PUBLIC VERSION

Draft Decision on Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline

Submitted by Goldfield Gas Transmission Pty Ltd

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Economic Regulation Authority
WESTERN AUSTRALIA

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Economic Regulation Authority
Perth, Western Australia
Phone: (08) 6557 7900

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Draft Decision

Background

1. On 15 August 2014, Goldfields Gas Transmission Pty Ltd (**GGT**) submitted to the Economic Regulation Authority (Authority) its proposed revisions to the access arrangement for the Goldfields Gas Pipeline (**GGP**). The proposed revised access arrangement covers the period 1 January 2015 to 31 December 2019 (herein referred to as **AA3**, or the third access arrangement period). The proposed revised access arrangement is applicable to the covered pipeline, which excludes uncovered expansions of the GGP.

2. The role of the Authority is to approve or not approve the proposed access arrangement revisions in accordance with the requirements of the National Gas Law (**NGL**) and National Gas Rules (**NGR**) as implemented in Western Australia by the *National Gas Access (WA) Act 2009* (**NGL(WA)**). GGP's first access arrangement and revisions to the GGP access arrangement for the second access arrangement period were considered under the *National Third Party Access Code for National Pipeline Systems* (**Code**).

3. The access arrangement revision proposal was submitted by GGT pursuant to rule 52 of the NGR and comprises a proposed revised access arrangement and revised access arrangement information. GGT also made several submissions of supporting information to the Authority with and following the submission of the access arrangement revision proposal. These submissions were made during the course of the Authority's assessment. The proposed revised access arrangement, access arrangement information and access arrangement supporting information (except for confidential information which is redacted) are available on the Authority's website.

4. The Authority notes that the current access arrangement has a review submission date of 1 January 2014, which means that GGT would have had to lodge its access arrangement proposal to the Authority on or before this date.[1] However, as a result of the amendment to rule 87 of the NGR by the Australian Energy Market Commission (**AEMC**) in 2012, the Authority was required to exercise its power under rule 52(3) of the NGR to extend the period for GGT to submit its access arrangement proposal. Furthermore, clause 35 of schedule 1 to the NGR, extended the period for GGT to submit its access arrangement proposal to six months after the date on which the Authority's Rate of Return Guidelines were published. A notice to this effect was published concurrently with the Authority's Rate of Return Guidelines on 16 December 2013.[2]

5. However, on 13 June 2014, the Authority approved a request by GGT to extend the date for submission of proposed revisions to the GGP access arrangement from 16 June 2014 to 15 August 2014. The Authority granted the extension to allow GGT to complete work that it had deferred, pending the Authority's decision on 30 May 2014 regarding GGT's election to treat an expansion of the GGP as not part of the covered pipeline.

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1 Economic Regulation Authority, *Access Arrangement for the Goldfields Gas Pipeline*, 30 March 2012.

2 Economic Regulation Authority, *Notice, Final Guidelines, Rate of Return Guidelines for Gas Transmission and Distribution Networks*, 17 December 2013.

6. GGT's current access arrangement (also referred to as **AA2**, or the second access arrangement) applies until a revised access arrangement is approved by the Authority.

7. The purpose of an access arrangement is to provide details regarding the terms and conditions, including price, upon which an independent third party user can gain access to the GGP for the purpose of transporting gas.

8. The Authority invited submissions from interested parties on the revised access arrangement by publishing an initiating notice on 5 September 2014. On 3 November 2014, the Authority published an Issues Paper in order to assist interested parties with understanding some of the significant issues to be addressed by the Authority in determining whether to approve or not to approve the proposed revised access arrangement. Interested parties were invited to make submissions on GGT's proposed revised access arrangement proposal for the GGP Access Arrangement Proposal by 17 November 2014.

9. The following parties provided submissions on GGT's proposed revised GGP access arrangement by the closing date:

   - BHP Billiton Limited (**BHPB**)
   - Santos (BOL) Pty Ltd (**Santos**)

10. The Authority also accepted further submissions after the closing date from:

    - GGT (in response to BHPB's submission)
    - BHPB (in response to GGT's further submission)

11. The submissions from these parties can be found on the Authority's website.

12. As required by rule 59(1) of the NGR and section 65(a) of the NGL (WA), in arriving at this Draft Decision the Authority has considered the public submissions that it received in response to its Issues Paper. The details of the public submissions that were received and considered by the Authority are set out in this Draft Decision.

13. Under rule 59 of the NGR, the Authority is required to make a Draft Decision that indicates whether the Authority is prepared to approve the access arrangement revision proposal as submitted and, if not, the nature of amendments that are required in order to make the proposal acceptable to the Authority. An access arrangement Draft Decision must include a statement of the reasons for the decision.

14. After considering submissions received from interested parties and advice from its technical advisor, Energy Market Consulting associates (**EMCa**), and its economic advisor, Associate Professor Martin Lally, the Draft Decision of the Authority is to not approve the access arrangement revision proposal. The Authority's reasons for not approving the access arrangement revision proposal are set out in this Draft Decision.

15. A consolidated list of the amendments that are required to be made to the proposed revised access arrangement revisions before the Authority will approve it are listed in Appendix 1. For the purposes of clarity, the required amendments are also indicated in the reasons for this Draft Decision at the point at which each relevant element of the proposed revised access arrangement is considered.

16. Under rule 59(3) of the NGR, the Authority is required to fix a period (revision period) within which GGT may, under rule 60, submit additions or other amendments to the access arrangement revisions proposal to address matters raised in this Draft Decision. The Authority fixes the revision period to be approximately six weeks from the date of this Draft Decision, expiring at 4.00 pm Western Standard Time (**WST**) on Friday, 29 January 2016.

17. The Authority also invites submissions on this Draft Decision for a period of 20 business days following the revision period allowed to GGT, consistent with the requirements of rule 59(5)(iii) of the NGR. The closing date for submissions is 4:00 pm WST on Friday, 26 February 2016.

18. Under rule 62 of the NGR, the Authority will consider any submissions received on this Draft Decision and make a final decision to approve, or to not approve, the proposed revised access arrangement (or proposed revised access arrangement revisions if submitted by GGT).

Overview

19. The GGP has been a regulated pipeline for third party access since its construction in 1996 by the Goldfields Gas Transmission Joint Venture (**GGTJV**). The first access arrangement for the GGP was approved by the Authority's predecessor, the Office of Gas Access Regulation under the Code. A subsequent access arrangement was made for the GGP under the Code for the second access arrangement period.

20. The GGP transports gas from gas fields in the Carnarvon basin and the North West Shelf to mining customers in the Pilbara, Murchison and Goldfields regions of Western Australia for industrial use and power generation.

21. The GGP is a pipeline with covered (regulated) users and uncovered (unregulated) users. Uncovered capacity consists of expansions that have not been covered by the access arrangement. Expansions of the pipeline are additional assets which lead to increased capacity of the pipeline, as opposed to extensions of the pipeline which extends the geographic range of the pipeline.

22. The regulated users of the GGP use the mainline (1,378 km in length) running from Yarraloola to Kalgoorlie, and a lateral pipeline 47 km in length extending from the mainline to Newman.[3]

23. The GGP's total gas transmission capacity is currently 200 TJ/day[4]:

    - 109 TJ/day capacity provided by the covered portion of the pipeline; and
    - 91 TJ/day capacity provided by the uncovered portions of the pipeline.

24. The construction of the GGP was completed in 1996 by the GGTJV. The original joint venture participants were a consortium of mining companies, including: Westminco Oil Pty Ltd; Normandy Pipelines Pty Ltd; and BHP Minerals Pty Ltd. The current joint venture participants, and their shares in the GGTJV are: Southern

[3] APA Group, http://www.apa.com.au/our-business/energy-infrastructure/western-australia.aspx, 23 October 2014.

[4] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal*, 15 August, 2014, p. 3.

Cross Pipelines Australia Pty Ltd (62.664 per cent); Southern Cross Pipelines (NPL) Australia Pty Ltd (25.493 per cent); and Alinta DEWAP Pty Ltd (11.843 per cent). Southern Cross Pipelines Australia Pty Ltd and Southern Cross Pipelines (NPL) Australia Pty Ltd are APA Group entities. Alinta DEWAP Pty Ltd is an entity within the Alinta Energy group.[5]

25. The GGTJV participants have assigned the task of operating the GGP to GGT, which is a wholly owned subsidiary of APA Group. The GGTJV has given its written permission for GGT to act on its behalf in respect of service provider requirements under the NGL(WA) and NGR. GGT is considered a service provider because it controls and operates the GGP. In accordance with section 10(2) of the NGL(WA), GGT is considered to be the "complying service provider".

GGT's Proposal

26. GGT has proposed the following key changes in the determination of its reference tariffs:[6]

- inclusion of all costs associated with the provision of services for the covered pipeline in the total revenue used to calculate the reference tariff, and exclude any incremental capital and operating costs associated with assets that are not covered;
- reductions in operating expenditure for the third access arrangement period. GGT's forecast operating expenditure is $132.019 million, which is circa 7.5 per cent lower than GGT's actual operating expenditure of $142.751 million during the second access arrangement period;
- $13.997 million in capital expenditure over the third access arrangement period, which is $5.795 million higher than its proposed conforming capital expenditure over the second access arrangement period. GGT has identified the main drivers for the proposed increase in capital expenditure as safety, compliance and integrity requirements for the GGP;
- a forecast depreciation of $53.966 million over the third access arrangement period. GGT proposes that the depreciation schedule should continue to be determined using the straight-line depreciation method with Historical Cost Accounting (**HCA**) to depreciate the GGP Regulatory Asset Base (**RAB**);
- the inclusion of an estimate of corporate income tax of $34.424 million less a value of imputation credits of $8.606 million; and
- an approach to calculating the rate of return that yields a nominal post-tax Weighted Average Cost of Capital (**WACC**) of 9.64 per cent. GGT's approach departs from the Authority's Rate of Return Guidelines in a number of key areas.

27. GGT has proposed to increase the throughput charge component of its reference tariffs, and slightly decrease the toll charge and capacity reservation charge components.

[5] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal*, 15 August, 2014, p. 2.

[6] Nominal dollars million

Key Points of this Draft Decision

28. The Authority has reviewed GGT's proposed revised access arrangement for the third access arrangement in accordance with the NGR and NGL(WA), including the National Gas Objective (**NGO**). The Authority appointed its technical advisor, EMCa to assist its review of GGT's proposed capital and operating expenditure and related governance arrangements. The Authority also appointed Associate Professor Martin Lally to review GGT's proposed options pricing method for estimating the rate of return, as well as its views on the present value principle.

29. The key amendments to GGT's proposed revised access arrangement for the third access arrangement period required by the Authority's Draft Decision are as follows:

- Joint costs of the covered and uncovered pipeline should be shared and not solely recovered by covered pipeline customers. As a result, the Authority has allocated a share of the joint costs to the uncovered pipeline for the purposes of calculating reference tariffs for the covered pipeline.
- The forecast operating expenditure for the third access arrangement used to calculate reference tariffs is to be capped at $97.749 million. The key adjustments to the forecast operating expenditure address GGT's proposed corporate cost revenue allocation and joint cost allocation.
- The forecast capital expenditure for the third access arrangement period used to calculate reference tariffs is to be capped at $9.254 million. The key adjustments to the forecast capital expenditure address GGT's proposed sustaining capital expenditure for receipt and delivery points, SCADA and communications, cathodic protection, and maintenance on bases and depots.
- The use of an indicative nominal post-tax WACC of 6.32 per cent for the purposes of setting tariffs for this Draft Decision. The Authority notes that the rate of return will be revised in the Final Decision for both 2015 and 2016. The resulting nominal post-tax WACC for 2016 will be used for the remaining years in the tariff model. The 2017, 2018 and 2019 rate of returns will be annually updated for the debt risk premium.
- The calculation of depreciation and the forecast capital base is to be amended via the application of straight-line depreciation with the Current Cost Accounting (**CCA**) approach.
- The calculation of the estimated cost of taxable income should be based on the smoothed tariff revenue rather than the building block revenue and tax depreciation should be based on assets recognised as commissioned rather than on an incurred basis. The valuation of imputation credits should be based on a value of gamma of 0.4 rather than 0.25. The calculation of the estimated cost of taxable income for the use of calculating reference tariffs is based on inputs following an allocation of joint costs to the uncovered pipeline.
- The tariff variation formulas, notice period requirements and cost pass-through events for the reference tariff variation mechanism are required to be amended.
- The wording of certain current general terms and conditions should be maintained. Also, GGT should ensure that the clauses remain in the proposed revised terms and conditions, in addition to being relocated into various sections of the access arrangement.

30. Table 1 and Table 2 compare key figures in GGT's proposal with the Authority's Draft Decision following an allocation of joint costs to the covered pipeline.

Table 1 Comparison of GGT's Proposal and the Authority's Draft Decision

Component	GGT Proposal	Draft Decision
Tariff Revenue (nominal $ millions)	393.764	199.544
Forecast Operating Expenditure for the Covered Pipeline (Nominal $ millions)	132.019	97.749
Forecast Capital Expenditure for the Covered Pipeline (Nominal $ millions)	13.997	9.254
Nominal post-tax WACC (per cent)	9.64%	6.32%
Gamma	0.25	0.40
Regulatory Depreciation for the Covered Pipeline (nominal $ millions)	50.754	31.105
Estimated Cost of Corporate Income Tax for the Covered Pipeline (nominal $ millions)	25.818	7.029

Source: Goldfields Gas Transmission Tariff Model; ERA, GGP Tariff Model, December 2015.

Table 2 Comparison of GGT's Proposal and the Authority's Draft Decision – Tariffs (Nominal)

	1 January 2015	1 July 2016	1 January 2017	1 January 2018	1 January 2019
GGT Proposal					
Toll Charge ($/GJ)	0.235806	0.235806	0.235806	0.235806	0.235806
Capacity Reservation Charge ($/GJ km)	0.001459	0.001459	0.001459	0.001459	0.001459
Throughput Charge ($/GJ km)	0.000442	0.000442	0.000442	0.000442	0.000442
Draft Decision					
Toll Charge ($/GJ)	0.214105	0.083075	0.083075	0.083075	0.083075
Capacity Reservation Charge ($/GJ km)	0.001469	0.000446	0.000446	0.000446	0.000446
Throughput Charge ($/GJ km)	0.000385	0.000163	0.000163	0.000163	0.000163

Source: Goldfields Gas Transmission Tariff Model; ERA, GGP Tariff Model, December 2015.

Decision Making Framework

Regulatory Framework

31. The purpose of an access arrangement for a gas pipeline is to provide details of the terms and conditions, including price, upon which an independent third party (user) can gain access to the pipeline.

32. The requirements for an access arrangement are established by the NGL(WA) and NGR as enacted by the *National Gas (South Australia) Act 2008* and as implemented in Western Australia by the *National Gas Access (WA) Act 2009* as the NGL(WA).

33. This is GGT's first access arrangement submitted in accordance with the requirements of the NGL(WA) and NGR. The Authority considered GGT's previous access arrangements under the Code. In January 2010, *the National Gas Access (WA) Act 2009* came into effect, replacing the scheme of access regulation of the Code with the scheme of the NGL(WA) and the NGR.

34. Under rule 100 of the NGR all provisions of an access arrangement are required to be consistent with the NGO.

35. The NGO is defined in section 23 of the NGL(WA) as:

> The objective of this Law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

36. Sections 28(1) and (2) of the NGL(WA) specify the manner in which the Authority must perform or exercise its economic regulatory functions or powers.

> 28 Manner in which [Authority] must perform or exercise [Authority] economic regulatory functions or powers-
>
> (1) The [Authority] must, in performing or exercising an [Authority] economic regulatory function or power-
>
> (a) perform or exercise that function or power in a manner that will or is likely to contribute to the achievement of the national gas objective; and
>
> (b) …
>
> (2) In addition, the [Authority]—
>
> (a) must take into account the revenue and pricing principles—
>
> (i) when exercising a discretion in approving or making those parts of an access arrangement relating to a reference tariff; or
>
> (ii) when making an access determination relating to a rate or charge for a pipeline service; and
>
> (b) may take into account the revenue and pricing principles when performing or exercising any other [Authority] economic regulatory function or power, if the [Authority] considers it appropriate to do so.

37. Section 24 of the National Gas Law outlines the Revenue and Pricing Principles:

> 24 Revenue and pricing principles
>
> (1) The revenue and pricing principles are the principles set out in subsections (2) to (7).
>
> (2) A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in-
>
> (a) providing reference services; and
>
> (b) complying with a regulatory obligation or requirement or making a regulatory payment [**RPP2**]
>
> (3) A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides. The economic efficiency that should be promoted includes-

(a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services; and

(b) the efficient provision of pipeline services; and

(c) the efficient use of the pipeline [**RPP3**]

(4) Regard should be had to the capital base with respect to a pipeline adopted-

(a) in any previous-

(i) full access arrangement decision; or

(ii) decision of a relevant Regulator under section 2 of the Gas Code;

(b) in the Rules [**RPP4**).

(5) A reference tariff should allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service to which that tariff relates [**RPP5**].

(6) Regard should be had to the economic costs and risks of the potential for under and over investment by a service provider in a pipeline with which the service provider provides pipeline services [**RPP6**].

(7) Regard should be had to the economic costs and risks of the potential for under and over utilisation of a pipeline with which a service provider provides pipeline services [**RPP7**].

Content of an Access Arrangement

38. Under section 2 of the NGL(WA), a "full access arrangement" means an access arrangement that:

(a) provides for price or revenue regulation as required by the NGR; and

(b) deals with all other matters for which the NGR require provisions to be made in an access arrangement.

39. The required content of a full access arrangement proposal is specified in rule 48 of the NGR.

48 Requirements for full access arrangement (and full access arrangement proposal)

(1) A full access arrangement must:

(a) identify the pipeline to which the access arrangement relates and include a reference to a website at which a description of the pipeline can be inspected; and

(b) describe the pipeline services the service provider proposes to offer to provide by means of the pipeline; and

(c) specify the reference services; and

(d) specify for each reference service:

(i) the reference tariff; and

(ii) the other terms and conditions on which the reference service will be provided; and

(e) if the access arrangement is to contain queuing requirements – set out the queuing requirements; and

(f) set out the capacity trading requirements; and

(g) set out the extension and expansion requirements; and

(h) state the terms and conditions for changing receipt and delivery points; and

(i) if there is to be a *review submission date* – state the *review submission date* and the revision commencement date; and

(j) if there is to be an *expiry date* – state the *expiry date*.

(2) This rule extends to an *access arrangement proposal* consisting of a proposed full access arrangement.

40. When submitting a full access arrangement proposal, the service provider must also submit access arrangement information as per rule 43 of the NGR. Access arrangement information is information that is reasonably necessary for users to understand the background to the access arrangement, and the basis and derivation of various elements of the access arrangement as per rule 42 of the NGR.

41. The GGP access arrangement is a full access arrangement, for which a proposed revised access arrangement and a revised access arrangement information have been submitted by GGT. The reasons for the Authority's Draft Decision address elements of GGT's access arrangement revision proposal in the following order:

- A description of the pipeline.
- Pipeline services, including the specification of reference services.
- Total revenue requirements.
- Reference tariffs (including variation mechanism)
- Non-tariff components.

Key Dates and Identification of the Pipeline

Regulatory Requirements

42. Rule 48(1)(a) of the NGR requires an access arrangement to identify the pipeline to which the access arrangement relates and to make reference to a website at which description of the pipeline can be inspected.

43. Rule 49(1)(a) of the NGR requires a full access arrangement to contain a review submission date and a revision commencement date, but must not contain an expiry date.

44. Rule 50(1) of the NGR states that as a general rule,

(1) As a general rule:

(a) a *review submission date* will fall four years after the access arrangement took effect or the last revision commencement date; and

(b) a revision commencement date will fall five years after the access arrangement took effect or the last revision commencement date.

45. Under rule 50(2) of the NGR, the Authority must accept the service provider's proposed dates if it is in accordance with rule 50(1) of the NGR.

46. If the service provider's proposed dates do not conform to rule 50(1) of the NGR, then rule 50(4) of the NGR allows the Authority to approve dates that are consistent with the NGO and the Revenue and Pricing Principles.

GGT's Proposed Revisions

47. GGT has referred to the pipeline as the Goldfields Gas Pipeline in the proposed revised access arrangement.

48. GGT has provided a website address (http://www.apa.com.au) that redirects to the APA group website.[7]

49. GGT has provided a description of the Goldfields Gas Pipeline in section 1.2 of its access arrangement revision proposal as follows:[8]

> Completed in 1996, the Pipeline delivers natural gas from the offshore gas fields in the north west of Western Australia to the mineral rich, inland regions of the State. The Pipeline's Receipt Point is located at Yarraloola. There are no other gas sources located along the route of the Pipeline. Gas is delivered to Delivery Points along the length of the Pipeline, primarily for use in electricity generation facilities associated with mining and minerals processing.[9]

50. GGT has also provided the following definition for Pipeline or Goldfields Gas Pipeline in Schedule C.1 of its proposed revised access arrangement:

> Pipeline or Goldfields Gas Pipeline means the pipeline as defined in Pipeline Licence 24 issued under the *Petroleum Pipelines Act 1969* (WA), being the pipeline or pipeline system for the transmission of natural gas from the North-West of Western Australia into the inland Pilbara and Goldfields regions, together with all structures for protecting or supporting the pipeline or pipeline system and associated facilities for the compression of gas, the maintenance of the pipeline and the receipt and delivery of gas and all fittings, appurtenances, appliances, compressor stations, scraper stations, mainline valves, telemetry systems (including communication towers) works and buildings used in connection with the pipeline or pipeline system and includes the lateral pipeline to Newman.

51. GGT's proposed access arrangement information and supporting information outlines the assets included in the covered portion of the pipeline as:

- Diameter Nominal 400mm main pipeline section (Yarraloola to start of Newman Lateral), and Diameter Nominal 350mm pipeline section (start of Newman Lateral to Kalgoorlie);
- Diameter Nominal 200mm Newman Lateral;
- Corrosion mitigation by trilaminate pipe coating and impressed current cathodic protection;
- Compressor stations at Yarraloola, Paraburdoo, Ilgarari and Wiluna;
- Custody transfer metering at Yarraloola, and at various delivery points along the pipeline;
- Gas control centre, Perth head office, and backup gas control centre in Kewdale;
- Maintenance bases and depots in Karratha, Newman, Leinster, and Kalgoorlie;
- Supervisory Control and Data Acquisition (**SCADA**) system;

[7] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 2.

[8] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 2.

[9] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 2.

- Satellite data communications system;
- Satellite telephone system; and
- Operations, maintenance, commercial, quality, safety, and environmental management systems. [10]

52. GGT has not included a date of commencement for its proposed revised access arrangement. GGT states in section 1.6 that this Access Arrangement commenced on the date on which the approval of the regulator took effect under rule 62 or rule 64 of the NGR (as relevant).

53. GGT has proposed a review submission date of the later of;

- on or before 1 January 2019; or
- 4 years from the date of commencement of the (proposed) revisions to the GGP access arrangement.

54. GGT has proposed that the revision commencement date will be the later of;

- 1 January 2020; or
- the date on which the Authority approves the revisions to the GGP access arrangement to take effect under the NGL(WA) and the NGR.

55. GGT submits that the proposed review submission and commencement dates are consistent with rule 50 of the NGR. The dates proposed by GGT for the third access arrangement period result in a four year access arrangement period beginning at a new calendar year and ending at the beginning of a calendar year.

Submissions

56. There were no submissions made in response to GGT's proposed amendments to the Key Dates or Identification of the Pipeline to which the reference service applies.

Considerations of the Authority

57. The Authority considers that GGT's proposed revised access arrangement identifies the GGP as the pipeline to which the access arrangement relates. The Authority notes that the specific assets used by the portion of the pipeline that is covered are available in the access arrangement information and supporting information, but not in the proposed revised access arrangement itself.

58. The Authority considers that the website link that GGT has provided in relation to the GGP does not take an interested party directly to information about the GGP, but rather to the APA group website. The Authority considers that compliance with rule 48(1)(a) of the NGR requires GGT to provide a website address that links directly to the description of the GGP on its website.

59. The Authority notes that it has no discretion if GGT proposes a review submission date or revision commencement date which is consistent with the general rule specified in rule 50(1) of the NGR. However, given the delays to the current access arrangement approval process, GGT's proposal to prescribe a review submission date as the later of on or before 1 January 2019 or four years from the date of

[10] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement Information*, 28 August 2014, pp. 2 - 3.

commencement of the proposed revised access arrangement would result in the next access arrangement being submitted after GGT's intended commencement date of 1 January 2020.

60. To address this inconsistency, the Authority considers that GGT should submit revisions to its access arrangement on or before 1 January 2019 to allow for the next access arrangement to commence on its intended date of 1 January 2020. The Authority notes that clause 7(1) of Part 2 of Schedule 2 of the NGL(WA) provides that interpreting a provision of the NGL(WA), "the interpretation that will best achieve the purpose or object of this Law is to be preferred to any other interpretation". The Authority considers that this revised review submission date would appear to best achieve the purpose or object of rule 50(1) of the NGR and would be consistent with the NGO and Revenue and Pricing Principles.

Required Amendment 1

The proposed revised access arrangement should be amended to:

Include a website address that links directly to the description of the GGP.

Remove the provision to submit revisions to the access arrangement four years from the commencement date of this access arrangement.

Pipeline Services

Regulatory Requirements

61. A "pipeline service" is defined under section 2 of the NGL(WA).

> *Pipeline service* means –
>
> (a) a service provided by means of a pipeline, including –
>
> (i) a haulage service (such as firm haulage, interruptible haulage, spot haulage and backhaul); and
>
> (ii) a service providing for, or facilitating, the interconnection of pipelines; and
>
> (b) a service ancillary to the provision of a service referred to in paragraph (a),
>
> but does not include the production, sale or purchase of natural gas or processable gas.

62. Under rule 48(1) of the NGR, a full access arrangement must:

> (1) A full access arrangement must:
>
> (a) identify the pipeline to which the access arrangement relates and include a reference to a website at which a description of the pipeline can be inspected; and
>
> (b) describe the pipeline services the service provider proposes to offer to provide by means of the pipeline; and
>
> (c) specify the reference services; and
>
> (d) specify for each reference service:
>
> (i) the reference tariff; and
>
> (ii) the other terms and conditions on which the reference service will be provided; and …

63. Rule 101 of the NGR requires a full access arrangement to specify all reference services.

> (1) A full access arrangement must specify as a reference service:
>
> (a) at least one pipeline service that is likely to be sought by a significant part of the market; and
>
> (b) any other pipeline service that is likely to be sought by a significant part of the market and which the [Authority] considers should be specified as a reference service.

GGT's Proposed Revisions

64. GGT's proposed revised access arrangement has retained the following services on the covered pipeline:[11]

- a firm service, which is a reference service; and
- a negotiated service, which is a non-reference service.

65. GGT's proposed firm service is a reference service provided at the reference tariff on the covered pipeline for the receipt of gas at the receipt point at Yarraloola, the transmission of gas to, and the delivery of gas at, the agreed delivery point(s).

66. GGT states that the service provider must provide the firm service on the following basis. The firm service is a service whereby the pipeline operator receives from a user, at the receipt point, on a day, a quantity of gas not exceeding the Maximum Daily Quantity (**MDQ**) specified in the user's gas transportation agreement, and delivers to the user, at one or more delivery points, on that day, a quantity of gas not exceeding the user's MDQ, at a rate per hour not exceeding the applicable delivery point MHQ, without interruption or curtailment, except in the specific and limited circumstances set out in the user's gas transportation agreement.[12] Provision of the firm service is subject to there being sufficient Spare Capacity.

67. GGT considers that there has been no material change in the market for gas transportation services since the Authority's assessment in its Draft Decision in 2009, and the firm service therefore continues to be the appropriate and relevant reference service for the next access arrangement period. GGT does not consider that any other service is likely to be sought by a significant part of the market.[13]

68. GGT is proposing to continue to offer negotiated services under the scheme of the NGL(WA) and the NGR. GGT's proposed negotiated service is a gas transportation service to meet the specific needs of a user, where such needs may differ from those of a user of the firm service. Examples of negotiated services include as-available and interruptible services.

69. GGT submits that a negotiated services cannot be considered as being sought after by a significant proportion of the market, as they are negotiated individually by prospective users to meet specific requirements. GGT submits that prospective users tend to seek access to firm services rather than negotiated services.

70. GGT has revised its access arrangement to give effect to specific requirements of the NGL(WA) and the NGR, and to align the access arrangement with other approved APA Group access arrangements.[14] Furthermore, GGT has undertaken a comprehensive revision of the terms and conditions that apply to the firm service. GGT considers that the terms and conditions which are currently in the GGP Access Arrangement no longer correspond with those negotiated with users in GGT and APA Group gas transportation agreements, or with the terms and conditions in the access arrangements for other APA Group pipelines.

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11 Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 5.

12 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 7.

13 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 8.

14 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 10.

71. GGT considers that the majority of changes have been made for one or more of the following three reasons:

- the change simplifies and/or streamlines the provisions of the GGP Access Arrangement without changing the essence of those provisions;
- the change transfers material from the terms and conditions to the main body of the GGP Access Arrangement, so that the access arrangement more clearly complies with the requirements of rule 48; and
- the change removes parts of the terms and conditions which are obsolete either because they are not used in GGT's gas transportation agreements or they no longer accord with the way in which the GGP is operated.

72. The full changes to the terms and conditions are discussed in the section below on Terms and Conditions applying to Firm Services.

73. GGT has replaced the section "Services Policy" in the current access arrangement with "Pipeline Services" in the proposed revised access arrangement. GGT has introduced the following sections into the proposed revised access arrangement: "Services under Access Arrangement"; "Transportation Agreement"; and "Access to and request for Service" along with relocating the "Conditions" section. GGT's new "Access to and request for Service" section sets out the process a prospective user must follow to gain access to a service on the covered pipeline, including reference to queuing requirements, the need to meet prudential requirements and the need to enter into a transportation agreement specific to the service.

74. GGT has moved the terms and conditions related to the firm service from the general terms and conditions into Section 2.2 of its proposed revised access arrangement. GGT has made comprehensive changes to the following terms and conditions that apply to the firm service:[15]

- Maximum Daily Quantity (**MDQ**) and Maximum Hourly Quantity (**MHQ**) – GGT requires users to establish a firm MDQ and MHQ at the commencement of the transportation agreement, for each contract year. GGT has also proposed to vary the MHQ formula to be in line with other APA contracts on the GGP.
- Adjustment in MDQ for Gross Heating Value (**GHV, Higher Heating Value or HHV**) – GGT has included a mechanism which provides for the user's MDQ to be reduced and for the user to pay higher transportation tariffs if the user's gas has a "GHV" below the minimum higher heating value specification for gas shipped through the GGP.
- Minimum GHV – GGT has proposed to increase the minimum GHV from 35.5 MJ/m^3 to 37.0 MJ/m^3. GGT submits that despite the fact that the GGP is a Pipeline Impact Agreement (**PIA**) pipeline[16] for the purposes of the *Gas Supply (Gas Quality Specifications) Act 2009*, (**GSL**) no reference specification has previously been set for it.[17] GGT considers that the minimum HHV previously set by the Authority in its second access agreement is below the initial assumption by the original de facto market standard of 37 MJ/m^3 as per the Dampier to Bunbury Natural Gas Pipeline (**DBNGP**) from which gas is

[15] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, pp. 7-11.

[16] A PIA pipeline is a pipeline that has been developed to allow gas producers to supply broader quality gas in Western Australia in order to encourage the development of gas fields that did not meet the previous specifications. http://www.slp.wa.gov.au/legislation/statutes.nsf/main_mrtitle_11249_homepage.html

[17] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 9.

delivered into the GGP. The proposed change in the GHV is also included in the gas specification in Appendix 2 of GGT's proposed terms and conditions.

- Overruns - GGT has removed the overrun provisions from the general terms and conditions and put them into sections 2.2.4 and 4.2.2 of the proposed revised access arrangement. GGT has changed the terminology of "Overrun" to align its approach with other APA Group access arrangements. GGT has made changes to how the MDQ is affected because of an overrun. GGT removed the "Supplementary Quantity Option (**SQO**)" and replaced it with the "Authorised Overrun" process. Finally, GGT has removed a clause that entitled GGT to only impose overrun (and imbalance) charges where there was significant risk that threatens the integrity of the GGP.
- Term – GGT has revised the minimum term of a transportation agreement for a firm service from 12 months to five years, which it notes is consistent with the majority of contracts on the GGP. GGT submits that contracts with terms shorter than 5 years may potentially be made available as negotiated services.
- Title to Gas - GGT's has proposed that title to gas *not* transfer to GGT when it takes possession of the gas at the receipt point, but be retained by the User except as set out in clause 66(a) and (b) of the terms and conditions applying to the firm service.

75. GGT has also included reference to the following terms and conditions that apply to the firm service:

- the technical specifications required to connect to the GGP;
- the requirement for compliance with the gas specification and commingling provisions;
- the user operational obligations in respect of system use gas and linepack;
- the charges for the firm service; and
- the toll and capacity reservation tariff.

76. GGT has relocated negotiated services to section 2.3 of the access arrangement and removed text which it claims as restrictive in order to increase the flexibility in offering and accessing alternative services to the firm service.

77. GGT submits that these changes were necessary due to the elapsed time since its last review of the terms and conditions for its firm service, and to the differences between its current firm service terms and conditions and those of its negotiated services. GGT submits that the terms and conditions under its current access arrangement for providing firm services no longer correspond with those of other transmission pipelines.[18]

Submissions

78. BHPB submits that GGT has made substantial changes from the current access arrangement. BHPB considers that GGT's proposed amendments represent a significant deterioration to the rights of both new and existing users compared to the current access arrangement. BHPB considers that GGT has not provided any compelling rationale for the changes to be made, and that substantial changes

[18] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 11.

should only be considered where they will increase economic efficiency and ultimately contribute to achievement of the NGO.

79. Santos submits that GGT has not adequately demonstrated the need for change. Santos considers that GGT's proposed wholesale changes create an unnecessary burden and cost to all stakeholders. Santos further considers that the continual change also creates an exposure for shippers and the regulatory process should provide a stable backdrop for both the users and the pipeline operator.[19]

80. BHPB submits that GGT's proposed changes to the gas specification under its proposed revised access arrangement are unnecessary:

> Gas with a low GHV (i.e. broad specification gas) has a lower energy content than higher GHV gas. Gas takes up the same volume regardless of its energy content. Pipelines have a fixed capacity and operators sell that capacity on the basis of energy transported (not volume of gas). As a result, lower GHV gas can result in less energy being transported by a pipeline. Clause 2.2.3 aims to 'compensate' GGT for this potential capacity reduction and the increased operating costs that can result from broad specification gas. However, an efficient mechanism already exists for compensating GGT for broad specification gas transported on the GGP. Minimum specifications for gas in Western Australia are already provided for by the *Gas Supply (Gas Quality Specifications) Act 2009* and *Gas Supply (Gas Quality Specifications) Regulations 2010* (together the **GSL**).
>
> …
>
> The GSL "already provides an appropriate compensation mechanism for below specification gas and contains rules against double compensation. For an additional or alternative compensation mechanism to be included in the access arrangement as proposed by GGT is contrary to the Western Australian government's policy objective to ensure that the GSL deals with 'all issues associated with the gas producer supplying gas at below the reference specification'" [Gas Supply (Gas Quality Specifications) Bill 2009 – Explanatory Memorandum page 30].
>
> "GGT previously tried to implement the same minimum GHV specification under the current access arrangement. The Authority rejected the change previously on the basis it might restrict competition from upstream producers of broader specification gas from being able to sell that gas into downstream markets, while also denying downstream customers competitive alternative gas."
>
> "BHP Billiton submits that the relevant analysis underlying this conclusion has not changed since the current access arrangement was decided. The proposed changes will lead to a number of negative consequences which are likely to be contrary to the achievement of the NGO:
>
> - increased prices to end customers – a higher minimum GHV specification than under the previous access arrangement will mean users will incur unnecessary or inflated costs in transporting broad specification gas as they will be required to pay compensation for what was previously within specification gas on the GGP. This will ultimately raise the costs to end customers;
> - GSL does not permit 'double recovery' – The proposed changes would potentially allow GGT to recover twice for transporting the same broad specification gas, such recovery is contrary to the GSL; and
> - reducing the future supply of gas – the proposed changes will create additional financial and other barriers to entry for gas producers looking to develop gas fields

[19] Santos (BOL) Pty Ltd, *Public Submission by Santos in Response to the Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement and Access Arrangement information*, 15 August 2014, dated 10 November 2014.

which include broader specification gas, potentially reducing the development of gas fields in the future."

81. Santos submits that: [20]

> "Tightening the specification on the GGP is contrary to the intention of the *Gas Supply (Gas Quality Specifications) Regulations*. Also contrary to the Regulations is GGT's proposal to penalise shippers through reduced capacity and higher tariffs should they obtain gas from a supplier utilising a broader specification field."

82. BHPB submits that the minimum term should remain unchanged at 1 year. BHPB submission considers that GGT's proposal: [21]

- represents a fivefold increase in the minimum term for reference services;
- offers no compelling rationale why such a change is necessary;
- forces users who require shorter terms (e.g. for flexibility reasons) to acquire higher priced negotiated services (offered at unregulated prices);
- is not consistent with reference services offered by other transmission pipelines such as the Dampier to Bunbury Natural Gas Pipeline (**DBNGP**).[22]

83. BHPB also submits that the regime relating to the transfer of title from the current access arrangement should remain. BHPB considers that users have no visibility or control over the transportation of gas via the GGP and therefore should not bear the risk of loss while gas is being transported.

Considerations of the Authority

84. The Authority is satisfied that the firm service is a service that is "likely to be sought by a significant part of the market", and therefore meets the requirements of rule 48 of the NGR. The Authority accepts GGT's nomination of its firm service as the reference service around which this access arrangement is constructed.

85. The Authority notes that GGT has moved some of the terms and conditions related to the firm service from the general terms and conditions into section 2.2 of its proposed revised access arrangement. The Authority accepts GGT's proposal to include terms and conditions for pipeline services in section 2 of the access arrangement. However, the Authority does not accept GGT's proposal to remove these terms and conditions from the terms and conditions applying to the firm service in Schedule D of the proposed revised access arrangement. The Authority considers this issue in more detail in the section below on terms and conditions applying to firm services.

86. Notwithstanding the required amendment to reinstate the terms and conditions that GGT has proposed to include in Pipeline Services section of the access arrangement, the Authority has assessed these terms and conditions below.

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[20] Santos (BOL) Pty Ltd, *Public Submission by Santos in Response to the Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement and Access Arrangement information*, 15 August, 2014, dated 10 November 2014 p. 2.

[21] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 16.

[22] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 16.

MDQ and MHQ

87. The requirement in proposed section 2.2.2(a) of the revised access arrangement for the user to "establish" at the contract outset, for each contract year a Firm MDQ and Firm MHQ, does not state clearly how the user must "establish" these quantities. Similarly, the requirement in proposed section 2.2.2(b) of the revised access arrangement for a user with multiple delivery points to "establish" an MDQ and MHQ for each delivery point does not state clearly how the user must "establish" these quantities. To avoid unnecessary uncertainty, the revised access arrangement should specify how these quantities are to be "established". As with the current access arrangement (see definitions of "MDQ" and "MHQ" in appendix 1 to current access arrangement), this should be done as follows:

- for MDQ, as specified by the user in the user's Order Form (or other contractual document forming part of the transportation agreement), and
- for MHQ, as mathematically derived from the MDQ by application of a formula contained in the transportation agreement.

88. Proposed section 2.2.2(c) of the revised access arrangement sets out a revised formula for calculating the maximum figure for MHQ such that GGT is now proposing that MHQ be no greater than MDQ ÷ 24 x 1.1, whereas in the current access arrangement the figure for MHQ is MDQ ÷ 24 x 1.2. So in effect, GGT is proposing to reduce the maximum figure a user can have for its MHQ.

89. GGT has claimed in its access arrangement supporting information that it is varying the MHQ formula "to be in line with other APA contracts on the GGP and more in line with load profiles for industrial customers. Revised MHQ will facilitate more efficient utilisation of the pipeline".[23] However, GGT did not provide any evidence to support these claims or to otherwise justify the proposed variation based on the NGO.

90. No submissions were received that specifically mentioned the proposed change to the MHQ formula. However, BHPB submitted that the amendments to the T&Cs generally:

> "represent a significant deterioration in the rights of both new and existing users from the existing access arrangement. GGT has not provided any compelling rationale for the changes and absent clearly articulated reasons the previous terms and conditions should remain. The proposed amendments will increase inefficiency, raise costs and would be contrary the achievement of the NGO".[24]

91. The Authority is of the view that GGT has not provided adequate justification for its proposed change to the MHQ formula. The existing MHQ formula in the definition of MHQ in Appendix 1 to the existing access arrangement should therefore be reinstated.

92. The Authority considers that, as is already the case with proposed section 2.2.2(d)(ii) of the revised access arrangement, proposed section 2.2.2(d)(i) and 2.2.2(d)(iii) of the revised access arrangement should be amended to expressly exclude system use gas and user's linepack from the determination of whether the service provider has received more than the "Firm MDQ" on any gas day or has

[23] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information, Attachment 1, Log of Changes to GGP Access Arrangement*, 15 August 2014, p 5-6.

[24] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 15.

exceeded the receipt point MHQ restriction. These amendments are to ensure that users are not prejudiced for exceeding receipt point MDQ and MHQ limits if this occurs because the service provider requires the user to supply system use gas or line pack. The Authority notes that GGT is proposing that the service provider dictates the timing and quantity of system use gas and line pack which a user must provide, without necessarily providing users with adequate notice – see proposed clauses 24 and 28 of the access arrangement terms and conditions.

Adjustment in MDQ for Gross Heating Value

93. The Authority notes that on 10 March 2015, the GSL was amended to include explicit gas specifications for the GGP.[25] In accordance with the regime of the GSL, a user can deliver gas into the GGP with a GHV of a minimum of 35.5 MJ/m^3 without having to compensate GGT for the effects this may have on pipeline capacity, or on the costs of operating the pipeline. However, this should have no impact on pipeline capacity as the reference gas specification set out by the GSL was consistent with the gas specification in GGT's current access arrangement.

94. The Authority notes that GGT considers that the minimum HHV applicable to the DBNGP is 37 MJ/m^3 and is a "de facto market standard" which also apply to the GGP. The Authority also notes that the Western Australian Government has now amended the GSL to include explicit gas specifications for the GGP which were different to the gas specification for the DBNGP. The Authority considers that the Western Australian Government had its reasons for stipulating a different gas specification for the GGP and that the DBNGP gas specification is not relevant.

95. The Authority considers that GGT has provided no reasonable justification for the proposed variations to the gas specification or to the associated provisions in section 2.2.3 of GGT's revised access arrangement. The Authority agrees with the concerns raised in the submissions received from BHPB and Santos. Specifically, the Authority considers that the GSL "already provides an appropriate compensation mechanism for below specification gas and contains rules against double compensation. For an additional or alternative compensation mechanism to be included in the access arrangement as proposed by GGT is contrary to the Western Australian government's policy objective to ensure that the GSL deals with 'all issues associated with the gas producer supplying gas at below the reference specification'".

96. The Authority considers that section 2.2.3 of GGT's revised access arrangement should be deleted and the changes to the Gas Specification in Appendix 2 to the proposed terms and conditions should be reversed.

Overruns

97. The Authority considers that it is not clear why GGT has removed the overrun provisions from the terms and conditions and inserted them into sections 2.2.4 and 4.2.2 of the revised access arrangement. The Authority considers that these provisions need to be comprehensively included in the terms and conditions.

98. The Authority considers that GGT's proposed revisions to overruns are inflexible in comparison with the terms and conditions regarding supplementary quantity options and overruns in the current access arrangement.

[25] Western Australian Government Gazette, Perth, *Gas Supply (Gas Quality Specifications) Amendment Regulations 2015*, Tuesday 10 March, 2015, No 36, p. 836.

