Competition Authority 2014d, Trailing Average Cost of Debt: Issues Paper, March.
- Queensland Competition Authority 2014e, Cost of Debt Estimation Methodology, Final Decision Paper, August.
- Queensland Competition Authority 2014f, Trailing Average Cost of Debt, Draft Decision Paper, August.
- Queensland Resources Council 2013a, The Risk Free Rate and the Market Risk Premium, QRC Submission to the QCA, March.
- Queensland Resources Council 2013b, QRC's WACC Submission, Annex to QRC Main Submission on Aurizon Network's Draft 2013 Undertaking, 10 October.
- Queensland Resources Council 2014, Further WACC Submission: QRC Response to QCA WACC Consultation Papers, Submission to Queensland Competition Authority, January.
- Queensland Treasury Corporation 2013, The Risk-Free Rate and the Market Risk Premium, Submission to the Queensland Competition Authority, 28 March.
- Queensland Treasury Corporation 2014, The Risk-Free Rate and the Market Risk Premium, Second Submission to the Queensland Competition Authority, 20 January.
- Queensland Treasury and Trade 2013, Letter to Queensland Competition Authority, 15 April 2013, viewed 3 February 2014, <[http://www.qca.org.au/getattachment/c7befc4e-7426-40ac-8981-908fcd164229/Queensland-Treasury-and-Trade-\(Apr-13\).aspx](http://www.qca.org.au/getattachment/c7befc4e-7426-40ac-8981-908fcd164229/Queensland-Treasury-and-Trade-(Apr-13).aspx)>.
- Queensland Urban Utilities 2013, Letter to Queensland Competition Authority, 28 March 2013, viewed 8 February 2014, <[http://www.qca.org.au/getattachment/05e48f7b-4c2b-44c4-8c83-57dfefec718e/Queensland-Urban-Utilities-\(Apr-13\)\).aspx](http://www.qca.org.au/getattachment/05e48f7b-4c2b-44c4-8c83-57dfefec718e/Queensland-Urban-Utilities-(Apr-13)).aspx)>.
- Reserve Bank of Australia 1999, 'Six Years of Inflation Targeting', Reserve Bank of Australia Bulletin, May, viewed 24 March 2014, <<http://www.rba.gov.au/publications/bulletin/1999/may/pdf/bu-0599-2.pdf>>.
- Reserve Bank of Australia 2012, 'The Commonwealth Government Securities Market', Letter to Australian Competition & Consumer Commission, 16 July 2012.
- Reserve Bank of Australia 2013, Statement on the Conduct of Monetary Policy, viewed 2 May 2014, <http://www.rba.gov.au/monetary-policy/framework/stmt-conduct-mp-6-24102013.html>.
- Reserve Bank of Australia 2014, The Australian Economy and Financial Markets, Chart Pack, August.
- Rio Tinto Coal Australia Limited Pty 2013, Submission to the QCA's Cost of Capital Methodology Review, 29 March.

- Schmalensee, R 1989, 'An Expository Note on Depreciation and Profitability Under Rate-of-Return Regulation', *Journal of Regulatory Economics*, vol. 1, pp. 293-298.
- Siegel, J 1992, 'The Equity Premium: Stock and Bond Returns Since 1802', *Financial Analysts Journal*, vol. 48, no. 1, pp. 28-38, 46.
- Siegel, J 1998, *Stocks for the Long Run*, 2nd edition, McGraw Hill.
- Siegel, J 1999, 'The Shrinking Equity Premium: Historical Facts and Future Forecasts', *Journal of Portfolio Management*, pp. 10-17, Fall.
- Solnik, B 1974, 'An Equilibrium Model of the International Capital Market', *Journal of Economic Theory*, vol. 8, pp. 500-524.
- Strategic Finance Group Consulting 2011, *Dividend Drop-off Estimate of Theta: Final Report, Re: Application by Energex Limited (No 2) [2010] ACompT7, Report for the Australian Competition Tribunal*, 21 March.
- Strategic Finance Group Consulting 2012a, *Estimating Gamma, Report for QR National, Annex D to Aurizon Network 2013 Draft Access Undertaking*, 25 January.
- Strategic Finance Group Consulting 2012b, *Term to Maturity of the Risk Free Rate Estimate in the Regulated Return, Annex C to Aurizon Network 2013 Draft Access Undertaking*, 29 August.
- Strategic Finance Group Consulting 2013a, *Testing the Reasonableness of the Regulatory Allowance for the Return on Equity, Annex A to Aurizon Network 2013 Draft Access Undertaking*, 11 March.
- Strategic Finance Group Consulting 2013b, *Response to the QCA Discussion Paper on Risk-free Rate and Market Risk Premium, Report for Aurizon Ltd*, 19 March.
- Strategic Finance Group Consulting 2013c, *Response to the QCA Approach to Setting the Risk-free Rate, Report for Aurizon Ltd.*, 25 March.
- Strategic Finance Group Consulting 2013d, *Response to the QCA Discussion Paper on Risk-free Rate and Market Risk Premium, Report for Unitywater and Queensland Urban Utilities*, 25 March.
- Strategic Finance Group Consulting 2013e, *Response to the QCA Approach to Setting the Risk-free Rate, Report for Unitywater and Queensland Urban Utilities*, 25 March.
- Strategic Finance Group Consulting 2013f, *Updated Dividend Drop-off Estimate of Theta, Report for the Energy Networks Association*, 7 June.
- Strategic Finance Group Consulting 2013g, *Evidence on the Required Return on Equity from Independent Expert Reports, Report for the Energy Networks Association*, 24 June.
- Strategic Finance Group Consulting 2013h, *Using Market Data to Estimate the Equilibrium Value of Distributed Imputation Tax Credits, Report for the Energy Networks Association*, 3 October.
- Strategic Finance Group Consulting 2013i, *Cost of Equity Estimates Implied by Analyst Forecasts and the Dividend Discount Model, Report for Citipower, Powercor, United Energy, SP AusNet and Jemena*, 18 October.
- Strategic Finance Group Consulting 2014a, *An Appropriate Regulatory Estimate of the Market Risk Premium, Report for Aurizon Ltd*, 16 January.
- Strategic Finance Group Consulting 2014b, *An Appropriate Regulatory Estimate of Gamma, Report for Aurizon Ltd*, 16 January.

- Strategic Finance Group Consulting 2014c, Estimating Gamma, Report for Aurizon Network, 6 March.
- Treasury 2012, The Commonwealth Government Securities Market, Letter to Australian Competition and Consumer Commission, 18 July.
- Treasury 2013, Mid-Year Economic and Fiscal Outlook 2013–14, December.
- Truong, G, Partington, G & Peat, M 2008, 'Cost-of-Capital Estimation and Capital-Budgeting Practice in Australia', *Australian Journal of Management*, vol.33, no. 1, pp. 95-121.
- Unitywater 2013, Letter to Queensland Competition Authority, 28 March 2013, viewed 8 February 2014, <[http://www.qca.org.au/getattachment/2d5ae3b0-7282-46a2-94f8-4ca6ed052fce/Unity-Water-\(Apr-13\).aspx](http://www.qca.org.au/getattachment/2d5ae3b0-7282-46a2-94f8-4ca6ed052fce/Unity-Water-(Apr-13).aspx)>.
- Vale 2013, Letter to Queensland Competition Authority, 28 March 2013, viewed 8 February 2014, <[http://www.qca.org.au/getattachment/f81d09e3-55d6-4ba5-934b-83db545345ea/Vale-\(Apr-13\).aspx](http://www.qca.org.au/getattachment/f81d09e3-55d6-4ba5-934b-83db545345ea/Vale-(Apr-13).aspx)>.
- Vo, D, Gellard, B & Mero, S 2013, 'Estimating the Market Value of Franking Credits: Empirical Evidence from Australia', Working Paper, April.
- Vo, D, Mero, S, Gellard, B & Sarawat, R 2013, 'Is There a Relationship Between the Risk-free Rate and the Market Risk Premium in Australia? Empirical Evidence', Working Paper, April.
- Welch, I & Goyal, A 2008, 'A Comprehensive Look at the Empirical Performance of Equity Premium Prediction', *Review of Financial Studies*, vol. 21, no. 4, pp. 1455–1508.
- Wright, S 2012a, Review of Risk Free Rate and Cost of Equity Estimates: A Comparison of UK Approaches with the AER, Report for APT Petroleum Pipeline, APA GasNet (Australia) Operations and SPI Networks (Gas), 25 October.
- Wright, S 2012b, Response to Professor Lally's Analysis, Report for APT Petroleum Pipeline, APA GasNet (Australia) Operations and SPI Networks (Gas), 2 November.
- Wright, S, Mason, R & Miles, D 2003, A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the U.K., Report on behalf of Smithers & Co Ltd, 13 February.