99. GGT has deleted the Supplementary Quantity Option (**SQO**) provision from the current access arrangement terms and conditions (see clauses 4.4 & 9.4 of the current terms and conditions) and replaced it with the "Authorised Overrun" process in its revised access arrangement (see proposed sections 2.2.4 & 4.2.2). Both the SQO and Authorised Overrun processes are provided at GGT's discretion and are fully interruptible. GGT claims the SQO has been removed because it has "never been used in gas transportation agreements".[26] The Authority considers that if the SQO is broadly equivalent to an authorised overrun, then GGT's claim seems unlikely. In any case, the Authority considers that GGT's change leads to some subtle but potentially significant differences between the current and proposed regimes for dealing with overruns. For example, under current clause 4.4(b), the user is required to give at least 18 hours of notice of its SQO (i.e. authorised overrun) prior to the relevant gas day. However, under the overrun provisions in the proposed access arrangement, the user must give notice of its overrun requirement" as part of the user's nomination for the firm service" (see proposed access arrangement section 2.2.4(c)) or else the overrun will be treated as unauthorised overrun (with potentially higher rates to pay). As the "User's Nomination for the Firm Service" is a two stage process requiring monthly nomination (at least 3 Days before the Month start – see proposed clause 6 of GGT's proposed revised terms and conditions) with the potential to revise that nomination by no later than the nomination deadline of 4.00pm on the day before the relevant gas day (see proposed clause 7 of GGT's revised terms and conditions), this may mean that the user has to give much more notice of its proposed overrun under the proposed access arrangement than under the existing access arrangement if it is to avoid it being treated as an unauthorised overrun (with potentially higher rates to pay for that consequence).

100. The Authority considers that section 2.2.4(c) should be amended to clarify that the User may, but need not, nominate its authorised overrun with its monthly nomination for the firm service (at least 3 Days before the Month start) but must nominate its authorised overrun by no later than the nomination deadline of 4.00pm on the day before the relevant gas day.

101. The Authority notes that GGT's proposed replacement provisions in section 2.2.4(k), and section 4.2.2(f) of the proposed revised access arrangement contain indemnities for unauthorised overrun by the user. The Authority also notes that the indemnities are unlimited (see proposed clause 93(c)(ii) of GGT's revised terms and conditions) and do not require GGT to take reasonable steps to mitigate any loss before claiming under the indemnity. The indemnities for unauthorised overruns in section 2.2.4(k) and section 4.2.2(f) of GGT's revised access arrangement should be deleted. There were no such indemnities for overruns in the second access arrangement, and GGT has not provided any good justification as to why it requires these indemnities in addition to the overrun charges.

102. The Authority considers that section 2.2.4(l) of GGT's proposed revised access arrangement is potentially detrimental to users compared to the current access arrangement for the following reasons:

- it applies to exceeding the receipt point MDQ or the delivery point MDQ, whereas existing clause 7.3(d) of the current terms and conditions only applies to exceeding the delivery point MDQ;

[26] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 12.

- it requires a user to exceed its MDQ by over 5 per cent on any 12 occasions within each year (which need not be consecutive), whereas current clause 7.3(d) requires 30 consecutive days of excesses [overruns] (although they need not be more than 5 per cent), so current clause 7.3(d) arguably gives users a greater buffer before action is taken; and
- it applies even if the overrun is an authorised overrun, whereas under current clause 7.3(d) the SQO (the equivalent of an authorised overrun) is subtracted from the calculation of "daily overrun quantity", so it is only unauthorised overruns that can trigger the threshold.

103. If the threshold is triggered, then the user's MDQ is increased by the average of the "highest daily quantities" irrespective of whether or not any of those quantities were authorised. The Authority considers that current clause 7.3(d) should be reinstated in place of proposed section 2.2.4(l).

104. The Authority has considered GGT's proposed changes to overrun charges in further detail in Appendix 9.

Minimum Term

105. GGT has sought to increase the minimum term of the firm service from one year to five years.

106. GGT considers that a revised minimum term of 5 years is consistent with the majority of the contracts for access to the GGP, and is aligned with the terms of investments in assets made by users of the GGP.

107. The Authority has taken the following into consideration when determining whether to accept GGT's proposal to increase the minimum term for its reference service:

- The Authority approved a minimum term of two years for DBP's reference services in its access arrangement for the period 2011 – 2015.
- The Australian Energy Regulator (**AER**) approved a three year minimum term for the 2011-2016 access arrangement for the Amadeus Gas Pipeline.[27]
- BHPB submits that increasing the minimum term from one year to a five year term will discourage use of the GGP and is not in line with the NGO.

108. The Authority considers that the reasoning provided by GGT for increasing its minimum term from 12 months to 5 years does not justify amending the minimum term for its reference service.

109. The Authority considers that users who wish to contract for the reference service for five years or longer may still do so under the current minimum term of 12 months. However, if GGT's proposed minimum term of five years is approved, then prospective users who may wish to access the firm service for less than five years will be forced to enter into a negotiated service agreement with GGT, an outcome that does not promote the NGO.

110. The Authority has therefore decided that GGT must amend the minimum term for a contract under its reference service from 5 years to 12 months.

[27] Australian Energy Regulator, *Access Arrangement proposal for the Amadeus Gas Pipeline Final Decision, 1 August 2011 – 30 June 2016*, July 2011.

Title to Gas

111. The Authority considers that if GGT does not take title to the user's gas at the receipt point when GGT commingles the gas with gas belonging to other users (as must happen in a shared pipeline), then GGT will not be physically able to return the same gas molecules to the user at the delivery point as the user gave to GGT at the receipt point. Instead, GGT will be giving the user commingled gas containing molecules of gas belonging to other users in circumstances where the user does not have any contractual arrangement with other users regarding the transfer of gas (such as an allocation of rights and liabilities in the event the gas received is defective). The Authority considers that GGT's proposed clause 59 in its revised terms and conditions does not address these problems.

112. If GGT does not take title to gas, it will not assume responsibility of the gas while it is in its possession (as the usual legal position is that risk passes with ownership, unless otherwise agreed). If avoiding ownership of gas is an attempt by GGT to avoid taking risk and responsibility for that gas (as GGT's proposed clause 57 would seem to indicate is the case), then that would leave users responsible for their gas when it is no longer within their possession or control. The Authority is of the view that GGT should take responsibility for gas when it is in its possession and control, even if title does not transfer to GGT.

113. The Authority is of the view that GGT's access arrangement and terms and conditions must be amended to provide that title to gas must pass from the user to GGT at the receipt point, and that title to an equivalent Gigajoule (**GJ**) quantity (but not the same molecules) of gas must pass from GGT to the user at the delivery point. The Authority considers that proposed clauses 57 and 66 should be deleted and current clauses 14.3 and 14.4 need to be reinstated. The Authority also considers that section 2.2.8 of GGT's revised access arrangement should be amended accordingly to clarify that title to gas does pass to GGT at the receipt point and will pass from GGT to User at a delivery point.

Technical Specifications for connecting to the Pipeline

114. The Authority requires GGT to replace proposed section 2.2.6 with clause 6.8 of the current terms and conditions and to reinstate clause 6.8 into GGT's proposed revised terms and conditions. Consequently, Appendix Three to the revised access arrangement ("Technical Requirements for Delivery Facilities") should be deleted. The Authority has addressed this required amendment under service provider's obligations as regards delivery facilities in Part 2 of Appendix 9.

Gas specification and commingling

115. The Authority requires GGT to align proposed section 2.2.7(a), (b) and (c) with the Authority's required amendments for clause 43 in GGT's proposed terms and conditions set out in Part 1 of Appendix 9. In addition, the following should be added as a new paragraph at the end of section 2.2.7:

> "The User's and Service Provider's respective rights and obligations concerning Gas Specification and commingling are more particularly set out in the Terms and Conditions."

Operational obligations - System Use Gas and the User's Linepack

116. The Authority requires GGT to incorporate the required amendments set out under "System Use Gas and Line Pack" in Part 1 of Appendix 9 into proposed section 2.2.9.

Toll and Capacity Reservation Tariff

117. The drafting of proposed section 2.2.11 should be amended to remove any doubt that all, not just "any" Conditions must be satisfied. The Authority suggests this be done by amending "any Conditions" to read "all and any Conditions".

Negotiated Services

118. The Authority notes that proposed section 2.3 of GGT's revised access arrangement does not include a provision equivalent to section 4.2(c) of the current access arrangement, which details the process of providing to a user an interruptible service when there is not sufficient spare capacity to meet the user's requirements. GGT has provided the following explanation for this proposed change in its supporting information:

> *"Removal of restrictive text that required only an interruptible service to be offered where the firm service is not available. Removal of clause increases flexibility for both service provider and user in offering and accessing alternative services to the firm service."*[28]

119. No submissions were received that specifically mentioned the proposed change to remove section 4.2(c) of the current access arrangement.

120. The Authority is of the view that while section 4.2(c) of the existing access arrangement does require GGT to offer an Interruptible Service as a Negotiated Service in the circumstances set out in that clause, the drafting of the section does not preclude GGT from also offering other services as alternatives to the Interruptible Service. So in the Authority's view, while GGT's proposed removal of section 4.2(c) may "increase flexibility" for GGT (as it no longer has to offer the interruptible service) this is not necessarily the case for users (as they would no longer have a right to be offered the interruptible service).

121. GGT has not explained why the increased flexibility it perceives for itself from the removal of section 4.2(c) (apparently at the expense of users losing a right to be offered an interruptible service and therefore potentially weakening their bargaining power) is justified based on the NGO.

122. The Authority is of the view that GGT has not provided adequate justification for its proposed change to remove section 4.2(c) of the current access arrangement. Section 4.2(c) of the current access arrangement should therefore be reinstated.

Required Amendment

123. The Authority does not accept GGT's proposal to remove the pipeline services terms and conditions from the terms and conditions applying to the firm service in Schedule D of the proposed revised access arrangement. Furthermore, as discussed in the terms and conditions chapter below, the Authority does not approve

[28] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information, Attachment 1, Log of Changes to GGP Access Arrangement*, 15 August 2014, p. 7.

changes proposed by GGT to the terms and conditions for the reference service that have the effect of preventing those terms and conditions being in a single document or bundle of documents annexed to the access arrangement.

124. The Authority considers that while this approach may result in a degree of duplication in order to comply with rule 48 of the NGR, it is not preferred. The Authority considers that overlap or duplication generally increases the risk of inconsistency and potential conflict between provisions, and makes the task of interpretation more difficult. The Authority considers that where possible, duplication of provisions in the access arrangement and terms and conditions must be avoided.

125. Notwithstanding the requirement for GGT to reinstate the pipeline services terms and conditions back into the general terms and conditions, GGT must amend these terms and conditions in line with the required amendments below.

Required Amendment 2

MDQ and MHQ

Amend proposed section 2.2.2(a) to clarify precisely how the user is to "establish" a Firm MDQ and Firm MHQ for each contract year.

Amend proposed section 2.2.2(b) of the revised access arrangement to clarify precisely how a user with multiple delivery points is to "establish" an MDQ and MHQ for each delivery point.

Amend proposed section 2.2.2(c) of the revised access arrangement to reinstate the existing MHQ formula from the definition of MHQ in Appendix 1 to the existing access arrangement.

Amend proposed section 2.2.2(d)(i) of the revised access arrangement so as to contain the same exclusion for System Use Gas and User's Linepack as regards receipt of gas (not deliveries) as exists in proposed section 2.2.2(d)(ii)).

Amend proposed section 2.2.2(d)(iii) so as to exclude System Use Gas and User's Linepack contributions from the receipt point MHQ restriction.

Adjustments to MDQ for Gross Heating Value

Delete section 2.2.3 of GGT's revised access arrangement and reverse all changes to the Gas Specification in Appendix 2 of the proposed revised terms and conditions.

Overrun

Amend section 2.2.4(e) to clarify that a user may, but need not, Nominate its Authorised Overrun with its monthly Nomination for the Firm Service (at least 3 Days before the Month start) but must Nominate its Authorised Overrun by no later than the Nomination Deadline of 4.00pm on the day before the relevant gas day.

Delete the indemnities for unauthorised overrun in section 2.2.4(k) and section 4.2.2(f) of GGT's revised access arrangement.

Reinstate clause 7.3(d) of the existing terms and conditions in place of proposed section 2.2.4(l).

Minimum Term

The Authority requires that GGT amend section 2.2.5 of GGT's revised access arrangement so the minimum term of the firm service will be 12 months rather than 5 years.

Title to Gas

Delete proposed clauses 57 and 66 of GGT's proposed terms and conditions and reinstate clauses 14.3 and 14.4 of the current terms and conditions.

Amend section 2.2.8 of GGT's revised access arrangement accordingly to clarify that title to gas does pass to GGT at the receipt point and will pass from GGT to User at a delivery point.

Gas specification and commingling

Amend sections 2.2.7(a),(b) and (c) of GGT's revised access arrangement to align the content with the Authority's required amendments for clause 43 in GGT's proposed terms and conditions set out in Part 1 of Appendix 9. In addition, the following should be added as a new paragraph at the end of section 2.2.7 of GGT's revised access arrangement:

> "The User's and Service Provider's respective rights and obligations concerning Gas Specification and commingling are more particularly set out in the Terms and Conditions."

Toll and Capacity Reservation Tariff

Amend proposed section 2.2.11 to clarify the drafting and remove any doubt that all, not just "any" Conditions must be satisfied. For example, this could be done by amending "any Conditions" to read "all and any Conditions."

Negotiated Services

Reinstate section 4.2(c) of the current access arrangement.

Total Revenue

Revenue Building Blocks

Regulatory Requirements

126. Rule 76 of the NGR provides that total revenue is to be determined for each regulatory year of the access arrangement period using a building block approach:

> 76 Total revenue
>
> Total revenue is to be determined for each regulatory year of the *access arrangement period* using the building block approach in which the building blocks are:
>
> (a) a return on the projected capital base for the year; and
>
> (b) depreciation on the projected capital base for the year; and
>
> (c) the estimated cost of corporate income tax for the year; and
>
> (d) increments or decrements for the year resulting from the operation of incentive mechanism to encourage gains in efficiency; and
>
> (e) a forecast of operating expenditure for the year.

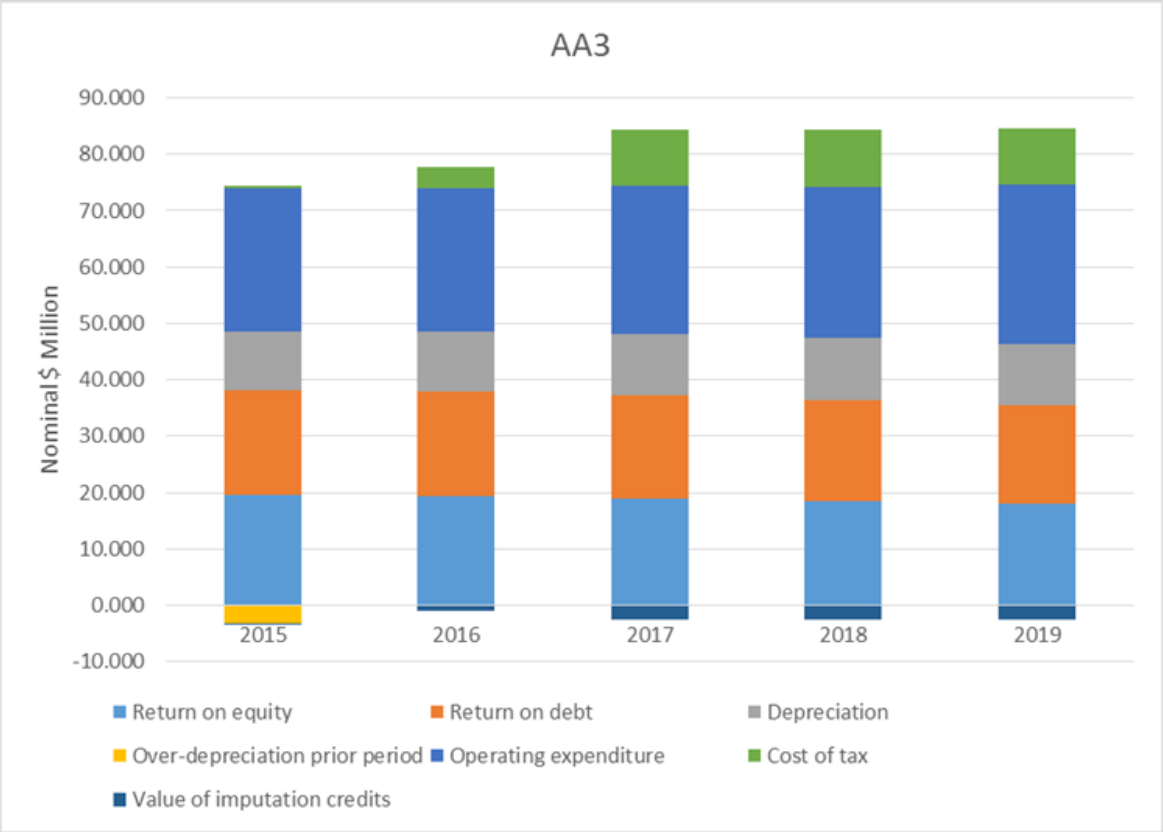
GGT's Proposed Revisions

127. GGT's proposed revised access arrangement has a total revenue requirement for the third access arrangement period of $393.76 million. GGT has calculated the total revenue in accordance with the building block approach, to determine the total revenue for the third access arrangement period, as the sum of the following:

- forecast operating expenditure;
- return on the projected capital base;
- depreciation of the projected capital base;
- an adjustment for an amount of over-depreciation during the prior period; and
- estimated cost of corporate income tax (net of imputation credits).

128. GGT's proposed total revenue for each year of the third access arrangement period is shown by the building blocks in Figure 1.

Figure 1 GGT Proposed Total Revenue Building Blocks (AA3)



Source: Goldfields Gas Transmission, Proposed revised Access Arrangement Information, 28 August 2014, Table 15, p. 28.

129. A breakdown of GGT's proposed total revenue for each year of the fourth access arrangement period in nominal dollars is set out in Table 3.

Table 3 GGT's Proposed Total Revenue (Nominal) Building Blocks (AA3)

Nominal $ million	2015	2016	2017	2018	2019	Total
Return on equity	19.47	19.30	18.98	18.52	18.01	94.28
Return on debt	18.77	18.60	18.30	17.85	17.37	90.89
Depreciation	10.35	10.72	10.91	10.99	11.00	53.97
Over-depreciation prior period	(3.21)	0.00	0.00	0.00	0.00	(3.21)
Operating expenditure	25.28	25.41	26.17	26.90	28.26	132.02
Cost of tax	0.59	3.68	9.99	10.13	10.03	34.42
Value of imputation credits	(0.15)	(0.92)	(2.50)	(2.53)	(2.51)	(8.61)
Total	**71.11**	**76.79**	**81.85**	**81.85**	**82.17**	**393.76**

Source: Goldfields Gas Transmission, Access Arrangement Revision Proposal: Supporting Information, 15 August 2014, Table 27, p. 188; ERA, Tariff Model, October 2014.

130. GGT proposes to include all costs associated with the provision of services for the covered pipeline, and to exclude from its calculation of total revenue any incremental capital and operating costs associated with assets that are not covered.[29]

131. GGT submits that this method of calculating total revenue was previously approved by the Authority and subsequently upheld by the Western Australian Electricity Review Board (**ERB**) on review for the last access arrangement, at which time the pipeline was covered by the Code.[30] GGT submits that its approach to calculating its total revenue ensures efficient use of the existing pipeline capacity as well as efficient investment in new capacity.

132. GGT has included an explicit cost of corporate income tax in its calculations to determine its rate of return for the third access arrangement period, as per rule 76 of the NGR. GGT notes that this is an amendment to its previous access arrangement, as the Code did not have this requirement.

133. GGT proposes that the return on the projected capital base should be calculated at the beginning of each regulatory year of the period from 1 January 2015 to 31 December 2019 as the product of a proposed nominal allowed rate of return and the projected historical cost capital base for the GGP. [31]

Submissions

134. BHPB submits that the changes to the total revenue building blocks proposed by GGT will contribute to financial gains that are inconsistent with the operation of a regulated asset. BHPB also considers that the proposed changes are not in accordance with the Authority's Rate of Return Guidelines. [32]

Considerations of the Authority

135. The Authority's assessment of GGT's proposed total revenue is documented in the following Draft Decision chapters:

- Demand Forecast;
- Operating Expenditure;
- Opening Capital Base;
- Projected Capital Base;
- Rate of Return;
- Gamma;
- Depreciation; and
- Taxation.

[29] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 23.

[30] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 23.

[31] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information: Attachment 3, CEG Cost Allocation for the Goldfields Gas Pipeline*, 15 August 2014, p. 30.

[32] BHP Billiton, *Public Submission by BHP Billiton In response to the Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 2.

136. As a result of the Authority's assessment of GGT's proposed total revenue building blocks as per rule 76 of the NGR, the Authority does not approve GGT's proposed total revenue for the third access arrangement period. The Authority's approved total revenue by building block in nominal dollars is set out in Table 4.

Table 4 Authority Approved Total Revenue (Nominal) Building Blocks (AA3)

Nominal $ million	2015	2016	2017	2018	2019	Total
Forecast Operating Expenditure	21.848	21.816	22.405	22.589	23.546	112.204
Return on Projected Capital Base	24.781	25.089	25.061	24.850	24.591	236.576
Regulatory Depreciation						
Depreciation	7.418	11.326	11.595	11.800	11.879	54.019
Inflationary Gain	(7.449)	(7.541)	(7.533)	(7.470)	(7.392)	(37.384)
Estimated Cost of Corporate Income Tax						
Corporate Income Tax	3.496	0.000	0.146	0.678	0.486	4.806
Imputation Credits	(1.398)	0.000	(0.059)	(0.271)	(0.194)	(1.923)
Authority Approved Total Revenue	**48.696**	**50.690**	**51.616**	**52.177**	**52.917**	**256.095**

Source: ERA, GGP Tariff Model, December 2015.

137. The Authority notes that Table 4 contains an adjustment to regulatory depreciation for inflationary gain. The Authority's required amendment for GGT to adopt the CCA depreciation approach necessitates a removal of the inflationary gain, which results from having a nominal post-tax weighted average cost of capital applied to an indexed regulatory asset base. This is discussed further in the Depreciation chapter of this Draft Decision.

138. The Authority has decided to apply the same approach as in the Final Decision on the Mid-West and South-West Gas Distribution Systems (**GDS**), and has removed inflationary gain from depreciation using the AER's Post Tax Revenue Model (**PTRM**) method (which removes the double count associated with indexation from the depreciation block). The Authority notes that the removal of inflationary gain does not constitute a deferral of depreciation under rule 89(2) of the NGR. The Authority considers that there is a need for transparency and requires the removal of inflation from the depreciation building block to be expressly acknowledged and shown as a separate line item.

139. The Authority has adjusted the approved total revenue in Table 4 for the purposes of calculating reference tariffs for the covered pipeline in the "Allocation of Total Revenue between Reference Services and Other Services" chapter of this Draft Decision.

Required Amendment 3

The Authority requires that GGT amend the proposed revised access arrangement values for total revenue (nominal) to reflect the values in Table 4.

Demand Forecast

Regulatory Requirements

140. Rule 72 of the NGR contains specific requirements for access arrangement information.

> 72. Specific requirements for access arrangement information relevant to price and revenue regulation
>
> (1) The access arrangement information for a full access arrangement proposal (other than an access arrangement variation proposal) must include the following:
>
> (a) if the access arrangement period commences at the end of an earlier access arrangement period:
>
> ...
>
> (iii) usage of the pipeline over the earlier access arrangement period showing:
>
> (A) for a distribution pipeline, minimum, maximum and average demand and, for a transmission pipeline, minimum, maximum and average demand for each receipt or delivery point; and
>
> (B) for a distribution pipeline, customer numbers in total and by tariff class and, for a transmission pipeline, user numbers for each receipt or delivery point.
>
> …
>
> (d) to the extent it is practicable to forecast pipeline capacity and utilisation of pipeline capacity over the access arrangement period, a forecast of pipeline capacity and utilisation of pipeline capacity over that period and the basis on which the forecast has been derived; …

141. In addition, rule 74 contains specific requirements for the provision of forecasts and estimates.

> 74. Forecasts and estimates
>
> (1) Information in the nature of a forecast or estimate must be supported by a statement of the basis of the forecast or estimate.
>
> (2) A forecast or estimate:
>
> (a) must be arrived at on a reasonable basis; and
>
> (b) must represent the best forecast or estimate possible in the circumstances.

GGT's Proposed Revisions

142. GGT submits that users of the GGP are primarily companies with mining and mineral processing operations within the Pilbara, Mid-West and Goldfields-Esperance regions of Western Australia, producing gold and nickel. Some gas is transported for power generation in regional communities, and a small quantity is delivered into the Kalgoorlie distribution system for commercial and residential use in the town.

143. In accordance with rule 72 of the NGR, GGT has provided the required pipeline usage information for both the second and third access arrangement periods. Table 5 below shows the actual reserved capacity and throughput of the pipeline over the second access arrangement period.

Table 5 Minimum, maximum and average historic demand by category (TJ/d)

(TJ/d)	2010 Actual	2011 Actual	2012 Actual	2013 Actual	2014 Forecast
Reserved Capacity					
Minimum	105.2	104.8	104.7	102.7	93.4
Maximum	106.1	105.5	105.6	106.7	102.0
Average	105.7	105.2	105.2	104.5	97.7
Throughput					
Minimum	84.0	81.3	80.6	80.6	77.8
Maximum	87.0	84.1	84.8	84.6	84.3
Average	85.6	82.4	82.5	83.5	81.1

Source: Goldfield Gas Transmission Pty Ltd, Access Arrangement Information, 28 August 2014, Table 4 p. 8.

144. Table 6 shows the user numbers for each receipt or delivery point over the second access arrangement period.

Table 6 Number of receipt points, delivery points and users

	2010	2011	2012	2013	2014
Receipt points	2	2	2	2	2
Delivery Points	15	15	15	15	15
Users	9	9	9	10	8

Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Information, 28 August 2014, Table 5 p.8.

145. GGT submits that its demand forecasts for the third access arrangement period are based on:

- user capacity entitlements in existing gas transportation agreements;
- GGT expectations concerning termination of existing transportation agreements, and likely new users of the GGP; and
- user provided estimates of the use of contracted capacity in the GGP.

146. GGT's forecast of covered pipeline capacity and throughput for the third access arrangement period are shown in Table 7 below.

Table 7 Forecast capacity and throughput 2015 - 2019

TJ/d	2015	2016	2017	2018	2019
Capacity	94.79	105.33	105.04	105.04	105.04
Throughput	71.42	78.04	78.04	78.04	78.04

Source: Goldfield Gas Transmission Pty Ltd, Access Arrangement Information, 28 August 2014, Table 11 p. 14.

147. GGT forecasts that demand for reserved capacity will largely remain stable over the third access arrangement period (except for 2015 where it will be approximately 10 TJ/d lower). However, average throughput will decline by 5TJ/d from the amounts recorded over the second access arrangement period and will be 11TJ/d

lower in 2015. GGT submits that 75 per cent of the current use of the capacity of the covered pipeline is contracted to companies using gas in nickel and gold mining and processing operations.

Nickel

148. [redacted]

149. GGT submits that the combination of dwindling stockpiles and worldwide growth in nickel consumption of around 1 per cent will cause the price of nickel in Australia to continue to rise throughout the third access arrangement period. However, GGT also concedes that this growth may be attenuated by the production of nickel in other countries.[33] GGT considers that the volatility in the price of nickel on the international market tends to be reflected in uncertainty regarding nickel mining and processing operations in Western Australia.[34]

150. GGT forecasts that the contracted capacity for these users is likely to remain unchanged over the third access arrangement period. [redacted]

Gold

151. [redacted]

152. GGT advises that the capacity requirements of gold mining and processing operations diminished in 2013 due to the steady devaluation of gold. [redacted]

153. [redacted] However, GGT states that no other prospective user is currently seeking a substantial tranche of capacity in the GGP.

Other uses

154. The remainder of the total capacity (some 22 TJ/day) is allocated as follows:

- 17 TJ/d is reserved by [redacted] (16TJ/d) and [redacted] (1 TJ/d) for the transport of gas for power generation in [redacted];

[33] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 34.

[34] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 35.

- 0.40 TJ/d is reserved by [redacted] for the transport of gas for power generation in [redacted];
- 3.00 TJ/d is reserved by [redacted] for the transport of gas through the GGP and into the [redacted] for power generation in [redacted]; and
- 1.04 TJ/d is reserved by [redacted] for the transport of gas into the [redacted].

155. [redacted]

156. [redacted]

157. [redacted]

Spare capacity

158. GGT states that the capacity of the covered pipeline is 109 TJ/day.[35] GGT's forecast capacity for the GGP from 2016 to 2019 is approximately 105 TJ/d. GGT states that (3.5 TJ/d) capacity became available in 2013 when Apex Minerals gold mining operation at Wiluna went into administration.

Submissions

159. In its submission in response to GGT's supporting information, BHPB suggested that GGT's forecasts should be carefully tested and considered to ensure that they comply with the forecasting requirements of the NGR. BHPB also suggested that the Authority should confirm whether GGT's proposed changes to its minimum HHV are included in the forecast.

Considerations of the Authority

160. The Authority has reviewed GGP's actual reserved capacity and throughput during the second access arrangement. The Authority has also assessed what the gas is used for, the proportions of what the gas is used for and whether the conditions in international commodity markets have an effect on demand.

161. The Authority has confirmed that the GGP transports gas for mining and processing nickel, gold and iron ore, power generation in Leonora and Esperance and gas distribution in Kalgoorlie.

[35] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal*, 15 August 2014, p. 3.

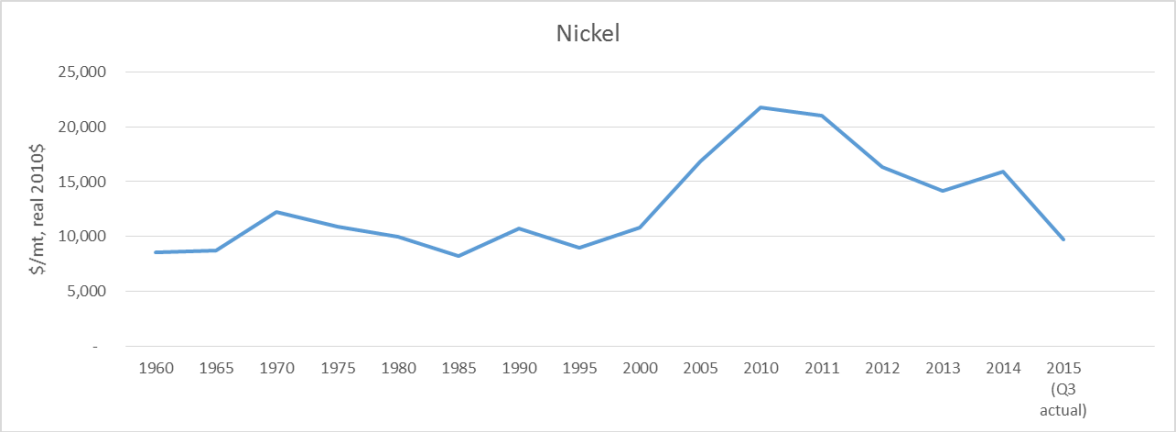
162. The Authority has reviewed the relative importance of customer use on the GGP and considers that the following share of capacity of the covered pipeline is represented by:

- Nickel mining operations (55 per cent)
- Gold mining (25 per cent)
- Iron ore mining (16 per cent)
- Power generation (4 per cent)

163. The Authority has considered historical World Bank Commodities Price Data to determine if GGT's forecast matches the conditions in international commodity markets. Specifically the Authority has checked the historical trend of the price of nickel, gold and iron ore.

164. Figure 2 shows the trend in nickel prices from the World Bank from 1960 to 2015.

Figure 2 Nickel Price Trend 1960-2015

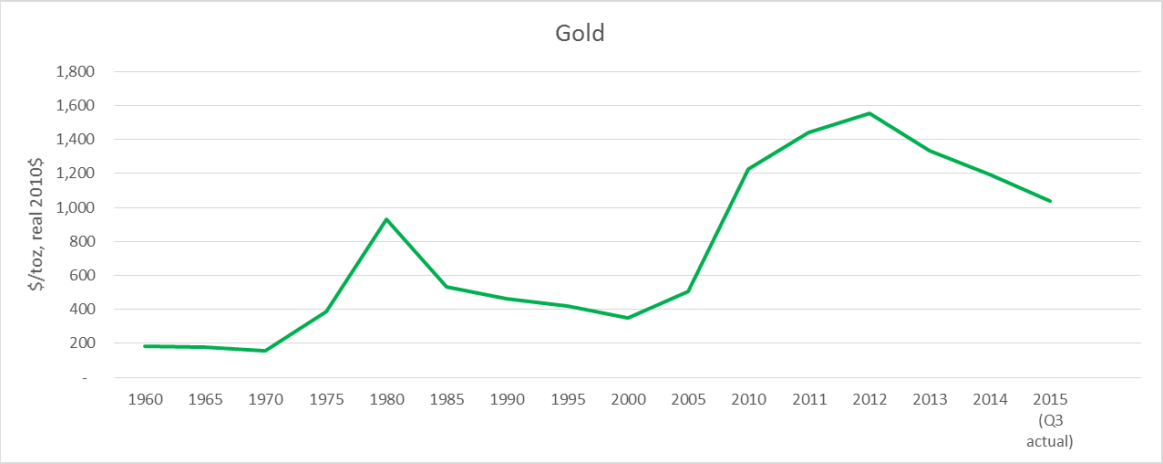


Source: Global Economic Monitor (Commodities), World Databank, The World Bank; ERA Analysis (2015 based on third quarter of 2015 and 2015 nominal to real conversion derived using the US GDP implicit price deflator series – see research.stlouisfed.org/fred2/series/GDPDEF).

165. The Authority notes that GGT has forecast that gas capacity of the pipeline related to nickel mining will remain constant while gas throughput is expected to fall over the third access arrangement period. This may reflect the fall in nickel prices from 2010 as shown in Figure 2.

166. Figure 3 shows the trend in Gold prices from the World Bank from 1960 to 2015.

Figure 3 Gold Price Trend 1960-2015

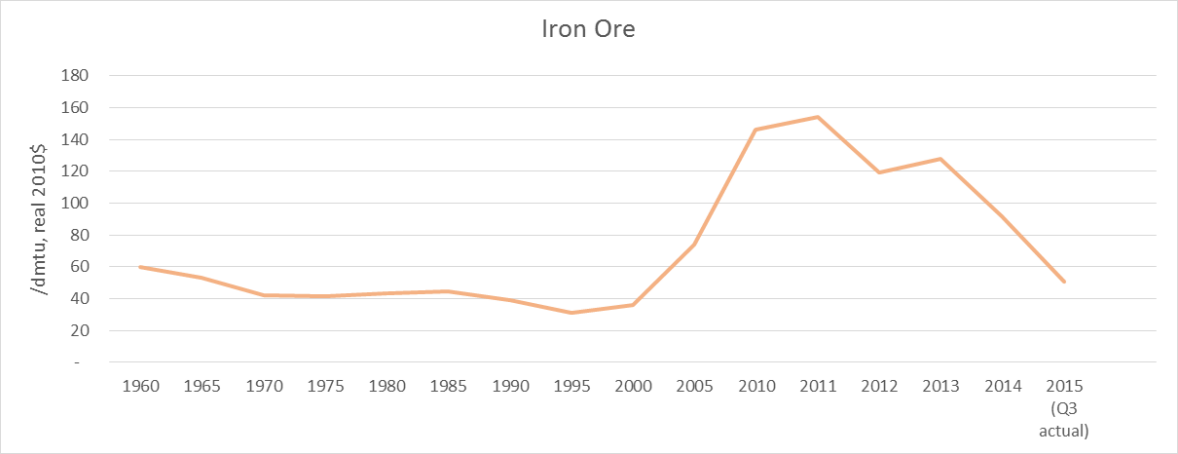


Source: Global Economic Monitor (Commodities), World Databank, The World Bank; ERA Analysis (2015 based on third quarter of 2015 and 2015 nominal to real conversion derived using the US GDP implicit price deflator series – see research.stlouisfed.org/fred2/series/GDPDEF).

167. The World Bank data shows that the price of gold has fallen since 2012. GGT states that this outlook is reflected in the forecasts for the gold mining operations. [redacted] However, the Authority notes that the capacity and throughput for gold will slightly increase in the third access arrangement period after 2016, [redacted]

168. Figure 4 shows the trend in Iron Ore prices from the World Bank from 1960 to 2015.

Figure 4 Iron Ore Price Trend 1960-2015



Source: Global Economic Monitor (Commodities), World Databank, The World Bank; ERA Analysis (2015 based on third quarter of 2015 and 2015 nominal to real conversion derived using the US GDP implicit price deflator series – see research.stlouisfed.org/fred2/series/GDPDEF).

169. [redacted]

170. The Authority notes that GGT's forecast of reserved capacity returns to pre-2013 figures from 2016 onwards. However, GGT has forecast a decline of 5 TJ/d in throughput for the third access arrangement period.

171. The Authority notes that the decline in forecast throughput is due to a decline in forecast throughput in nickel mining operations. Based on the Authority's assessment of commodity prices in paragraphs 164 to 169, the Authority considers that GGT's assessment of the impact of projected prices for nickel on the demand for throughput over the third access arrangement period is reasonable.

172. The Authority's technical consultant EMCa has advised the Authority on whether GGT's forecast capacity and throughput has any impact of GGT's forecast capital and operating expenditure. EMCa has identified that GGT has made no provision in the third access arrangement period for expansion of pipeline services. However, EMCa notes that the GGTJV is investing in significant expansion of the pipeline and related assets that are not part of the covered pipeline. EMCa has also identified that as corporate operating costs (the costs of APA Group corporate functions which provide services to the covered pipeline) are allocated to entities within the APA Group on the basis of revenue earned (which in turn varies with throughput), operating expenditure is materially affected by throughput. To a lesser extent, the field services component of APA operations operating expenditure will also be affected by changes in throughput.

173. In its proposed revised access arrangement, GGT revised the minimum HHV to 37.0 MJ/m^3 from 35.5 MJ/m^3 in the current access arrangement. As stated in paragraph 93, on 10 March 2015, the *Gas Supply (Gas Quality Specifications) Act 2009* (**GSL**) was amended to include explicit gas specifications for the GGP.[36] The reference gas specification set out by the GSL was consistent with the gas specification in GGT's current access arrangement. Given this, the Authority considers that the pipeline capacity will remain the same at 109 TJ/day and therefore have no impact on the spare capacity available. The Authority notes that GGT's proposal was submitted prior to the GSL amendment and that GGT may address the GSL amendment in its response to this Draft Decision.

174. The Authority is satisfied that GGT's forecast for capacity and throughput are reasonable, and are based on the best information available at the time they were made. As the Authority has confirmed GGT's forecast capacity of around 105 TJ/day, the resulting spare capacity is approximately 4 TJ/day.

Key Performance Indicators

Regulatory requirements

175. Rule 72(1)(f) requires the access arrangement information for a full access arrangement proposal to include the Key Performance Indicators (**KPI**s) to be used by the service provider to support expenditure to be incurred over the access arrangement period.

[36] Western Australian Government Gazette, Perth, *Gas Supply (Gas Quality Specifications) Amendment Regulations 2015*, Tuesday 10 March 2015, No 36, p. 836.

GGT's Proposed Revisions

176. GGT frames its KPIs in terms of unit operating costs of $/PJ per day for capacity reservation and throughput, however, GGT attests that these measures do not account for the fact that the outlets of the covered pipeline are distributed over 78 per cent of its length.[37]

177. GGT's forecast unit operating costs indicate an overall reduction in operating expenditure over the third access arrangement period.[38]

178. GGT submits that the unusually low operating expenditure on engineering operations from late 2012 to the first half of the 2014 calendar year was partially due to the reassignment of labour from the covered pipeline to support the expansion of the pipeline in the Pilbara.[39]

179. GGT submits that the reduction in administration costs in 2013 was due to the transfer of administration staff to operations related to uncovered portions of the pipeline. In 2014 these staff were transferred back to their substantive administrative roles where they will remain for the third access arrangement period.

Submissions

180. None of the submissions made to the Authority on the proposed revisions to the access arrangement address KPIs.

Considerations of the Authority

181. The Authority directed EMCa, its technical advisor, to assess GGT's proposed KPIs from the following perspectives:

- how they have been used to support capital and operating expenditure forecasts in comparison with industry standards; and
- operational and service level performance in comparison with industry standards.

182. EMCa considered that GGT's approach to accounting for the length and throughput of the GGP was reasonable; however, GGT presented no benchmark comparison for its operating costs to demonstrate that its expenditure is efficient.[40] EMCa also noted that GGT did not present other "outcomes based" KPIs in its access arrangement proposal.

183. EMCa considered that while GGT may have an incentive to minimise its direct operational costs, it also has an inverse incentive to maximise its corporate

[37] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 16.

[38] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Information*, 15 August 2014, p. 16.

[39] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 166.

[40] Energy Market Consulting Associates, *Goldfields Gas Transmission's Proposed Revised Access Arrangement for the Goldfields Gas Pipeline: Review of Technical Aspects of the Proposed Access Arrangement*, December 2014, p. 27.

overhead allocation to the covered pipeline.[41] EMCa calculated that 6 per cent of the 7 per cent total reduction in operating expenditure from the second access arrangement period is due to the reduced allocation of corporate costs to the covered pipeline. The remaining 1 per cent reduction may be considered as reductions in expenditure due to efficiency related initiatives.[42] EMCa considered that there were opportunities for further reductions in operating expenditure over the course of GGT's third access arrangement period beyond the 4 per cent forecast by GGT.

184. EMCa benchmarked GGT's operating costs against those of other regulated transmission pipeline operators, with operating expenditure normalised by pipeline length. EMCa found that, of seven benchmark firms, GGT's operating expenditure was the equal second highest when normalised by pipeline length and pipeline diameter in the year 2011.

185. EMCa considered that, while GGT's KPI in units of operating expenditure/PJ per day supports its expenditure over the third access arrangement period, it does not facilitate comparison with other transmission pipelines, which base their KPIs on units of $/Km. EMCa recommended that the Authority require GGT to present an operational expenditure KPI based on units of $/Km.

186. EMCa also suggested that based on KPIs in GGT's Asset Management Plan (**AMP**), the Authority could consider requiring GGT to include pipeline integrity and availability KPIs and targets in its access arrangement and link expenditure to them.

187. The Authority concurs with EMCa's suggestion that there are likely to be opportunities for further reductions in operating expenditure over the third access arrangement period, given the results of the benchmarking conducted by EMCa.

188. The Authority notes EMCa's conclusion that GGT has provided no link between its expenditure and KPIs and that the units provided by GGT do not facilitate benchmarking with comparable firms.[43] [44] Therefore, the Authority requires GGT to provide operating expenditure cost KPIs in units of $/Km of pipeline so that the Authority can compare GGT's expenditure against the operating expenditure of other transmission pipelines.

189. The Authority also considers that GGT should provide operational expenditure linked KPIs that relate to pipeline integrity, availability and reliability of compressor stations as shown in its AMP.

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41 Energy Market Consulting Associates, *Goldfields Gas Transmission's Proposed Revised Access Arrangement for the Goldfields Gas Pipeline: Review of Technical Aspects of the Proposed Access Arrangement*, December 2014, p. 27.

42 Energy Market Consulting Associates, *Goldfields Gas Transmission's Proposed Revised Access Arrangement for the Goldfields Gas Pipeline: Review of Technical Aspects of the Proposed Access Arrangement*, December 2014, p. 28.

43 Energy Market Consulting Associates, *Goldfields Gas Transmission's Proposed Revised Access Arrangement for the Goldfields Gas Pipeline: Review of Technical Aspects of the Proposed Access Arrangement*, December 2014, p. 18.

44 Energy Market Consulting Associates, *Goldfields Gas Transmission's Proposed Revised Access Arrangement for the Goldfields Gas Pipeline: Review of Technical Aspects of the Proposed Access Arrangement*, December 2014, p. 28.

Required Amendment 4

GGT must provide an operating expenditure cost per Km KPI in units of $/Km of pipeline to facilitate benchmarking with comparable firms.

GGT must provide operational expenditure linked KPIs that relate to pipeline integrity, availability and reliability as shown in its asset management plan.

Operating Expenditure

Regulatory Requirements

190. Rule 91 of the NGR sets out the criteria the Authority must consider in approving a service provider's operating expenditure:

> 91. Criteria governing operating expenditure
>
> (1) Operating expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of delivering pipeline services.
>
> (2) The [Authority's] discretion under this rule is limited.

191. Rule 74 of the NGR contains specific requirements for the provision of forecasts and estimates.

> 74. Forecasts and estimates
>
> (1) Information in the nature of a forecast or estimate must be supported by a statement of the basis of the forecast or estimate.
>
> (2) A forecast or estimate:
>
> (a) must be arrived at on a reasonable basis; and
>
> (b) must represent the best forecast or estimate possible in the circumstances.

192. Rule 71 of the NGR is also relevant to the Authority's consideration of forecast operating expenditure.

> 71. Assessment of compliance
>
> (1) In determining whether capital or operating expenditure is efficient and complies with other criteria prescribed by these rules, the [Authority] may, without embarking on a detailed investigation, infer compliance from the operation of an incentive mechanism or on any other basis the [Authority] considers appropriate.
>
> (2) The [Authority] must, however, consider, and give appropriate weight to, submissions and comments received when the question whether a relevant *access arrangement proposal* should be approved is submitted for public consultation.

GGT's proposed changes

193. GGT has forecast operating expenditure of $117.205 million for the third access arrangement period.[45,46] GGT's forecast operating expenditure is 6.7 per cent lower than GGT's actual operating expenditure of $125.64 million during the second access arrangement period.[47,48]

194. GGT presented its forecast operating expenditure in its proposed revised access arrangement information document under the following five categories: pipeline operations; commercial operations; regulatory costs; insurance; and corporate overheads.

195. However, in GGT's proposed revised access arrangement supporting information document, it explained its forecast operating expenditure under the following four categories: APA operations, GGT operations, APA commercial operations and corporate costs.

196. GGT developed its forecast operating expenditure for APA operations, GGT operations and APA commercial operations over the third access arrangement period based on the latest five-year budget approved by the GGTJV on 20 June 2014.[49] GGT periodically prepares a detailed operating expenditure budget for five years ahead for the GGP. GGT notes that its budget is prepared as follows:[50]

- all forecast operating expenditure directly attributable to uncovered assets has been removed;
- forecasts of operating expenditure attributable to both the covered pipeline and uncovered assets are allocated to the covered pipeline using different ratios;[51]
- a "base year" of actual expenditure has been selected and the five-year budget forecasts have been compared against the base year; and
- significant differences have been identified and, where appropriate, adjustments have been made to the budget forecasts.

197. GGT's forecast corporate costs are calculated using an approach which allocates corporate costs across the APA Group entities on the basis of revenues earned. The corporate costs are actual corporate costs which have been identified from the audited accounts from the APA Group in 2013. GGT's forecast corporate costs were calculated as follows: actual corporate costs were identified from APA Group's audited accounts in 2013:[52]

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45 Real $ million at 31 December 2013.

46 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 170.

47 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Table 24, p. 164.

48 The Second access arrangement period was less than five years from 20 August 2010 to 31 December 2014. However for comparison purposes, the operating expenditure is compared on a five year basis i.e. from the 1 January 2010.

49 Goldfields Gas Transmission Pty Ltd, *Email response to EMCa17,* 10 October 2014.

50 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 165.

51 Allocation ratios are explained in detail in paragraph 200.

52 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, 15 August 2014, pp. 183-184.

- APA Group's corporate costs were allocated, on the basis of revenues earned in 2013, to each of the entities within the APA Group, including APT Goldfields Pty Ltd, and GGP service providers Southern Cross Pipelines Australia Pty Ltd and Southern Cross Pipelines (NPL) Australia Pty Ltd;
- corporate costs attributable to specific projects which are unrelated to GGP service provision are removed;
- escalation is applied to the total to obtain estimates of corporate costs for each year in the period 2015 to 2019; and
- a proportion of GGT's forecast corporate costs is attributed to the covered pipeline, the proportion, 70 per cent, is the ratio of TJ.km/day of capacity in the covered pipeline to the total TJ.km/day of capacity in the covered pipeline and the uncovered pipeline.

198. GGT proposes to include in total revenue, all costs that would be incurred by a prudent service provider in operating the covered pipeline on a standalone basis, as in the current access arrangement. The only costs that are not included in total revenue for the covered pipeline are the incremental costs associated with the uncovered pipeline and a share of APA's corporate costs.

199. GGT sets out in section 3 of its access arrangement supporting information the reasons why its proposed allocation of costs between the covered pipeline and the uncovered pipeline complies with the NGR, the NGO, and the revenue and pricing principles set out in the NGL(WA).[53]

200. GGT has proposed to allocate operating expenditure attributable to both the covered and uncovered pipeline using a ratio. GGT has proposed to allocate operating expenditure on the following basis:

- APA operating costs are allocated 100 per cent to the covered pipeline except for the following:
  - field services costs provided by APT Pipelines (WA) Pty Ltd are allocated based on GGT's assessment of the expected relative direct cost of field services in 2015, with a resulting 76 per cent allocation to the covered pipeline.
- GGT operating costs are allocated 100 per cent to the covered pipeline except for the following:
  - APA operations management - a management fee for managing APT Pipelines (WA) Pty Ltd is allocated based on GGT's assessment of the expected relative direct cost of field services in 2015, with a resulting 76 per cent allocation to the covered pipeline.
  - APA commercial management – a commercial service fee for managing APT Goldfields Pty Ltd is allocated based on relative distance-weighted contracted capacity i.e. contracted TJ.Km/day between covered pipeline contracted capacity and uncovered pipeline contracted capacity with a resulting 70 per cent allocation to the covered pipeline.
- APA commercial operating costs are allocated 100 per cent to the covered pipeline.
- APA corporate overheads are firstly allocated to the GGT based on relative revenue within the APA Group. Secondly the GGT corporate overheads are

[53] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, 15 August 2014, pp. 22-28.

allocated between the covered and uncovered pipeline based on relative distance-weighted contracted capacity (i.e. contracted TJ.Km/day between covered pipeline contracted capacity and uncovered pipeline contracted capacity with a resulting 69 per cent allocation to the covered pipeline.

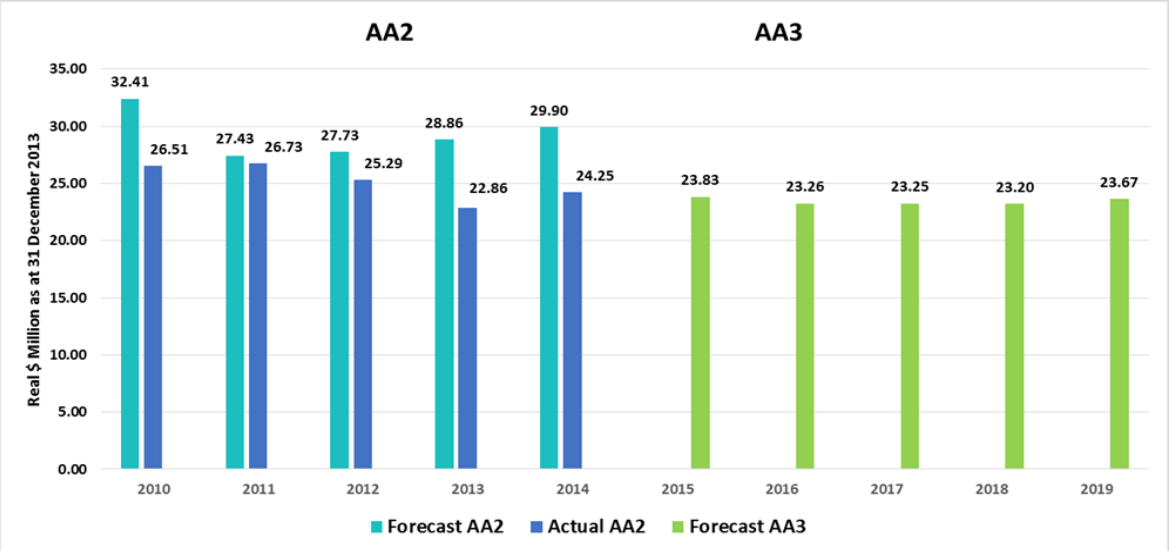
201. GGT has selected 2012 as the base year for assessing the efficiency and prudency of forecast of operating expenditure for the third access arrangement period. GGT has selected 2012 as the base year, as it claims that:

- expenditure during 2012 is representative of operating expenditure in the second access arrangement period;
- certain specific factors caused expenditure on the covered pipeline in 2013 and 2014 to be abnormally low and not representative of future expenditures; and
- an external auditor has reviewed operating expenditure attributed to the covered pipeline in 2012.

202. GGT considers that the main reason for which operating expenditure in 2013 and 2014 was abnormally low, was that staff were reassigned from work on the covered pipeline to expansion projects on the uncovered pipeline as labour was in short supply.

203. Figure 5 shows the Authority's approved operating expenditure forecast for the second access arrangement period, and GGT's proposed actual operating expenditure in the second access arrangement period, and GGT's proposed operating expenditure forecast for the third access arrangement period.

Figure 5 Authority's Approved Forecast and Actual Operating Expenditure (AA2) and GGT's Proposed Operating Expenditure (AA3) by Year



Source: Goldfields Gas Transmission Pty Ltd, Access Information Revision proposal: Supporting information, 15 August 2014 and Goldfields Gas Transmission Pty Ltd, Proposed Revision to Access Arrangement Information, 5 August 2010.

204. GGT's forecast operating expenditure ($117.205 million) for the third access arrangement period consists of the following:[54]

[54] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, 15 August 2014, Table 26, p. 170.

- APA operations accounts for 44 per cent ($51.75 million)
- GGT operations accounts for 15 per cent ($17.38 million)
- APA commercial operations accounts for 15 per cent ($17.95 million)
- Corporate costs accounts for 26 per cent ($30.12 million).

205. Table 8 shows GGT's proposed operating expenditure forecast by category for the third access arrangement period.

Table 8 GGT's Proposed Forecast Operating Expenditure (AA3) by Category[55]

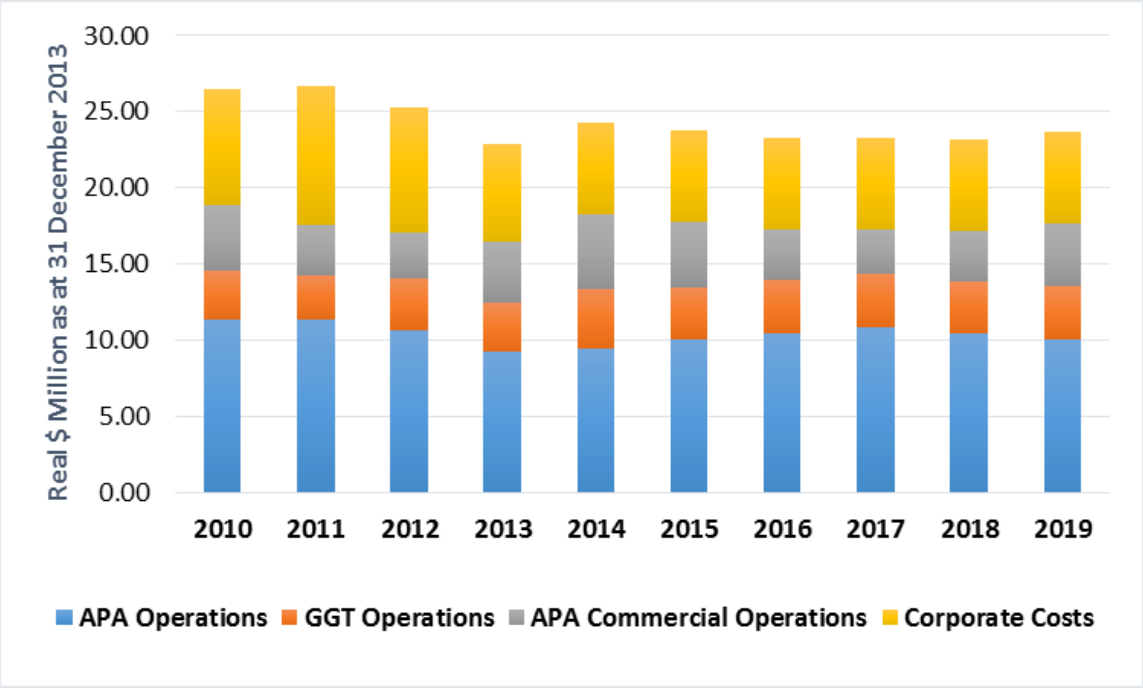
Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
APA Operations	10.027	10.430	10.823	10.391	10.083	51.753
GGT Operations	3.449	3.480	3.483	3.483	3.483	17.378
APA Commercial Operations	4.325	3.322	2.920	3.303	4.080	17.950
Corporate Costs	6.025	6.025	6.025	6.025	6.025	30.123
GGT Operating Expenditure	**23.826**	**23.257**	**23.250**	**23.202**	**23.670**	**117.205**

Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Tables 24 and 26, p.164 and p. 170.

206. Figure 6 shows GGT's actual annual operating expenditure in the second access arrangement period, and GGT's proposed annual forecast operating expenditure for the third access arrangement period by category.

[55] GGT's proposed corporate cost forecast includes an allocation of 30 per cent to the uncovered pipeline.

Figure 6 **GGT's Actual Operating Expenditure (AA2) and Proposed Operating Expenditure (AA3) by Category and Year (Real $ million at 31 December 2013)**



Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Tables 24 and 26, p. 164 and p. 170.

APA Operations

207. GGT has forecast a decrease in APA operations expenditure of 0.40 per cent from $51.962 million for the second access arrangement period to $51.753 million for the third access arrangement period.

208. GGT's proposed forecast APA operations expenditure can be broken down as follows:

- Administration (business services), $1.685 million or 3 per cent; with expenditure incurred in providing the administrative and office services required to support APA provision of pipeline engineering and field services to the Covered Pipeline.
- Engineering, $7.319 million or 14 per cent; with expenditure incurred in providing the specialist engineering support required for pipeline operation and maintenance, and for the execution of the minor projects required to sustain day-to-day operations.
- Field services, $40.805 million or 79 per cent; with expenditure incurred in "on site" or "in the field" operation and maintenance of the covered pipeline.
- Major expenditure jobs, $1.944 million or 4 per cent; with large scale, non-recurrent activities undertaken to maintain the covered pipeline.

GGT Operations

209. GGT has forecast an increase in GGT operations expenditure of 4.15 per cent from $16.685 million for the second access arrangement period to $17.378 million for the third access arrangement period.

210. The proposed forecast GGT operations expenditure subcategories can be broken down as follows:

- Administration, $7.951 million or 46 per cent; with expenditure incurred in providing office services, rents, taxes, levies and licence fees.
- APA operations recoverable, -$4.934 million or - 28 per cent; GGT recovers a portion of the rent from the proportion of its premises that is occupied by APT Pipelines (WA) and APT Goldfields.
- APA operations management, $6.526 million or 38 per cent; GGT has a contract with APT Pipelines (WA) Pty Ltd for the provision of engineering and field services for the operation and maintenance of the covered pipeline.
- APA commercial management, $5.947 million or 34 per cent; GGT has a contract with APT Goldfields Pty Ltd for the provision of services which support the commercial operation of the covered pipeline.
- Projects/operations, $1.599 million or 9 per cent; with expenditure for operations-related projects as a result of cyclones.
- 1 per cent or $0.215 million for a contractor to provide field services on the Newman Lateral.
- Less than 1 per cent or $0.058 million on marketing, $0.005 million on public relations and $0.010 million on technical regulatory.

APA Commercial Operations

211. GGT has forecast a decrease in APA commercial operations expenditure of 8.38 per cent from $19.593 million for the second access arrangement period to $17.950 million for the third access arrangement period. APA commercial operations expenditure consists of the following eight subcategories:

- Administration, $2.490 million or 14 per cent; with expenditure for the administrative and office services directly supporting commercial operations for the covered pipeline.
- Legal, $1.114 million or 6 per cent; with expenditure required when new gas transportation agreements are negotiated, when existing agreements are modified or extended, and when contractual matters are in dispute or a user defaults.
- Marketing, $2.582 million or 14 per cent; with expenditure incurred in activities intended to generate new business for the covered pipeline, and to secure the retention of existing users.
- Public relations, $0.022 million; with expenditure for contributions made to community development programs in remote areas.
- ERA charges, $2.065 million or 12 per cent; with expenditure to meet charges levied by the ERA.
- GGT regulatory costs, $5.105 million or 28 per cent; with expenditure incurred by GGT in responding to economic, environmental and other regulation which impacts on, or which may impact on, the covered pipeline.
- Communications equipment lease and maintenance, $1.089 million or 6 per cent.

- Insurance, $3.483 million or 19 per cent; with expenditure for the cost of insurance attributable to the covered pipeline is a portion of the APA Group cost of insuring the assets of its component infrastructure businesses.

Corporate Costs

212. GGT has forecast a decrease in corporate costs of 19.46 per cent from $37.400 million for the second access arrangement period to $30.123 million for the third access arrangement period.

Submissions

213. BHPB considers that GGT's approach to cost allocation needs to be reconsidered following the transition from the Code to the NGL(WA) and NGR. BHPB considers that a key distinction between the Code and the NGL(WA)/NGR is the introduction of the NGO.

214. BHPB states that a number of Australian and International regulators consider it desirable that a contribution be made to the recovery of regulated costs from unregulated services where joint costs are present. BHPB provided examples where this had occurred in the National Electricity Market, Australian telecommunications services, Australian airport terminals and decisions from the New Zealand regulator (**Commerce Commission**).

Considerations of the Authority

215. The Authority has sought to verify GGT's operating expenditure during the second access arrangement period, in order to review GGT's proposed forecast operating expenditure for the third access arrangement period.

Verification of Operating Expenditure

216. GGT has provided the Authority with copies of its regulatory financial accounts for the years ending 31 December 2010, 31 December 2011, 31 December 2012 and 31 December 2013.

217. GGT engaged Deloitte to conduct a non-statutory review of the financial information relating to the schedule of regulatory revenue, operating expenditure and capital expenditure for the regulatory financial accounts provided to the Authority.

218. Deloitte stated that for all regulatory accounts, based on its review, which was not an audit, nothing came to its attention that caused it to believe that the Schedule does not present fairly, in all material respects, the Operating and Capital Expenditure of GGTJV in accordance with the accounting policies described in Note 1 to the Schedules.

219. The Authority has undertaken its own review of GGT's regulatory accounts. The Authority has sought to ensure that the expenditures recorded in the financial accounts are consistent with GGT's proposal, specifically the access arrangement supporting information.

220. The Authority notes that for the operating expenditure category, APA Commercial Operations – Insurance, there were discrepancies between the regulated accounts and Table 23 of the access arrangement supporting information for the years 2010 to 2013. The amounts recorded by GGT in the regulated accounts and

subsequently reviewed by Deloitte were consistently lower than the amounts GGT provided in its Table 23 of the access arrangement supporting information. The Authority requested that GGT provide an explanation for this discrepancy by way of a reconciliation between the regulatory accounts and the access arrangement supporting information. GGT stated that the discrepancy between the two sources was due to Table 23 of the access arrangement supporting information including, "in addition to the amounts in the regulated accounts reviewed by Deloitte, an allowance for self-insurance which was included in the ERA approved non capital costs for the period 2010 to 2014".[56]

221. The Authority is concerned with the process and approach in which the expenditure figures were recorded by GGT and provided to Deloitte for review. The Authority considers that a more robust review approach would not have led to this discrepancy being recorded. The Authority considers that the regulatory accounts should be reviewed after all allocations and reviews have been completed by GGT, or alternatively Deloitte should conduct a review prior to GGT submitting the reviewed accounts to the Authority for the access arrangement review process.

222. Notwithstanding the discrepancy between the reviewed accounts and the access arrangement supporting information, the Authority considers that the regulatory accounts for the years ending 31 December 2010, 31 December 2011, 31 December 2012 and 31 December 2013 are free from material misstatement. The Authority requires GGT to submit its reviewed regulatory accounts for the year ending 31 December 2014 in any response to the Authority's Draft Decision.

223. GGT's access arrangement supporting information provides a description of its proposed Cost Allocation Methodology (**CAM**) for determining total revenue for the covered pipeline. GGT considers that the total revenue should be the total of the costs of offering to provide, and providing, the reference service, negotiated services and services to the joint venturers using the covered pipeline, excluding:

- the capital costs of those parts of the pipeline system (a second compressor added at Paraburdoo, in 2006, and compressors installed at Wyloo West and at Ned's Creek in 2009) which are uncovered;
- the capital costs of the recent pipeline expansion for Rio Tinto Iron Ore and for BHP Billiton Iron Ore, which GGT has elected be uncovered; and
- the costs of operating and maintaining those parts of the GGP which are uncovered, and the costs of operating and maintaining the expansion for Rio Tinto Iron Ore and BHP Billiton Iron Ore.

224. As discussed in the Allocation of Total Revenue between covered services and other services, the Authority does not accept GGT's proposed CAM. Further detail regarding the Authority's required amendment for the CAM can be found in a subsequent Chapter to this Draft Decision on the Allocation of Total Revenue between Services and Other Services.

Assessment of Operating Expenditure

225. The Authority's technical advisor, EMCa, has assessed the alignment of GGT's governance framework with its corporate objectives in relation to operating expenditure forecasting. EMCa focused on the effectiveness of the governance

[56] Goldfields Gas Transmission Pty Ltd, *Email Response to ERA12*, 12 October 2015.

process, gathering evidence that the processes and procedures were being used in practice and checking that they were aligned with good industry practice.

226. EMCa's review of forecast operating expenditure covers an assessment of GGT's proposed APA operations, GGT operations, APA commercial operations and corporate costs categories.

227. EMCa has assessed GGT's proposed forecast operating expenditure for the third access arrangement period. EMCa's assessment framework is set out in Figure 2 of its report.[57] EMCa has a three step approach when assessing operating expenditure.

228. First, EMCa reviewed whether GGT's proposed operating expenditure is such as would be incurred by a prudent service provider acting efficiently in accordance with accepted good industry practice, as set out in rule 91(1) of the NGR. For example, EMCa has considered whether proposed increases are justified against a range of matters, including actual costs incurred in the second access arrangement period and benchmarking against other pipelines.

229. Second, EMCa has considered whether GGT's forecasts or estimates underlying its operating expenditure have been arrived at on a reasonable basis and represent the best forecast or estimate possible in the circumstances, as required by rule 74(2) of the NGR. For example, EMCa checked GGT's proposed labour rates.

230. Third, EMCa has assessed whether GGT's proposed method for allocating operating costs conforms to rule 93(2) of the NGR. For example, EMCa considered GGT's proposal to allocate significant categories of operational expenditure 100 per cent to the covered pipeline.

231. EMCa's main concerns in relation to GGT's proposed operating expenditure forecasting are as follows:

- GGT has underspent against the Authority's approved forecast by 14 per cent in the second access arrangement period. This indicates that there are issues with GGT's forecasting and governance processes.
- GGT has not provided evidence that the top-down challenge process from the GGP JV Management Committee was followed.
- GGT proposes that a large amount of operating expenditure is allocated 100 per cent to the covered pipeline.
- GGT proposed operating expenditure includes large amounts of labour-related expenditure.
- GGT proposed to include corporate costs derived from the APA Group in its operating expenditure.

232. Assessment of GGT's proposed forecast operating expenditure for the third access arrangement period has covered the following:

- Base year
- Labour rates
- APA Operations

[57] Energy Market Consulting associates, *Final Report*, December 2014, p. 13.

- GGT Operations
- APA Commercial Operations
- Corporate costs

Base year

233. GGT has proposed to use 2012 as a base year for assessing the efficiency and prudence of forecast operating expenditure for the third access arrangement period. GGT has chosen 2012 for the following reasons:[58]

- GGT considers 2012 to be representative of operating expenditure over 2010 to 2014.
- GGT considers that operating expenditure in 2013 and 2014 has been abnormally low due to the following:
  - lower component expenditures in APA operations (engineering and field services) and GGT operations (administration); and
  - smaller increases over 2012 in GGT operations expenditure (APA operations recoverable) and APA commercial operations expenditure (carbon liability).
- GGT's external auditor has reviewed operating expenditure attributed to the covered pipeline in 2012.

234. Even though GGT states in its access arrangement supporting information that it uses a "base year" for assessing the efficiency and prudence of forecast operating expenditure, EMCa did not find any evidence that a base year was used to inform its forecast operating expenditure. EMCa considers that GGT makes only general and entirely qualitative statements as to why certain line items are proposed to increase and others to decrease in its access arrangement supporting information. EMCa also identified that GGT's forecasts in its operating expenditure forecasting spreadsheet are simply entered values that are not related through any formula to the base year amounts.

235. The Authority generally accepts EMCa's assessment of GGT's operating expenditure that it does not consider base-lining operating expenditure costs based on 2012 costs. The Authority has assessed GGT's forecast operating expenditure by the categories highlighted in paragraph 232.

Labour rates

236. GGT's access arrangement supporting information document identifies the following categories for operating the GGP: APA operations, GGT operations and APA commercial operations.

237. EMCa has identified that APA operations expenditure is mainly made up of labour-related expenditure. GGT operations expenditure has only a small amount of labour-related expenditure and 41 per cent of APA commercial operations expenditure is labour-related expenditure.

238. GGT has used labour rates from the APA Group for APA operations expenditure and GGT Operations expenditure. GGT provided rates for 22 labour resource

[58] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, 15 August 2014, p. 165.

categories from the APA Group.[59] The APA Group rates are approved by the GGTJV through its budget approval process.[60] GGT uses the hourly rates for nine categories of professional services that are stipulated in the Commercial Services Agreement for the APA commercial operations expenditure.[61]

239. The Authority's assessment of GGT's proposed labour rates is addressed under each of the category headings below.

APA operations

240. GGT, as manager of the GGP, obtains services from APT Pipelines (WA) Pty Ltd to physically operate the GGP under an agreement known as the Operating Services Agreement.

241. GGT has stated that APA operations expenditure includes services provided under the Operating Services Agreement. APT Pipelines (WA) Pty Ltd is an entity within the APA Group. The services that APT Pipelines (WA) Pty Ltd provides are provided by personnel from other APA Group entities.[62]

242. GGT has proposed to spend $51.75 million on APA operations:[63]

- Administration (business services), $1.685 million
- Engineering, $7.319 million
- Field services, $40.805 million
- Major expenditure jobs, $1.944 million

243. Figure 7 shows the difference between APA operations expenditure in the second access arrangement period and the proposed expenditure during the third access arrangement period. GGT advises that the 'dip' in field services and engineering expenditure in 2013 and 2014 resulted from temporary diversion of staff from work on the covered pipeline to other GGP assets.[64]

[59] Goldfields Gas Transmission Pty Ltd, *Response to EMCa Information request 29*, 3 November 2014.

[60] Goldfields Gas Transmission Pty Ltd, *Response to EMCa Information request 21*, 8 October 2014.

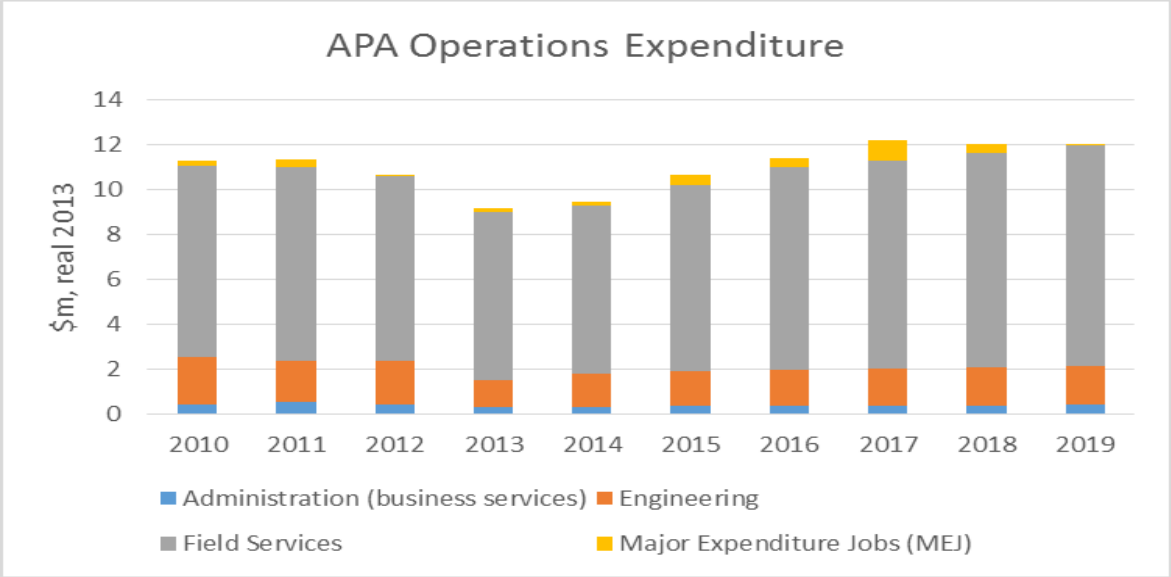
[61] Energy Market Consulting associates, *Final Report*, December 2014, p. 60.

[62] Goldfields Gas Transmission Pty Ltd, *Response to EMCa Information request 11*, 8 October 2014.

[63] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, Table 26 converted to real $ December 2013.

[64] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, December 2013, p. 166.

Figure 7 GGT's Actual APA Operating Expenditure (AA2) and Proposed APA Operating Expenditure (AA3) (Real $ million at 31 December 2013)



Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Tables 24 and 26, p. 164 and p. 170.

244. GGT has proposed to spend $1.685 million on APA operations administration (business services). GGT stated that this expenditure is incurred in providing administrative and office services to support APA's provision of pipeline engineering and field services. This includes provision for 50 per cent of the time of a finance manager, 60 per cent of the time of a Management Accountant and an Administrative assistant.[65]

245. As stated in paragraph 200, GGT has allocated 100 per cent of APA operating costs to the covered pipeline except for the field services costs provided by APT Pipelines (WA) Pty Ltd. GGT has allocated 32 field services employees based on GGT's assessment of the expected relative direct cost of field services in 2015, with a resulting 76 per cent allocation to the covered pipeline.

246. GGT indicates that no engineering expenditure has been planned for the uncovered pipeline in 2015 and has therefore allocated the 6.7 engineering employees on a 100 per cent allocation to the covered pipeline.[66]

247. GGT has proposed to spend $1.94 million on major expenditure jobs, which are large scale, non-recurrent activities undertaken to maintain the pipeline.[67]

248. The forecasts of expenditure under APA operations include substantial components of labour-related expenditure. The forecasts of expenditure have been derived by applying the labour rates to be used under the Operating Services Agreement to estimates of the number of hours expected to be worked. The labour rates to be used are rates established within APA Group and approved by the GGTJV through its budget approval process.

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65 Goldfields Gas Transmission Pty Ltd, *Response to EMCa Information request 24*, 24 September 2014.

66 Goldfields Gas Transmission Pty Ltd, *Response to EMCa Information request 14*, 8 October 2014.

67 Goldfield Gas Transmission Pty Ltd, *Access Arrangement Supporting Information – Attachment 10 – Major Expenditure Jobs: 2015 - 2019*, 15 August 2015.

249. EMCa concludes that GGT's required Full Time Equivalent (**FTE**) expenditure for administration, field services and engineering is reasonable and would be incurred by a prudent service provider in accordance with rule 91(1) and rule 74(2) of the NGR.

250. EMCa has determined that labour rates applied by GGT to derive forecast APA operating expenditure are acceptable. EMCa's assessment is based on its experience, reference to information in the KPMG Report and consideration of GGT's sector and location.[68] EMCa found that the labour rates were in the upper quartile of a reasonable range of remuneration for the resource categories, the non-salary payroll costs are reasonable and the non-payroll costs are reasonable. The Authority accepts EMCa's recommendation that GGT's forecast FTE and labour rates are reasonable and considers that they comply with rule 91(1) and rule 74(2) of the NGR.

251. EMCa concludes that although the major expenditure jobs are almost double what was spent in the second access arrangement period they are satisfied that GGT has provided sufficiently compelling information to demonstrate that the proposed expenditure is justified according to rule 91(1) of the NGR.[69]

252. The Authority is satisfied that GGT's forecast major expenditure jobs comply with rule 91(1) of the NGR as shown in Table 9.

Table 9 Authority Approved APA Operations Expenditure Forecast (AA3) under rules 91 and 74 of the NGR.

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
GGT Proposed APA Operations	**10.027**	**10.430**	**10.823**	**10.391**	**10.083**	**51.753**
Authority Approved APA Operations under rules 91 and 74 of the NGR.[70]	**10.027**	**10.430**	**10.823**	**10.391**	**10.083**	**51.753**

Source: ERA, GGP Tariff Model, December 2015.

253. As stated in paragraph 200, GGT's has allocated its proposed field services between the covered and uncovered pipeline. The Authority has not considered GGT's allocation in this chapter. The Authority has assessed GGT's proposed cost allocation for APA operations expenditure in paragraphs 1507 to 1512.

68 Goldfield Gas Transmission Pty Ltd, *Access Arrangement Supporting Information* – Attachment 11 – KPMG Cost Benchmarking, 15 Aug 2015.

69 Goldfield Gas Transmission Pty Ltd, *Access Arrangement Supporting Information – Attachment 10 – Major Expenditure Jobs: 2015 - 2019*, 15 August 2015.

70 This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

GGT Operations

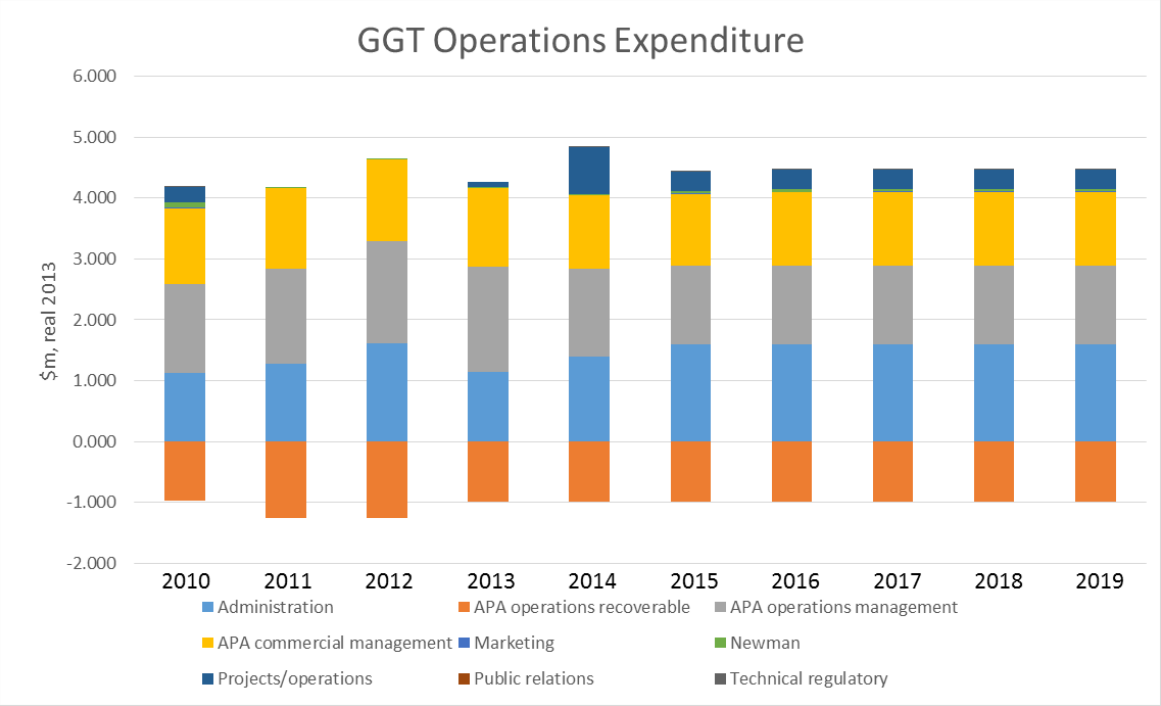
254. GGT operations expenditure includes services sourced directly by GGT for the ongoing operation of the pipeline (rather than through the Operating Services Agreement and the Commercial Services Agreement).

255. GGT has proposed to spend $17.38 million on GGT operations, including:[71]

- Administration, $7.951 million
- APA operations recoverable, -$4.934 million
- APA operations management, $6.526 million
- APA commercial management, $5.947 million
- Marketing, $0.058 million
- Newman, $0.215 million
- Projects/operations, $1.599 million
- Public relations, $0.005 million
- Technical regulatory, $0.010 million

256. Figure 8 shows the difference between GGT operations expenditure in the second access arrangement period and the third access arrangement period.

Figure 8 GGT's Actual GGT Operating Expenditure (AA2) and Proposed GGT Operating Expenditure (AA3) (Real $ million at 31 December 2013)



Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Tables 24 and 26, p. 164 and p. 170.

[71] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, Table 26 converted to real $ December 2013.

257. GGT has proposed to spend $1.590 million annually on GGT operations administration over the third access arrangement period. GGT stated that GGT Operations administration are services required for the ongoing operation of the GGP sourced directly by GGT. GGT stated that the services in question are provided by third parties and that the forecast expenditures do not include any component of APA Group labour costs. EMCa has identified the largest expenditure items to be office accommodation related expenses ($0.98 million, 62 per cent), and taxes, levies and licence fees ($0.52 million, 33 per cent).[72]

258. GGT has proposed to recover a portion of the rent from the proportion of its premises from APT Pipelines (WA) and APT Goldfields, which is classified as APA operations recoverable.

259. GGT has forecast an average annual expenditure of $1.305 million for APT Pipelines (WA) to manage the engineering and field services delivery, and an average annual expenditure of $1.197 million for APT Goldfields to provide services to support the commercial operation of the GGP.

260. GGT has allocated $0.32 million per year ($1.60 million in total) for projects/operations as a provision for unspecified repairs to the pipeline easement and to surface facilities resulting from cyclones. GGT has forecast expenditure of $0.29 million over the 5 year period ($0.06 million per year) for marketing, field services on the Newman lateral, public relations and technical regulatory expenditure.

261. EMCa is satisfied that the forecast amounts for administration, APA operations recoverable, marketing, Newman, public relations and technical regulatory are necessary to support the overall management of the GGP and are justified under rule 91(1) and rule 74(2) of the NGR. The Authority has assessed EMCa's recommendations and accepts EMCa's view that GGT's forecast amounts for administration, APA operations recoverable, marketing, Newman, public relations and technical regulatory are justified under rule 91(1) and 74(2) of the NGR.

262. EMCa is satisfied that GGT's forecast expenditure to compensate APT Pipelines (WA) for the overall management of engineering and field services delivery complies with the requirements of rule 91(1) and rule 74(2) of the NGR.

263. EMCa considers that GGT has not provided sufficient justification for the step increase to compensate APT Goldfields for its services in 2016. EMCa, therefore is not satisfied that $0.133 million, which relates to the step increase, complies with rule 91(1) of the NGR. On the basis of EMCa's advice the Authority considers that GGT has not justified the step increase, with the result that $0.133 million does not satisfy rule 91(1) of the NGR. The Authority considers that only $5.815 million for APA Commercial Management is prudent and complies with the requirements of rule 91(1) of the NGR.

264. EMCa considers that GGT has not provided sufficient information to justify the increased provision in projects. EMCa finds that $1.20 million is a reasonable estimate of the total operating costs likely to be incurred on this activity during the third access arrangement period. The Authority has reviewed this expenditure and agrees with EMCa's assessment that only $1.20 million satisfies rule 91(1) and rule 74(2) of the NGR.

[72] Goldfields Gas Transmission Pty Ltd, *Response to EMCa Information request 24*, 24 September 2014.

265. EMCa identified that GGT has based the labour rates for GGT operations expenditure on the same basis as APA operations expenditure (i.e. the 'internal' APA Group labour rates). As stated in paragraph 250, EMCa considers that the labour rates are reasonable and are in accordance with rule 91(1) and rule 74(2) of the NGR. The Authority accepts EMCa's recommendation that GGT's forecast labour rates are reasonable and considers that they are in accordance with rule 91(1) and rule 74(2) of the NGR.

266. In total, the Authority has accepted $16.770 million of GGT operations expenditure proposed by GGT satisfies rules 91 and 74 of the NGR as shown in Table 10.

Table 10 Authority Approved GGT Operations Expenditure Forecast (AA3) under rules 91 and 74 of the NGR.

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
GGT Proposed GGT Operations	**3.449**	**3.480**	**3.483**	**3.483**	**3.483**	**17.378**
APA commercial management (2016 baseline)	0.000	(0.031)	(0.034)	(0.034)	(0.034)	(0.133)
Projects/operations (AA2 baseline)	(0.095)	(0.095)	(0.095)	(0.095)	(0.095)	(0.475)
Total reductions	(0.095)	(0.126)	(0.129)	(0.129)	(0.129)	(0.608)
Authority Approved GGT Operations under rules 91 and 74 of the NGR.[73]	**3.354**	**3.354**	**3.354**	**3.354**	**3.354**	**16.770**

Source: ERA, GGP Tariff Model, December 2015.

267. As stated in paragraph 200 GGT has allocated its proposed APA operations management and APA commercial management between the covered and uncovered pipeline. The Authority has not considered GGT's allocation in this chapter. The Authority has assessed GGT's proposed cost allocation for GGT operations expenditure in paragraphs 1510 to 1514.

APA Commercial Operations

268. GGT states that it obtains services for the commercial operation of the GGP under an agreement – the Commercial Services Agreement. These services are provided by APT Goldfields who are an entity within the APA Group.[74]

269. GGT proposes to spend $17.95 million on APA Commercial operations:

- Administration, $2.490 million
- Legal, $1.114 million
- Marketing, $2.582 million

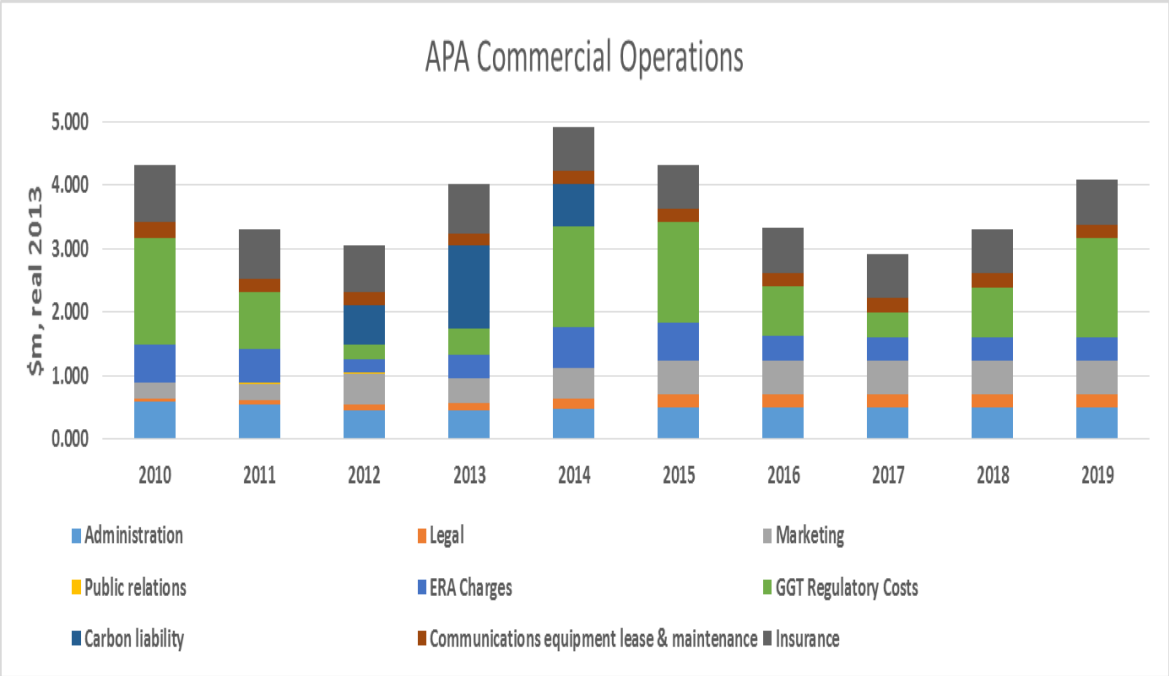
[73] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

[74] Goldfields Gas Transmission Pty Ltd, *Response to EMCa Information request 11*, 8 August 2014.

- Public relations, $0.022 million
- ERA charges, $2.065 million
- GGT regulatory costs, $5.105 million
- Communications equipment lease and maintenance, $1.089 million
- Insurance, $3.483 million

270. Figure 9 shows the difference between APA commercial operations expenditure in the second access arrangement period and the third access arrangement period.

Figure 9 GGT's Actual APA Commercial (AA2) and Proposed APA Commercial (AA3) (Real $ million at 31 December 2013)



Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Tables 24 and 26, p. 164 and p. 170.

271. GGT has proposed to spend $2.490 million on APA commercial operations administration. GGT stated that the expenditure provides administration and office support for the commercial operations of the GGP.

272. GGT has proposed to spend $1.114 million on legal services. GGT states that legal advice is required when new gas transportation agreements are negotiated, when existing agreements are modified or extended, and when contractual matters are in dispute or a user defaults.[75]

273. GGT has proposed to spend $2.582 million on marketing activities to generate new business for the covered pipeline, and to secure the retention of existing users.