Queensland Competition Authority**Final Decision - Cost of Debt estimation methodology - August 2014**

- Allen Consulting Group 2004, Debt and Equity Raising Transaction Costs - Final Report, Report to the Australian Competition and Consumer Commission, December.
- Anglo American Metallurgical Coal Pty Ltd 2014, Submission to Queensland Competition Authority re: PwC's Discussion Paper on Cost of Debt Methodology for Businesses Regulated by the Queensland Competition Authority, January.
- Arsov, I, Brooks, M and Kosev, M 2013, New Measures of Australian Corporate Credit Spreads, RBA Bulletin, December.
- Australian Competition and Consumer Commission 2002, GasNet Australia: Access Arrangement Revisions for the Principal Transmission System, Final Decision, November.
- Australian Competition Tribunal 2012a, Application by Envestra Limited (No 2) [2012] ACompT 4 (11 January 2012).
- Australian Competition Tribunal 2012b, Application by APT Allgas Energy Limited (No 2) [2012] ACompT 5 (11 January 2012).
- Australian Competition Tribunal 2012c, Application by WA Gas Networks Pty Ltd (No 3) [2012] ACompT 12 (8 June 2012).
- Australian Competition Tribunal 2012d, Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14 (26 July 2012).
- Australian Energy Regulator 2012, ElectraNet - Transmission determination 2013-14 to 2017-18, Draft decision, November.
- Australian Energy Regulator 2013a, Better Regulation: Rate of Return Guideline, December.
- Australian Energy Regulator 2013b, Better Regulation: Explanatory Statement, Rate of Return Guideline, December.
- Australian Energy Regulator 2014, Return on debt: Choice of third party data service provider, Issues Paper, April.
- Davis, K 2010, Determining Debt Costs in Access Pricing: A Report to IPART, December.
- Economic Regulation Authority Western Australia 2011a, Draft Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline, March.
- Economic Regulation Authority Western Australia 2011b, Final Decision on Proposed Revisions to the Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline, October.
- Economic Regulation Authority Western Australia 2013, Explanatory Statement for the Rate of Return Guideline - Meeting the requirements of the National Gas Rules, December.
- Essential Services Commission 2002a, Review of Gas Access Arrangements: Draft Decision, July.
- Essential Services Commission 2002b, Review of Gas Access Arrangements: Final Decision, October.
- Franks, J, Lally, M, and Myers, S 2008, Recommendations to the New Zealand Commerce Commission on an Appropriate Cost of Capital Methodology, Report prepared for the New Zealand Commerce Commission, December.

- Incenta Economic Consulting 2013, Aurizon Network: Review of Benchmark Credit Rating and Cost of Debt for Aurizon Network, Report to the Queensland Competition Authority, November.
- Independent Pricing and Regulatory Tribunal 2010, IPART's Weighted Average Cost of Capital: Research - Final Decision, April.
- Independent Pricing and Regulatory Tribunal 2011a, Developing the Approach to Estimating the Debt Margin: Other Industries - Draft Decision, February.
- Independent Pricing and Regulatory Tribunal 2011b, Developing the Approach to Estimating the Debt Margin: Other Industries - Final Decision, April.
- Independent Pricing and Regulatory Tribunal 2013a, WACC Methodology, Research - Draft Report, September.
- Independent Pricing and Regulatory Tribunal 2013b, Review of WACC Methodology, Final Report, December.
- Independent Pricing and Regulatory Tribunal 2014a, New Approach to Estimating the Cost of Debt - Use of the RBAs Corporate Credit Spreads, Fact Sheet, February.
- Independent Pricing and Regulatory Tribunal 2014b, WACC - IPART's New Approach to Estimating the Cost of Debt, Fact Sheet, April.
- Independent Pricing and Regulatory Tribunal 2014c, Essential Energy's water and sewerage services in Broken Hill - Review of prices from 1 July 2014 to 30 June 2018, June.
- PricewaterhouseCoopers 2011, Powerlink - Debt and equity raising costs, April.
- PricewaterhouseCoopers 2013a, Cost of debt for SEQ distribution-retail water and wastewater entities, report prepared for the Queensland Competition Authority, February.
- PricewaterhouseCoopers 2013b, A cost of debt methodology for businesses regulated by the Queensland Competition Authority, report prepared for the Queensland Competition Authority, June.
- PricewaterhouseCoopers 2013c, Cost of capital for PR14: Methodological considerations, July.
- Queensland Competition Authority 2011, SEQ Interim Price Monitoring for 2010/11 Final Report - Part B - Detailed Assessment, March.
- Queensland Competition Authority 2014a, Trailing Average Cost of Debt, Issues Paper, March.
- Queensland Competition Authority 2014b, Trailing Average Cost of Debt, Draft Decision Paper, August.
- Queensland Treasury Corporation 2014a, Submission to the Queensland Competition Authority re: PwC's Discussion Paper on Cost of Debt Methodology for Businesses Regulated by the Queensland Competition Authority, January.
- Queensland Treasury Corporation 2014b, Submission to the Queensland Competition Authority re: Trailing Average Cost of Debt Issues Paper, April.
- Unitywater 2014a, Submission to Queensland Competition Authority re: PwC's Discussion Paper on Cost of Debt Methodology for Businesses Regulated by the Queensland Competition Authority, April.
- Unitywater 2014b, Submission to Queensland Competition Authority re: Trailing Average Cost of Debt Issues Paper, April.