274. GGT has proposed to spend $5.105 million on regulatory costs in response to economic, environmental and other regulation, which impacts on the covered

[75] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, December 2013, p. 176.

pipeline and $2.065 million to meet the standing and other charges levied by the ERA.

275. GGT has proposed to spend $4.594 million on public relations, communications equipment lease and maintenance, insurance and carbon liability.

276. EMCa has identified that 41 per cent of forecast APA commercial operations expenditure is internal labour-related expenditure. The administration, marketing and GGT regulatory categories make up the internal labour-related expenditure.[76] [redacted] EMCa has determined that the APA commercial operations labour rates are 27 per cent higher than the equivalent APA Group rates. EMCa concludes that these rates are excessively high and that the appropriate basis for the APA commercial operations labour rates is the internal (APA Group) comparator.[77] EMCa proposed to reduce the administration, marketing and GGT regulation components of APA commercial operations expenditure by 27 per cent.

277. The Authority accepts EMCa's assessment that GGT's proposed APA commercial operations labour rates for administration, marketing and regulatory costs are excessively high. The Authority therefore considers that $2.210 million, which represents the labour rate adjustment of 27 per cent, of APA commercial operations expenditure does not satisfy rule 91(1) of the NGR.

278. EMCa is satisfied that the proposed allocation of time and activities for administration and marketing are justified under rule 74(2) and 91(1) of the NGR. EMCa is not satisfied that GGT's proposed resourcing for its regulatory activity meets the criteria under rule 91(1) of the NGR. EMCa considers that the FTE amount for the regulatory function is too high and appears disproportionate in relation to the rest of the entities within the APA Group and recommends a reduction of $0.446 million.[78] The Authority considers that GGT's proposed resourcing for its regulatory activity does not meet rule 91(1) of the NGR and accepts EMCa's recommendation to reduce GGT regulatory costs by $0.446 million.

279. The Authority has assessed GGT's proposed expenditure to meet the ERA standing and specific charges. The Authority considers that GGT's estimated costs for 2017 and 2018 are high as the Authority does not expect there will be any work on access arrangements in these years. However, the Authority notes that on aggregate GGT's forecast is in line with GGT's actual expenditure for the second access arrangement period. Therefore, the Authority considers that GGT's estimates of the ERA costs meet rule 74(2) and rule 91(1) of the NGR. The Authority considers that should there be a regulatory regime change in the future with respect to the transfer of access functions, any changes to the ERA charges as a result of that change could be considered a change in law and would be assessed under the tariff variation mechanism.

280. GGT submits that the cost of insurance is a portion of the APA Group cost of insuring the assets of its component infrastructure businesses. Corporate insurance includes policies for industrial special risks, public and product liability, fidelity guarantee, motor vehicles, marine transit and workers' compensation. GGT submits that its forecast APA commercial operations insurance expenditures for the

[76] Goldfields Gas Transmission Pty Ltd, *Response to EMCa Information request 37*, 1 December 2014.

[77] Energy Market Consulting associates, *Final Report*, December 2014, p. 61.

[78] Energy Market Consulting associates, *Final Report*, December 2014, p. 68.

period 2015 to 2019 do not specifically include allowances for self-insurance. GGT submits that its forecast annual insurance costs of $0.697 million in real terms are similar to the comparable 2012 base year figure of $0.715 million. GGT also provided an estimate of the annual cost of the GGP as a standalone business of $0.937 million from Marsh (an insurance broker). GGT states that using an allocation of 70 per cent to the covered pipeline (measured in TJ MDQ km/d) yields an estimate of $0.656 million, which is close to GGT's forecast of $0.697 million.

281. The Authority has been unable to determine how much GGT's portion is compared to other APA Group companies as GGT has not provided the total APA Group cost of insurance or the percentage that is allocated to GGT. The Authority notes that GGT has only provided one non-binding quote to support its forecast annual insurance cost.

282. The Authority notes that the comparable 2012 base year figure of $0.715 million quoted by GGT included self-insurance. Given GGT states that its proposed forecast operating expenditure excludes self-insurance, the Authority has calculated the comparable 2012 base year figure ($0.502 million). The Authority considers that GGT has not provided reasonable evidence to justify why its proposed annual insurance costs of $0.697 million exceed the comparable amount net of self-insurance. Accordingly the Authority considers that GGT's annual amount of $0.697 million for forecast insurance costs should be reduced by the amount of self-insurance costs incurred in by GGT in the base year (2012). Therefore the Authority considers that only an annual amount of $0.502 million for insurance costs meets rule 91 and 74 of the NGR.

283. The Authority accepts that the forecast amounts for legal, public relations, communications equipment lease and maintenance, and carbon liability are necessary to support the overall management of the GGP and are justified under rule 91(1) and rule 74(2) of the NGR.

284. In total, the Authority has accepted that $14.324 million of APA commercial operations expenditure proposed by GGT satisfies rules 91 and 74 of the NGR as shown in Table 11.

Table 11 Authority Approved APA Commercial Operations Expenditure Forecast (AA3) under rules 91 and 74 of the NGR.

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
GGT Proposed APA Commercial Operations	**4.325**	**3.322**	**2.920**	**3.303**	**4.080**	**17.950**
Administration reduction (Labour rates adjustment of 27%)	(0.134)	(0.134)	(0.134)	(0.134)	(0.134)	(0.672)
Marketing reduction (Labour rates adjustment of 27%)	(0.139)	(0.139)	(0.139)	(0.139)	(0.139)	(0.697)
GGT Regulatory costs reductions (FTE adjustment)	(0.215)	(0.117)	0.003	(0.117)	0.001	(0.445)
GGT Regulatory costs reductions (Labour rates adjustment of 27%)	(0.220)	(0.139)	(0.088)	(0.139)	(0.255)	(0.840)
Insurance (Baseline)	(0.194)	(0.194)	(0.194)	(0.194)	(0.194)	(0.971)
Total reductions	(0.903)	(0.724)	(0.553)	(0.724)	(0.722)	(3.626)
Authority Approved APA Commercial Operations under rules 91 and 74 of the NGR.[79]	**3.422**	**2.598**	**2.367**	**2.579**	**3.358**	**14.324**

Source: ERA, GGP Tariff Model, December 2015.

285. The Authority has assessed GGT's proposed cost allocation for GGT operations expenditure in paragraphs 1515 to 1518.

Corporate Costs

286. GGT states that it obtains a range of corporate services from the APA Group. Corporate functions that the corporate centre performs include: executive management; company secretarial; finance and accounting; risk management; human resources; IT; legal and regulatory; and project services.

287. GGT's forecast corporate costs are calculated using a single approach which allocates corporate costs across the APA Group entities on the basis of revenues earned. The corporate costs are actual APA Group corporate costs which have been identified from the audited accounts from the APA Group in 2013.[80]

288. GGT's forecast corporate costs were calculated as follows:

- actual corporate costs were identified from APA Group's audited accounts in 2013:

[79] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

[80] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, December 2013, p. 182.

- APA Group's corporate costs were allocated, on the basis of revenues earned, to each of the entities within the APA Group, including APT Goldfields Pty Ltd, and GGP service providers Southern Cross Pipelines Australia Pty Ltd and Southern Cross Pipelines (NPL) Australia Pty Ltd;
- corporate costs attributable to specific projects which are unrelated to GGP service provision are removed; and
- escalation is applied to the total to obtain estimates of corporate costs for each year in the period 2015 to 2019;

289. GGT has determined that corporate costs should be allocated to both the covered and uncovered pipeline. GGT has forecast corporate costs attributable to the covered pipeline based on a proportion of 70 per cent, which is the ratio of TJ km of capacity in the covered pipeline to the total TJ km of capacity in the covered pipeline and the uncovered pipeline.

290. GGT stated that its revenue-based approach to allocating corporate costs has been accepted by the AER and the Authority in the past.[81] GGT provided a report from KPMG that takes a bottom-up build approach of identifying and quantifying a benchmark cost for an efficient stand-alone covered pipeline business.

291. GGT calculated its proposed annual corporate costs for the covered pipeline of $6.025 million as follows:[82]

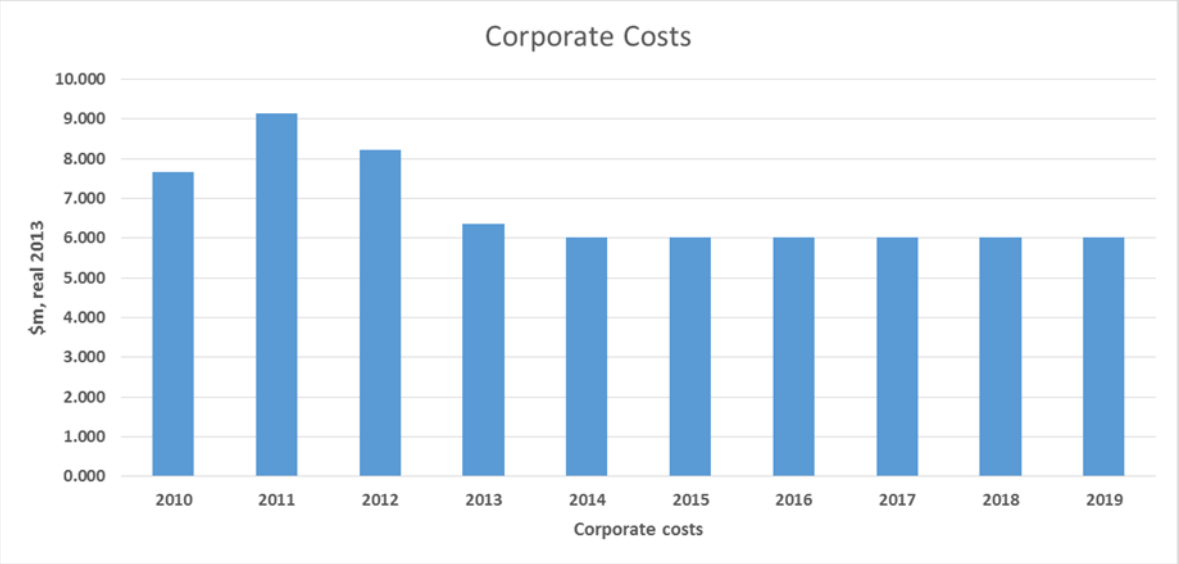
- GGT identified corporate costs of $50.065 million from the consolidated and audited accounts for the APA Group for the financial year ended 30 June 2013;
- GGT allocated these costs to each of the entities within the APA Group based on revenues earned;
- GGT removed any corporate costs that were attributable to specific projects which are unrelated to the GGP service provision;
- GGT stated the amount to be allocated to the GGP via allocations to APT Goldfields, Southern Cross Pipelines Australia and Southern Cross Pipelines (NPL) Australia was $8.480 million;
- GGT applied escalation to the total to obtain estimates of corporate costs for each year in the period 2015 to 2019; and
- GGT allocated $6.025 million per year, which is 70 per cent of $8.480 million corporate overheads to the covered pipeline. It has done so on the basis of a ratio of contracted covered pipeline transportation capacity-distance to total GGP transportation capacity-distance (in TJ.km/day).

292. Figure 10 below shows GGT's actual corporate costs operating expenditure for the second access arrangement period and GGT's proposed corporate operating expenditure for the third access arrangement period.

[81] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, December 2013, p. 183.

[82] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Supporting Information*, December 2013, pp. 183-184.

Figure 10 GGT's Actual Corporate Costs Operating Expenditure (AA2) and Proposed Corporate Operating Expenditure (AA3) (Real $ million at 31 December 2013)



Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Tables 24 and 26, p. 164 and p. 170.

293. GGT also engaged KPMG to estimate the corporate costs of an efficient stand-alone transmission pipeline business. GGT engaged KPMG to establish whether its corporate costs were an estimate of the expenditure that would be incurred by a prudent service provider acting efficiently in accordance with good industry practice to achieve the lowest sustainable cost of delivering that service. KPMG concluded that the likely range of corporate costs for a stand-alone business with scale of operations similar to that associated with the GGP, was from $4.539 million per annum to $8.178 million per annum with a mid-point of $6.5 million (at December 2013 prices).

294. EMCa found that it is reasonable for GGT to allocate a proportion of APA Group corporate costs for services that GGT would otherwise incur in undertaking the prudent operation of the covered pipeline. However, EMCa considered that GGT's proposed allowance for corporate overheads has not been derived on a reasonable basis and is biased towards imposing a higher proportion of APA Group's corporate overheads on the GGP.

295. EMCa is concerned that GGT has not been able to provide reasonable justification to explain its derivation of an allocation of corporate costs to its GGP business. EMCa states that its confidence in GGTs calculation is undermined by the significant changes in data and formulae in the successive spreadsheets, the presence of hard coded data that does not add but contains excluded amounts that are not evident from inspection of the spreadsheet and changing descriptions of what value is used as the revenue denominator in the allocation.[83]

296. EMCa also states that GGT has not supported its claim that its allocation follows the same process as it has applied in regulatory resets with the AER and is as used internally for GGTJV budget approvals.

[83] Energy Market Consulting associates, *Final Report*, December 2014, p. 72.

297. EMCa has determined that GGT's annual costs before allocation between the covered and uncovered pipeline should be $6.053 million based on a contribution of revenue of 13 per cent, not $8.480 million as calculated by GGT. EMCa has based this on the following information provided by GGT:[84]

- APA Group corporate costs of $45.6 million, per GGT's response to EMCa 36 and excluding the items referred to in GGT's response to EMCa 31.
- APA Group revenue of $911.5 million, which it has determined from GGT's response to EMCa 36.
- Revenues for APT Goldfields, Southern Cross Pipelines Australia and Southern Cross Pipelines (NPL) Australia of $121 million, per GGT's response to EMCa 36.

298. The Authority accepts EMCa's assessment that GGT's proposed corporate costs have not been derived on a reasonable basis and is biased towards imposing a higher proportion of APA Group's corporate overheads on the GGP.

299. The Authority considers that the provision of corporate services provided by a corporate centre are a necessary function of the prudent operation of a large business. However, the Authority is not satisfied that GGT's proposed corporate support operating expenditure is consistent with what a prudent service provider acting efficiently, in accordance with good industry practice, to achieve the lowest sustainable cost, would incur because of the following:

- GGT has not plausibly explained the derivation of its allocation of corporate costs to its GGP business or provided a calculation that shows this derivation.
- GGT has not supported its claim that this allocation follows the same process as it has applied in regulatory resets with the AER and is as used internally for GGTJV budget approvals.
- GGT has provided inconsistent cost and revenue information through its responses to information requests from EMCa.

300. The Authority is therefore not satisfied that GGT's proposed annual forecast of $8.480 million which is allocated to the GGP complies with rules 91 and 74 of the NGR. The Authority accepts EMCa's recommendation that an annual amount of $6.053 million (before any allocation of costs between the covered and uncovered pipeline satisfies rules 91 and 74 of the NGR). Therefore the Authority considers that $12.135 million[85] does not meet the requirements of rules 91 and 74 of the NGR.

301. KPMG's assessment of GGT's corporate costs included; external relations, finance, information and communications technology, administration and executive office, legal and corporate affairs and regulatory strategy.

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[84] Energy Market Consulting associates, *Final Report*, December 2014, p. 72.

[85] The Authority has not accepted $12.135 million corporate costs in accordance with rule 91 and 74 of the NGR. GGT's proposed corporate costs represents 70 per cent of its total corporate costs as it has allocated 30 per cent to the uncovered pipeline. The Authority's adjustment in Table 12 is different to $12.135 million as it includes GGT's proposed allocation of 30 per cent on the Authority's adjusted amount of $30.267 million. The Authority has not considered GGT's proposed cost allocation in this chapter. The Authority has considered the allocation of costs between the covered and uncovered pipeline in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

302. EMCa considered each of the component activities for reasonableness and whether any of the activities might double-count activities that GGT has included in its GGP budgets.

303. EMCa determined that the majority of activities within external relations can be described as marketing. EMCa determines that no further allowance is required for marketing as GGT already allows $0.5 million for marketing under APA commercial operations expenditure. EMCa considers that KPMG's median of $1.6 million for finance is too high and that GGT with 16 customers is more likely to be at the low end of the range. EMCa considers $0.8 million per annum to be a more reasonable interpretation of KPMG's benchmark. As with finance, EMCa considers that IT and communications should be at the low end of KPMG's benchmark range. EMCa considers that there is considerable duplication and over-estimation under administration and executive costs. EMCa considers that the low end of KPMG's range provides a more relevant benchmark than the median and could be considered to consolidate out the duplication between this cost and GGP's own budgets. EMCa has removed the duplication of legal consultancy services under legal and corporate affairs. EMCa determines that no further allowance is required for regulatory strategy costs as GGT already allows for this under APA commercial operations expenditure.[86]

304. EMCa's assessment concludes that KPMG's estimate of $6.5 million per annum in December 2013 dollars is too high and that a more relevant benchmarked value would be around $3.8 million per annum.[87]

305. The Authority considers that $21.183 million of GGT's proposed corporate costs satisfies rules 91 and 74 of the NGR as shown in Table 12.

Table 12 Authority Approved Corporate Cost Forecast (AA3) under rules 91 and 74 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
GGT Proposed Corporate Costs	**6.025**	**6.025**	**6.025**	**6.025**	**6.025**	**30.123**
(adjustment based on EMCa's calculation of GGT's contribution to APA's revenue detailed in para 297)[88]	(1.788)	(1.788)	(1.788)	(1.788)	(1.788)	(8.940)
Authority Approved Corporate costs under rules 91 and 74 of the NGR[89]	**4.237**	**4.237**	**4.237**	**4.237**	**4.237**	**21.183**

Source: ERA, GGP Tariff Model, December 2015.

306. The Authority notes that GGT has proposed to allocate corporate costs across the covered and uncovered pipeline. GGT has allocated 30 per cent of its forecast

[86] Energy Market Consulting associates, *Final Report*, December 2014, pp. 74-75.

[87] Energy Market Consulting associates, *Final Report*, December 2014, p. 75.

[88] The Authority has not accepted $12.135 million corporate costs in accordance with rule 91 and 74 of the NGR. GGT's proposed corporate costs represents 70 per cent of its total corporate costs as it has allocated 30 per cent to the uncovered pipeline. The Authority's adjustment in Table 12 is different to $12.135 million as it includes GGT's proposed allocation of 30 per cent on the Authority's adjusted amount of $30.267 million. The Authority has not considered GGT's proposed cost allocation in this chapter. The Authority has considered the allocation of costs between the covered and uncovered pipeline in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

[89] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

corporate costs to the uncovered pipeline. The Authority considers that GGT is correct in allocating corporate costs across the covered and uncovered pipeline. However, the Authority has not assessed GGT's proposed cost allocation in this chapter. The Authority has assessed GGT's allocation of corporate costs in paragraphs 1519 to 1521 of the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Required Amendments

307. The Authority does not approve GGT's proposed operating expenditure for the third access arrangement period as submitted. The Authority concludes that $13.173 million does not satisfy rules 74 and 91 of the NGR. Table 13 shows the Authority's required amendments for the third access arrangement period under rules 91 and 74 of the NGR.

Table 13 Authority's Operating Expenditure Reductions (AA3) under rules 91 and 74 of the NGR

Real $ million as at 31 December 2013	Corporate cost revenue allocation	FTE	Labour rates	Base line of costs	Total
APA Operations					
GGT Operations				(0.608)	(0.608)
APA Commercial Operations		(0.445)	(2.210)	(0.971)	(3.626)
Corporate Costs[90]	(8.940)				(8.940)
Total[91]	**(8.940)**	**(0.445)**	**(2.210)**	**(1.579)**	**(13.173)**

Source: ERA, GGP Tariff Model, December 2015.

308. Table 14 summarises the Authority's approved operating expenditure under rules 91 and 74 of the NGR by category for the third access arrangement period.

[90] See Table 12.

[91] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table 14 GGT Proposed Operating expenditure and Authority Approved Operating expenditure forecast by AASI Category (AA3) under rules 91 and 74 of the NGR [92]

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
GGT Proposed Operating expenditure	**23.826**	**23.257**	**23.250**	**23.202**	**23.670**	**117.204**
APA Operations	10.027	10.430	10.823	10.391	10.083	51.753
GGT Operations	3.354	3.354	3.354	3.354	3.354	16.770
APA Commercial Operations	3.422	2.598	2.367	2.579	3.358	14.324
Corporate Costs	4.237	4.237	4.237	4.237	4.237	21.183
Authority Approved Operating expenditure under rules 91 and 74 of the NGR[93]	**21.040**	**20.619**	**20.780**	**20.561**	**21.031**	**104.031**

Source: ERA, GGP Tariff Model, December 2015.

309. Table 14 shows the Authority's required amended value for operating expenditure for the third access arrangement period. The Authority has assessed GGT's proposed allocation of operating expenditure across the covered and uncovered pipeline in the Total Revenue between Reference Services and Other Services chapter. As a result of this assessment, the Authority has made further reductions to GGT's proposed forecast operating expenditure under rule 93(2) of the NGR to reflect the unique circumstances of the GGP and to ensure the application of the NGR is consistent with the NGO and RPP under the NGL(WA).

Required Amendment 5

The Authority requires GGT to amend its forecast operating expenditure to the amounts in Table 14 to account for the Authority's required reductions under rules 91 and 74 of the NGR.

Opening Capital Base

Regulatory Requirements

310. The capital base is the capital value attributed to the pipeline assets that are used to provide regulated services. The capital base is used to calculate the return on capital and depreciation (return of capital).

92 GGT's proposed OPEX excludes costs that GGT has allocated to the uncovered pipeline.

93 This table does not include any further adjustments that may be made to the Authority's amended values under Rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

311. Rule 77(2) of the NGR establishes the approach to determining the opening capital base for an access arrangement period that follows immediately on the conclusion of a preceding access arrangement period.

312. The Authority notes that the AEMC published an updated version of the NGR on 2 October 2014, which added text to rule 77(2)(a).

313. Rule 77(2) of the NGR states:

> 77. Opening capital base
>
> ...
>
> (2) If an *access arrangement period* follows immediately on the conclusion of a preceding *access arrangement period*, the opening capital base for the later *access arrangement period* is to be:
>
> (a) the opening capital base as at the commencement of the earlier *access arrangement period* adjusted for any difference between estimated and actual capital expenditure included in that opening capital base. This adjustment must also remove any benefit or penalty associated with any difference between the estimated and actual capital expenditure;
>
> plus:
>
> (b) conforming capital expenditure made, or to be made, during the earlier *access arrangement period*;
>
> plus:
>
> (c) any amounts to be added to the capital base under rule 82 [capital contributions by users to new capital expenditure], rule 84 [speculative capital expenditure account] or rule 86 [re-use of redundant assets];
>
> less:
>
> (d) depreciation over the earlier *access arrangement period* (to be calculated in accordance with any relevant provisions of the access arrangement governing the calculation of depreciation for the purpose of establishing the opening capital base); and
>
> (e) redundant assets identified during the course of the earlier *access arrangement period*; and
>
> (f) the value of pipeline assets disposed of during the earlier *access arrangement period*.

314. Rule 79 of the NGR sets out the criteria for new capital expenditure. Rule 79 of the NGR states:

> 79. New capital expenditure criteria
>
> (1) Conforming capital expenditure is capital expenditure that conforms with the following criteria:
>
> (a) the capital expenditure must be such as would be incurred by a prudent service provider acting efficiently, in accordance with accepted good industry practice, to achieve the lowest sustainable cost of providing services;
>
> (b) the capital expenditure must be justifiable having regard to one of the following grounds stated in rule 79(2).
>
> (2) Capital expenditure is justifiable if:
>
> (a) the overall economic value of the expenditure is positive; or
>
> (b) the present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure; or

(c) the capital expenditure is necessary:

(i) to maintain and improve the safety of services; or

(ii) to maintain the integrity of services; or

(iii) to comply with a regulatory obligation or requirement; or

(iv) to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or

(d) the capital expenditure is an aggregate amount divisible into 2 parts, one referable to incremental services and the other referable to a purpose referred to in paragraph (c), and the former is justifiable under paragraph (b) and the latter under paragraph (c).

(3) In deciding whether the overall economic value of capital expenditure is positive, consideration is to be given only to economic value directly accruing to the service provider, gas producers, users and end users.

(4) In determining the present value of expected incremental revenue:

(a) a tariff will be assumed for incremental services based on (or extrapolated from) prevailing reference tariffs or an estimate of the reference tariffs that would have been set for comparable services if those services had been reference services;

(b) incremental revenue will be taken to be the gross revenue to be derived from the incremental services less incremental operating expenditure for the incremental services; and

(c) a discount rate is to be used equal to the rate of return implicit in the reference tariff.

(5) If capital expenditure made during an access arrangement period conforms, in part, with the criteria laid down in this rule, the capital expenditure is, to that extent, to be regarded as conforming capital expenditure.

(6) The [Authority's] discretion under this rule is limited.

315. Rule 82(1) of the NGR provides that a user may make a capital contribution towards a service provider's capital expenditure. Any capital contributions by a user may, with the approval of the Authority, be rolled into the capital base for a pipeline on condition that the service provider does not benefit through increased revenue from the user's contribution to the capital base.

316. Rules 88, 89 and 90 of the NGR specify particular requirements for the depreciation of pipeline assets in the RAB.

317. Rule 88(2) of the NGR states that the depreciation schedule may consist of a number of separate schedules, each relating to a particular asset or asset class.

318. Rule 89(1) of the NGR states that the depreciation schedule should be designed so that:

- reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services;
- so that each asset or group of assets (asset class) is depreciated over the economic life of that asset or group of assets (asset class);

- so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset or a particular group of assets (asset class);
- so that (subject to the rules about capital redundancy in rule 85 of the NGR), an asset is depreciated only once (i.e. the amount by which the asset is depreciated over its economic life does not exceed the value of the asset at the time of its inclusion in the capital base (adjusted, if the accounting method approved by the Authority permits, for inflation)); and
- so as to allow the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.

319. Rule 90(1) of the NGR specifies that a full access arrangement must contain provisions governing the calculation of depreciation for establishing the opening capital base for the next access arrangement period. Rule 91(2) of the NGR states that those provisions must resolve whether depreciation of the capital base is to be based on forecast or actual capital expenditure.

GGT's Proposed Changes

320. The opening capital base for the second access arrangement period was set at $436.258 million (in nominal terms) at 20 August 2010. GGT has derived the opening capital base for the third access arrangement period by adding to the opening capital base, proposed conforming capital expenditure for the period 20 August 2010 to 31 December 2014, and subtracting depreciation for the period. GGT has stated that no redundant assets were identified/removed from the capital base, and no asset disposals were deducted from the capital base, over the second access arrangement period.[94] GGT proposes an opening capital base for the third access arrangement period of $393.341 million (in nominal terms). Table 15 shows GGT's derivation of the opening capital base for the third access arrangement period.

Table 15 GGT's Proposed Opening Capital Base for AA3

Nominal $ million	2010	2011	2012	2013	2014
Opening capital base	436.258	432.602	421.878	411.191	402.379
Proposed conforming capital expenditure	0.244	0.435	1.021	3.101	2.991
Proposed depreciation	3.901	11.159	11.699	11.913	12.029
GGT's Proposed Opening Capital Base for AA3					**393.341**

Source: GGT, Access Arrangement Information, 15 August 2014, Table 6, p.10

321. During the second access arrangement period, GGT spent $8.224 million[95] on sustaining/Stay in Business (**SIB**) capital expenditure on the covered pipeline. SIB capital expenditure covers projects that are required to maintain and improve the safety or integrity of services and/or comply with a regulatory obligation or requirement. GGT did not spend any growth capital expenditure on the covered

[94] Goldfields Gas Transmission Pty Ltd , *Access Arrangement Information*, 15 August 2014, p. 6.

[95] Unless otherwise indicated, all capital expenditure figures are in real December 2013 dollars; Goldfields Gas Transmission Pty Ltd , Access Arrangement Information, 15 August 2014.

pipeline, which includes projects that are carried out to extend or expand the network to accommodate new/increased demand.

322. Over the second access arrangement period, GGT directed the majority of its capital expenditure to compressor stations and SCADA and communications. In 2013, GGT directed the majority of its capital expenditure to rebuilding three maintenance bases/depots. Table 16 breaks down GGT's proposed conforming capital expenditure for the second access arrangement period by asset class.

Table 16: GGT Proposed Conforming Capital Expenditure (AA2)

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Pipeline and laterals	(0.090)	0.000	0.000	0.026	0.000	(0.064)
Main line valve and scraper stations	0.000	0.000	0.000	0.000	0.000	0.000
Compressor stations	0.466	0.050	0.266	0.580	0.882	2.243
Receipt and delivery point facilities	0.000	0.000	0.000	0.136	0.169	0.305
SCADA and communications	0.197	0.383	0.747	0.473	0.841	2.640
Cathodic protection	0.000	0.000	0.000	0.000	0.000	0.000
Maintenance bases and depots	0.096	0.000	0.000	1.320	0.089	1.505
Other (depreciable) assets	0.048	0.024	0.026	0.567	0.924	1.590
Non-depreciable assets	0.000	0.000	0.000	0.000	0.000	0.000
GGT Proposed Conforming Capital Expenditure (AA2)	**0.717**	**0.457**	**1.039**	**3.102**	**2.905**	**8.219**

Source: GGT, Access Arrangement Supporting Information, 15 August 2014 (figures converted to real dollars as per ERA analysis)

323. Apart from reversal corrections, GGT has sought to justify all of the proposed conforming capital expenditure for the third access arrangement period under one or more of the grounds in rule 79(2)(c) of the NGR (i.e. safety, integrity, compliance and/or maintaining capacity to meet existing levels of demand). GGT has also claimed that all of the expenditure satisfies the prudent service provider test as per rule 79(1)(a) of the NGR.

324. GGT has proposed depreciation at $50.698 million (in nominal terms) for the second access arrangement period from 20 August 2010 to 31 December 2014.

Submissions

325. The Authority received a submission from BHPB, which discussed the efficiency of the allocation of indirect capital expenditure across the covered pipeline and uncovered assets. The Authority has considered this submission in the context of allocation of total revenue between reference services and other services.

Considerations of the Authority

Verification of Capital Expenditure

326. GGT has provided the Authority with copies of its regulatory financial accounts for the years ending 31 December 2010, 31 December 2011, 31 December 2012 and 31 December 2013.

327. GGT engaged Deloitte to conduct a non-statutory review of the financial information relating to the schedule of regulatory revenue, operating expenditure and capital expenditure for the regulatory financial accounts provided to the Authority.

328. Deloitte stated that for all regulatory accounts, based on its review, which was not an audit, nothing came to its attention that caused it to believe that that the Schedule does not present fairly, in all material respects, the Operating and Capital Expenditure of GGTJV in accordance with the accounting policies described in Note 1 to the Schedules.

329. The Authority has undertaken its own review of GGT's regulatory accounts. The Authority has sought to ensure that the expenditures recorded in the financial accounts are consistent with GGT's proposal, specifically the access arrangement supporting information and tariff model.

330. The Authority identified the following discrepancies which are discussed further below.

Cathodic Protection and Maintenance Bases and Depots - 2010

331. The Authority notes that there is a discrepancy between GGT's proposed conforming capital expenditure for 2010, as stated in the access arrangement supporting information and tariff model, and the 2010 reviewed regulated accounts. Specifically, the reviewed regulated accounts show that an expenditure of $0.075 million (nominal) was recorded as cathodic protection, whilst an expenditure of $0.013 million (nominal) was recorded as maintenance bases and depots. GGT's access arrangement supporting information shows that no capital expenditure was incurred for cathodic protection during the second access arrangement, whilst an amount of $0.089 million (nominal) was incurred in 2010 as maintenance bases and depots.

332. The Authority requested that GGT provide an explanation for this discrepancy by way of a reconciliation between the reviewed regulatory accounts and the access arrangement supporting information. In its response, GGT states that all capital expenditure for 2010 to 2014 was reviewed internally by GGT with relevant engineering, technical and operations staff at the time of preparation for the access arrangement proposal. Additionally, GGT states the review found that in 2010, $0.075 million had been spent on accommodation units at Paraburdoo and Leinster, and there had been no expenditure on cathodic protection. Accordingly, no expenditure was incurred for cathodic protection and the amount of $0.075 million on accommodation units was recorded against maintenance bases and depots.[96]

333. The Authority considers that GGT's responses and reconciliations adequately explain the differences between the regulatory financial accounts and access arrangement supporting information. The Authority has accordingly applied the figures from the access arrangement supporting information in conducting its assessment of GGT's proposed conforming capital expenditure for the third access arrangement period.

Other Assets - 2013

334. The Authority also notes that there is a discrepancy between GGT's proposed conforming capital expenditure for 2013, as stated in the access arrangement

[96] Goldfields Gas Transmission Pty Ltd, *Email Response to ERA13*, 12 October 2015.

supporting information and tariff model, and the 2013 reviewed regulated accounts. Specifically, the reviewed regulated accounts show that an expenditure of $0.282 million (nominal) was recorded in the asset category, 'other assets', whilst GGT's access arrangement supporting information and tariff model show that an amount of $0.567 million (nominal) was incurred in 2013 as 'other assets'.

335. The Authority requested that GGT provide an explanation for this discrepancy by way of a reconciliation between the reviewed regulatory accounts and the access arrangement supporting information. GGT states that at the time of Deloitte's review, the costs of developing its Enterprise Asset Management System (**EAMS**) were not certain and no allocation of costs had been made to individual businesses within the APA group.[97] GGT states that by 2014 an allocation had been made, being the difference between the 'other assets' figure in the reviewed regulated accounts and the access arrangement supporting information.[98]

336. The Authority considers that GGT's responses and reconciliations adequately explain the differences between the regulatory financial accounts and access arrangement supporting information. The Authority has accordingly applied the figures from the access arrangement supporting information in conducting its assessment of GGT's proposed conforming capital expenditure for the third access arrangement period.

Compressor Stations and Receipt and Delivery Points - 2013

337. The Authority also notes that there is a discrepancy between GGT's proposed conforming capital expenditure for 2013, as stated in the access arrangement supporting information and, and GGT's tariff model. Specifically, the reviewed regulated accounts and access arrangement supporting information show that an expenditure of $0.395 million (nominal) was recorded as compressor stations, whilst an expenditure of $0.320 million (nominal) was recorded as receipt and delivery point facilities. However, GGT's tariff model and capital expenditure supporting information show that an amount of $0.580 million (nominal) was incurred as compressor stations and an amount of $0.136 million (nominal) was incurred as receipt and delivery point facilities.

338. The Authority requested that GGT provide an explanation for this discrepancy between the access arrangement supporting information and tariff model. GGT states that the substantive difference is an expenditure of $0.185 million on the rebuild of a gas engine alternator at the Wiluna Compressor Station. GGT notes that the expenditure has been recorded in the receipt and delivery point facilities in the access arrangement supporting information, whilst it has been recorded in the compression category in the capital expenditure supporting information. GGT considers that the alternator is an integral part of the Wiluna Compressor Station and expenditure on its rebuild should be classified as compression and not as receipt and delivery points. [99]

339. The Authority considers that GGT's responses and reconciliations adequately explain the differences between the regulatory financial accounts and access arrangement supporting information. The Authority has accordingly applied the

[97] GGT states the purpose of the EAM is to support maintenance activity across all of the businesses owned or operated by the Group.

[98] Goldfields Gas Transmission Pty Ltd, *Email Response to ERA14*, 12 October 2015.

[99] Goldfields Gas Transmission Pty Ltd, *Email Response to ERA03*, 19 December 2014; Goldfields Gas Transmission Pty Ltd, *Email Response to ERA15*, 12 October 2015.

figures from the access arrangement supporting information in conducting its assessment of GGT's proposed conforming capital expenditure for the third access arrangement period.

Summary

340. The Authority is concerned with the process and approach in which the expenditure figures are recorded by GGT and provided to Deloitte for review. The Authority considers that a more robust review approach would not have led to these discrepancies being recorded. The Authority is especially concerned that a reclassification of 2013 expenditure from compressor stations to receipt and delivery point facilities was made after the regulated accounts were reviewed by Deloitte. The Authority considers that the regulatory accounts should be reviewed after all allocations and reviews have been completed by GGT which should be conducted in a timely manner.

341. Notwithstanding the discrepancies in proposed conforming capital expenditure and the post review reclassification of expenditure by GGT, the Authority considers that the regulatory accounts for the years ending 31 December 2010, 31 December 2011, 31 December 2012 and 31 December 2013 are free from material misstatement. The Authority requires GGT to submit its reviewed regulatory accounts for the year ending 31 December 2014 if it decides to responds to the Authority's Draft Decision.

342. GGT's access arrangement supporting information provides a description of its proposed CAM for determining total revenue for the covered pipeline. GGT considers that the total revenue should be the total of the costs of offering to provide, and providing, the reference service, negotiated services and services to the joint venturers using the covered pipeline, excluding:

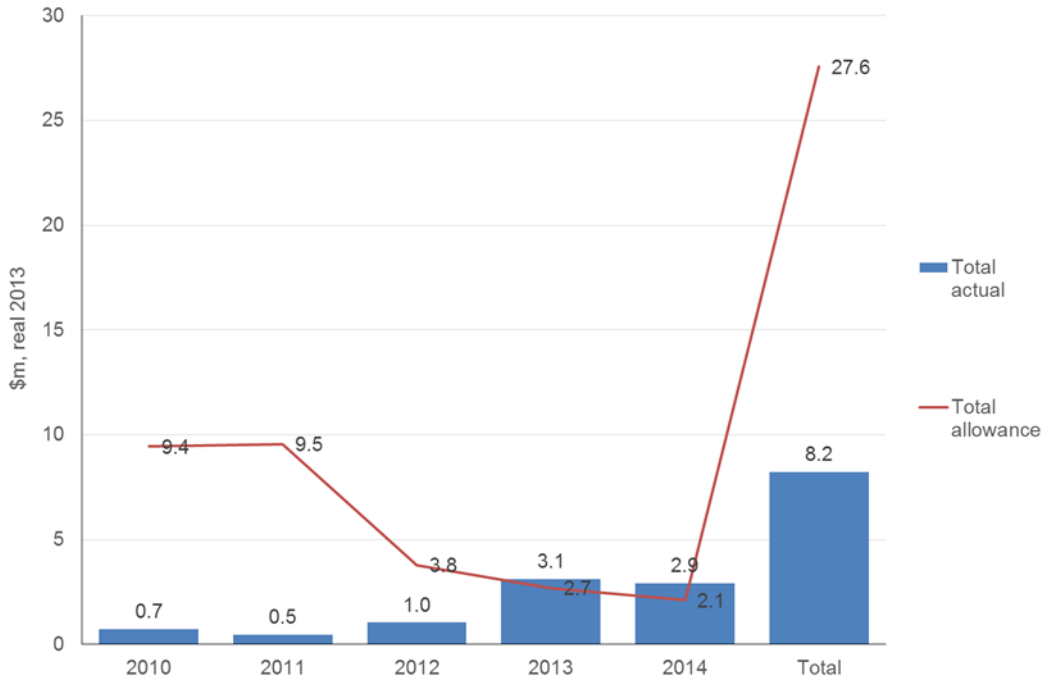
- the capital costs of those parts of the pipeline system (a second compressor added at Paraburdoo, in 2006, and compressors installed at Wyloo West and at Ned's Creek in 2009) which are used to deliver uncovered pipeline services;
- the capital costs of the recent expansion for Rio Tinto Iron Ore and for BHP Billiton Iron Ore, pipeline expansion which GGT has elected be uncovered; and
- the costs of operating and maintaining those parts of the GGP which are uncovered, and the costs of operating and maintaining the expansion for Rio Tinto Iron Ore and BHP Billiton Iron Ore.

343. As discussed in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision, the Authority does not accept GGT's proposed CAM. Further detail regarding the Authority's required amendments for the CAM can be found in a subsequent Chapter to this Draft Decision on the Allocation of Total Revenue between Services and Other Services.

Assessment of Capital Expenditure

344. GGT spent 30 per cent of the $27.55 million that the Authority considered to be forecast conforming capital expenditure for the second access arrangement period. Figure 11 shows the Authority's approved forecast conforming capital expenditure and GGT's proposed conforming capital expenditure for the second access arrangement period.

Figure 11: Authority Approved Forecast and GGT Proposed Conforming Capital Expenditure (AA2)



Source: GGT's email response to EMCa09 and Energy Market Consulting associates, Review of the Technical Aspects of the Proposed Access Arrangement, Goldfields Gas Transmission's Proposed Revised Access Arrangement for the Goldfields Gas Pipeline, December 2014

345. The Authority's technical advisor, EMCa, reviewed GGT's governance in relation to capital expenditure. EMCa's main findings were as follows:

- GGT's governance of its actual expenditure reflects good industry practice, demonstrates efficient expenditure outcomes and prudent deferrals.
- There is a lack of explicit linkage and top-down/ bottom-up alignment of objectives and requirements between corporate objectives, KPIs, the Asset Management Plan (**AMP**) and the Safety Case.

346. EMCa has then reviewed GGT's proposed conforming capital expenditure for the second access arrangement period as per the following steps:

- Reviewed whether GGT's proposed expenditure satisfies rule 79(2) of the NGR, with particular reference to:
  - GGT's AMP;
  - GGT's Safety Case, and the Formal Safety Assessments (**FSA**) carried out by GGT;
  - Gas Standards (Gas Supply and System Safety) Regulations 2000;
  - Australian Standard AS2885 (Pipelines – Gas and Liquid Petroleum Pipelines); and
  - other supporting information provided by GGT.
- Reviewed whether GGT's proposed expenditure that satisfies rule 79(2) of the NGR satisfies rule 79(1) of the NGR, with particular reference to:

  - GGT's project governance framework, including business planning process, AMP, Safety Case, investment governance arrangements, forecasting methodology, and procurement policy;
  - GGT's capability to deliver the proposed projects; and
  - Extent to which GGT has adequately assessed and accounted for any benefits from productivity or efficiency enhancing programs.

- GGT has divided its capital expenditure for the second access arrangement period into the following asset classes:
  - Pipeline and laterals
  - Main line valve and scraper station
  - Compressor stations
  - Receipt and delivery point facilities
  - SCADA and communications
  - Cathodic protection
  - Maintenance bases and depots
  - Other (depreciable) assets
  - Non-depreciable assets

347. GGT has not included any capital expenditure under main line valve and scraper station, cathodic protection or non-depreciable assets for the second access arrangement period.

348. EMCa has examined in detail the three largest capital expenditure projects over the second access arrangement period: Replacement of SCADA system master station (SCADA and communications asset class), Yarraloola accommodation (Maintenance bases and depots), and the Enterprise Asset Management System (Other depreciable assets). EMCa's assessment of these projects is discussed below under the relevant asset classes. EMCa has recommended a number of adjustments to the conforming capital expenditure for the second access arrangement period, predominantly related to the allocation of expenditure to the covered and uncovered services. The Authority has not made an assessment of GGT's proposed conforming expenditure for the second access arrangement period against rule 93 of the NGR. The Authority has assessed cost allocation between covered and uncovered services in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

349. The Authority's assessment of conforming capital expenditure is under the following asset categories (of which GGT has proposed capital expenditure be added to the capital base):

- Pipeline and laterals
- Compressor stations
- Receipt and delivery point facilities
- SCADA and communications
- Maintenance bases and depots
- Other (depreciable) assets

Pipeline and laterals

350. GGT has proposed two projects under this asset class. EMCa has recommended not to approve GGT's proposed capital expenditure on the Gorgon-GGP interconnection. EMCa considers that the expenditure has been based on a speculative requirement upon the request of one major user.

351. The Authority agrees with EMCa that $0.026 million of GGT's proposed capital expenditure on pipeline and laterals over the second access arrangement period does not satisfy rule 79(1)(b) of the NGR. The Authority notes that -$0.090 million was included as a reversal of costs for the work near easement project, which GGT was subsequently reimbursed by the instigator. Therefore, the Authority considers that only -$0.090 million of GGT's proposed capital expenditure on pipeline and laterals for the second access arrangement period is conforming under rule 79(1)(b) of the NGR.

352. Table 17 shows the Authority's required adjustments as per rule 79 of the NGR by project on GGT's proposed capital expenditure on pipeline and laterals over the second access arrangement period.

Table 17 Authority Approved Capital Expenditure on Pipeline and Laterals (AA2) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Pipeline and laterals – proposed by GGT	**(0.090)**	**0.000**	**0.000**	**0.026**	**0.000**	**(0.064)**
Gorgon-GGP interconnection	-	-	-	(0.026)	-	(0.026)
Authority Approved pipeline and laterals – rules 74 and 79 of the NGR[100]	**(0.090)**	**0.000**	**0.000**	**0.000**	**0.000**	**(0.090)**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 2, p. 3 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Compressor stations

353. GGT has proposed 16 projects under this asset class. EMCa has recommended not to approve GGT's proposed capital expenditure on the PLC support software. EMCa considers that GGT has failed to present a case to demonstrate that the project has funded itself.

354. The Authority agrees with EMCa that GGT has failed to present a case to demonstrate that the project has funded itself. As a result, the Authority considers that $0.098 million of GGT's proposed capital expenditure on PLC support software is not conforming under rule 79 of the NGR.

355. Table 18 shows the Authority's required adjustments as per rule 79 of the NGR by project on GGT's proposed capital expenditure on compressor stations over the second access arrangement period.

[100] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table 18 Authority Approved Capital Expenditure on Compressor Stations (AA2) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Compressor stations – proposed by GGT	**0.466**	**0.050**	**0.266**	**0.580**	**0.882**	**2.243**
PLC support software	-	-	(0.072)	(0.026)	-	(0.098)
Authority Approved compressor stations – rules 74 and 79 of the NGR[101]	**0.466**	**0.050**	**0.194**	**0.554**	**0.882**	**2.145**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 3, p.6 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p.35

Receipt and delivery point facilities

356. GGT has proposed two projects under this asset class. EMCa has recommended to approve GGT's proposed capital expenditure on these projects.

357. The Authority agrees with EMCa that GGT's proposed capital expenditure on receipt and delivery point facilities for the second access arrangement period of $0.305 million is conforming under rule 79 of the NGR.

358. Table 19 confirms GGT's proposed capital expenditure on receipt and delivery point facilities over the second access arrangement period is conforming under rule 79 of the NGR.

Table 19 Authority Approved Capital Expenditure on Receipt and Delivery Point Facilities (AA2) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Receipt and delivery point facilities – proposed by GGT	**0.000**	**0.000**	**0.000**	**0.136**	**0.169**	**0.305**
Authority Approved receipt and delivery point facilities – rules 74 and 79 of the NGR[102]	**0.000**	**0.000**	**0.000**	**0.136**	**0.169**	**0.305**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 4, p.17 and EMCa, GGT's Proposed Revised Access Arrangement for GGP,: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p.35

SCADA and communications

359. GGT has proposed five projects under this asset class: GGP satellite communications upgrade, Replacement of SCADA system master station, Yarraloola SCADA communications upgrade, Paraburdoo SCADA communications

[101] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

[102] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

upgrade and GGP UPS upgrade. EMCa has assessed these projects and considers that these are justified under rule 79(2)(c)(ii) of the NGR.

360. GGT has proposed conforming capital expenditure of $1.988 million on the Replacement of SCADA system master station project for the second access arrangement period. The Authority had approved forecast capital expenditure of $2.94 million for this project. GGT has deferred the $0.95 million balance to the third access arrangement period. EMCa considers that GGT's identified driver for the project, system obsolescence, is valid and consistent with industry IT-based infrastructure management strategies. GGT has explained the underspend from the approved forecast by its ability to take advantage of the scale economies afforded by APA Group's common approach to replace all its outmoded SCADA systems. The project has been procured following APA Group procurement policies, under a competitive tender. EMCa is satisfied that the project satisfies rule 79(2)(c)(ii) of the NGR, and is prudent under rule 79(1) of the NGR.

361. The Authority has reviewed the advice from EMCa and considers the GGT's proposed capital expenditure on SCADA and communications is conforming under rule 79 of the NGR.

362. Table 20 confirms GGT's proposed capital expenditure on SCADA and communications over the second access arrangement period is conforming under rule 79 of the NGR.

Table 20 Authority Approved Capital Expenditure on SCADA and Communications (AA2) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
SCADA and communications – proposed by GGT	**0.197**	**0.383**	**0.747**	**0.473**	**0.841**	**2.640**
Authority Approved SCADA and communications – rules 74 and 79 of the NGR[103]	**0.197**	**0.383**	**0.747**	**0.473**	**0.841**	**2.640**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 5, p.20 and EMCa, GGT's Proposed Revised Access Arrangement for GGP,: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Maintenance bases and depots

363. GGT has proposed four projects under this asset class: Karratha maintenance base repairs, Karratha spare parts storage, Yarraloola accommodation and Accommodation units (Paraburdoo and Leinster). EMCa has assessed these projects and considers that they are justified under rule 79(2)(c)(ii) of the NGR.

364. GGT has proposed conforming capital expenditure of $1.320 million on the Yarraloola accommodation project for the second access arrangement period. The project has aimed at making accommodation at the Yarraloola compressor station, which is 150 km away from the nearest major town, consistent with industry standards for remote operations in the Pilbara. The original accommodation was established in 1995, and has deteriorated rapidly due to the harsh environment.

[103] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

GGT has reported following its procurement practices in procuring contractor services to undertake the upgrade. EMCa is satisfied that the project satisfies rule 79(2)(c)(ii) of the NGR, and is prudent under rule 79 (1) of the NGR.

365. The Authority has reviewed the advice from EMCa and considers the GGT's proposed capital expenditure on maintenance bases and depots is conforming under rule 79 of the NGR.

366. Table 21 confirms GGT's proposed capital expenditure on maintenance bases and depots over the second access arrangement period is conforming under rule 79 of the NGR.

Table 21 Authority Approved Capital Expenditure on Maintenance Bases and Depots (AA2) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Maintenance bases and depots – proposed by GGT	**0.096**	**0.000**	**0.000**	**1.320**	**0.089**	**1.505**
Authority Approved maintenance bases and depots – rules 74 and 79 of the NGR[104]	**0.096**	**0.000**	**0.000**	**1.320**	**0.089**	**1.505**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 6, p. 24 and EMCa, GGT's Proposed Revised Access Arrangement for GGP,: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Other (depreciable) assets

367. GGT has proposed 13 projects under this asset class. EMCa considers that GGT has provided inadequate justification for tools and gas detectors, purchase of test instruments, fluke process calibrator, and electrical and instrumentation field response equipment. The Authority considers that inadequate justification was provided and accordingly does not satisfy rule 79 or the NGR

368. GGT has proposed conforming capital expenditure of $1.098 million on an Enterprise Asset Management System (**EAMS**) for the second access arrangement period. The project has aimed at replacing six systems with an EAMS using a widely used software package (MAXIMO). Five of the six systems are obsolete, and not supported by the vendor. Moreover, the supporting IT infrastructure is nearing the end of its serviceable life. GGT has argued that this represents a significant operational risk, and that EAMS will enable improved maintenance scheduling capabilities and analysis of equipment performance. The EAMS has been introduced across all APA Group pipelines, and is managed by APA group to ensure a consistent and cost effective delivery. This project is forecast to continue through to 2016. EMCa is satisfied that the full $1.098 million can be considered conforming capital expenditure in accordance with rules 79(1) and 79(2) of the NGR.

369. The Authority agrees with EMCa that $0.214 million of GGT's proposed capital expenditure on other assets for the second access arrangement period is not conforming under rule 79 of the NGR.

[104] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

370. Table 22 shows the Authority's required adjustments as per rule 79 of the NGR by project on GGT's proposed capital expenditure on other depreciable assets over the second access arrangement period.

Table 22 Authority Approved Capital Expenditure on Other (Depreciable) Assets (AA2) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Other (depreciable) assets – proposed by GGT	**0.048**	**0.024**	**0.026**	**0.567**	**0.924**	**1.590**
Tools and gas detectors	(0.046)	(0.008)	(0.026)	(0.079)	-	(0.160)
Purchase of test instruments	(0.004)	-	-	-	-	(0.004)
Fluke process calibrator	-	(0.029)	-	-	-	(0.029)
E&I Field Response Equipment (33175)	-	-	-	-	(0.021)	(0.021)
Authority Approved other (depreciable) assets – rules74 and 79 of the NGR[105][106]	**(0.002)**	**(0.013)**	**0.000**	**0.488**	**0.903**	**1.376**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 7, p. 28 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Non-depreciable assets

371. GGT has not proposed any capital expenditure under this category.

Required Amendments

372. The Authority does not approve GGT's proposed capital expenditure for the second access arrangement period as submitted.

373. The Authority has decided that:

- $7.881 million of GGT's proposed capital expenditure complies with the criteria set out in rule 79 of the NGR; and
- $0.338 million of GGT's proposed capital expenditure does not comply with the criteria set out in rules 74 or 79 of the NGR and should not be included in the opening value of the asset for the third access arrangement period.

374. Table 23 shows the Authority's required adjustments as per rules 74 and 79 of the NGR to GGT's proposed capital expenditure for the second access arrangement period.

[105] The Authority notes that there are negative amounts for capital expenditure due to the presence of reversal calculation errors. GGT has proposed to correct $0.016 million of accounting errors. Accordingly, this has resulted in a lower number to begin with for GGT's proposed other asset capital expenditure for the second access arrangement period.

[106] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table 23 Authority Approved Capital Expenditure (AA2) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Pipeline and laterals	(0.090)	0.000	0.000	0.000	0.000	(0.090)
Compressor stations	0.466	0.050	0.194	0.554	0.882	2.145
Receipt and delivery point facilities	0.000	0.000	0.000	0.136	0.169	0.305
SCADA and communications	0.197	0.383	0.747	0.473	0.841	2.640
Maintenance bases and depots	0.096	0.000	0.000	1.320	0.089	1.505
Other (depreciable) assets	(0.002)	(0.013)	0.000	0.488	0.903	1.376
Authority Approved Capital Expenditure (AA2) – rules 74 and 79 of the NGR[107]	**0.667**	**0.420**	**0.941**	**2.971**	**2.884**	**7.881**

Source: ERA, GGP Tariff Model, December 2015

375. The Authority has not considered GGT's cost allocation methodology in this chapter between covered and uncovered services. This is discussed in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Assessment of Depreciation

376. GGT has proposed to include an amount of depreciation in the opening capital base for the third access arrangement period, as set out in Table 24.

Table 24 GGT Proposed Depreciation (AA2)

Nominal $ million	2010	2011	2012	2013	2014
Proposed depreciation	**3.901**	**11.159**	**11.699**	**11.913**	**12.029**

Source: GGT, Access Arrangement Supporting Information, 15 August 2014, Table 7, p.56

377. The Authority notes that GGT's proposed depreciation is less than that of the Authority's approved depreciation forecast for the second access arrangement period, as shown in Table 25.

[107] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table 25 Authority Approved Depreciation (AA2) under rules 74 and 79 of the NGR

Nominal $ million	2010	2011	2012	2013	2014
Authority Approved Depreciation (AA2) – rules 74 and 79 of the NGR[108]	**3.920**	**11.294**	**11.892**	**12.160**	**12.262**

Source: GGT, Proposed Revisions to Access Arrangement Information – As Amended by the Western Australian Electricity Review Board, 30 March 2012, Table 7, p.9 Opening Capital Base and ERA, GGP Tariff Model, December 2015.

378. Table 26 shows the Authority's required amended values for calculating the opening capital base under rule 77 of the NGR taking into account the required amendments for conforming capital expenditure and depreciation for the second access arrangement period as set out in Table 23 and Table 24 respectively.

Table 26 Authority Approved Opening Capital Base at 1 January 2015 under rules 74 and 79 of the NGR

Nominal $ million	2010	2011	2012	2013	2014
Opening Capital Base (AA2)	436.117	432.422	421.528	410.552	401.363
Plus: Capital Expenditure	0.225	0.400	0.916	2.971	2.939
Less: Depreciation	3.920	11.294	11.892	12.160	12.262
Plus: Non-Depreciable Variation	0.000				
Closing Capital Base (AA2)	432.422	421.528	410.552	401.363	392.040
Authority Approved opening capital Base at 1 January 2015 – rules 74 and 79 of the NGR[109]					**392.040**

Source: ERA, GGP Tariff Model, December 2015.

379. The Authority notes the approved values for the opening capital base in Table 26 will be further adjusted under Rule 93(2)(c) of the NGR to reflect the unique circumstances of the GGP, in which covered assets provide both covered and uncovered services. The Authority has determined that this adjustment is required by the National Gas Objective (**NGO**) and Revenue Pricing Principles (**RPP**) of the NGL(WA) in order to ensure that the total revenue allocated to covered services under rule 93 of the NGR is consistent with calculating a reference tariff that reflects the efficient cost of covered services. The Authority's consideration on this matter is outlined in more detail in a subsequent chapter of this Draft Decision on the Allocation of Total Revenue between Services and Other Services.

[108] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

[109] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Required Amendment 6

The opening capital base for 1 January 2015 in the proposed revised access arrangement must be amended to reflect the values in Table 26 of this Draft Decision.

Projected Capital Base

Regulatory Requirements

380. Rule 78 of the NGR establishes the approach to determine the projected capital base for an access arrangement period.

381. Rule 78 of the NGR states that the projected capital base for a particular period is:

> 78 Projected capital base
>
> The projected capital base for a particular period is:
>
> (a) the opening capital base;
>
> plus:
>
> (b) forecast conforming capital expenditure for the period;
>
> less:
>
> (c) forecast depreciation for the period; and
>
> (d) the forecast value of pipeline assets to be disposed of in the course of the period.

382. Rule 79 of the NGR sets out the criteria that capital expenditure must meet to be considered conforming capital expenditure. As discussed previously in the opening capital base section, capital expenditure must be incurred by a prudent service provider acting efficiently, and the expenditure must be justifiable on economic, safety or regulatory grounds.

383. The Authority's discretion is limited under rule 79. Rule 40(2) of the NGR sets out the Authority's limited discretion powers. Rule 40(2) states that the regulator must not withhold its approval of an element of an access arrangement proposal if it is satisfied that the element complies with the applicable requirements of the NGL(WA) and is consistent with any applicable criteria (if any) prescribed by the NGL(WA).

384. Rule 74 of the NGR provides that information in the nature of a forecast or estimate must be supported by a statement of its basis, and must be arrived at on a reasonable basis, and must represent the best forecast or estimate possible in the circumstances.

385. Rule 71 of the NGR is relevant to the Authority's consideration of actual and forecast capital expenditure against the requirements of rule 79 of the NGR, and states that:

> 71. Assessment of compliance
>
> (1) In determining whether capital or operating expenditure is efficient and complies with other criteria prescribed by these rules, the [Authority] may, without embarking on a detailed investigation, infer compliance from the operation of an incentive mechanism or on any other basis the [Authority] considers appropriate.

(2) The [Authority] must, however, consider and give appropriate weight to, submissions and comments received when the question whether a relevant *access arrangement proposal* should be approved is submitted for public consultation.

386. Rule 88 of the NGR provides that the forecast depreciation of the capital base for the purpose of determining a reference tariff is to be calculated for each year of the access arrangement period on the basis set out in the depreciation schedule(s). The requirements in relation to forecast depreciation are set out in rule 89 of the NGR.

GGT's Proposed Changes

387. GGT proposes to spend $12.858 million on sustaining/SIB capital expenditure on the covered pipeline over the third access arrangement period. Some of the proposed expenditure covers projects that continue work that started in the second access arrangement period. GGT has not proposed any growth capital expenditure for the third access arrangement period. GGT's proposed conforming capital expenditure for the third access arrangement period is $4.634 million higher than GGT's proposed conforming capital expenditure of $8.224 million for the second access arrangement period.

388. Table 27 summarises GGT's proposed conforming capital expenditure for the third access arrangement period.

Table 27: GGT Proposed Conforming Capital Expenditure (AA3)

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Pipeline and laterals	3.192	1.830	0.278	0.000	0.214	5.514
Main line valve and scraper stations	0.000	0.641	0.000	0.000	0.000	0.641
Compressor stations	1.009	0.822	0.000	0.209	0.288	2.328
Receipt and delivery point facilities	0.384	0.000	0.641	0.363	0.000	1.388
SCADA and communications	0.534	0.456	0.192	0.043	0.043	1.268
Cathodic protection	0.096	0.033	0.083	0.025	0.025	0.262
Maintenance bases and depots	0.620	0.000	0.000	0.000	0.000	0.620
Other (depreciable) assets	0.559	0.096	0.075	0.053	0.053	0.836
Non-depreciable assets	0.000	0.000	0.000	0.000	0.000	0.000
GGT Proposed Conforming Capital Expenditure (AA3)	**6.394**	**3.878**	**1.269**	**0.693**	**0.623**	**12.857**

Source: GGT, Access Arrangement Supporting Information, 15 August 2014 (figures converted to real dollars as per ERA analysis, December 2015).

389. In support of its proposed conforming capital expenditure for the third access arrangement period, GGT has provided 18 business cases that total $11.704 million, or 91 per cent of GGT's proposed conforming capital expenditure for the third access arrangement period. The Authority's technical advisor, EMCa, has noted that the business cases for projects whose costs are less than $2 million were developed specifically for the revised access arrangement proposal and not for internal use.

390. GGT's AMP lists capital expenditure project costs that exclude a [redacted] margin for project management and overheads that are applicable under the Operating Agreement.[110] This margin is included in the business cases and the revised access arrangement proposal.

391. GGT has sought to justify its proposed expenditure on sustaining capital expenditure under one or more of the grounds in rule 79(2)(c) of the NGR (i.e. safety, integrity or compliance). Maintaining system integrity is the basis for justifying 92 per cent of the expenditure; three business cases covering the balance of expenditure are justified solely on safety grounds.[111]

Considerations of the Authority

Assessment of Capital Expenditure

392. EMCa has reviewed GGT's proposed capital expenditure for the third access arrangement period as follows:

- EMCa has first considered whether the projects are justified under one or more of the grounds set out in rule 79(2) of the NGR. In doing so, EMCa has reviewed:
  - Rationale provided by GGT for each project;[112]
  - Revised Safety Case that was accepted by the Department of Mines and Petroleum (**DMP**) in May 2014;
  - Risk assessment process provided by GGT in the business case documents; and
  - GGT's 2014 AMP.
- EMCa considers that it has received insufficient evidence from GGT that it has taken into account the difference between approved and actual capital expenditure for the second access arrangement period. GGT has clarified that the capital expenditure forecast for the second access arrangement period was based on preliminary estimates, and that GGT has consistently found ways to prudently deliver the required projects for much less than estimated or to defer the projects. EMCa has assessed the information provided by GGT in accordance with rule 74(2), and has made adjustments in accordance with the expectation that GGT will be able to prudently identify ways of delivering the proposed work for much less than its preliminary estimate as follows:
  - If the estimate is derived from a competitive tender, then EMCa has recommended to accept it;
  - If the estimate is based on a single quote or is similar to work completed during the second access arrangement period, then EMCa has considered that GGT will deliver the project at 80 per cent of the preliminary estimate;
  - If GGT has provided little or no information to support the robustness of its preliminary estimate, EMCa has considered that GGT will be

[110] Operating Agreement between Goldfields Gas Transmission, Southern Cross Pipelines Australia and Southern Cross Pipelines (NPL) Australia and Duke Energy WA, APT Pipelines and APT Pipelines (WA).

[111] GGT, Business Cases 12, 14 and 22, Attachment 6, Proposed revised access arrangement (AA3).

[112] Goldfields Gas Transmission, *Access Arrangement Supporting Information, Attachment 6: Forecast conforming capital expenditure: 2015-2019*; and Goldfields Gas Transmission, *Access Arrangement Supporting Information, Attachment 10: Major Expenditure jobs*: 2015-2019.

able to deliver the project at 65 per cent of the preliminary estimate, as GGT has, on average, delivered projects during the second access arrangement period for less than 52 per cent of its preliminary estimate.

393. EMCa reviewed GGT's governance in relation to capital expenditure. EMCa's main findings in relation to capital expenditure forecasts for the third access arrangement period were as follows:

- GGT's governance of its actual expenditure reflects good industry practice, demonstrates efficient expenditure outcomes and prudent deferrals.
- There is a lack of explicit linkage and top-down/bottom-up alignment of objectives and requirements between corporate objectives, Key Performance Indicators, the Asset Management Plan and the Safety Case.
- GGT has not demonstrated a management response or an updated capital expenditure forecasting approach to address the significant capital expenditure underspend in the second access arrangement period compared to the Authority approved forecast conforming capital expenditure for the period. According to EMCa, this undermines confidence in GGT's capital expenditure forecast for the third access arrangement period.

394. EMCa has recommended that the Authority approve $8.72 million of the $12.86 million of forecast confirming capital expenditure proposed by GGT. EMCa's reductions were due primarily to a lack of sufficient information to demonstrate that GGT's forecasts are the best estimate possible and that a share of common capital expenditure costs should be allocated to uncovered services. The Authority has not made an assessment of GGT's proposed conforming expenditure for the second access arrangement period against rule 93 of the NGR. The Authority has assessed cost allocation between covered and uncovered services in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

395. In line with capital expenditure for the second access arrangement period, GGT has divided capital expenditure for the third access arrangement period into the following asset classes:

- Pipeline and laterals
- Main line valve and scraper station
- Compressor stations
- Receipt and delivery point facilities
- SCADA and communications
- Cathodic protection
- Maintenance bases and depots
- Other (depreciable) assets
- Non-depreciable assets

396. The Authority has assessed GGT's proposed capital expenditure for the third access arrangement period under GGT's assets classes below.

Pipeline and laterals

397. GGT has proposed nine projects under this asset class. EMCa considers that GGT has provided inadequate justification for pipeline protection repair, as GGT has not provided a business case. For easement erosion repair, EMCa considers that GGT's cost estimate is preliminary and can be reduced by 35 per cent. Moreover, EMCa considers that GGT requires 60 rather than 72 digs under in-line inspection verification dig-ups. EMCa finds that this work is a requisite aspect of assessing the integrity of the pipeline. However, EMCa considers that only two digs per section rather than the assumed six should be required on the Newman lateral and the two interconnects. Finally, EMCa considers that the cost estimates for in-line inspection and verification dig-ups and the remaining projects can be reduced by 20 per cent to account for the gap between approved estimates and actual spend on capital expenditure during the second access arrangement period.

398. The Authority has considered EMCa's recommendations regarding GGT's proposed capital expenditure on pipeline and laterals for the third access arrangement. The Authority agrees with EMCa's recommendations and has decided that $1.325 million of GGT's proposed capital expenditure on pipeline and laterals for the third access arrangement period is not conforming under rules 74 and 79 of the NGR. Therefore, the Authority considers that $4.189 million of GGT's proposed capital expenditure on pipeline and laterals for the third access arrangement period is conforming under rule 79 of the NGR.

399. Table 28 shows the Authority's required adjustments as per rule 74 and 79 of the NGR by project on GGT's proposed capital expenditure on pipeline and laterals over the third access arrangement period.

Table 28 Authority Approved Capital Expenditure on Pipeline and Laterals (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Pipeline and laterals – proposed by GGT	**3.192**	**1.830**	**0.278**	**0.000**	**0.214**	**5.514**
Easement repair for in-line inspection	(0.043)	-	-	-	-	(0.043)
16" Mainline in-line inspection	(0.216)	-	-	-	-	(0.216)
14" Mainline in-line inspection	(0.339)	-	-	-	-	(0.339)
Newman Lateral in-line inspection	(0.041)	-	-	-	-	(0.041)
In-line inspection verification dig-ups	-	(0.308)	-	-	-	(0.308)
Pipeline protection repair - unanticipated encroachment	-	-	(0.064)	-	-	(0.064)
In-line inspection of DBNGP interconnect pipeline	-	(0.029)	-	-	-	(0.029)
In-line inspection of Apache interconnect pipeline	-	(0.029)	-	-	-	(0.029)
Easement erosion repair	-	-	(0.128)	-	(0.128)	(0.256)
Authority Approved pipeline and laterals – rules 74 and 79 of the NGR[113]	**2.554**	**1.464**	**0.085**	**0.000**	**0.085**	**4.189**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Main line valve and scraper station

400. GGT has proposed two projects under this asset class. These projects are required to enable the use of In-Line Inspection pigs for inspections required by 2016 under the agreement with the Department of Mines and Petroleum. EMCa considers that cost estimates for these projects can be reduced by 20 per cent to account for the gap between approved estimates and actual spend on capital expenditure during the second access arrangement period.

401. The Authority has considered EMCa's advice and decided that $0.128 million of GGT's proposed capital expenditure on main line valve and scraper station for the third access arrangement period is not conforming under rule 74(2) of the NGR. Therefore, the Authority considers that $0.513 million of GGT's proposed capital expenditure on main line valve and scraper station for the third access arrangement period is conforming under rules 79(2)(c)(i), (ii) and (iii) of the NGR.

402. Table 29 shows the Authority's required adjustments as per rule 74 and 79 of the NGR by project on GGT's proposed capital expenditure on main line valve and scraper station over the third access arrangement period.

[113] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table 29 Authority Approved Capital Expenditure on Main Line Valve and Scraper Station (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Main line valve and scraper station – proposed by GGT	**0.000**	**0.641**	**0.000**	**0.000**	**0.000**	**0.641**
Install scraper station facilities on DBNGP-GGP interconnect	-	(0.064)	-	-	-	(0.064)
Install scraper station facilities on Apache-GGP interconnect	-	(0.064)	-	-	-	(0.064)
Authority Approved main line valve and scraper station – rules 74 and 79 of the NGR[114]	**0.000**	**0.513**	**0.000**	**0.000**	**0.000**	**0.513**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Compressor stations

403. GGT has proposed 18 projects under this asset class. GGT has not presented any justification for six of these projects (Yarraloola GEA PLC upgrade, Yarraloola accommodation to workshop conversion, Paraburdoo unit 1 human-machine interface upgrade, Paraburdoo accommodation upgrade, Ilgarari GEA PLC upgrade, Rotational spare DN 300 RA valve), which EMCa recommends not to approve on this basis.

404. For three projects (Yarraloola and Ilgarari lighting towers replacement, Yarraloola GEA 2 major overhaul and Ilgarari GEA 1 major overhaul), EMCa considers that the estimates are preliminary and should be reduced by 35 per cent.

405. Six projects (Yarralola fire protection system upgrade, Yarraloola hazardous area upgrade, Paraburdoo hazardous area upgrade, Ilgarari unit PLC backplane upgrade, Ilgarari hazardous area upgrade, Wiluna hazardous area upgrade) are related to inspections and rectification as required by AS/NZS 60079.17:2009. The compressor stations were all upgraded in the second access arrangement period, and two stations are scheduled to have two inspections in the third access arrangement period. EMCa considers that cost estimates for these projects can be reduced by 20 per cent, as EMCa considers it unreasonable to assume that the cost at each site will be equivalent to the cost in the second access arrangement period (as without evidence to the contrary, the extent of upgrade work from successive inspections can reasonably be expected to decline). Furthermore, APA has some experience with this work and has a preferred vendor. The Authority agrees with EMCa that the extent of upgrade work from successive inspections can reasonably be expected to decline due to efficiencies, previous experience and a preferred vendor.

406. The Authority agrees with EMCa's recommendations and considers that $0.606 million of GGT's proposed capital expenditure on compressor stations for

[114] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

the third access arrangement period is not conforming under rules 74(2) and 79(2) of the NGR.

407. Table 30 shows the Authority's required adjustments as per rule 74 and 79 of the NGR by project on GGT's proposed capital expenditure on compressor stations over the third access arrangement period.

Table 30 Authority Approved Capital Expenditure on Compressor Stations (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Compressor stations – proposed by GGT	**1.009**	**0.822**	**0.000**	**0.209**	**0.288**	**2.328**
Yarraloola and Ilgarari lighting towers replacement	(0.075)					(0.075)
Yarraloola unit PLC backplane upgrade	(0.021)					(0.021)
Yarraloola fire protection system upgrade	(0.020)					(0.020)
Yarraloola GEA PLC upgrade	(0.043)					(0.043)
Yarraloola hazardous area upgrade	(0.026)			(0.026)		(0.052)
Yarraloola accommodation to workshop conversion	(0.064)					(0.064)
Paraburdoo Unit 1 human-machine interface upgrade		(0.021)				(0.021)
Paraburdoo hazardous area upgrade		(0.016)			(0.016)	(0.032)
Paraburdoo accommodation upgrade	(0.043)					(0.043)
Ilgarari unit PLC backplane upgrade	(0.021)					(0.021)
Ilgarari GEA PLC upgrade	(0.043)					(0.043)
Ilgarari hazardous area upgrade		(0.032)				(0.032)
Wiluna hazardous area upgrade	(0.026)				(0.026)	(0.051)
Rotational spare DN 300 RA valve	(0.032)					(0.032)
Yarraloola GEA 2 major overhaul	0.000	0.000	0.000	0.000	(0.028)	(0.028)
Ilgarari GEA 1 major overhaul	0.000	0.000	0.000	(0.028)	0.000	(0.028)
Authority Approved compressor stations – rules 74 and 79 of the NGR[115]	**0.595**	**0.753**	**0.000**	**0.155**	**0.218**	**1.722**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP,: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Receipt and delivery point facilities

408. GGT has proposed 11 projects under this asset class. GGT has not presented any justification for three of these projects (Leonora offtake battery upgrade, DBNGP-

[115] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

GGP interconnect C9 gas chromatograph installation, Apache-GGP interconnect C9 gas chromatograph installation), which EMCa recommends not to approve on this basis. For seven projects (hydrocarbon dewpoint monitoring, Leonora offtake flow computer upgrade, Murrin Murrin inlet flow computer upgrade, in addition to Paraburdoo, Ilgarari, Wiluna and Jeedamya scraper station flow computer 1 upgrades), EMCa considers that the estimates are preliminary and can be reduced by 35 per cent. For the Apache-GGP interconnect assessment project, EMCa considers that the cost estimate can be reduced by 20 per cent to account for the gap between approved estimates and actual spend on capital expenditure during the second access arrangement period.

409. The Authority agrees with EMCa's recommendations and has decided that $0.742 million of GGT's proposed capital expenditure on receipt and delivery point facilities for the third access arrangement period is not conforming under rules 74 (2) and 79 (2) of the NGR. Therefore, the Authority considers that $0.646 million of GGT's proposed capital expenditure on receipt and delivery point facilities for the third access arrangement period is conforming under rule 79 (c) (ii) of the NGR.

410. Table 31 shows the Authority's required adjustments as per rule 74 and 79 of the NGR by project on GGT's proposed capital expenditure on receipt and delivery point facilities over the third access arrangement period.

Table 31 Authority Approved Capital Expenditure on Receipt and Delivery Point Facilities (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Receipt and delivery point facilities – proposed by GGT	**0.384**	**0.000**	**0.641**	**0.363**	**0.000**	**1.388**
Hydrocarbon dewpoint monitoring	(0.011)	-	-	-	-	(0.011)
Leonora offtake flow computer upgrade	(0.056)	-	-	-	-	(0.056)
Murrin Murrin inlet flow computer upgrade	(0.056)	-	-	-	-	(0.056)
Leonora offtake battery upgrade	(0.032)	-	-	-	-	(0.032)
Paraburdoo flow computer 1 (fuel gas) upgrade	-	-	(0.056)	-	-	(0.056)
Ilgarari flow computer 1 (fuel gas) upgrade	-	-	(0.056)	-	-	(0.056)
Wiluna flow computer 1 (fuel gas) upgrade	-	-	(0.056)	-	-	(0.056)
Jeedamya scraper station flow computer 1 upgrade	-	-	(0.056)	-	-	(0.056)
DBNGP-GGP interconnect C9 gas chromatograph installation	-	-	-	(0.214)	-	(0.214)
Apache-GGP interconnect C9 gas chromatograph upgrade	-	-	-	(0.150)	-	(0.150)
Authority Approved receipt and delivery point facilities – rules 74 and 79 of the NGR[116]	**0.230**	**0.000**	**0.417**	**0.000**	**0.000**	**0.646**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

SCADA and communications

411. GGT has proposed 19 projects under this asset class. GGT has not presented any justification for two of these projects (Wiluna compressor station AB PLC5 upgrade and engineering PC in gas control centre), which EMCa recommends not to approve on this basis. For 16 projects (quantum RTU upgrades at Yarraloola, Paraburdoo, Newman, Ilgarari, Three Rivers, Wiluna, Mount Keith, Leinster, Thunderbox, Leonora, Gwalia, Jeedamya, Kalgoorlie North, Kalgoorlie West, and BM 85 replacement program phase 2)), EMCa considers that the estimates are preliminary and can be reduced by 35 per cent. For the national satellite SCADA project, EMCa considers that the cost estimate can be reduced by 20 per cent to account for the gap between approved estimates and actual spend on capital expenditure during the second access arrangement period. The Authority agrees with EMCa that GGT can leverage from APA experience to decrease the proposed cost estimate.

[116] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

412. The Authority considers that EMCa's recommendations are reasonable and has decided that $0.408 million of GGT's proposed capital expenditure on SCADA and communications for the third access arrangement period is not conforming under rules 74(2) and 79(2) of the NGR. Therefore, the Authority considers that $0.859 million of GGT's proposed capital expenditure on SCADA and communications for the third access arrangement period is conforming under rule 79(2) of the NGR.

413. Table 32 shows the Authority's required adjustments as per rule 74 and 79 of the NGR by project on GGT's proposed capital expenditure on SCADA and communications over the third access arrangement period.

Table 32 Authority Approved Capital Expenditure on SCADA and Communications (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
SCADA and communications – proposed by GGT	**0.534**	**0.456**	**0.192**	**0.043**	**0.043**	**1.268**
Yarraloola Quantum RTU upgrade	(0.005)	-	-	-	-	(0.005)
Paraburdoo compressor station Quantum RTU upgrade	-	-	-	-	(0.007)	(0.007)
Newman scraper station Quantum RTU upgrade	(0.007)	-	-	-	-	(0.007)
Ilgarari compressor station Quantum RTU upgrade	-	(0.007)	-	-	-	(0.007)
Three Rivers main line valve Quantum RTU upgrade	-	-	-	-	(0.007)	(0.007)
Wiluna compressor station Quantum RTU upgrade	(0.007)	-	-	-	-	(0.007)
Mt Keith main line valve Quantum RTU upgrade	-	(0.007)	-	-	-	(0.007)
Leinster scraper station Quantum RTU upgrade	-	(0.007)	-	-	-	(0.007)
Thunderbox offtake Quantum RTU upgrade	-	(0.007)	-	-	-	(0.007)
Leonora main line valve Quantum RTU upgrade	-	-	(0.007)	-	-	(0.007)
Leonora offtake Quantum RTU upgrade	-	-	(0.007)	-	-	(0.007)
Gwalia offtake Quantum Station RTU upgrade	-	(0.007)	-	-	-	(0.007)
Jeedamya scraper station Quantum RTU upgrade	-	-	-	(0.007)	-	(0.007)
Kalgoorlie North main line valve Quantum RTU upgrade	(0.007)	-	-	-	-	(0.007)
Kalgoorlie West main line valve Quantum RTU upgrade	-	-	-	(0.007)	-	(0.007)
BM 85 replacement program phase 2	-	-	(0.052)	-	-	(0.052)
Wiluna compressor station AB PLC5 upgrade	(0.085)	-	-	-	-	(0.085)
Engineering PC in Gas Control Centre	(0.021)	-	-	-	-	(0.021)
National satellite SCADA	(0.070)	(0.070)	-	-	-	(0.140)
Authority Approved SCADA and communications – rules 74 and 79 of the NGR[117]	**0.330**	**0.349**	**0.125**	**0.028**	**0.028**	**0.859**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Cathodic protection

414. GGT has proposed five projects under this asset class. GGT has not presented any justification for any of these projects, which EMCa recommends not to approve on this basis.

415. Given the lack of sufficient justification from GGT, the Authority has decided that GGT's proposed capital expenditure of $0.262 million on cathodic protection for the third access arrangement period is not conforming under rule 79 (2) of the NGR.

416. Table 33 shows the Authority's required adjustments as per rule 79 of the NGR by project on GGT's proposed capital expenditure on cathodic protection over the third access arrangement period.

Table 33 Authority Approved Capital Expenditure on Cathodic Protection (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Cathodic protection – proposed by GGT	**0.096**	**0.033**	**0.083**	**0.025**	**0.025**	**0.262**
CP insulation joint surge protection upgrade	[redacted]					
CP surge diverter upgrades						
CP telemetry for KP670						
CP power supply replacements						
Wireless system interface for non-critical control						
Authority Approved cathodic protection – rules 74 and 79 of the NGR[118]	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Maintenance bases and depots

417. GGT has proposed one project under this asset class. EMCa has noted that GGT's proposed cost estimate is based on one quote from a local contractor. Therefore, EMCa considers that the cost estimate for this project can be reduced by 20 per cent to account for the gap between approved estimates and actual spend on capital expenditure during the second access arrangement period.

[117] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table may not add up due to rounding.

[118] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

418. The Authority agrees with EMCa's recommendation and has decided that $0.124 million of GGT's proposed capital expenditure on maintenance bases and depots for the third access arrangement period is not conforming under rules 74(2) of the NGR. Therefore, the Authority considers that $0.496 million of GGT's proposed capital expenditure on maintenance bases and depots for the third access arrangement period is conforming under rule 74(2) of the NGR.

419. Table 34 shows the Authority's required adjustments as per rule 74 of the NGR by project on GGT's proposed capital expenditure on maintenance bases and depots over the third access arrangement period.

Table 34 Authority Approved Capital Expenditure on Maintenance Bases and Depots (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Maintenance bases and depots – proposed by GGT	**0.620**	**0.000**	**0.000**	**0.000**	**0.000**	**0.620**
Karratha maintenance base rebuild	(0.124)	0.000	0.000	0.000	0.000	(0.124)
Authority Approved maintenance bases and depots – rules 74 and 79 of the NGR[119]	**0.496**	**0.000**	**0.000**	**0.000**	**0.000**	**0.496**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Other (depreciable) assets

420. GGT has proposed two projects and a set of minor spending under this asset class. GGT has not presented any justification for hazardous area management software investigation and design, which EMCa recommends not to approve on this basis. For minor capital items, EMCa considers that the cost estimate can be reduced by 20 per cent to account for the gap between approved estimates and actual spend on capital expenditure during the second access arrangement period.

421. The Authority agrees with EMCa's recommendations and has decided that $0.181 million of GGT's proposed capital expenditure on other assets for the third access arrangement period is not conforming under rules 74(2) and 79(2) of the NGR. Therefore, the Authority considers that $0.698 million of GGT's proposed capital expenditure on other assets for the third access arrangement period is conforming under rules 74 and 79 of the NGR.

422. Table 35 shows the Authority's required adjustments as per rule 74 and 79 of the NGR by project on GGT's proposed capital expenditure on other assets over the third access arrangement period.

[119] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table 35 Authority Approved Capital Expenditure on Other Assets (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Other assets – proposed by GGT	**0.559**	**0.096**	**0.075**	**0.053**	**0.053**	**0.836**
Hazardous area management software investigation and design	(0.080)	-	-	-	-	(0.080)
Minor capital items	(0.019)	(0.019)	(0.026)	(0.019)	(0.019)	(0.101)
Authority Approved other assets – rule 74 and 79 of the NGR[120]	**0.460**	**0.077**	**0.049**	**0.034**	**0.034**	**0.655**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP,: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Non-depreciable assets

423. GGT has not proposed any capital expenditure under this category.

Required Amendments

424. The Authority does not approve GGT's proposed capital expenditure for the third access arrangement period as submitted.

425. The Authority has decided that:

- $9.080 million complies with the criteria set out in rule 79 of the NGR; and
- $3.777 million does not comply with the criteria set out in rules 74 or 79 of the NGR and should not be included in the opening value of the asset base for the third access arrangement period.

426. Table 36 shows the Authority's required adjustments as per rules 74 and 79 of the NGR to GGT's proposed capital expenditure for the second access arrangement period.

[120] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table 36 Authority Approved Capital Expenditure (AA3) under rules 74 and 79 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Pipeline and laterals	2.554	1.464	0.085	0.000	0.085	4.188
Main line valve and scraper station	0.000	0.513	0.000	0.000	0.000	0.513
Compressor stations	0.595	0.753	0.000	0.155	0.218	1.721
Receipt and delivery point facilities	0.230	0.000	0.417	0.000	0.000	0.647
SCADA and communications	0.330	0.349	0.125	0.028	0.028	0.860
Cathodic protection	0.000	0.000	0.000	0.000	0.000	0.000
Maintenance bases and depots	0.496	0.000	0.000	0.000	0.000	0.496
Other assets	0.460	0.077	0.049	0.034	0.034	0.655
Authority Approved Capital Expenditure (AA3) - rules 74 and 79 of the NGR[121]	**4.665**	**3.156**	**0.676**	**0.217**	**0.365**	**9.080**

Source: ERA, GGP Tariff Model, December 2015

427. The Authority has not considered GGT's cost allocation methodology in this chapter between covered and uncovered services. This is discussed in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Required Amendment 7

The value of capital expenditure for 2015 to 2019 access arrangement period must be amended to reflect the values shown in Table 36 of this Draft Decision.

Assessment of Depreciation

428. GGT has proposed to continue using the straight-line depreciation method with historical cost accounting to depreciate the GGP RAB. Under Schedule 1 of the *Gas Pipelines Access (Western Australia) Act 1998 - National Third Party Access Code for Natural Gas Pipeline Systems* (**Code**), GGT has applied straight-line HCA depreciation on the historical cost of its RAB since its first access arrangement. GGT's proposal is discussed in detail in the Depreciation chapter of this Draft Decision.

429. Table 37 shows GGT's proposed annual depreciation for each asset class over the third access arrangement period.

[121] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

Table 37 GGT Proposed Depreciation (AA3)

Nominal $ million	2015	2016	2017	2018	2019
Pipeline and laterals	6.811	6.811	6.860	6.888	6.893
Main line valve and scraper stations	0.207	0.207	0.207	0.221	0.221
Compressor stations	2.622	2.680	2.716	2.746	2.746
Receipt and delivery point facilities	0.109	0.120	0.133	0.133	0.157
SCADA and communications	0.169	0.305	0.341	0.370	0.371
Cathodic protection	0.119	0.119	0.126	0.128	0.133
Maintenance bases and depots	0.178	0.210	0.223	0.223	0.223
Other assets	0.133	0.265	0.301	0.282	0.259
Total Depreciation	**10.348**	**10.717**	**10.907**	**10.991**	**11.003**

Source: Goldfields Gas Transmission, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Table 10.

430. As discussed in paragraphs 1263 to 1264 in the Depreciation chapter of this Draft Decision, the Authority requires that GGT amend its proposed approach, to adopt the CCA method of depreciation. The Authority only requires that the CCA depreciation method be applied from the commencement of the third access arrangement. It does not require a retrospective application of CCA. Therefore the depreciated value of the RAB at the end of the second access arrangement period will be taken to be the current cost in that year. Indexation will only apply to that value, going forward to the third access arrangement.

431. Table 38 shows the Authority's calculated annual depreciation for each asset class over the third access arrangement period.

432. It may be noted that there is a need to revise the RAB for some asset classes downwards – in the first year of the third access arrangement – to align with actual approved capital expenditure outcomes for the second access arrangement period. This is because the capital expenditure forecasts in the second access arrangement were not achieved. The Authority considers that the best approach to achieve that is to apply an 'over-depreciation' adjustment to each asset class in the first year of the third access arrangement which is shown in net terms in Table 38. For the Authority's reasoning on this issue, refer to paragraphs 1267 to 1278 in the depreciation section below.

Table 38 Authority Approved Depreciation (AA3) under rules 74 and 79 of the NGR

$ million nominal	2015	2016	2017	2018	2019
Pipeline and laterals	6.856	7.111	7.269	7.408	7.549
Main line valve and scraper stations	0.205	0.215	0.230	0.234	0.239
Compressor stations	2.402	2.799	2.879	2.934	2.995
Receipt and delivery point facilities	0.100	0.132	0.135	0.153	0.156
SCADA and communications	0.184	0.414	0.431	0.433	0.322
Cathodic protection	-0.522	0.123	0.126	0.128	0.129
Maintenance bases and depots	0.211	0.227	0.232	0.236	0.241
Other assets	-2.018	0.305	0.295	0.274	0.249
Authority Approved Depreciation (AA3) – rules 74 and 79 of the NGR[122]	**7.418**	**11.326**	**11.595**	**11.800**	**11.879**

Source: ERA, GGP Tariff Model, December 2015.

Assessment of Overall Method for Calculating Projected Capital Base

433. As discussed in the Opening Capital Base chapter, the Authority has revised the Opening Capital Base consistent with rules 74 and 79 of the NGR

434. Table 39 shows the Authority's required amended values for the projected capital base as at 31 December 2019. This takes into account the Authority's required amendments to capital expenditure as provided by the rules 74 and 79 of the NGR and the amendments to depreciation for the third access arrangement period that are relevant to this calculation.

Table 39 Authority Approved Projected Capital Base (AA3) under rules 74 and 79 of the NGR

Nominal $ million	2015	2016	2017	2018	2019
Opening Capital Base (start of period)	399.488	404.456	404.002	400.605	396.436
Plus: Capital Expenditure	4.844	3.340	0.729	0.239	0.409
Less: Depreciation	7.418	11.326	11.595	11.800	11.879
Authority Approved closing capital base (AA3) –rules 74 and 79 of the NGR[123]					**384.965**

Source: ERA, GGP Tariff Model, December 2015.

[122] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

[123] This table does not include any further adjustments that may be made to the Authority's amended values under rule 93(2)(c) of the NGR to allocate joint costs between reference and other services. Adjustments made under rule 93(2)(c) is undertaken in the Allocation of Total Revenue between Services and Other Services chapter of this Draft Decision.

435. As explained at paragraphs 378 to 379 in the previous chapter on the Opening Capital Base, the Authority will make a further adjustment under rule 93(2)(c) of the NGR to reflect the unique circumstances of the GGP and to ensure the application of the NGR is consistent with the NGO and RPP under the NGL(WA). The Authority's consideration on this matter is outlined in more detail in a subsequent chapter of this Draft Decision on the Allocation of Total Revenue between Services and Other Services.

Required Amendment 8

The projected capital base in the proposed revised access arrangement must be amended to reflect the values in Table 39 of this Draft Decision

Rate of Return

436. This section considers GGT's proposal for estimating the rate of return.

437. As provided in the *Amended Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems* (hereafter, the **ATCO GDS Final Decision**) published as amended on 10 September 2015, the Authority has recently modified its approach to estimating the return on debt and the return on equity as outlined in the Authority's Rate of Return Guidelines.[124]

438. The Authority considers the modified approach is aligned with the regulatory requirements for the rate of return as specified in the National Gas Rules (**NGR**).[125]

439. For this Draft Decision, the Authority has determined that it will:

- first, continue to estimate the rate of return based on the debt proportion of total capital – the gearing - for the benchmark efficient entity of 60 per cent;
- second, with regard to the estimate of the return on equity:
  - retain the Sharpe Lintner Capital Asset Pricing Model (**SL CAPM**) as the primary method for estimating the return on equity;
  - utilise information from other relevant models – including the Black CAPM and the Dividend Growth Model (**DGM**) – to establish the value of parameters in the Sharpe Lintner CAPM;
  - estimate the risk free rate parameter for input to the Sharpe Lintner CAPM from Commonwealth Government Securities with a 5 year term to maturity;
  - estimate a range for the 5 year forward looking market risk premium (**MRP**) based on historic excess return data and the DGM, in recognition that it fluctuates in response to prevailing conditions;
  - draw on a range of forward looking information to establish the point value of the MRP;

[124] Economic Regulation Authority, *Rate of Return Guidelines*, 16 December 2013.

[125] Economic Regulatory Authority, *Final Decision on Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems*, 10 September 2015.

- estimate the beta parameter based on first, a sample of Australian firms with similar characteristics to the benchmark efficient entity, and second, an analysis of the likely risk characteristics of the benchmark efficient entity.

- third, with regard to the estimate of the return on debt:
  - continue to estimate the cost of debt as the sum of the risk free rate, relevant Debt Risk Premium (**DRP**), and relevant debt raising and hedging transactions costs;
  - estimate the risk free rate from the bank bill swap rate with the same term as the regulatory period, that is, 5 years;
  - adopt a hybrid trailing average approach to estimating the return on debt, with the risk free rate estimated once, just prior to the regulatory period, and the DRP estimated using an equally weighted 10 year trailing average;
  - estimate the DRP based on a BBB band credit rating, for a term of 10 years, using the Authority's enhanced bond yield approach that includes international bonds issued by domestic entities (and for estimates of the DRP prior to the averaging period, the Authority will utilise the Reserve Bank of Australia's credit spread data for the BBB band); and
  - annually update the estimate of the DRP.

440. The reasons for the Authority's position and outcomes are explained in detail in the following sub-sections.

Regulatory Requirements

441. Rule 87 in the NGR sets out the requirements for the rate of return.

442. The overarching objective for the Authority's consideration of the rate of return is provided by rule 87(3) of the NGR:

> The allowed rate of return objective is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

443. Rule 87 includes a number of sub-rules which refer to matters the regulator is to have 'regard' to, when determining the allowed rate of return, including:

> 87. Rate of return
>
> …
>
> (5) In determining the allowed rate of return, regard must be had to:
>
> (a) relevant estimation methods, financial models, market data and other evidence;
>
> (b) the desirability of using an approach that leads to the consistent application of any estimates of financial parameters that are relevant to the estimates of, and that are common to, the return on equity and the return on debt; and
>
> (c) any interrelationships between estimates of financial parameters that are relevant to the estimates of the return on equity and the return on debt.
>
> …
>
> (7) In estimating the return on equity under subrule (6), regard must be had to the prevailing conditions in the market for equity funds.
>
> …

(11) In estimating the return on debt under subrule (8), regard must be had to the following factors:

(a) the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity referred to in the allowed rate of return objective ;

(b) the interrelationship between the return on equity and the return on debt;

(c) the incentives that the return on debt may provide in relation to capital expenditure over the access arrangement period, including as to the timing of any capital expenditure; and

(d) any impacts (including in relation to the costs of servicing debt across access arrangement periods) on a benchmark efficient entity referred to in the allowed rate of return objective that could arise as a result of changing the methodology that is used to estimate the return on debt from one access arrangement period to the next.

444. In addition, rule 87 of the NGR sets out a number of additional requirements for the allowed rate of return, including that it:

- is to be determined such that it achieves the allowed rate of return objective (NGR 87(2));
- subject to NGR 87(2) and therefore also NGR 87(3), the allowed rate of return for a regulatory year is to be:
  - a weighted average of the return on equity for the access arrangement period in which the regulatory year occurs and the return on debt for that regulatory year (new NGR 87(4)(a));
  - determined on a nominal vanilla rate of return that is consistent with the estimate of the value of imputation credits (new NGR 87(4)(b));
- results in a return on debt for a regulatory year which contributes to the achievement of the allowed rate of return objective (NGR 87(8)) which is either the same in each year of the access arrangement period or which varies in each year through the application of an automatic formula (NGR 87(9) and NGR 87(12));
- incorporates a return on debt that would be required by debt investors over a relevant time period (whether shortly before the access arrangement decision, or on average over an historical period, or some combination of the two approaches) (NGR 87(10)).

GGT's Proposed Revisions

445. GGT's approach to estimating the rate of return is provided in the Supporting Information to the Goldfields Gas Pipeline Access Arrangement Revision Proposal that was submitted by GGT to the Authority on 15 August 2014.[126]

446. GGT has followed the Authority's Rate of Return Guidelines by:

- adopting gearing of 60 per cent for the benchmark efficient entity and employing this in its calculation of the allowed rate of return as the nominal vanilla weighted average of returns on equity and debt; and

[126] Goldfields Gas Transmission Pty Ltd, *Goldfields Gas Pipeline, Access Arrangement Revisions Proposal Supporting Information*, 15 August 2014.

- estimating the debt risk premium based on a benchmark sample of bonds issued by similar service provider's that have a credit rating in the BBB-/BBB/BBB+ bands, as rated by Standard and Poor's.

447. However, GGT has diverged from the Authority's Rate of Return Guidelines by:

- calculating the risk free rate based on yields of Commonwealth Government Securities (**CGS**) with a term to maturity of 10 years;
- estimating the return on equity based on calculations of an equity beta for the Covered Pipeline that does not rely on an assumed similarity with the Authority's benchmark efficient sample that was set out in the Rate of Return Guidelines; and
- estimating the rate of return on debt using a 10 year trailing average approach for both the risk free rate and DRP.

448. The following sub-sections provide more detail on GGT's proposal for the rate of return only where revisions depart from the Authority's *Rate of Return Guidelines*.

Risk Free Rate

449. GGT submits that the 'risk free rate of return is the rate of return on a financial asset which is without risk. It is the rate of return on a financial asset which provides an investor with the same return in each contingent state'.[127] GGT also submits that a proxy for this financial asset which is without risk – the risk free asset – must be found from among the traded financial assets for which returns can be observed. GGT proposes this proxy is to be Commonwealth Government Securities bonds, for which observed yields are reported daily by the Reserve Bank of Australia.[128]

450. GGT's submission in relation to the estimate of a risk free rate focuses on the following three key areas: (i) the present value principle; (ii) studies by Associate Professor Lally; (iii) studies by Professor Davis. GGT's views in each of these key areas are summarised below.

The present value principle

451. GGT submits that the present value principle will be satisfied for any rate of return, provided that the rate of return used in discounting cash flows for reference tariff calculation is the same as the rate of return used in determining the return included in total revenue. GGT submits that these 'present value calculations can be carried out using any discount rate'.[129]

452. GGT argues that the present value principle does not impose any constraint on the way in which the rate of return is estimated, or on the "internal structure" of that rate of return. GGT considers that the present value principle does not require that the

[127] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 70.

[128] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 71.

[129] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 71.

term to maturity of a proxy for the risk free asset which might be used in estimating the rate of return be equal to the length of the access arrangement period.[130]

453. GGT also argues that the studies by Associate Professor Lally, and by Professor Davis, to which the Explanatory Statement refers, do not provide support for a view that the term to maturity of the proxy for the risk free asset should be equal to the length of the access arrangement period so that the present value principle is satisfied.[131]

Studies by Lally

454. GGT considers that Lally's view is clear: if the present value principle is to be satisfied, the term to maturity of the debt issued by the firm should be equal to the length of the regulatory period. GGT argues that Lally's view has nothing to say about the term to maturity of the proxy for the risk free rate of return.[132]

455. GGT does not agree with the reasoning which leads Associate Professor Lally to his conclusion about the term to maturity of the debt issued by a regulated firm, and does not see that conclusion as being supported by the empirical evidence on debt raised by regulated firms.[133]

456. GGT argues that it is not correct for Lally to assume that, in determining the regulated rate of return, the regulated firm and the regulator are free to choose the risk free rate of return, and the debt margin, and should do so to satisfy the present value principle.[134]

457. GGT considers that these asset pricing models model the behaviours of participants, in particular, of investors, in financial markets. GGT argues that if they are to provide estimates of the returns on equity and the returns on debt which are required by those investors, the parameters of those models must be estimated by reference to investor behaviour. GGT considers that neither the regulated firm nor the regulator is free to arbitrarily choose the parameters of those models, or to choose the parameters subject to the constraint that the present value principle, applied in the context of price setting for the regulated firm, is satisfied.[135]

458. GGT argues that:[136]

> In regulated tariff setting, the regulated firm and the regulator must choose the parameters of the asset pricing models they employ to provide estimates of the return on equity, and of the return on debt, which are estimates of the returns which investors require. If they do not, the regulated firm will not be provided with the opportunity to earn returns sufficient to efficiently finance its provision of regulated services, or may

[130] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 72.

[131] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 72.

[132] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 74.

[133] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 74.

[134] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 75.

[135] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 75.

[136] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, pp. 75-6.

> be provided with the opportunity to earn returns which are more than sufficient to efficiently finance the provision of those services.
>
> Contrary to the assumption made by Associate Professor Lally, the risk free rate of return and the debt margin are not free to be chosen by the regulated firm or the regulator. In particular, the regulated firm and the regulator are not free to choose the term to maturity of the proxy for the risk free asset so that it is equal to the length of the regulatory period. Moreover, the present value principle does not require that the term to maturity of the proxy be the same as the regulatory period. Any choice of the proxy for the risk free asset, and any choice of the debt margin, used in the asset pricing models which the regulated firm and the regulator employ to estimate the return on equity and the return on debt will lead to a rate of return which, provided it is used to calculate the financing costs included in the present value of the firm's efficiently incurred costs, and to calculate the present value of the forecast revenue which recovers those costs, will satisfy the present value principle.

459. In addition, GGT also argues the regulated firm, and the regulator, may choose the term to maturity of the debt issued by the regulated firm, and may do so by reference to the present value principle, as Associate Professor Lally suggests. However, GGT considers that they do not choose the term to maturity of the proxy for the risk free asset. The risk free asset is a factor in the portfolio decisions of investors.[137]

Studies by Davis

460. GGT submits that in Davis' analysis, the tracking portfolio was set up so that its expected cash flows would match the expected returns on the regulated asset, allowing a comparison to be made between the outlay required on the portfolio and the investment in the asset. If the outlay on the tracking portfolio were equal to the investment in the asset, the present value principle would be satisfied. In Professor Davis's terminology, NPV would be zero.[138]

461. GGT submits that Professor Davis's use of a tracking portfolio is 'an interesting application of the Sharpe-Lintner CAPM. However, GGT argues that 'his analysis is incomplete and, therefore, does not lead to a correct conclusion'.[139]

462. GGT argues that:[140]

> Professor Davis assumes that the regulator is able to implement the correct rate of return on equity through its choice of the term to maturity of the proxy for the risk free asset. However, as we explained above, the regulator does not have freedom of choice in respect of the term to maturity of the proxy for the risk free asset. The proxy for the risk free asset must be chosen so that the rate of return is the market rate of return sought by investors. It must be the proxy relevant to those investors, and there is no reason to expect that its term to maturity should be equal to the length of the regulatory period.
>
> In making an allowance for the return on equity, the regulator must take as given the market rate of return on equity. If that market rate of return is estimated using the

[137] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 76.

[138] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 77.

[139] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 79.

[140] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, pp. 75-6.

> Sharpe-Lintner CAPM, the model must incorporate an investor – and not a regulator – view of the risk free asset.

GGT's estimate of the risk free rate of return

463. GGT concludes that:[141]

> The view that the term to maturity of a proxy for the risk free asset should be equal to the length of the access arrangement period, is not supported by the studies by Associate Professor Lally, and by Professor Davis, to which the Explanatory Statement refers. Those studies conclude that the term to maturity of the debt issued by a regulated firm should be equal to the length of the regulatory period. We do not agree with this conclusion, but that is not relevant to the issue of the term to maturity of the proxy for the risk free asset.

464. GGT disagrees with the Authority's view set out in the Rate of Return Guidelines that market practitioners often have an interest in 'talking up' investments, and that market practitioners are not investors.[142]

465. GGT submits that the practice of using of Commonwealth Government bonds with term to maturity of 10 years as the proxy for the risk free asset is supported by economic theoretical arguments. Therefore, GGT submits its estimate of the risk free rate of return using yields on Commonwealth Government bonds with terms to maturity of 10 years.

466. GGT has estimated the risk free rate of return for its access arrangement revisions proposal as an average of yields on Commonwealth Government bonds reported by the Reserve Bank of Australia for the period of 40 trading days to 30 June 2014. The estimate GGT has obtained is 3.73 per cent.[143]

Return on Equity

467. GGT has utilised the five step approach in estimating a return on equity from the Authority's Rate of Return Guidelines in determining the proposed allowed rate of return for the GGP Access Arrangement revision proposal.[144] Each of these steps in GGT's submissions is summarised in turn below.

Identifying relevant material and its role in the estimate

468. GGT submitted that the Sharpe-Lintner CAPM is not referred to in rule 87 of the NGR and that its use, as recommended by the Rate of Return Guidelines, is guided by economic principles. GGT argued that empirical analysis does not provide much support for the model. GGT also considers that it is concerned to ensure that the Authority's application of the Sharpe-Lintner CAPM is in the way intended in the

[141] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 81.

[142] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 82.

[143] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 84.

[144] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 85.

Rate of Return Guidelines, and is consistent with the relevant underlying economic theory.[145]

Identifying parameter values

469. GGT submitted that if the return on equity is to be estimated in a way which contributes to achievement of the allowed rate of return objective, and the Sharpe-Lintner CAPM is to be used for that purpose, then the beta used in applying that model must be the beta of the benchmark efficient entity. GGT then argued that unlike the risk free rate of return and the market risk premium, the beta is entity-specific.[146]

The benchmark efficient entity and similar risk

470. GGT submitted that a difference in risk may arise between the service provider and the entities in the sample of comparators from which data are to be obtained for the purpose of estimating efficient financing costs. GGT argued that the entities in the sample may have degrees of risk different from that of the service provider if they serve different markets for pipeline services (for example markets for transmission and distribution services), and undertake the provision of other – regulated and unregulated – services (for example unregulated pipeline services and regulated electricity distribution services) within the corporate entity which provides regulated pipeline services.[147]

471. GGT argued that although adjustments might be made to individual parameter values, to the rate of return on equity or debt estimated using those parameter values, or to the overall rate of return, those adjustments are not intended to fully align the benchmark efficient entity and the service provider: The benchmark entity should reflect the most efficient financial means of delivering the reference service.[148]

Equity beta

472. GGT submitted that the estimate of the equity beta is to be an estimate of the beta for the benchmark efficient entity of the allowed rate of return objective. GGT argued that if there were material and substantiated risk differences between the companies for which data were obtained for the purpose of estimating beta and the service provider which was the subject of a particular regulatory decision, then a further adjustment to beta may be considered.

473. GGT agreed with the Authority and noted that the key risks to which an infrastructure asset is exposed are revenue risk, input price risk, financial risk and political/regulatory risk. In the case of gas pipelines, revenue risk is the result of potential variability in revenue due to variability in throughput. GGT also argued that not only is the GGP exposed to changes in pipeline throughput as users change their gas usage in response to changes in economic conditions. The GGP is also

[145] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 86.

[146] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 87.

[147] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, pp. 88-9.

[148] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 89.

exposed to those users seeking to reduce their contracted capacities, when commodity prices are low and, on occasion, seeking to terminate their contracts, or defaulting, when their own production operations become uneconomic.[149]

474. GGT considered that none of the entities for which the beta estimates from the sample which was adopted by the Authority have been made is similar to the Covered Pipeline in respect of the users and end users of gas which it serves and that none has the same small number of users concentrated in the mining and mineral processing sectors. GGT considered that each may serve a small number of users (end users consuming large quantities of gas, and gas retailers), but those users themselves supply gas or electricity to a wide range of customers located in major – and growing – urban areas.[150]

475. GGT argued that the gas transportation business based on the Covered Pipeline is not unlike the rail business of The Pilbara Infrastructure Pty Ltd for the following reasons.[151] *First*, it has low prospects for diversification given its remote location and the associated economic base. *Second*, limited prospects for diversification, and a high dependence on the mining sector, expose it to the relatively high volatility of minerals markets. *Third*, its major customers are in the mining sector and produce for export, indicating a potentially higher level of risk.

476. GGT considers that:[152]

> The similarity between the circumstances of The Pilbara Infrastructure and the GGP indicates that an estimate of the equity beta for the Covered Pipeline might well be outside the range 0.50 to 0.70 of the Rate of Return Guidelines, and above – possibly significantly above – 0.80.

477. GGT noted that even if the sampling frame were extended to include overseas comparators, finding pipeline businesses which are similar to the business based on the Covered Pipeline, and which have traded shares, is likely to be difficult.[153] As a result, GGT submitted that it sought advice from SFG Consulting (**SFG**) on how an equity beta for the Covered Pipeline might be estimated using available and relevant Australia data.

478. SFG's estimation of the return on equity for the Covered Pipeline is discussed in detail in Appendix 3.

479. GGT submitted that it has used an estimate of 1.10 for the equity beta for estimation of the rate of return on equity used in determining the total revenue and reference tariff for the proposed revisions to the GGP Access Arrangement. This equity beta of 1.10 is drawn from SFG's analysis for GGT. In its analysis, SFG concluded that, for total revenue and reference tariff determination, the best estimate of the return on equity for a benchmark gas pipeline with similar risk to the GGP is 11.24 per

[149] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 94.

[150] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 95.

[151] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 98.

[152] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 99.

[153] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 99.

cent. This rate of return implies an equity beta of 1.10 in the Sharpe-Lintner CAPM.[154]

Market Risk Premium

Estimating the market risk premium when using the Sharpe-Lintner CAPM

480. GGT noted that the Market Risk Premium (**MRP**) is, as the Explanatory Statement notes, a forward looking premium. GGT argued that:[155]

> In the context of the application of the Sharpe-Lintner CAPM, this forward looking risk premium must be constructed in a way which is consistent with the assumptions about investor expectations made for derivation of the model. If it is not constructed in this way, then the estimate of the return on equity which is obtained will not be an estimate made using the Sharpe-Lintner.

And that:[156]

> The use of a long term average of historical risk premiums to estimate the market risk premium of the Sharpe Lintner CAPM is incorrect.

481. GGT argued that:[157]

> Considering the market risk premium independently of the Sharpe-Lintner CAPM, when applying that model, as the Rate of Return Guidelines and the Explanatory Statement propose, leads to error. The market risk premium of the Sharpe-Lintner CAPM is not the persistent difference between the expected return on the market portfolio and the risk free rate of return, as might be measured by an average of historical risk premiums. Forecasts of this persistent difference – forecasts of the long run equity premium – may provide information potentially important to equity investors, but they are not relevant to the application of the Sharpe-Lintner CAPM.

482. GGT considered that if the Sharpe-Lintner CAPM is used, at a particular time, to estimate the expected return on equity, then the estimate of the risk free rate used in applying the model must be the estimate of the risk free rate prevailing at that time, and not an average of historical values.[158]

483. GGT then submitted that historical data was used to directly estimate that expected return. In addition, GGT also examined estimates of that expected return obtained from dividend growth models.[159]

[154] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 106.

[155] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 108.

[156] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 108.

[157] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 110.

[158] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 110.

[159] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 110.

Estimating the expected return on the market portfolio from historical data

484. GGT concluded that the expected return on the market portfolio may lie between 10.25 per cent and 11.6 per cent.[160]

485. *First*, the return on the market obtained using the Brailsford, Handley and Maheswaran data for the period 1961 to 2010, calculated from the source data as a real rate, converted to a nominal rate assuming inflation of 2.5 per cent, is 10.25 per cent.[161]

486. *Second*, GGT notes that SFG has similarly used the Brailsford, Handley and Maheswaran data to estimate the expected return on the market portfolio for ATCO Gas Australia. SFG has, however, extended the equity return series to 2012, and has adjusted the data for an inaccuracy in the calculation of dividend yields identified by Authority. SFG's estimate of the expected return on the market portfolio is 11.6 per cent.[162]

Estimating the expected return on the market portfolio using the dividend growth model

487. GGT provided a summary of the estimates of expected return on the market (after adjustment for the value of imputation credits with $\gamma = 0.25$). GGT noted that the estimates presented are not all of the estimates available. However, they are the estimates which have been made in the context of the publication of rate of return guidelines by the Authority and by the AER.[163] GGT's summary is presented as Table 40 below.

[160] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 112.

[161] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 112.

[162] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 111.

[163] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 116.

Table 40 GGT's summary of dividend growth model estimates of expected return on the market

Study	Date reported	Expected market return (Per cent)
Authority (no bias adjustment)	August 2013	9.41
Authority (adjusted for bias)	August 2013	8.60
CEG	March 2012	12.3
CEG	November 2012	11.9
Authority	March 2012	11.7
Capital Research	March 2012	13.3
SFG (2002-2012)	December 2012	11.7
SFG (six months to December 2012)	December 2012	12.2
SFG	May 2014	11.7
SFG (six months to February 2014)	May 2014	11.4

Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Revision Proposal: Supporting Information, 15 August 2014, p. 116.

GGT's estimate of the market risk premium

488. GGT submitted that historical data on equity returns indicate that the expected return on the market portfolio may lie between 11 per cent and 12 per cent.[164] In addition, GGT noted that estimates made using the dividend growth model indicate that the expected return on the market portfolio may lie between 8.6 per cent and 13.3 per cent.[165]

489. However, the Authority's study which estimated the equity market return of 8.60 per cent and 9.41 per cent was ignored. GGT concluded that:[166]

> Use of the dividend growth model indicates an expected return on the market portfolio of between 11.4 per cent and 13.3 per cent. However, only one estimate made using the model exceeds 13.0 per cent; the remainder are in the range 11.4 per cent to 12.3 per cent.

490. GGT considered that GGT has taken a conservative view, and has used an estimate of 11.5 per cent for the expected return on the market.[167]

491. GGT concluded that with an estimate of the 10-year risk free rate of return of 3.73 per cent, the equity market return of 11.5 per cent, GGT's estimate of the

[164] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 111.

[165] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 111.

[166] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 117.

[167] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 118.

market risk premium to be used when applying the Sharpe-Lintner CAPM to estimate the rate of return on equity is 7.77 per cent.[168]

Estimation of the return on equity using the Sharpe-Lintner CAPM

492. With an estimate of the 10-year risk free rate of return of 3.73 per cent, the MRP of 7.77 per cent, together with equity beta of 1.10, GGT's calculations indicated that its rate of return on equity is 12.28 per cent.[169]

Cross checking the estimate of return on equity

493. GGT noted that the absence of comparators which can be shown to have a degree of risk similar to that of GGT in its provision of the reference service using the Covered Pipeline makes the task of cross checking the return on equity difficult. GGT argued that the circumstances of the GGP being indicative of systematic risk higher than the systematic risks of Australian utility businesses with traded shares implies that the estimate of the return on equity for the Covered Pipeline should be higher than a comparable estimate of the return on equity for those businesses.[170]

494. GGT noted SFG's study of an estimate of the return on equity for Australian listed energy networks businesses using the dividend growth model for Jemena Gas Networks, Actew AGL, APA Group, Ergon, Networks New South Wales and Transgrid. SFG's estimate was 11.04 per cent. The implied equity beta obtained using the Sharpe-Lintner CAPM was 0.94. GGT argued that this is consistent with a view of those businesses having lower systematic risk than the Covered Pipeline.[171]

495. GGT also noted SFG's recent estimate of the market return using the Fama French model indicated the return on equity of 10.9 per cent. GGT considered the result is similar to the estimate of the return on equity for a listed networks business obtained using the dividend growth model (11.0 per cent), and consistent with an estimate of 12.28 per cent for the GGP with higher systematic risk.[172]

Determination of the return on equity

496. GGT submitted that it has made estimates of those parameters in ways which are consistent with the theoretical construction of the Sharpe-Lintner CAPM, and has used the model to estimate the return on equity for the Covered Pipeline. GGT argued that:[173]

> The GGP serves mainly end users engaged in mining and minerals processing in remote areas of Western Australia, and who supply commodities into international markets. The risks of providing service using the GGP are, therefore, likely to be

[168] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 118.

[169] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 118.

[170] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 118.

[171] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 119.

[172] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 119.

[173] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 120.

> different from the risks of those listed Australian energy utilities for which equity betas are often estimated. If the share prices and dividends of those listed Australian Energy utilities were used to estimate the return on equity for the GGP, there would be no reason to expect that that return could contribute to achievement of an allowed rate of return commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to GGT in respect of the provision of the reference service using the Covered Pipeline.

497. GGT submitted that its estimate of the return on equity is 12.28 per cent. GGT argued that its estimate is consistent with estimates made of the return on equity for listed Australian energy networks businesses using the dividend growth model and the three factor model of Fama and French. As a result, GGT's proposed estimate of the expected return on equity for the Covered Pipeline is 12.28 per cent.[174]

Return on debt

498. GGT considers that:[175]

> No rationale for the ERA return on debt model, in terms of economic principles and empirical evidence is provided in the Rate of Return Guidelines or the Explanatory Statement. Nor is any reason given for why the model might yield an estimate of the return on debt which can contribute to achievement of the allowed rate of return objective.

499. GGT notes that the SL CAPM is a general model which may be applied to the pricing of financial assets including debt, but that direct application of the model is precluded due to data issues. GGT agree that the alternate approach of summing the risk free rate and the (debt) risk premium – set out in the Rate of Return Guidelines – is used in practice.[176]

500. GGT notes in its proposal that it utilises a trailing average:[177]

> The return on debt was estimated using a trailing average method. It was not estimated using the "on the day" method of the Rate of Return Guidelines.
>
> …Use of the trailing average method yields a return on debt which should provide the opportunity to recover the efficiently incurred costs of providing the reference service. The ability to recover efficiently incurred costs provides, in turn, incentives for further efficient investment in the pipeline, and for the efficient provision of pipeline services. This is in the long term interests of consumers of natural gas, and will contribute to achievement of the national gas objective.

501. Each term of the trailing average used to estimate the return on debt has, in turn, been estimated as the sum of:

- risk free rate of return;
- debt risk premium; and
- allowances for debt raising and hedging costs.

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[174] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 120.

[175] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 123.

[176] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 124.

[177] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement Information*, 15 August 2014, p. 18.

Risk free rate

502. GGT utilise the risk free rate with a term of 10 years.

Debt risk premium

503. GGT consider that using the bond yield approach, in the way proposed in the Rate of Return Guidelines, will not lead to an estimate of the return on debt which meets the requirements of NGR 87 because:[178]

- using the joint weighted remaining term to maturity for the term of the debt underestimates the term to maturity of the debt issued, and hence the required debt risk premium, assuming an upward sloping yield curve;
- the term to maturity estimated on a sample of bonds that have two years or longer remaining does not necessarily reflect the term to maturity of debt of the benchmark efficient entity; and
- debt issues in offshore markets are excluded, whereas the benchmark efficient entity would be expected to issue at least part of its debt in those markets.[179]

504. GGT therefore proposes that the debt risk premium be based on an average of credit spreads reported by the Reserve Bank of Australia – for non-financial corporations with a credit rating in the BBB band and a term to maturity of 10 years – for the three months from April to June in each year for contributing to the calculation of the 10 year trailing average.[180] This is combined with an on the day estimate of the 10 year risk free rate, based on the 40 day average to 30 June in each relevant year of the trailing average, plus a margin of 0.15 per cent to cover debt raising and hedging costs in each year.[181]

505. GGT proposes that the resulting 10 year trailing average estimate of the return on debt would be updated annually during the access arrangement period. At each update, the earliest annual estimate would be dropped from the trailing average, and an estimate for the current year added. No transitional arrangement is proposed.

Proposed rate of return

506. In revisions to the GGP Access Arrangement, GGT proposed an allowed rate of return for the benchmark efficient entity of 9.64 per cent.

507. Assuming gearing of 60 per cent, GGT's proposed rate of return is a nominal vanilla weighted average of:

- a return on equity of 12.28 per cent; and
- a return on debt of 7.89 per cent.

[178] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement Information*, 15 August 2014, p. 12.

[179] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement Information*, 15 August 2014, pp. 125-127.

[180] The Authority notes that it has recently accepted that the appropriate term for the debt risk premium is 10 years (see Economic Regulation Authority, *Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 14 October 2014, pp. 188-189).

[181] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement Information*, 15 August 2014, p. 135.

Submissions

508. The Authority received four submissions on GGT's proposed revisions to the GGP access arrangement:

- BHP Billiton Limited (BHPB)
- Santos (BOL) Pty Ltd (Santos)
- GGT (in response to BHP Billiton's submission)
- BHPB (in response to GGT's further submission).

509. These submission are available on the Authority's website.

510. The initial submission by BHPB was the only submission to raise issues that were specifically related to GGT's proposal for estimating the rate of return. Although, more generally, Santos observed:

> Goldfields Gas Transmission (GGT) has proposed many amendments to the 2015-2019 GGP Access Arrangement when it is compared to the 2010-2014 Access Arrangement. Santos questions the need for such wholesale change. It creates an unnecessary burden on all stakeholders particularly in terms of analysing and ensuring that changes do not result in a deterioration of rights for both new and existing shippers or for any party which supplies gas into the pipeline.[182]

511. BHPB submitted that GGT had diverged from the Authority's *Rate of Return Guidelines*, and used higher values for the equity beta and the market risk premium, despite the fact that the these Guidelines had only been finalised on 10 March 2014, less than twelve months prior to GGT submitting its proposed revisions to the GGP Access Arrangement.

512. Specifically GGT has proposed:

- an estimate for the equity beta of 1.10, compared to between 0.50 and 0.70 in the Authority's *Rate of Return Guidelines*
- a value for the market risk premium of 7.7 per cent, compared to between five and seven per cent in the Authority's *Rate of Return Guidelines*.

513. BHPB made the point:

> The issues that GGT raises in support of these higher values are not new. The Guidelines were developed over the course of nearly a year of consultation and the Authority received a significant volume of material, including numerous expert reports from various parties and 3 submissions from GGT itself. In light of that material, the Authority carefully selected the values and ranges set out in the Guidelines.[183]

514. BHPB also noted that, while the Authority's Rate of Return Guidelines are not mandatory, any reason for departures from these guidelines must be compelling. BHPB used the ATCO GDS Final Decision as an example, stating:

> … in respect of the equity beta, the Authority noted that ATCO had not raised any new evidence to support its proposed deviations from the guidelines and had only raised

[182] Santos, 2014, *Public Submission by Santos in Response to the Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement and Access Arrangement Information*, 15 August, p. 1.

[183] BHPB, *Public Submission by BHP Billiton In Response to goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, pp. 6-7.

> issues which the Authority had already considered in great detail as part of the Guidelines approval process.[184]

515. BHPB dismissed GGT's claim that higher values were justified on the basis that it serviced only a small number of users that are concentrated in the mining and mineral processing sectors and, hence, is exposed to higher levels of risk than other gas pipelines. BHP indicated that GGT already received favourable treatment compared to most other regulated business in Australia through the allowance of a straight line method of depreciation to the historical capital base of the GGP.

516. BHP submitted:

> Given that GGT already receives favourable treatment, it should not also be allowed to increase tariffs by using values that are higher than those established in the Guidelines issued less than a year ago following a lengthy and extensive consultation process. GGT should not receive special treatment and the Authority should follow its published approach, which is designed to achieve the allowed rate of return objective.

Considerations of the Authority

517. The Authority does not agree with GGT's approach for estimating the rate of return. This approach does not comply with the Authority's *Rate of Return Guidelines*[185] and neither is it consistent with subsequent amendments recently applied as a result of the ATCO GDS Amended Final Decision,[186] which the Authority considers to be correctly aligned with the regulatory requirements for the rate of return as specified in the NGR.[187]

518. The Authority notes that GGT has referred to advice contained in the Authority's *Rate of Return Guidelines* to indicate that, where the NGL and the NGR are silent and an exercise of judgement is required, then economic principles with strong empirical support should provide guidance. In particular, GGT states:

> When economic principles are applied, as is very likely to be the case in determination of the allowed rate of return, they should be applied in ways which are consistent with those theories. Departure from the underlying theories, or from the empirical support, would mean that rate of return determination was inherently arbitrary, and that there was no reason to expect that the resulting rate of return could achieve the allowed rate of return objective.[188]

519. In its Rate of Return Guidelines released in December 2013, the Authority set out the criteria it would use to assess the appropriateness of the proposed approach/model to be utilised in estimating the inputs of the rate of return. The Authority is of the view that it is appropriate to utilise these criteria to assess the approach proposed by SFG in estimating the return on equity for GGT.

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[184] BHPB, *Public Submission by BHP Billiton In Response to goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 135.

[185] Economic Regulation Authority, *Rate of Return Guidelines*, 16 December 2013.

[186] Economic Regulatory Authority, *Final Decision on Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems*, as amended 10 September 2015.

[187] Economic Regulatory Authority, *Final Decision on Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems*, as amended 10 September 2015.

[188] Goldfields Gas Transmission Pty Ltd, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal – Supporting Information*, 15 August 2014, p. 68.

520. The Authority considers that the criteria necessarily need to be consistent with the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective. The requirements of the NGL, the NGO, the NGR and the allowed rate of return objective have primacy at all times. The criteria allow the Authority to articulate its interpretation of these requirements set out in the NGL and the NGR.

521. As indicated in the Rate of Return Guidelines, the Authority was of the view that the criteria, which are reproduced below, are not intended to supplant the NGL and NGR. Rather they are subordinate to the requirements set out in the two instruments. That said, the Authority considers it desirable if the proposed rate of return methods are:

- driven by economic principles;
  - based on a strong theoretical foundation, informed by empirical analysis;
- fit for purpose;
  - able to perform well in estimating the cost of debt and the return on equity over the regulatory years of the access arrangement period;
  - implemented in accordance with best practice;
- supported by robust, transparent and replicable analysis that is derived from available, credible datasets;
  - based on quantitative modelling that is sufficiently robust as to not be unduly sensitive to small changes in the input data;
  - based on quantitative modelling which avoids arbitrary filtering or adjustment of data, which does not have a sound rationale;
- capable of reflecting changes in market conditions and able to incorporate new information as it becomes available;
- supportive of specific regulatory aims; and thereby:
  - recognise the desirability of consistent approaches to regulation across industries, so as to promote economic efficiency;
  - seek to achieve rates of return that would be consistent with the outcomes of efficient, effectively competitive markets;
  - as far as possible, ensure that the net present value of returns is sufficient to cover a service provider's efficient expenditures (the 'NPV=0' condition);
  - provide incentives to finance efficiently;
  - promote simple approaches to estimating the rate of return over complex approaches where appropriate;
  - promote reasoned, predictable and transparent decision making;
  - enhance the credibility and acceptability of a decision.

522. The following sub-sections outline the Authority's considerations with regard to GGT's approach to estimating the rate of return, with regard to estimates of:

- gearing;
- the risk free rate;
- the return on equity;
  - beta
  - the market risk premium; and
- the return on debt;
  - estimating the debt risk premium;
  - hedging and other transactions costs.

Gearing

523. The Authority accepts GGT's proposed gearing of 60 per cent debt, as it is consistent with assumptions in the Guidelines.

Risk free rate

524. The key issues for the estimate of the risk free rate are:

- the term of the estimate;
- the method of estimating the risk free rate; and
- the averaging period.

The term of the risk free rate

525. The Authority considers that, in order to ensure NPV = 0 (or the *present value condition*), the appropriate term for the risk free rate in the current regulatory setting should be 5 years. This follows because the rate of return is reset every 5 years, concomitant with the term of the access arrangement.

526. The Authority's detailed consideration of this issue was set out in the Rate of Return Guidelines.[189] The Authority conclusions with regard to the term were based on the work of Lally and Davis.

527. The Authority notes that it took account, in the final draft of the Rate of Return Guidelines, of an extensive critique by GGT on this material and the Authority's (draft) interpretation of it.[190]

528. The Authority recently engaged Lally to undertake a review of its conclusions in the Rate of Return Guidelines. Lally noted a small number of relatively minor points with regard to interpretation, but otherwise concurred with the Authority's analysis and conclusions. That analysis included the response by the Authority to the submitted views of GGT with regard to the Lally and Davis material.[191]

[189] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 2.

[190] Goldfields Gas Transmission 2013, *Submission on the Economic Regulation Authority's Draft Rate of Return Guidelines*, 19 September, p. 28 - 33.

[191] M. Lally, Review of arguments on the term of the risk free rate, forthcoming, p. 3.

529. However, GGT in its access arrangement proposal takes further issue with the *same* material from Lally and Davis:[192]

> …the studies by Associate Professor Lally, and by Professor Davis, to which the Explanatory Statement refers, do not provide support for a view that the term to maturity of the proxy for the risk free asset should be equal to the length of the access arrangement period so that the present value principle is satisfied.

530. This time, GGT take a different approach to their assessment of Lally's work, submitting now that Lally was not concerned with the term of the risk free rate:[193]

> Associate Professor Lally is not concerned with the term to maturity of the proxy for the risk free asset which might be used in estimating the rate of return on that debt, or which might be used in estimating the rate of return on equity…
>
> In each of the analyses in his 2007 paper, Associate Professor Lally is concerned, not with the term of the proxy used to estimate the risk free rate of return, but with the question of whether the term to maturity of the debt issued by the regulated firm should be the same as the length of the regulatory period…
>
> The 2010 report summarises, rather than repeats, the argument of Associate Professor Lally's earlier papers. It also extends his earlier analysis to take into account refinancing risk. Associate Professor Lally's extension of his earlier analysis, through an examination of five options which might be available to a regulated firm, makes no reference to the term to maturity of the proxy for the risk free asset. He is concerned, again, with the implications of the regulated firm choosing a term to maturity for the debt it issues which diverges from the length of the regulatory period, and assesses those implications using the present value principle…

531. GGT also make the following claim with regard to the process of the setting of the regulated rate of return:[194]

> Contrary to the assumption made by Associate Professor Lally, the risk free rate of return and the debt margin are not free to be chosen by the regulated firm or the regulator. In particular, the regulated firm and the regulator are not free to choose the term to maturity of the proxy for the risk free asset so that it is equal to the length of the regulatory period. Moreover, the present value principle does not require that the term to maturity of the proxy be the same as the regulatory period. Any choice of the proxy for the risk free asset, and any choice of the debt margin, used in the asset pricing models which the regulated firm and the regulator employ to estimate the return on equity and the return on debt will lead to a rate of return which, provided it is used to calculate the financing costs included in the present value of the firm's efficiently incurred costs, and to calculate the present value of the forecast revenue which recovers those costs, will satisfy the present value principle.

532. In a similar vein, GGT conclude with regard to the cited work of Davis that:[195]

> Professor Davis assumes that the regulator is able to implement the correct rate of return on equity through its choice of the term to maturity of the proxy for the risk free asset. However, as we explained above, the regulator does not have freedom of choice in respect of the term to maturity of the proxy for the risk free asset. The proxy for the risk free asset must be chosen so that the rate of return is the market rate of return sought by investors. It must be the proxy relevant to those investors, and

[192] Goldfields Gas Transmission, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal Supporting Information*, 15 August 2014, p. 72.

[193] Goldfields Gas Transmission, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal Supporting Information*, 15 August 2014, p. 73 - 74.

[194] Goldfields Gas Transmission, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal Supporting Information*, 15 August 2014, p. 75.

[195] Goldfields Gas Transmission, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal Supporting Information*, 15 August 2014, p. 79.

> there is no reason to expect that its term to maturity should be equal to the length of the regulatory period. In making an allowance for the return on equity, the regulator must take as given the market rate of return on equity. If that market rate of return is estimated using the Sharpe-Lintner CAPM, the model must incorporate an investor – and not a regulator – view of the risk free asset.

533. With regard to the work of Lally, contrary to GGT's assertions, the Authority considers that it is quite clear that both Lally's 2007 and 2010 papers address the appropriate regulatory term of the risk free rate:

- Lally summarises his 2007 paper in its Abstract as follows:[196]

  > If the regulator seeks to ensure that the present value of the future cash flows to equity holders equals their initial investment then the only choice of term for the risk free rate that can achieve this is that matching the regulatory cycle, but it also requires that the firm match its debt duration to the regulatory cycle.

- Furthermore, Lally's 2010 paper is titled *The Appropriate Term for the Risk Free Rate and the Debt Margin*. This title suggests – and the contained material bears out – that he is concerned with the term of the risk free rate.

534. Perhaps most importantly, GGT's claim that the regulator is not required to 'choose' an appropriate term is misplaced – when determining the rate of return the Authority is required to identify the efficient financing costs associated with the degree of risk in delivering the reference services. Those efficient financing costs will contribute to investors having 'reasonable opportunity' to recover at least the efficient costs of providing the reference services, including through the setting of the rate of return.[197] As noted by Lally:[198]

> GGT attributes to Lally (2010) the claim that the regulator is free to choose the allowed rate of return, and implies that this allows the regulator to "arbitrarily" choose the parameter values in these asset pricing models. The last claim is false and GGT are manufacturing an inconsistency where none exists. It is an administrative fact that the regulator chooses the allowed rate of return and therefore has the power to choose. Naturally, some choices are better than others. The choice should satisfy the Present Value Principle, which implies that the appropriate choice for the risk-free rate is the market rate for a term matching the regulatory period, but the principle does not dictate how the risk premium should be determined; the latter requires an asset pricing model, and such models do reflect investor behaviour.

535. With regard to the work of Davis, GGT makes similar arguments, which should be rejected for the same reasons.[199] For example, with regard to Davis' 2003 paper for the ACCC, GGT suggest that:[200]

> Professor Davis's use of a tracking portfolio is an interesting application of the Sharpe- Lintner CAPM. Unfortunately, his analysis is incomplete and, therefore, does not lead to a correct conclusion.
>
> Professor Davis assumes that the regulator is able to implement the correct rate of return on equity through its choice of the term to maturity of the proxy for the risk free asset. However, as we explained above, the regulator does not have freedom of choice in respect of the term to maturity of the proxy for the risk free asset. The proxy for the risk free asset must be chosen so that the rate of return is the market rate

[196] M. Lally, Regulation and the Term of the Risk Free Rate: Implications of Corporate Debt, *Accounting Research Journal*, Volume 20, No.2, 2007, p. 74.

[197] National Gas Law, Part 3 – National Gas Objective and Principles.

[198] M. Lally, *Review of arguments on the term of the risk free rate*, forthcoming, p. 9.

[199] M. Lally, *Review of arguments on the term of the risk free rate*, forthcoming, p. 11.

[200] Goldfields Gas Transmission, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal Supporting Information*, 15 August 2014, p. 79.

> of return sought by investors. It must be the proxy relevant to those investors, and there is no reason to expect that its term to maturity should be equal to the length of the regulatory period.
>
> In making an allowance for the return on equity, the regulator must take as given the market rate of return on equity. If that market rate of return is estimated using the Sharpe-Lintner CAPM, the model must incorporate an investor – and not a regulator – view of the risk free asset.

536. With regard to investor expectations, the Authority noted in the Rate of Return Guidelines that:[201]

> The question as to investors' horizons for investment is therefore an important consideration…
>
> The Authority considers that evidence for investors' horizons is inconclusive. Market practitioners often have an interest in 'talking up' investments, and market practitioners are not investors. Many investors only hold stocks for a much shorter period – as little as a year or two – consistent with the evidence provided by Lally. On this basis, a five year term would be consistent with a weighted average of investors' horizons.

537. The Authority recognises that some market practitioners – such as those subject to legal requirements – are not in the business of 'talking up' investments. However, in those cases market practitioners generally are seeking to value the firm, which requires a discount rate to perpetuity. That is a different exercise to the one undertaken by the Authority in setting the regulated rate of return.

538. Finally, GGT claim that Davis in 2012 resiled from the view that the term to maturity of the proxy for the risk free rate should equal the length of the regulatory period:[202]

> In his work for IPART, and in his 2012 working paper, Professor Davis no longer maintains that the term to maturity of the proxy for the risk free rate should equal the length of the regulatory period. Instead, he argues that the term to maturity of the debt of the regulated firm should equal the length of the regulatory period.

539. This is a perplexing comment as, quoting from Davis' 2012 paper (which sums up the correct approach in succinct fashion):[203]

> Focusing solely on the debt financed component, the principal difference with the floating rate note is that cash flows are reset at regular dates by the regulator in line with movements in both risk free interest rates and the credit spread facing the asset owner-borrower. Then, by issuing debt of the same maturity as the reset period with the same coupon as applied by the access regulator, the asset owner will have financed and perfectly hedged the current period cash flows. Moreover, at the next reset date, the asset owner will be able to reissue one period debt at par with the same coupon rate as that reset for the debt financed component of the asset by the regulator. Thus, if the regulator resets asset cash flows in line with the one period cost of borrowing (using the one period risk free rate and one period credit spread) the asset owner is able to meet debt financing costs and be perfectly hedged by a succession of one period borrowings.

540. The Authority therefore rejects GGT's view that the term of the risk free rate should be set at 10 years. The Authority maintains its view – clearly set out in the Rate of

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[201] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2016, Appendix 2, p. 29.

[202] Goldfields Gas Transmission, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal Supporting Information*, 15 August 2014, p. 81.

[203] K. Davis, *The Debt Maturity Issue in Access Pricing*, Working Paper Draft 3, 2 September 2012.

Return Guidelines – that the appropriate term should be commensurate with the term of the regulatory period. That term is 5 years.

Proxy for the risk free rate

541. GGT consider that the return on Commonwealth Government Securities provides an acceptable proxy for the risk free rate:[204]

> This practice of using of Commonwealth Government bonds.. as the proxy for the risk free asset is, as we noted above, supported by economic theoretical arguments… GGT has therefore estimated the risk free rate of return using yields on Commonwealth Government bonds...

542. GGT then uses this proxy for estimating both the return on debt and the return on equity.

543. The Authority considers that the return on CGS does provide a reasonable proxy for the risk free rate. The Authority therefore agrees that CGS may be used to estimate the risk free rate for the return on equity.

544. For the return on debt, the Authority will use estimates of the prevailing interest rate swap of the appropriate term for estimating the return on debt. The swap rate incorporates a spread to the rate on Commonwealth Government Securities. Use of the swap rate is a convenience which simplifies the calculation of the DRP (the alternative would be to use the CGS and incorporate the spread to swap in the DRP). On that basis, the Authority considers that use of the swap rate is not inconsistent with the use of the CGS as the proxy for the risk free rate.

Averaging period

545. In the Rate of Return Guidelines, the Authority determined that the averaging period should be a 40 day period, consistent with the position set out in the Guidelines.[205]

546. GGT has adopted the following averaging periods:

- 40 trading days to 30 June 2014 for the risk free rate for its access arrangement revisions proposal (based on the return to Commonwealth Government Securities with a term of 10 years, as reported by the Reserve Bank of Australia, which GGT report is 3.73 per cent);[206]
- 40 trading days for the risk free rate (preceding 30 June in each relevant year) for the nine previous historic annual estimates included in the proposed 10 year trailing average;
- three months for the DRP (from April to June in each relevant year) to be included in the proposed 10 year trailing average.

547. The Authority has no issue with GGT's proposed 40 day period for the purposes of removing day to day variation in the estimates.

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[204] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 84.

[205] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2016, p. 86.

[206] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 84.

548. In this context, the Authority notes that it recently accepted a proposal from ATCO for a 20 day averaging period.[207] In addition the Authority also notes that DBP in its response to the Authority's Discussion Paper on estimating the return on debt suggested that a longer averaging period – up to 60 days – could be adopted with little loss of predictive power.[208] The Authority acknowledges this point.

The estimate of the risk free rate

549. For illustrative purposes for this Draft Decision, the Authority utilises the rate of return estimates from its recent ATCO GDS decision. These provide an outcome that is indicative of the results of the method which will apply for the GGP Final Decision. However, as noted above, that ATCO GDS estimate, which is reported here, utilised a 20 day averaging period. Nevertheless, the use of the 20 day average here is indicative only; it does not preclude GGT retaining a 40 day averaging period.

550. With that caveat, the average of the observed 20 days of the 5-year Commonwealth Government Securities risk-free rate as at 2 April 2015 was 1.96 per cent. This provides an indicative point estimate for the risk free rate for the return on equity set out in this Draft Decision.

551. The average of the observed 20 days of the 5-year swap rate (**BBSW**) as at 2 April 2015 was 2.431 per cent. This provides a point estimate for the risk free rate for the return on debt set out in this Draft Decision.

Inflation

552. The expected rate of inflation for the coming 5 year regulatory period is estimated using the procedure outlined in the Rate of Return Guidelines over the nominated averaging period.[209]

553. For illustrative purposes for this Draft Decision, the Authority utilises the rate of return estimates from its recent ATCO GDS decision. The resulting estimate of inflation over the course of the regulatory period for this Draft Decision is 1.90 per cent.

Return on equity

554. In line with the requirements of NGR 87(5), the Authority considers that it evaluated the relevance of a broad range of material for estimating the return on equity in the Rate of Return Guidelines, covering relevant estimation methods, financial models, market data and other evidence.[210]

[207] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems*, as amended 10 September 2015, p. 216.

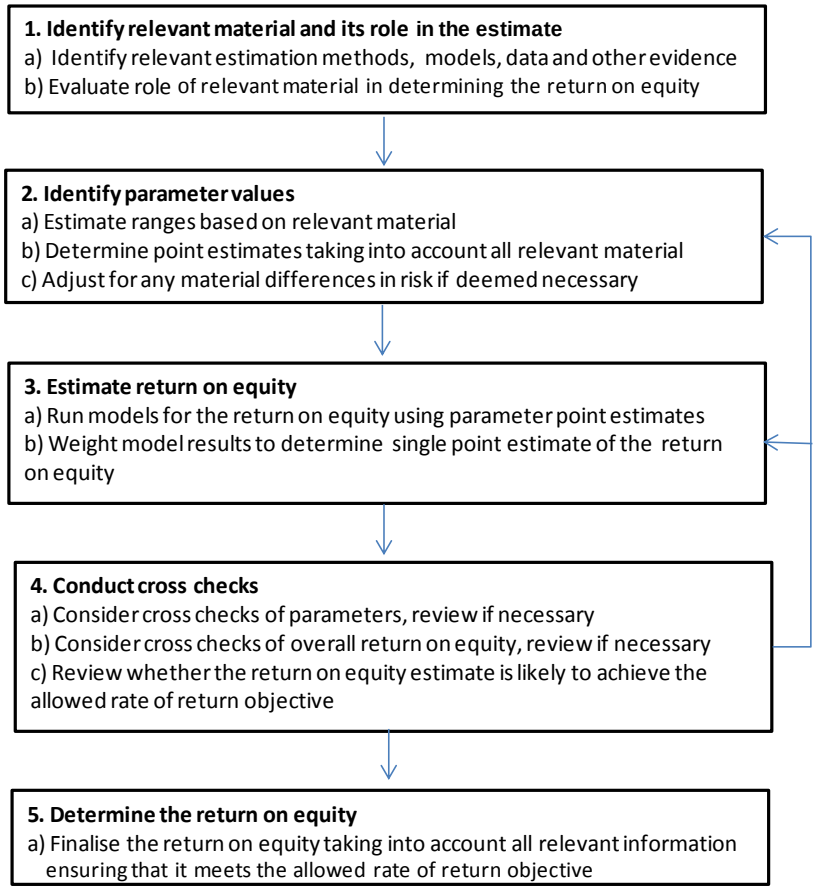
[208] Dampier Bunbury Pipeline, *Estimating the Return on Debt: Response to Authority Discussion Paper of 4 March 2015*, 25 March 2015, p. 7.

[209] Economic Regulation Authority, *Rate of Return Guidelines*, 16 December 2013, pp. 32-33.

[210] Australian Energy Market Commission, *Rule Determination: National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2013, p. 36.

555. The Rate of Return Guidelines set out that the Authority will utilise a five step approach for estimating the return on equity.[211] The five steps are summarised in Figure 12.

Figure 12 Proposed approach to estimating the return on equity[212]



Source: Economic Regulation Authority, Rate of Return Guidelines, 16 December 2013, p. 23.

556. Through this approach, the Authority has assessed a wide range of material, and identified relevant models for the return on equity, as well as a range of other relevant information. For this Draft Decision, the Authority has given weight to relevant material, according to its merits at the current time, seeking to achieve fully the requirements of the allowed rate of return objective.[213]

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[211] Economic Regulation Authority, *Rate of Return Guidelines: Meeting the requirements of the National Gas Rules*, 16 December 2013, p. 22.

[212] The Authority considers that the term:

- 'approach' refers to the overall framework or method for estimating the return on equity, which combines the relevant estimation methods, financial models, market data and other evidence;
- 'estimation material' refers to any of the relevant estimation methods, financial models, market data and other evidence that contribute the 'approach'; and
- 'estimation method' relates primarily to the estimation of the parameters of financial models, or to the technique employed within that model to deliver an output.

[213] The allowed rate of return objective is set out at NGR 87(3):

The allowed rate of return objective is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

557. The Authority in the Rate of Return Guidelines determined that only a subset of the evaluated material could be considered relevant in the Australian context, so as to best achieve the allowed rate of return objective. The Authority is of the view that:

> Rate of return estimate materials – the estimation methods, financial models, market data and other evidence – would need to be broadly consistent with the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective to be considered relevant. Some estimation materials may perform better on some requirements and less well on others, and yet may still be considered relevant. Accordingly, the assessment is whether, on balance, estimation materials are consistent with the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective.
>
> Nevertheless, estimation materials would need to pass a threshold of adequacy to be considered relevant. To the extent that estimation materials failed the adequacy threshold, then they would be rejected. This rejection would be consistent with the AEMC's purpose for the guidelines:[214]
>
> > In order for the guidelines to have some purpose and value at the time of the regulatory determination or access arrangement process, they must have some weight to narrow the debate.
>
> Once over the threshold for adequacy, then, as noted, any particular estimation material may meet the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective to a greater or lesser degree. With this in mind, the criteria would then be used as a means to articulate the Authority's evaluation of the estimation materials, in terms of how they performed in meeting the requirements of the NGL, the NGO, the NGR and the allowed rate of return objective. In this way, the criteria are intended to assist transparency around its exercise of judgement. [215]

558. In that context, the following analysis provides the Authority's determination for this Draft Decision of the return on equity for GGT. The Authority considers that the estimate is consistent with delivering an outcome that meets the allowed rate of return objective, as well as the NGL and NGR more broadly.[216]

Step 1: Identifying relevant material and its role in the estimate

559. The Authority evaluated the relevance of the following materials for estimating the return on equity in the Rate of Return Guidelines, in terms of their ability to contribute to the achievement of the allowed rate of return objective:[217]

- the Sharpe Lintner Capital Asset Pricing Model (**SL CAPM**), as well as other asset pricing models in the Capital Asset Pricing Model (**CAPM**) 'family'; and
- an extensive range of other models and approaches which seek to estimate the return on equity.

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[214] Australian Energy Market Commission, *Rule Determination, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November, p. 58.

[215] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 12.

[216] The allowed rate of return objective is set out at NGR 87(3):

The allowed rate of return objective is that the rate of return for a service provider is to be commensurate with the efficient financing costs of a benchmark efficient entity with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

[217] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 8.

560. The Authority concluded in the Guidelines that the Sharpe Lintner CAPM model is relevant for informing the Authority's estimation of the prevailing return on equity for the regulated firm at the current time.

561. However, the Authority determined that it would give weight to relevant outputs from the Dividend Growth Model (**DGM**) when estimating the market risk premium (**MRP**), which is an input to the Sharpe Lintner CAPM.[218]

562. The Authority also noted the empirical evidence provided by the Black and Empirical CAPM models, pointing to potential bias in the estimates from the Sharpe Lintner CAPM, and noted that it would take this relevant information into account when estimating the point estimate of the equity beta from within its estimated range.[219]

563. The Authority concluded that other models and approaches are not relevant within the Australian context, at the current time, without some new developments in terms of the theoretical foundations or in the empirical evidence. Generally, there are resulting shortcomings with regard to robustness in the Australian context. On this basis, the Authority considered that these other models are not 'fit for purpose' or able to be 'implemented in accordance with best practice'.

564. The Authority considered that its approach in the Rate of Return Guidelines with regard to the determination of relevance – in terms of best meeting the allowed rate of return objective – is consistent with the intent of the AEMC:[220,221]

> … In general the final rules give the regulator greater discretion than it has currently. The objectives and factors show the regulator what it must bear in mind when it exercises that discretion.
>
> The role of the objective is to indicate what the regulator should be *seeking* to achieve in the exercise of its discretion. Some stakeholders appear to have understood the objectives as imposing on the regulator a requirement and that failure to comply with this would mean the regulator is in breach of the rules. This is not the case. Although the language of an obligation is used in some objectives, it is not necessarily expected that the substance of the objective will always be fully achieved, but rather the regulator should be striving to achieve the objective as fully as possible. Where it is used in rate of return and capital expenditure incentives, the objective has primacy over other matters which the regulator is directed to consider.
>
> These other matters include factors which the regulator is directed to consider. The rules use language such as "have regard to" and "take into account" to direct the regulator to consider certain factors. Throughout this rule change process there has been discussion over the respective meanings of these phrases. The Commission's approach is that these phrases mean the same thing and nothing is implied by the use of one rather than the other. The Johnson Winter & Slattery advice attached to the Australian Pipeline Industry Association (**APIA**) submission[222] includes a useful guide

[218] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 78.

[219] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 67.

[220] Australian Energy Market *Commission, Rule Determination, National Gas Amendment (Price and Revenue Regulation of Gas Services) Rule 2012*, 29 November 2013, p. 36.

[221] The Authority notes that relevant means 'closely connected or appropriate to the matter in hand' (Oxford dictionary) or 'bearing upon or connected with the matter in hand; to the purpose; pertinent' (Macquarie dictionary).

[222] APIA, *Economic Regulation of Network Service Providers: Response to AEMC*, 4 October 2012, Appendix 1, p. 11. The Authority notes that that the Johnson Winter & Slattery advice stated:

… as long as the Regulator has taken into account the specified factors, it remains in the Regulator's discretion how those factors influence its decision. The practical application of this rule could result in the

> to how the phrases should be interpreted. The regulator must actively turn its mind to the factors listed, but it is up to the regulator to determine how the factors should influence its decision. It may, indeed, consider all of them and decide none should influence its decision. It is not intended that the regulator's decision is solely dependent on how it applies any or all of those factors. The intention is that where the rules require the regulator to consider certain factors in conjunction with an overall objective, it should explain its decision including how it has had regard to those factors in making a decision that meets the objective.

565. The Authority notes that GGT accepted the validity of the Sharpe Linter CAPM for the purpose of estimating the return on equity for GGT. However, in relation to the estimate of equity beta – an input of the Sharpe Lintner CAPM – GGT argued that none of the entities included in the benchmark sample from which the beta is estimated are similar to the GGP in terms of risk. GGT considered that no entity in the benchmark sample has the same small number of users concentrated in the mining and mineral processing sectors. Each may serve a small number of users (end users consuming large quantities of gas, and gas retailers), but those users themselves supply gas or electricity to a wide range of customers located in major – and growing – urban areas.

566. On the basis of the above argument, GGT considered that:[223]

> The lack of comparators, for which long series of share price and dividend data can be obtained, makes difficult the estimation of beta using conventional statistical (regression) methods. Furthermore, even if suitable series were available for the Covered Pipeline, there is a substantial body of evidence showing that the application of regression methods leads to return on equity estimates which have little or no relationship with realised share prices.

567. GGT then concluded that another approach must be taken, engaging SFG to provide expert advice in relation to the proposed approach. SFG developed an option pricing approach for estimating the return on equity for the GGP.

568. The Authority is of the view that SFG's proposed approach to directly estimate the return on equity is not driven by economic principles. The Authority considers that SFG's proposed approach does not follow any standard finance theory. In addition, the Authority considers that SFG's proposed approach to estimating the return on equity for GGT is fundamentally flawed and as a result, this approach should not be adopted. The approach is not well established and is untested. The Authority's detailed analysis leading to this conclusion are discussed in Appendix 3.

569. The Authority notes that GGT has presented only limited new information in its proposal – in relation to relevant estimation methods, financial models, market data and other evidence – that was not considered as part of the development of the Rate of Return Guidelines.

> Regulator considering other estimation methods, financial models, etc. but then putting all but one to the side and continuing to estimate the cost of debt and cost of equity using its already stated preferred approach (i.e. the Sharpe Lintner CAPM)…
>
> If evidence is "irrelevant", the Regulator will not fall into error by failing to "take it into account".
>
> In practice, of course, this will require some form of value judgment by the Regulator about whether evidence put before it is relevant or not. This appears to be consistent with the very broad discretion envisaged by the AEMC in the Draft Rule Determinations.

[223] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 99.

570. However, given GGT's submission, a further detailed evaluation of the merits of the Sharpe Lintner CAPM, the Black CAPM and the DGM is at Appendix 4.

571. Based on that re-evaluation, the Authority has determined the following:

- The Sharpe Lintner CAPM will be utilised to estimate the return on equity.
- The Black CAPM is relevant for the purpose of estimating a return on equity. However, given it is not reliable and practical to estimate a robust return on equity using this model, the model will not be used directly, but only to inform the point estimate of the equity beta from within its range for input to the Sharpe Lintner CAPM.
- The DGM is a relevant model for informing the *market* return on equity and hence also the forward looking MRP.
- Other information such as historical data on equity risk premium; surveys of market risk and other equity analysts' estimates are also relevant for the purpose of estimating the MRP and the market return on equity. This other material will be used as a cross check for the return on equity.

572. The Authority remains of the view that its reasons for adopting the Sharpe Lintner CAPM are sound. The Authority considers that its application of the Sharpe Lintner CAPM meets the requirements of the NGR, and the allowed rate of return objective.

- The Authority does not agree with GGT's submission that it has not taken all of the relevant information into consideration with respect to its estimate of the return on equity. The Authority is of the view that all of the issues raised by GGT and its consultants have been considered in this Draft Decision.
- The Authority also disagrees with GGT's estimates of the rate of return on equity. The Authority has conducted significant research into the rate of return and has cross checked its estimate across various sources. The Authority considers its estimate for the rate of return is consistent with other industry estimates.
- The Authority considers that the estimated return on equity adopted in this Draft Decision is commensurate with the equity costs incurred by a benchmark efficient entity with a similar degree of risk as GGT with respect to the provision of reference services. The Authority therefore considers that the estimated rate of return meets the allowed rate of return objectives and the requirements of the NGR and NGL.

Step 2 – Estimate parameters for the relevant models

573. The second step involves estimating parameters for relevant models. The Authority considers the Sharpe Lintner CAPM to be the only relevant model for directly estimating the return on equity for an efficient benchmark entity in the Australian context.

574. The Authority notes that the return on equity will be estimated using the Sharpe Lintner CAPM in the following form shown in (1).

$$E_t(R_i) = R_{F,t} + \beta_i \times MRP_t \quad (1)$$

where

- $E_t(R_i)$ is the return on asset i;
- $R_{F,t}$ is the risk free rate of return;
- β_i is equity beta; and
- MRP_t is the Authority's estimate of the forward looking market risk premium for the regulatory period.

575. The Authority notes that the above Sharpe Lintner CAPM equation represents a well-established approach to estimating the return on equity for the benchmark efficient entity.

576. In addition, as discussed in the Authority's Rate of Return Guidelines and the Draft Decision for ATCO's proposed Access Arrangement, the Authority was of the view that the relationship between the risk free rate and the MRP is inconclusive. This means that the risk free rate of return may be positively (or negatively) correlated with the MRP. In addition, it may also be the case when there is no relationship between a risk free rate and the MRP in Australia. For this reason the MRP must be determined for each decision as opposed to relying on predetermined ranges and point estimates, which implicitly assume a particular relationship.

577. On balance, the following parameters are considered when the Sharpe Lintner CAPM is adopted to estimate a return on equity for a network service provider.

- risk free rate;
- equity beta; and
- MRP or the Market Return on Equity.

578. The Authority is of the view that estimating the MRP and the market return on equity are two different processes. As such, the Authority considers that it is appropriate to consider all relevant information for each process. Doing so involves a repetition of the information/data. However, the Authority is of the view that doing so will ensure that all relevant information will be considered for the estimate of any input parameter which will be adopted in the Sharpe Lintner CAPM.

Estimate of the risk free rate

579. The risk free rate will be based on a 5 year term to maturity, determined as the average of the observed yields of the 5-year Commonwealth Government Securities over the nominated 40 business day averaging period that is just prior to the start of the regulatory period.

580. The *indicative* risk free rate for this Draft Decision is 1.96 per cent (see paragraph 549 to 550 above).

Estimate of the equity beta

581. The Authority in its 2010 GGP Final Decision noted that there were no direct comparators for the GGP benchmark entity:[224]

> For the purpose of this Final Decision, the equity beta could be derived from the calculated average asset betas of suitable comparators or from an asset beta value in the range associated with comparator businesses. The closest comparators would appear to be two Australian-operated companies, APA Group and Envestra, whose assets included transmission assets. The Authority was unable to identify any direct comparators for GGT.
>
> The Authority could also adopt an equity beta value, taking into account the particular characteristics of the GGP and the associated level of risk. This 'first principles' approach requires judgement on the sensitivity of GGT's returns to movements in the economy/market.

582. The Authority concluded in its 2010 GGP Final Decision that a reasonable range for the equity beta of the GGP was 0.8 to 1.0. This was a downward revision to the range adopted for the previous first access arrangement, which was for an equity beta in the range of 0.8 to 1.33.[225] The lower bound was based on evidence from the benchmark sample, while the upper bound was based on a qualitative assessment of the GGP risks. The Authority summarised its reasoning as follows:[226]

> The Authority confirms its view, as set out in the Draft Decision, that a reasonable value for the lower bound of the equity beta range is 0.8.
>
> The Authority has further considered the reasonable value for the upper bound of equity beta.
>
> The Authority notes that the GGP pipeline has a small number of users, whose operations are primarily in the mining industry. In the Draft Decision, the Authority accepted that the average daily and total throughputs on the GGP were expected to remain constant during the forthcoming Access Arrangement Period. In response to the Draft Decision, BHPB noted in its submission that a number of expansion projects have been publicly announced by companies operating in the region serviced by the GGP.
>
> The Final Decision only pertains to the covered portion of the GGP capacity rather than the total capacity of this pipeline, which includes the uncovered throughput. The majority of the covered capacity involves long-term take-or-pay contracts (including pre-2005 contracts) that substantially reduce the volume or price risk on the covered capacity.
>
> The Authority considers that, with any expiration of customer contracts on the covered portion of the capacity on the GGP, it is reasonable to assume that existing customers (currently taking gas from the covered or uncovered capacity) and/or new customers, would provide continued demand for the covered capacity. Given the above, the Authority considers it reasonable to assume that there is limited volume or price risk for the covered portion of the GGP capacity. Given an assessment of the latest available information and on the basis of the above, the Authority has revised its view on the upper bound of the equity beta range. The Authority considers that a reasonable value for this upper bound is 1.0.

[224] Economic Regulation Authority, *Final Decision on GGT's Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline Submitted by Goldfields Gas Transmission Pty Ltd*, 13 May 2010. p. 50.

[225] Economic Regulation Authority, *Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline*, 17 May 2005, p. 64.

[226] Economic Regulation Authority, *Final Decision on GGT's Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline Submitted by Goldfields Gas Transmission Pty Ltd*, 13 May 2010. p. 51.

> Therefore, the Authority considers that a reasonable range of values for equity beta is 0.8 to 1.0, at a gearing level of 60 per cent debt to total assets.

583. The Authority's decision on beta for the 2010 GGP Final Decision was thus based on both capital market evidence and qualitative evaluation.

584. For this Draft Decision, the Authority does not automatically assume that the GGP has an equity beta similar to the average of the benchmark sample established in the Rate of Return Guidelines. Given the significantly different characteristics of the GGP, additional evidence needs to be adduced.

Evaluation of GGT's approach

585. GGT has also recognised the issue of comparability to the benchmark sample. To address the issue, GGT sought alternative means to establish the rate of return (and by corollary, the implied value of the equity beta within the Sharpe Lintner CAPM framework).

586. Specifically, GGT engaged SFG Consulting to estimate the return on equity for the GGP.[227] SFG's approach is to determine a direct estimate of the return on equity for the benchmark entity. This contrasts with the indirect estimate of return on equity for the GGP benchmark efficient entity, which utilises the Sharpe Lintner CAPM, drawing on information from the benchmark sample to estimate the equity beta; and utilising available relevant information to estimate the market risk premium.

587. SFG conducted its analysis of return on equity by estimating the expected return outcomes for the benchmark entity in different market situations, drawing on insights from what it says is standard finance theory.

588. SFG argues that GGP's systematic risk is higher than typical pipeline businesses in Australia and that the comparators included in the Authority's benchmark sample for estimating GGP's beta are unsuitable. Therefore, SFG was of the view that a different approach is required. SFG's proposed approach involves the use of a binomial option pricing framework and provides an estimated cost of equity for GGP conditional upon no default occurring because SFG argued that this is appropriate for regulatory purposes.

589. The Authority has considered SFG's proposed approach to estimating the return on equity/equity beta for GGT. Based on its review, and informed by advice from Lally, the Authority is of the view that SFG's proposed approach to directly estimate the return on equity is not driven by economic principles or based on a strong theoretical foundation.[228] In particular, the Authority considers that SFG's proposed approach to estimating the return on equity for GGT does not follow any standard finance theory.

590. The Authority agrees with Lally's advice that SFG's proposed approach to estimating the return on equity for GGT is fundamentally flawed and as a result, this approach should not be adopted. The approach is not well established and is untested. In addition, as evidenced in Lally's report, there are fundamental issues attached to SFG's proposed approach, setting aside its failure on theoretical grounds.

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[227] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7.

[228] The Authority engaged Associated Professor Lally from Capital Financial Consultants Ltd to provide expert advice in relation to SFG's proposed approach to determine the return on equity for GGT.

591. In addition, the Authority is also of the view that evidence presented in the SFG analysis to support the spread between the cost of debt and return on equity is inconclusive. The Authority acknowledges that there may be a link between the cost of debt and the return on equity. As such, regulators are required to take into account the observed cost of debt when the return on equity is determined. However, SFG's proposed approach to estimating the return on equity for GGT is not robust to establish a quantitative link between the two markets, as SFG claims that its analysis does. As a result, the Authority is of the view that SFG's analysis is not relevant for the purpose of estimating the return on equity for GGT and it should not be used.

592. The Authority also conducts a sensitivity analysis of SFG's proposed approach to estimating the return on equity for GGT. The Authority is convinced that the equity beta produced from SFG's proposed approach relies significantly on the assumed inputs utilised in the analysis. When one of many inputs changes, the final estimate of the return on equity for GGT changes significantly.

593. In this context, the Authority notes Lally's advice that SFG's approach is very sensitive to estimates of several unobservable parameters, most particularly the market standard deviation, the recovery rate on defaulting bonds, the range in the firm's payoff from the best to worst market states sans default, and the expected default rate. These sensitivities must be compared with those from the CAPM, whose estimate for the cost of equity is sensitive to only estimates for the MRP and the equity beta. Lally is of the view that prima facie, with twice as many parameters to estimate, SFG's approach seems much more sensitive to errors.

594. Lally also considers that while there is a considerable body of empirical literature on estimating the CAPM parameters, there is much less evidence on the extent of estimation error in most of the parameters used in SFG's approach.

595. Based on the above considerations, the Authority considers that SFG's estimates of the market return/equity beta for GGT are not robust because SFG's proposed approach is not well established and untested.

596. Detailed responses in relation to SFG's proposed approach to estimating the equity beta for GGT are discussed in Appendix 1.

The benchmark efficient entity and similar risk

597. GGT submitted that none of the entities in the benchmark sample used in the Authority's beta estimations is similar to the Covered Pipeline with respect to factors that affect its throughput and thus revenue stream. The factors cited were as follows:

- small numbers of customers concentrated in mining and mineral processing;
- customers reducing contracted capacity when commodity prices are low;
- termination contracts under the same circumstances; or
- default in circumstances where customer's production operations become uneconomic.[229]

598. GGT argued that if there were material and substantiated risk differences between the companies for which data were obtained for the purpose of estimating beta and

[229] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 94.

the service provider which was the subject of a particular regulatory decision, then a further adjustment to beta may be considered.

599. The Authority acknowledges evidence that GGT has submitted, showing that:

1. there has been delay and difficulties in contracting replacement demand on the GGP, for out of contract tranches of capacity, which has been taken into account in the demand forecasts from 2015;[230]
2. the customer bases of the benchmark sample entities are much larger, both in terms of connections and volume, than that of the GGP;
3. the customer bases of the benchmark sample entities are distributed across a broader range of sectors than the customer base of GGT; and

600. The Authority addresses the first point above by referring to its Rate of Return Guidelines method for estimating equity beta. In the Guidelines, systematic risk is measured by empirical estimates of equity beta. The empirical estimates are based on the last 5 years of historic data.[231] The empirical estimates of equity beta based on the last 5 years of historic data effectively constitutes the forecast of systematic risk for the next 5 years. The first point above makes reference to *forecast demand data from 2015 onward in support of GGT's claims that its systematic risk is differentiated from the benchmark.* The Authority considers using *forecast data inappropriate and inconsistent with the Rate of Return Guidelines, because the Guidelines specifically use the last 5 years of historic or realised data for assessing systematic risk. The Authority, therefore, considers the forecast data based on qualitative evidence, outlined in the first point above, irrelevant to the analysis of systematic risk*.

601. With respect to the second and third points above, the Authority accepts the evidence that shows GGT's customer base is significantly different to the benchmark sample of firms that the Authority uses to calculate equity beta. In this context, the Authority has assessed whether GGT's systematic risk is differentiated from the benchmark sample, purely on the grounds that a large proportion of its end user demand is related to nickel and iron industries, as shown in Table 41. This recognises that it is unusual for a utility to have such a low proportion of residential end user demand while having a high proportion of resource based end user demand.

Table 41 Relative shares of GGT end user demand

Nickel	Gold	Iron ore	Distribution
54.74%	24.85%	16.18%	4.23%

Source ERA analysis, December 2015.

602. However, it does not automatically follow that the GGP's customer base results in it facing higher systematic risk than the entities in the benchmark sample. GGT has not submitted any robust evidence linking the characteristics of their customer base to higher systematic risk.

603. In particular, the Authority notes that GGT's arguments:

- are exclusively focussed on revenue, thus ignoring expenses;

[230] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, pp. 95-97.

[231] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 171.

- do not account for possible countercyclical elements in its risk profile such as gold prices or input costs; and
- potentially classify non-systematic risk factors as systematic risk factors, for example, decisions on contracting and hedging.

604. Any number of qualitative justifications can be proposed as theoretical reasons why a Network Service Provider should face a *higher or lower* level of systematic risk. For example, it could be theoretically argued that:

- the gold producing operation's demand is uncorrelated to the cyclical demand for nickel and iron ore and so reduces systematic risk;
- during downturns GGT may experience declining input costs which may, to some extent, offset cyclical reductions in revenue, thereby, reducing systematic risk; or
- the efficient benchmark firm in GGT's situation would contract efficiently such that systematic risks are mitigated.

605. While the Authority does not pursue these arguments, they highlight that qualitative arguments informing the level of systematic risk are inferior to inferences made on observable evidence. This point was previously made in the Authority's Final Decision in 2010, where it considered that primary reliance should be placed on capital market evidence and statistical estimates of beta values, where these are available for comparable businesses.[232]

606. The Authority considers statistical estimates of equity beta using a sample of comparable exchange listed Australian firms (as was done in the Rate of Return Guidelines) to be the preferred method of estimating systematic risk for the benchmark firm.

607. Where exchange listed Australian comparators cannot be found, the next most preferred method is to estimate asset and equity beta using comparable international firms (as was done in the 2015 Weighted Average Cost of Capital for Railway Networks).[233] However, the Authority is not aware of any listed network utility that is comparable to GGT's covered pipeline in terms of having a comparable customer base. That is, the Authority could not find a network utility listed on any stock exchange (reported on Bloomberg) that has a small number of customers, concentrated in the mining and mineral processing sector.

608. Where neither of these approaches are possible, then alternative approaches can be considered. Given the lack of similar comparators, the Authority is of the view that 'conventional' practices from the investment management industry – used to assess the potential risks associated with a firm – can be applied in the regulatory context. These methods are considered in the following section.

Evidence based on financial statement analysis

609. Financial statement analysis is both a fundamental and well-accepted means of assessing the performance of an investment in terms of future net income and cash flow. It is the Authority's view that financial statements are logically the next best

[232] Economic Regulation Authority, *Final Decision on GGT's Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline Submitted by Goldfields Gas Transmission Pty Ltd*, 13 May 2010, p. 47.

[233] Economic Regulation Authority, *Final Determination relating to the 2015 Weighted Average Cost of Capital for Railway Networks*, 18 September 2015.

source of empirical evidence for assessing systematic risk in lieu of an exchange listed comparator being available because a firm's actual and expected financial performance determines its stock price, which in turn, determines the firm's empirically observed equity beta. The extent to which the arguments outlined by GGT are justified will be manifest in the benchmark firm's financial performance.[234]

610. Since the Authority cannot readily determine if GGT's systematic risk is differentiated from the benchmark sample using empirical estimates for a comparable benchmark, the Authority has opted to use financial statement based metrics for GGT that are commonly accepted as being linked to systematic risk. This is carried out over the same period the Authority empirically observes equity beta (the last 5 years) for consistency with the Rate of Return Guidelines method. While the Authority considers this approach inferior to statistically derived empirical estimates of equity beta, it considers this approach superior to unsubstantiated qualitative arguments.

611. The financial statement based analysis has been undertaken as follows:

- *First*, a number of well-accepted financial statement based measures of systematic risk (metrics) are identified. This is done with reference to academic and investment management industry literature to ensure the selection of these measures is guided by accepted practice in finance.
- *Second*, a sample of Australian network utilities that have been profitable over the last 5 years is identified.[235] Each of the metrics is calculated for each company in the sample. The observations for each metric are then ranked from highest to lowest in terms of the systematic risk they reflect. This creates a 'risk gauge' for each metric which allows the Authority to determine if GGT is significantly different to other Australian network utilities in terms of risk.
- *Third*, the same metrics are calculated for GGT using the Further Final Decision AA2 model, reference tariffs and actual demand realised. GGT's metrics are compared to the table to assess whether its systematic risk is high or low (relative to the sample range of metrics) based on each measure.

Financial statement-based measures of systematic risk

612. Beaver, Kettler and Scholes produced one of the earlier papers that investigated the association between market-determined and financial statement based measures of systematic risk. They recognised that, although accounting measures of risk are not explicitly defined in terms of covariance of returns, they can be viewed as surrogates for the total variance of returns. They found evidence to support the hypothesis that accounting data reflect underlying events that differentiate the risk of securities and that these events are reflected in market prices.[236] They also found evidence that indicated positive correlation between diversifiable and non-diversifiable risk.[237] This suggests that other measures of total risk should be

[234] W. Beaver, P. Kettler and M. Scholes, 'The Association between Market Determined and Accounting Determined Risk Measures', *The Accounting Review*, vol.15, no.4, 1970, p. 679.

[235] Grabowski and King used a track record of profitability as a criterion for selecting companies in their risk study. See S. Pratt and R. Grabowski, *Cost of Capital: Applications and Examples*, 4th edn, Hoboken, NJ, John Wiley & Sons, 2010, p. 289. for more details.

[236] W. Beaver, P. Kettler and M. Scholes, 'The Association between Market Determined and Accounting Determined Risk Measures', *The Accounting Review,* vol.15, no.4, 1970, pp. 654-682.

[237] W. Beaver, P. Kettler and M. Scholes, 'The Association between Market Determined and Accounting Determined Risk Measures', *The Accounting Review*, vol.15, no.4, 1970, p. 659.

considered, but not relied on in isolation, in assessing systematic risk from an accounting perspective.

613. Hamada investigated the effect of a firm's capital structure on systematic risk. He found that around 21 per cent to 24 per cent of observed systematic risk can be explained by a firm's capital structure.[238]

614. Lev associated risk differentials between firms with differences in the production process that affect the relative shares of fixed and variable costs (operating leverage). Higher operating leverage was associated with higher systematic risk and characterised as a real determinant of systematic risk.[239]

615. Gahlon and Gentry provide a simple conceptualisation of the sources of systematic risk including revenue variability, its magnification through operating and financial leverage and the degree of the sensitivity to of the firm's cash flow to broader economic factors. They emphasise the link between systematic risk, the Degree of Operating Leverage (**DOL**) and Degree of Financial Leverage (**DFL**).[240]

616. Mandelker and Rhee undertook an empirical study investigating the joint impact of both the DOL and DFL on the systematic risk of common stock. They found that both of these measures of leverage explain a large proportion of the variation in beta.[241]

617. In light of Beaver, Kettler and Scholes evidence indicating that there is positive correlation between diversifiable and non-diversifiable risk, some key measures of total risk are also identified. The Duff & Phelps *Risk Premium Report – Risk Study* uses three alternative measures of company specific total risk:[242]

- Operating margin;
- Coefficient of Variation (**CV**) in operating margin;
- CV in return on equity.

618. Their data showed a significant empirical relationship between these measures of risk and historical rates of return and realised premiums for profitable companies.[243]

619. Each of the measures identified in the literature above is defined below.

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238 R. Hamada, 'The Effects of the firm's capital structure on the systematic risk of common stocks', *Journal of Finance*, vol.27, no.2, 1972, pp. 435-452.

239 B. Lev, 'On the Association between Operating Leverage and Risk', *The Journal of Financial and Quantitative Analysis*, vol.9, no.4, 1974, p. 638.

240 J. Gahlon and J Gentry, 'On the Relationship between Systematic Risk and the Degrees of Operating and Financial Leverage', *Financial Management*, vol.11, no.2, 1982, pp. 15-23.

241 G. Mandelker and S. Rhee, 'The Impact of the Degrees of Operating and Financial Leverage on Systematic Risk of Common Stock', *The Journal of Financial and Quantitative Analysis*, vol.19, no.1, 1984, p. 56.

242 S. Pratt and R. Grabowski, *Cost of Capital: Applications and Examples*, 4th edn, Hoboken, NJ, John Wiley & Sons, 2010, p. 289.

243 S. Pratt and R. Grabowski, *Cost of Capital: Applications and Examples*, 4th edn, Hoboken, NJ, John Wiley & Sons, 2010, pp. 289-291.

620. The operating margin measures operating income as a proportion of net sales.

$$\text{Operating Margin} = \frac{\text{Operating Income}}{\text{Net Sales}} \quad (2)$$

Where:

Operating Income is annual revenue less operating expenses, depreciation and amortisation and is synonymous with Earnings Before Interest & Tax (**EBIT**); and

Net Sales is annual revenue less discounts and other allowances (revenue in the context of network service providers).

621. GGT's first principles based arguments only related to revenue and ignored those relating to benchmark costs. Observing operating income 'nets off' the variations in cost (ignoring financing and tax for the time being) from the variations in revenue. Generally speaking, the lower the operating margin the higher the total risk; however, it is the year to year variations in this operating margin (that also consider costs) that are more relevant to total risk. The higher the operating margin, the lower the total risk (as per Duff & Phelps).

622. The coefficient of variation in operating margin is a measure of the year-to-year variation in the operating income.

$$\text{Coefficient of variation in operating margin} = \frac{\sigma_{\text{Operating Margin}}}{\overline{\text{Operating Margin}}} \quad (3)$$

Where:

$\sigma_{\text{Operating Margin}}$ is the annual standard deviation in the operating margin over the last 5 years; and

$\overline{\text{Operating Margin}}$ is the average annual operating margin over the last 5 years.

623. This metric is a measure of total risk from operations independent of risk stemming from financing decisions and taxation arrangements. The higher the coefficient of variation in operating margin the higher the total risk (as per Duff & Phelps).

624. The degree of operating leverage measures how sensitive a firm's operating income (which is synonymous with EBIT in the regulatory context) is to changes in revenue.

$$\text{DOL} = \frac{\%\Delta\ \text{EBIT}}{\%\Delta\ \text{Revenue}} \qquad (4)$$

Where:

$\%\Delta\ \text{EBIT}$ is the Compound Annual Growth Rate (**CAGR**) in EBIT over 5 years; and

$\%\Delta\ \text{Revenue}$ is the CAGR in revenue over 5 years.[244]

625. This metric reflects the relative shares of fixed and variable costs chosen for the production process. When revenue increases strongly, a profitable firm with a relatively high proportion of fixed costs will meet these costs and benefit from each unit sale contributing a relatively large amount to operating income. A profitable firm with a lower proportion of fixed costs will find each unit sales contributes relatively little to operating income because a large proportion of revenue will always be consumed by variable costs. This was measured over a 5 year horizon using CAGRs to ensure a stable estimate. The higher the DOL the higher the systematic risk (as per Lev, Gahlon & Gentry, Mandelker and Rhee).

626. The degree of financial leverage reflects the effect of the firm's financing decisions on net income or the 'bottom line'.

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT-Interest}} \qquad (5)$$

Where:

EBIT is the compound annual growth rate (CAGR) in EBIT over 5 years; and

Interest is the annual interest expense on debt financing.

627. While affected by gearing, this metric considers the 'magnification' effect that gearing has on the cash flows available to pay shareholders by also considering operating income or EBIT. This metric therefore takes a revenue *and* cost perspective. The higher the DFL the higher the systematic risk (as per Hamada, Gahlon & Gentry, Mandelker and Rhee).

[244] The 5 year CAGR is calculated as $\left(\frac{X_{year\ 5}}{X_{year\ 1}}\right)^{1/5} - 1$

628. The coefficient of variation in return on equity is a measure of the year-to-year variation in the return on equity.

$$\text{Coefficient of variation in return on equity} = \frac{\sigma_{\text{Return on Equity}}}{\text{Return on Equity}} \quad (6)$$

Where:

$\sigma_{\text{Return on Equity}}$ is the annual standard deviation in the return on equity over the last 5 years;

Return on Equity is the average annual return on equity over the last 5 years, where the return on equity is defined by the net income available to common equity as a proportion of common equity.

629. This metric is a measure of the total risk, in terms of the historic variability, that shareholders (common equity) received. The greater the CV in return on equity, the higher the total risk (as per Duff & Phelps).

Gauging systematic risk using a sample of Australian utilities

630. Australian utilities are used as the 'yardstick' to gauge whether GGT's financial based measures of systematic risk are abnormally high compared to other Australian network utilities. The Bloomberg equity screening function was used to search for listed firms that met the following criteria:[245]

- **Country of listing:** Australia
- **Global Industry Classification Sector Name:** Utilities
- **Industry Subgroup:** Electric-Integrated, Gas-Distribution, Electric-Distribution, Gas-Transportation, Electric-Transmission, Pipelines

631. This returned five listed Australian companies. Their descriptions retrieved from Bloomberg are shown below (Table 42).

[245] This sample was downloaded on 21 October 2015.

Table 42 Companies matching equity screen with relevant data

Ticker	Bloomberg Description
AGL AU Equity	AGL Energy Limited sells and distributes gas and electricity. The Company retails and wholesales energy and fuel products to customers throughout Australia.
APA AU Equity	APA Group is a natural gas infrastructure company. The Company owns and or operates gas transmission and distribution assets whose pipelines span every state and territory in mainland Australia. APA Group also holds minority interests in energy infrastructure enterprises.
DUE AU Equity	DUET Group invests in energy utility assets located in Australia and New Zealand. The Group's investment assets include gas pipelines and electricity distribution networks.
SKI AU Equity	Spark Infrastructure Group invests in utility infrastructure assets in Australia.
EPX AU Equity[246]	Ethane Pipeline Income Fund is a fund established to provide cash flows. The fund, through its subsidiary, operates a natural gas pipeline.

Source: Bloomberg LP, Bloomberg, up to date as at November.

632. The metrics outlined above were calculated for each company and then the results for each company were ranked from highest to lowest systematic risk for each metric. This ranking is based on views in the literature of the relationship between market-determined and financial statement based measures of systematic risk.[247]

GGT's systematic risk metrics

633. GGT has submitted that its customer base, and thus end user demand and revenues, differentiate its systematic risk from the benchmark network service provider. To assess the extent to which its actual end user demand and revenue differentiates its systematic risk from the hypothetical benchmark firm, the actual demand realised over the last 5 years was input into the AA2 model to estimate the five accounting metrics outlined from paragraphs 619 to 629 above.

634. To calculate the actual revenues in the AA2 model a 'revenue adjustment factor' was computed by dividing actual demand by the forecast demand in the model. The reserved capacity adjustment factors were then multiplied by the toll charge and multiplied by the reservation charge revenue to arrive at actual annual revenue for these revenue items. The throughput adjustment factor was applied to the throughput charge revenue to arrive at actual annual revenue for this revenue item.[248] The revenue adjustment factors calculated are shown in Table 43.

[246] Although Ethane Pipeline Income Fund was not in the equity beta sample outlined in the Rate of Return Guidelines it is considered to be an appropriate comparator because it is a gas pipeline that services industrial end users.

[247] Spark Infrastructure only returned adequate data for the coefficient of variation of return on equity and so was not included in the sample for the other metrics.

[248] With respect to revenue, 'Actual' means from a benchmark efficient entity perspective as constructed by the financial model.

Table 43 GGT Actual versus Forecast AA2 Demand and Revenue Adjustment Factors

Load	2010	2011	2012	2013	2014
Reserved Capacity					
Actual[249]	105.7	105.2	105.2	104.5	97.7
Forecast (Annual Average)	109.9	108.6	108.5	108.9	109.0
Revenue Adjustment Factor	0.9614	0.9686	0.9692	0.9595	0.8966
Throughput					
Forecast (Annual Average)	90.7	89.5	89.4	89.7	89.7
Actual[250]	85.6	82.4	82.5	83.5	81.1
Revenue Adjustment Factor	0.9441	0.9209	0.9229	0.9308	0.9038

635. The total actual revenue calculated in the AA2 model (after these adjustments were applied) is shown in the first line of Table 44 which outlines GGT's benchmark AA2 accounts.

Table 44 GGT AA2 Further Final Decision Accounts

$m	2010	2011	2012	2013	2014
Adjusted Revenue	**82.07**	**82.22**	**82.43**	**81.97**	**77.12**
Operating Expenditure	-29.97	-26.13	-27.00	-28.86	-30.80
Depreciation	-10.62	-11.16	-11.70	-11.91	-12.03
EBIT (Operating Income)	**41.48**	**44.94**	**43.73**	**41.20**	**34.29**
Interest	-23.22	-23.22	-23.09	-22.63	-22.13
Tax	-5.48	-6.51	-6.19	-5.57	-3.65
Net Income	**12.78**	**15.20**	**14.45**	**13.00**	**8.51**
Equity	177.02	177.04	176.00	172.49	168.74
Return on Equity	7.22%	8.59%	8.21%	7.54%	5.04%
DFL	2.27	2.07	2.12	2.22	2.82
Operating Margin	50.54%	54.65%	53.06%	50.26%	44.47%

636. The relevant cost of service building blocks (operating expenditure and depreciation) are deducted from revenue to arrive at operating income, which, in the context of the building block approach, is analogous to EBIT. Depreciation is derived from the AA3 financial model using actual approved capex over AA2 to reflect any cost savings or cost over-runs that may have materialised under the economic conditions that prevailed. Interest and tax are then deducted to arrive at net income. Equity was arrived at by multiplying 40 per cent (1 minus the benchmark gearing) by the opening regulated asset base in each year. Return on equity is the net income, in each year, as a proportion of equity.

637. The line items outlined in Table 44 were used to calculate the systematic risk metrics defined above. The results are shown in Table 45.

Table 45 GGT Determinants of Systematic Risk

Systematic Risk	Average Operating Margin	CV Operating Margin	5 Year DOL (absolute value)	Average DFL	CV Return on Equity
Value of Metric	50.47%	0.08	3.23	2.31	0.19

[249] 2014 actuals are, at this stage and updated forecast and will be updated, when the figure is received.

[250] 2014 actuals are, at this stage and updated forecast and will be updated, when the figure is received.

638. A comparison of these results to the metrics calculated for the other Australian network service providers in the sample described above follows. The metrics are ranked by value from high risk to low risk.

Table 46 Average Operating Margin

Company Ticker – highest to lowest risk	Metric Value (%)[251]
AGL AU Equity	9.28
EPX AU Equity	41.22
DUE AU Equity	41.85
GGT Benchmark	50.47
APA AU Equity	55.57

639. The average operating margin over the last 5 years is the second highest in the sample. This indicates that the GGT benchmark has been particularly solvent prior to financing and tax considerations.

Table 47 Coefficient of Variation in Operating Margin

Company Ticker – highest to lowest risk	Metric Value
APA AU Equity	0.50
AGL AU Equity	0.31
DUE AU Equity	0.16
EPX AU Equity	0.09
GGT Benchmark	0.08

640. The GGT benchmark's coefficient of variation in operating margin is lower than all of the other Australian network utilities indicating that there is very little fluctuation in its year to year profitability in its operations. This could possibly reflect efficient contracting practices, low correlation between the demand of the various end users or even stable demand from all existing users. From this perspective the GGT benchmark is very low risk.[252]

Table 48 5 Year Degree of Operating Leverage (Absolute Value)

Company Ticker – highest to lowest risk	Metric Value
APA AU Equity	3.67
GGT Benchmark	3.23
EPX AU Equity	2.61
AGL AU Equity	1.52
DUE AU Equity	1.30

641. While not the highest, the GGT benchmark has a fairly high degree of operating leverage. The indicates that relative to other Australian network utilities, GGT has a high proportion of fixed costs per unit of output which would tend to exacerbate any systematic risk it faces. From this perspective the GGT benchmark has a higher level of systematic risk.

[251] Note, for this metric, a lower value is associated with a higher systematic risk.

[252] In the 2010 Final Decision for GGT's second Access Arrangement, Frontier Economics noted the lack of substantial withdrawal of volume during the economic downturn. See Economic Regulation Authority, *Final Decision on GGT's Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline Submitted by Goldfields Gas Transmission Pty Ltd*, 13 May 2010, p. 47.

Table 49 5 Year Average Degree of Financial Leverage

Company Ticker – highest to lowest risk	Metric Value
DUE AU Equity	6.44
GGT Benchmark	2.31
APA AU Equity	2.30
AGL AU Equity	1.20
EPX AU Equity	1.07

642. The GGT benchmark's degree of financial leverage is the second highest in the sample. This indicates a high degree of debt repayment vis-à-vis operating income used to pay debt. Like the DOL this would tend to exacerbate any systematic risk faced by the GGT benchmark and so from this perspective it also has a higher level of systematic risk.

Table 50 Degree of Total Leverage

Company Ticker – highest to lowest risk	Metric Value
APA AU Equity	8.46
DUE AU Equity	8.37
GGT Benchmark	7.47
EPX AU Equity	2.79
AGL AU Equity	1.83

643. The DOL and DFL operate together multiplicatively to 'amplify' any systematic risk faced by the firm. The Degree of Total Leverage (**DTL**) reflects this and is simply equal to DOL multiplied by DFL. By this measure it appears that GGT has less systematic risk than APA Group and the DUET Group, but is significantly riskier than AGL and Ethane Pipeline Income Trust.

Table 51 Coefficient of Variation in Return on Equity

Company Ticker – highest to lowest risk	Metric Value
DUE AU Equity	1.71
APA AU Equity	0.55
SKI AU Equity	0.28
EPX AU Equity	0.26
AGL AU Equity	0.26
GGT Benchmark	0.19

644. The coefficient of variation in the return on equity for the GGT benchmark, is the lowest of all of the Australian network utilities. This can be viewed as a summary measure because it reflects all of the measures above and indicates that the GGT benchmark is much lower risk than the other Australian network utilities.[253] This possibly reflects the very low variation in the GGT benchmark's operating margin. Even when the variation in the GGT benchmark's operating margin is amplified by its high DTL the resultant variation, reflected in the CV of return on equity is still very low.

645. GGT falls within the spectrum of risk for four of the metrics and is the lowest risk Australian network utility for two of the metrics. None of these indicators suggest that GGT faces a level of systematic risk that is significantly higher than other network utilities in Australia. However, the leverage indicators suggest that if GGT

[253] This is a summary measure in the sense that the return on equity can be decomposed using the 'Dupont System' and is also a measure of variation. See R. Brealey, S. Myers and F. Allen, *Corporate Finance*, 8th edn. New York, McGraw-Hill Irwon, 2006, p. 796.

were to experience increased volatility in revenues, then the risk to common stock would be magnified by a factor that is higher, but not much higher, compared to other utilities. This indicates that the cash flows to the shareholders are relatively more sensitive as compared to the other utilities to fluctuations in operating income (or EBIT), given its level of EBIT and financial leverage. That said, the CV in the operating margin has been very low (0.08) compared to the other Australian network utilities, so this sensitivity has not been a factor over the past five years. This concurs with Frontier Economics' observation that there was a lack of 'substantial withdrawal' of volume during the 2008 economic downturn.[254]

646. Based on the above, the Authority is unwilling to consider a range of equity betas outside those empirically observed for the other Australian network utilities over the 5 year period prior to 2015. The total variation in operating margin and return on equity for the GGT benchmark is remarkably low and appears to be fairly immune to an economic downturn.

647. The Authority acknowledges that none of the above metrics quantitatively measure covariance with equity market returns. The evidence from Frontier economics suggests that GGT's volumes, and therefore revenue streams based on benchmark tariffs, have been fairly insensitive to economic conditions. If the low variability in the benchmark operating margin was shown to be strongly and robustly correlated to stock market returns over the past five year period an argument for GGT facing a higher systematic risk than the benchmark utility may exist. The Authority, to date, has received no evidence that indicates this is the case.

Table 52 Equity Beta Estimates over 5 years to 2014

Company Ticker – highest to lowest risk	2014 Equity Beta[255]
SKI AU Equity	0.73
APA AU Equity	0.67
ENV AU Equity	0.59
SPN AU Equity	0.48
DUE AU Equity	0.32

648. Although the CV of operating margin was very low over the 5 year period observed, the combination of the DOL and DFL indicate that the GGT benchmark is 'finely poised' in terms of being a profitable investment to shareholders. In light of the low observed risk in the operating margin and the medium to high observed risk in the degree of total leverage (DFL x DOL), the Authority is of the view that the upper bound of systematic risk faced by the GGT benchmark is in the 'medium' and 'high' range compared to the other utilities in the benchmark sample. Accordingly, the Authority views GGT as ranking in between Envestra and APA Group in Table 52 which represent the 'medium' and 'high' ranked equity betas respectively. The mid-point of the associated equity beta estimates for these companies is (0.59 and 0.67) is 0.63.

[254] Economic Regulation Authority, *Final Decision on GGT's Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline Submitted by Goldfields Gas Transmission Pty Ltd*, 13 May 2010, p. 47.

[255] These equity beta estimates were made on data over the 5 years from September 2009 to September 2014 using the method outlined in the December 2013 Rate of Return Guidelines.

649. In the Rate of Return Guidelines the Authority observed that the average of the empirical estimates for the benchmark sample gas firms was 0.52.[256]

650. For its Final Decision for the ATCO GDS, the Authority adopted a beta of 0.70, above the mid-point of the Rate of Return Guidelines range, as a means of accounting for potential downward bias in equity beta estimates that was noted in the Rate of Return Guidelines.[257]

- The difference between the average empirical estimate in the Rate of Return Guidelines (0.52) and the medium-high equity beta arrived at in paragraph 648 (0.63) is 0.11. It is the Authority's view that this difference reflects the potential for GGT to have a different risk profile to the firms in the benchmark sample.
- Applying this difference of 0.11 as a means to adjust the benchmark equity beta of 0.7 determined in the Final Decision for the ATCO GDS, results in an estimate for the GGP of 0.81.

651. The Authority notes that this is the top of the range estimated in the Rate of Return Guidelines.

652. This analysis suggests that an equity beta of 0.8 (rounded) is appropriate. This reflects a reduction from the mid-point of the 2010 GGP Final Decision range, which is consistent with the downward trend in equity beta estimates in regulatory decisions in recent times.

653. Therefore, for the purposes of this draft decision the Authority will apply an equity beta of 0.8.

Estimate of the Market Risk Premium

654. The Authority notes GGT's argument that if the Sharpe-Lintner CAPM is used, at a particular time, to estimate the expected return on equity, then the estimate of the risk free rate used in applying the model must be the estimate of the risk free rate prevailing at that time, and not an average of historical values.[258] In addition, GGT argued that historical data was used to directly estimate that expected return. In addition, GGT also examined estimates of that expected return obtained from dividend growth models.[259]

655. The Authority's views on the best means to estimate the forward looking MRP have evolved in recent decisions.

656. In the Final Decision for the third Western Power Access Arrangement the Authority applied an MRP of 6 per cent in the Sharpe Lintner CAPM, based on regulatory precedent and analysis by Handley with regard to the historic average MRP.[260] The

[256] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, pp. 185-186.

[257] Economic Regulation Authority, *Rate of Return Guidelines*, 16 December 2013, p. 27.

[258] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 110.

[259] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 110.

[260] J. Handley, *An Estimate of the Historical Equity Risk Premium for the Period 1883 to 2010*, 25 January 2011.

view implicit in this approach was that the MRP is mean reverting, such that the historic average provided a robust estimator for future outcomes (on average).

657. Handley's analysis was based on Brailsford, Handley and Maheswaran (**BHM**) data.[261] At the time, the Authority did not have access to the underlying BHM data.

658. The Authority gained access to the BHM data during the development of the Rate of Return Guidelines, enabling it to undertake statistical testing on the long run average market return on equity and MRP, in order to ascertain whether each series was stationary (in the sense of being mean reverting). Stationarity is an important property of a data set if historic averages are to be used as a predictor for outcomes likely to prevail over future periods.

659. The results indicated the market return on equity was stationary.[262]

660. However, the results produced mixed evidence on the stationarity of the MRP, with the analysis supporting a conclusion that the MRP is likely non-stationary.[263,264] This finding led the Authority to the important conclusion that the long run historical estimate of 6 per cent could be a poor predictor of the MRP prevailing in future regulatory periods. The Authority therefore dropped the fixed estimate of 6 per cent, instead establishing a range of possible future outcomes for the MRP, informed by information that a rational market participant would use in making investment decisions. The resultant range for the MRP in the Rate of Return Guidelines was 5 to 7.5 per cent.[265]

661. With respect to this range, the Authority subsequently acknowledged a contention that the range of 5 to 7.5 per cent established in the Rate of Return Guidelines may lead to outcomes that are too low.[266] In particular, it is clear that using a range with an inappropriately constrained upper bound could result in downward bias in the Authority's forward looking MRP estimates. The Authority therefore reviewed the approach to establishing a range for the forward looking MRP.

662. Most significantly, the Authority has now concluded that it is not reasonable to constrain the MRP to a fixed range over time. The erratic behaviour of the risk free rate in Australia to date, and more particularly, its pronounced decline in the current economic environment, leads to a situation where the combination of a fixed range for the MRP and prevailing risk free rate may not result in an outcome which is consistent with the achievement of the average market return on equity over the long run.

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[261] T.J. Brailsford, J.C. Handley and K. Maheswaran, The Historical Equity Risk Premium in Australia: Post-GFC and 128 Years of Data, *Accounting and Finance*, 52, 2012, pp. 237-247.

[262] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 8, p. 63 and Appendix 16.

[263] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 8, p. 63 and Appendix 16.

[264] Further support for the non-stationarity of the MRP is given by the finding that the risk free rate is non-stationary (Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 16). As the market return on equity is comprised of the risk free rate and the MRP, if follows that then that MRP must be non-stationary, by construction.

[265] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 137.

[266] ATCO Gas Australia, *ATCO Gas Australia's Response to the ERA's Draft Decision*, 22 December 2014, p. 190.

663. Specifically, the estimate of the upper bound for the forward looking MRP of 7.5 per cent that was based on the DGM will fluctuate in line with the risk free rate. So for example, at times when the risk free rate is low, as it currently is, the upper bound for the MRP should be higher. There will be times – such as during the Global Financial Crisis (**GFC**) – when the Authority would be more likely to select a point estimate of the MRP which is close to the upper bound. The resulting required return on the market in that type of situation could possibly exceed the long run average return on equity indicated by the historical data.

664. For this reason the Authority considers it appropriate to determine a range for the MRP at the time of each decision.

Interpreting the historic evidence

665. The Ibbotson approach is consistent with the view that *MRP* is stationary and therefore will return to some constant long run average that is a good predictor for the MRP in future. If the stationarity of the MRP is borne out in reality, then the Ibbotson approach, despite being based on historical data, could be used as a reasonable 'on-the-day' prediction of the MRP over a future period. It can be combined with the on-the-day estimate of the risk free rate, which is considered the best predictor of future rates in light of the efficient market hypothesis.

666. On the other hand, the Wright approach concludes that the MRP is not mean reverting, rather it is the long run real historical *market return on equity* that is mean reverting. With the Wright interpretation – at any point in time – the real average market return on equity may be combined with the estimate of the long run *expected* inflation rate, using the Fisher equation, to provide a best estimate of the expected nominal future average value of the return on the market. It follows then that deducting the on the day estimate of the risk free rate from that nominal estimate will provide the contemporaneous on the day forward looking estimate of the MRP. This approach implies that the MRP and risk free rate are perfectly correlated one for one.

667. For this Draft Decision, the Authority accounts for the Ibbotson approach in its process for establishing the lower bound of a range for the forward looking MRP.

668. The use of the Ibbotson approach to inform the lower bound of the MRP bound does not mean the Authority ascribes to the view that the MRP in Australia is stationary.[267] The Authority remains of the view that evidence on mean reversion of the MRP in Australia is inconclusive as outlined in the Guidelines which conducted empirical tests on the Australian data.

669. The Authority also notes that any empirical testing may be subject to shortcomings such as those relating to the data itself, its span or in the methods applied. Empirical evidence may provide information that assists in understanding economic and financial relationships, but should be grounded in theory. For this reason the Authority considers it reasonable that investors may give credence to historical

[267] Equally, the Authority does not accept the Wright approach as being the sole guide for the estimate. The 'Wright' view on the stationarity of the market return on equity was considered in the Guidelines. However, the Guidelines rejected the view that the MRP and risk free rate are perfectly correlated one for one. The Authority remains of the view that while being an acceptable theoretical foundation, sole reliance on the one for one correlation over anything but the very long run is not likely to be helpful in practice.

averages of the MRP in forming their views for the future.[268] Therefore, the Authority considers that the two opposing theoretical interpretations for estimating the MRP (Ibbotson and Wright) cannot be dismissed.[269]

670. Turning now to the estimates themselves, the Authority first evaluated the long run average market return observed from the Brailsford, Handley and Maheswaran (**BHM**) series in Rate of Return Guidelines. The BHM (2012) series spanned 128 years and so was considered the most appropriate data set for determining the long run average market return on equity and the related MRP.

671. However, concerns have been raised relating to the quality of the BHM data. Additionally, the series covers a pre- and post-imputation credit regime and so requires adjustment from 1987 onward to ensure returns are estimated on a consistent basis over the whole series.

672. With regard to data quality, the BHM historic series are claimed to be downwardly biased on account of an inadequate adjustment made to the dividend yields employed in the data. To address this perceived issue, in 2013 NERA produced an Australian stock market total return series that readjusted the dividend yields prior to 1957.[270]

673. For the purpose of ATCO Final Decision, the Authority has extended the BHM and NERA series through to 2014, based on the most recent data.[271]

674. The difference between the long run average (nominal) market return on equity based on the BHM and NERA series is 36 basis points (Table 53).

Table 53 BHM and NERA long-run historic nominal and real annual average market returns for 1883 to 2014 (excluding imputation credits)

	NERA approach	BHM approach	Difference
Nominal return	12.00%	11.64%	0.36%
Real return	8.76%	8.40%	0.36%

Source: NERA (2013), Brailsford, Handley and Maheswaran (2012) and ERA Analysis, December 2015.

675. Handley's advice to the AER prepared in October 2014 raised a number of concerns regarding the analysis underlying the NERA (2013) data. In particular, he highlighted a lack of consistency between NERA's source of dividend yields and those employed by Lamberton on which the BHM series was based.[272] Additionally, he highlighted that NERA had not reconciled their adjusted yields with those of

[268] For example, many private sector equity analysts, such as Grant Samuel, utilise a historic estimate of the MRP when undertaking valuations.

[269] For the risk free rate, the efficient market hypothesis provides a theoretical foundation, which is therefore supported by empirics.

[270] NERA Economic Consulting, *The Market Risk Premium: Analysis in Response to the AER's Draft Rate of Return Guideline*, A Report for the Energy Networks Association, October 2013.

[271] Daily ASX All Ordinaries (AS30) and Accumulation (ASA3) indices were sourced from Bloomberg. Annual outcomes were calculated consistent with the method set out by BHM in their 2012 study (see T.J. Brailsford, J.C. Handley and K. Maheswaran, The Historical Equity Risk Premium in Australia: Post-GFC and 128 Years of Data, *Accounting and Finance*, 52, 2012, section 2, p. 238). Bond and bill yields were extended based on the Reserve Bank of Australia statistics (90 day Bank Accepted Bills were used for 2013 and 2014 as there is no 3 month Treasury bills data for those years). Gamma was assumed at 0.4 consistent with the Authority's estimate for ATCO Final Decision.

[272] J. Handley, *Advice on the Return on Equity*, *A Report prepared for the Australian Energy Regulator*, 16 October 2014, p. 19.

Lamberton. The Authority therefore is of the view that the analysis underlying the NERA (2013) data is insufficient grounds to justify the full upward adjustment to the BHM series performed by NERA.

676. Given the uncertainty surrounding the most appropriate adjustment to the market return series, the Authority will use an average of the two series to minimise any potential error with use of either series alone. The real returns of both series are used (Table 53), removing inflation on a consistent basis (informed by the estimates of historic inflation set out in the BHM data).[273]

Imputation Gross-Up Adjustment

677. The real long term average market return of the BHM and NERA series is estimated as the 'gross return' investors in equity would expect to receive on the market. That is, it is reported inclusive of yields from capital gains and dividends. The series do not account for the introduction of imputation after 1987, so need to be adjusted up from that point on to account for the imputation credit yields.[274]

678. The post-tax financial model which is a requirement under NGR 87 compensates for required returns lost to taxation by providing an explicit allowance in the model cash flows for the taxes payable, which are then recovered in regulated tariffs.[275] At the same time, the reduction for the value of imputation credits is also explicitly accounted for in the cash flows, following the requirements of NGR 87A.

679. Therefore, applying a return on equity in the post–tax model which was not 'grossed up' for imputation credits would result in under compensation for the investor. This would result because the value of imputation credits would be removed twice, first from the rate of return, and second from the revenue cash flows.

680. It follows that the Authority needs to 'gross up' the observed post 1987 market returns in the BHM data for the estimated value of imputation credits. Applying this in the post-tax revenue model will then ensure that the investor receives an 'after company tax, after some personal tax' return.[276] The final component of the required return on equity is then received through the investor's tax return.

681. To calculate the value of imputation credit yields in each year from 1988 (inclusive) onwards, equation (7) based on that set out by Handley (2008), accounting for theta directly, is used (see paragraph 462 and 462 above for the derivation of this equation):[277,278]

[273] T.J. Brailsford, J.C. Handley and K. Maheswaran, , The Historical Equity Risk Premium in Australia: Post-GFC and 128 Years of Data, *Accounting and Finance*, 52, 2012, p. 241; NERA Economic Consulting, *The Market Risk Premium: Analysis in Response to the AER's Draft Rate of Return Guideline*, A Report for the Energy Networks Association, October 2013, Table 2.7, p. 28.

[274] T.J. Brailsford, J.C. Handley and K. Maheswaran, The Historical Equity Risk Premium in Australia: Post-GFC and 128 Years of Data, *Accounting and Finance*, 52, 2012, Table 2, pp. 237-247.

[275] Gamma in the post-tax approach is factored in through a reduction in the compensation for company tax, reflecting the estimated cash flows received by investors from imputation credits through their personal tax.

[276] J.C. Handley, *Further comments on the historical equity risk premium*, 14 April 2009, pp. 16-17.

[277] T.Brailsford, J.Handley and K.Maheswaran, *Re-examination of the Historical Equity Risk Premium in Australia*, Accounting and Finance, vol. 48, 2008, p. 85. The F in equation 4 is taken to be 0.75, hence a value for theta of 0.53 corresponds to an estimate of gamma of 0.4.

[278] The imputation credit regime commenced from 1 July 1987.

$$c_t = F \times d_t \left(\frac{T_t}{1-T_t} \right) \times \theta \qquad (7)$$

Where:

- θ is the value of distributed imputation credits consistent with the Authority's estimate of gamma;
- d_t is the dividend yield in year t ;
- F is the proportion of dividends which are franked; and
- T_t is the corporate tax prevailing in that year.

682. The yield is then added on to the total return in each year 1988 through to 2014. The results for both series for the period following the introduction of imputation are the same, as the NERA and BHM total return series do not differ over this period. The average yield value of imputation credits to investors from 1988 to 2014 based on these assumptions and the real return data is an estimated 0.88 per cent.

683. The imputation credit yields for each year are then added to the real total returns for both the BHM and NERA series from 1988 on and the two series are then averaged (Table 54).

Table 54 Average annual imputation credit yields and grossed up arithmetic average returns (nominal, consistent with the estimate of gamma of 0.4)

	NERA	BHM	Average
Nominal returns excluding imputation yield (1883-2014)	12.00%	11.64%	11.82%
Nominal imputation credit yield (1988-2014)	0.88%	0.88%	0.88%
Grossed up nominal returns (1883-2014)	12.19%	11.83%	12.01%
Grossed up real returns (1883-2014)	8.94%	8.58%	8.76%
Expected inflation for AA4	1.90%	1.90%	1.90%
Grossed up nominal return commensurate with current inflation expectations	11.01%	10.64%	10.83%

Source: ERA Analysis December 2015, NERA (2013), Brailsford, Handley and Maheswaran (2012).

684. As a final step, the grossed up expected return on equity for the market may be developed consistent with the inflation outlook for the next 5 years. The estimate of inflation for the next 5 years used in for this Draft Decision is 1.90 per cent. This estimate is used to inflate the resulting average real return geometrically (based on the Fisher equation). This produces a nominal estimate for the average return on the market of 11.01 per cent for the NERA based data and 10.64 per cent for the BHM based data.

685. The average of the two series is 10.83 per cent. The Authority considers that this estimate provides the estimate for the nominal average market return on equity that is consistent with Wright's interpretation of the historic data and the current inflation outlook.

686. This is an important marker for the market return on equity. As the available evidence supports the hypothesis that the market return on equity is mean reverting,

this historic outcome from a long span of data may be used as a cross check for the long run average of the forward looking market return on equity from each regulatory period.

687. The Authority also notes that with the current risk free rate at 1.96 per cent[279], the MRP that is consistent with the Wright interpretation of the data is (10.83 – 1.96 =) 8.87 per cent.

Upper bound of the MRP range

688. The Authority notes GGT's position that estimates made using the dividend growth model indicate that the expected return on the market portfolio may lie between 8.6 per cent and 13.3 per cent.[280] This range is derived based on various studies which have been used by the Authority in its Rate of Return Guidelines. However, the Authority notes that the Authority's own study, which provides the estimated equity market return of 8.60 per cent to 9.41 per cent, was not considered by GGT in its assessments in relation to the DGM. GGT concluded that it had taken a conservative view, and used an estimate of 11.5 per cent for the expected return on the market.[281]

689. The Authority disagrees with GGT's view in relation to the expected return on the market of 11.5 per cent. Given inherent instability in the estimates of the MRP or the return on the equity market, the Authority is of the view that various studies should be considered to form a possible range of the MRP or the equity market return.

690. The upper bound of the MRP range in the Rate of Return Guidelines in 2013 was set at 7.5 per cent, based on the range for the return on the market from a range of Dividend Growth Models (**DGM**) evaluated for the Rate of Return Guidelines.

691. As noted above, the Authority considers that this bound is not high enough given prevailing market conditions. There are two potential issues with the range for the market return on equity estimates derived from the DGM:

- first, there is a need to ensure that returns from all estimates are grossed up, so as to be on a consistent basis for input to the Authority's estimate; and
- second, the Authority should account for the range of outcomes based on the credible DGM estimates.

692. The Authority has revisited the DGM estimates, gathering a range of grossed up market return on equity estimates from the more recent DGM models (Table 55).

[279] This was the risk free rate used for the Final Decision on the Mid-West and South-West Gas Distribution System Access Arrangement.

[280] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 111.

[281] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 118.

Table 55 Recent estimates of the MRP using the DGM

Study/Author	Date	Dividend yield source	Theta	Risk free rate (%)	Implied MRP (%)
Capital Research	Feb 2012	Factset	0.5	3.8	9.7
NERA	Sep 2012	Bloomberg	0.35	3.13	8.03
CEG	Nov 2012	RBA	0.35	3.05	8.89
Lally	Mar 2013	Bloomberg	0.35	3.26	5.90 – 8.39
ERA	Aug 2013	Bloomberg	0.35 – 0.7	3.31	5.34 – 7.57
SFG	Dec 2014	Thomson Reuters I/B/E/S	0.35 - 0.7	2.95 – 3.58	7.84 – 9.58
AER	Sep 2014	Bloomberg	0.7	3.48	6.6 – 7.8
ERA	Mar 2015	Bloomberg	0.53	1.96	8.24
Estimated range of the MRP consistent with gamma of 0.4			0.55		**5.6 – 9.7**

Source: *Capital Research, Forward Estimate of the Market Risk:Premium: Update, A response to the draft distribution determination by the AER for Aurora Energy Pty Ltd, February 2012, p. 20; NERA Economic Consulting, The Market, Size and Value Premiums, June 2013, p. 49; Competition Economists Group, Update to March 2012 Report, November 2012, p. 31., M. Lally, The Dividend Growth Model, 4 March 2013, p. 16. Economic Regulation Authority, Appendices to the Explanatory Statement for the Rate of Return Guidelines, 16 December 2013, pp. 125 – 127. ATCO Gas Australia, ATCO Gas Australia's Response to the ERA's Draft Decision, 22 December 2014, Appendix 9.1 (SFG), p. 32; and*

Australian Energy Regulator, Draft decision: Jemena Gas Networks (NSW) Ltd: Access arrangement 2015–20, Attachment 3: Rate of return, November 2014 p. 3-200; and

Authority estimates, December 2015.

693. The majority of studies in Table 55 use a franking proportion of 0.75 to gross up returns. The commensurate estimate of theta for that franking proportion, which delivers a gamma of 0.4, is just under 0.55. Based on these results, the Authority judges that a range for the MRP commensurate with a gamma of 0.4 is 5.6 to 9.7 per cent. The lower bound is established by the Authority's August 2013 lower bound estimate for a theta of 0.55, while the upper bound is given by Capital Research's February 2012 estimate.

694. In addition, the Authority updated its two stage DGM estimate (Box 1), to be current as at March 2015 (which is the date of the *indicative* estimates for this Draft Decision). The model was used to develop the range for the MRP in the Rate of Return Guidelines.[282]

Box 1 The two stage DGM

The return implied by the Gordon DGM is based on a forecast dividend based on a forecast dividend growth rate to calculate a forecast dividend yield and then augments this yield with the growth forecast itself. This is shown in equation (8).

$$r_e = \left(\frac{E(D_1)}{P_0} \right) + g \qquad (8)$$

Where $E(D_1) = D_0(1+g)$ and is the last dividend per share paid.

The Authority's current estimate of the DGM is based on a simple two stage approach as outlined in equation (9).

$$P_0 = \frac{m \text{ x } E(D_0)}{(1+k)^{m/2}} + \sum_{t=1}^{N} \frac{E(D_t)}{(1+k)^{m+t-0.5}} + \frac{\frac{E(D_N)(1+g)}{k-g}}{(1+k)^{m+N-0.5}} \qquad (9)$$

Where:

D_t is current price the of the equity index;

m is the fraction of the current year remaining;

t is the dividend per share expected in the current year;

$E(D_t)$ is the dividend per share expected years into the future;

k is the return on equity implied by the model;

N is the year of the furthest out dividend forecast; and

g is the long run dividend growth rate.

Monthly net dividend per share forecasts for the All Ordinaries Index were sourced from Bloomberg for the current year, the next year and the year after. The monthly closing price for the All Ordinaries index was also sourced from Bloomberg.

Source: Australian Energy Regulator and ERA Analysis, December 2015.

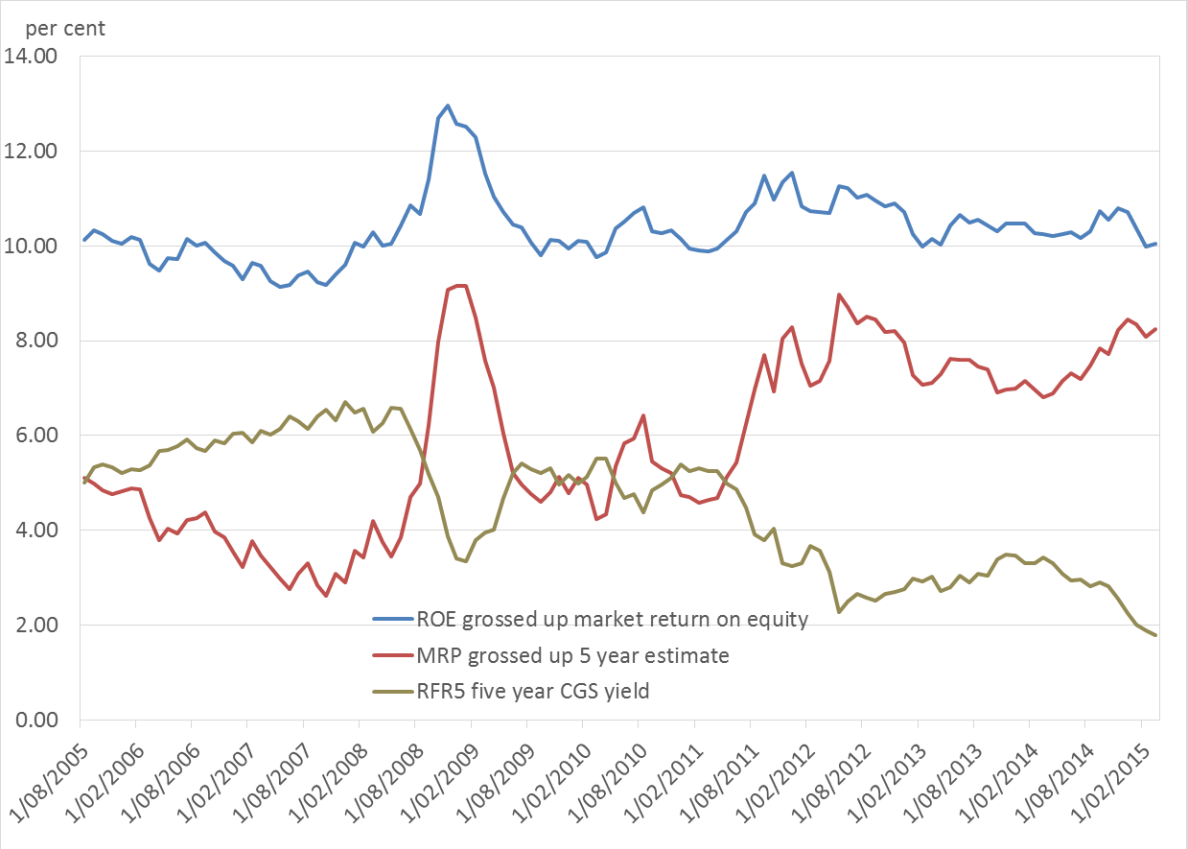
695. The assumption for the long run dividend growth rate in the updated DGM model, *g*, at 4.6 per cent, is consistent with the analysis in Lally's 2013 study.[283] This equates *g* to the estimated long run nominal GDP growth, of 5.6 per cent, less 1.0 per cent to account for new share issues and new companies. The resulting grossed up DGM estimate of the required return on the market is 10.04 per cent as at 31 March 2015.

[282] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 122.

[283] M. Lally, *The Dividend Growth Model*, 4 March, 2013, p. 17.

696. The corresponding results for *g* of 4.6 per cent – when combined with the historic consensus dividend forecasts and share prices from Bloomberg going back to 2005 – are shown in Figure 13.

Figure 13 Dividend Growth Model implied return on equity: All Ordinaries Index (monthly, grossed up)



Source: Bloomberg and ERA analysis, December 2015.

697. The implied expected market return on equity (grossed up for imputation credit yields) typically fluctuates, in this case between 9 and 11 per cent, only breaking higher in periods of perceived heightened risk, such as 2008 to 2009 and 2011 to 2012. The model indicates that, from the end of 2014 through March 2015, expected returns declined somewhat.

698. The monthly observation for 31 March 2015 at 10.04 per cent is below the middle of the 'more typical' range for the return on equity (that is, excluding the GFC type periods). It is at the 30th percentile of the observations reported in Figure 13.

699. Deducting the Authority's on-the-day estimate of the 5 year risk free rate, of 1.96 per cent, from the return on the market for the end of March 2015, gives a forward looking 5 year MRP of 8.24 per cent, which also may be observed in Figure 13.[284]

[284] Lally considers that deducting the risk free rate with a term of 5 years from a DGM estimate will tend to over-estimate the MRP (see M. Lally, *Review of arguments on the term of the risk free rate*, 20 November 2015, p. 21). This is based on the view that consistency between the perpetuity nature of the DGM and the associated estimate of the MRP requires a deduction of the 10 year risk free rate, rather than a 5 year risk free rate. The Authority notes that the majority of estimates in Table 55 deduct a 10 year risk free rate in that way. However, the Authority considers that expectations for the 5 year and 10 year MRP can diverge at any point in time. For that reason, the Authority retains the estimate of the MRP reported here as being one of the estimates made using the DGM.

The MRP series suggests that the current forward looking estimate is near the top end of its typical range, exceeded only by estimates at the height of the GFC.

700. The estimates from the DGM are sensitive to input assumptions, particularly the long run growth rate. Varying the long run growth rate, *g*, from 4.0 to 5.1 per cent leads to a range for the MRP estimate at an *indicative* March 2015 of 7.67 to 8.70 per cent.

701. The Authority notes that DGM estimates are recognised to have shortcomings, including that:[285]

- analyst forecasts (which underpin some of the studies reported in Table 55 and which will be incorporated in the 'consensus' estimates from Bloomberg) have a tendency to be upwardly biased, as they are based on over-optimistic expectations for target prices and earnings;
- DGMs proxy the free cash flow to equity through the estimated dividends, however dividends may not react to changes in market conditions, for example in downturns where companies may maintain their dividend policy, which will upwardly bias returns;
- DGMs do not capture non-dividend cash flows, such as share repurchases or dividend re-investment plans.

702. Furthermore, the DGM estimates reported here provide a single discount rate, which equates the present value of the future infinite dividend stream with the observed share price. The estimate therefore looks out beyond the 5 year period for which the Authority is seeking to estimate the MRP. If a lower nominal GDP estimate is expected than assumed – say for the two years beyond the three actual dividend growth rate forecasts incorporated in the model – then the estimates of the DGM should be lower than that reported here. The implication would be that the 5 year forward looking MRP would also be lower.

703. The Authority notes that there is no clear agreement among experts as to the best form for the DGM, or its input assumptions. For that reason, the Authority adopts a wide range, informed by a spectrum of recent studies.

704. Ideally, DGM return on equity estimates should be based on the most current on-the-day dividend forecasts. However, the Authority notes that the number of studies estimating return on equity using the DGM in Australia is limited and that it is not possible to update all of the various estimates available. Therefore, to allow for a broad range of information, DGM return on equity estimates since 2012 have been accounted for. The Authority is of the view that it is appropriate that the most recent estimates (since mid-2014) provide the more relevant and up-to-date information as presented in Table 55.

705. Overall, the Authority infers from the DGM MRP information before it that the market expectation is that the MRP has moved upwards in recent times due to declines in the risk free rate.

[285] See for example M. McKenzie and G. Partington, *Report to the AER, Part A: Return on equity*, October 2014, pp. 26-31.

706. Figure 13 suggests that a representative *indicative* range for the estimate of the grossed up MRP from the DGM, consistent with the estimate of gamma of 0.4 adopted for this Draft Decision, is 5.6 to 9.7 per cent.[286]

707. The Authority adopts this range for the DGM estimate for this Draft Decision. The upper bound of the DGM range – 9.7 per cent – provides the upper bound of the Authority's overall range for the MRP. However, as indicated, the Authority considers that this estimate of 9.7 per cent is a less relevant estimate in comparison with all other estimates as presented in Table 55.

Lower bound of the MRP range

708. As noted above, for this Draft Decision, the Authority will utilise the 'Ibbotson' approach to inform its estimate for the lower bound for the range of the forward looking MRP. The Ibbotson approach uses the concept of a long run average MRP as today's best estimate of the MRP in future and combines this with an on the day risk free rate to arrive at an on the day estimate of the market return on equity.

709. For consistency, the estimate of the long run average MRP must reflect the term of the risk free rate used in the Sharpe Lintner CAPM, which is 5 years for this Draft Decision. For this purpose the Authority has made an estimate of the historic average MRP with reference to 5 year bonds, by taking an average of the historic MRP annual estimates referenced to bonds and bills.[287]

710. The nominal 5 year MRP estimates (grossed up for imputation credit yields) were calculated on both the NERA and BHM data by subtracting relevant bond and bill yields from the nominal NERA and BHM annual grossed up returns. The average arithmetic and geometric means of the resulting four series were then calculated (Table 56). Averaging the bill and bond MRPs for both NERA and BHM produces 5 year MRP estimates that range between 5.8 and 6.6 per cent for the arithmetic means and 3.8 and 5.1 per cent for the geometric means.

711. The Authority notes that there are mixed views as to the best estimator of historic returns. Arithmetic average returns will tend to overstate returns, whereas geometric returns will tend to understate returns.[288] An unbiased estimator is likely to lie somewhere between the two estimates. (That said, the Authority's view is that arithmetic means are preferred in most circumstances.)

[286] The lower bound of 5.6 per cent is the Authority's 2013 estimate for a gamma of 0.4. The upper bound of 9.7 per cent is the Capital Research's estimate, which is based on a 'net theta' of 0.5, which aligns with a gamma of 0.4.

[287] In the BHM data, bills are around 3 months and bonds are around 10 years, thus the average term of the two estimates is approximately 5 years (see T.Brailsford, J.Handley and K.Maheswaran, Re-examination of the Historical Equity Risk Premium in Australia, *Accounting and Finance*,vol. 48, 2008, pp. 81 to 83). Taking the average of the historic annual MRPs with respect to bonds and bills will give an estimate of the annual MRP that is close to a 5 year term. The Authority notes Lally's observation that this is likely to underestimate the 5 year risk free rate due to the concavity of the typical yield curve (see M. Lally, *Review of Arguments for the Term of the Risk Free Rate*, 18 November 2015, p. 8). However, the effect is to slightly overstate the historic estimate of the MRP. Lally notes that there will only be a few basis points in it. Accordingly, the Authority considers that the resulting estimate remains reasonable, making use of the available information.

[288] M. McKenzie and G. Partington, *Supplementary report on the equity MRP*, 22 February 2012, p. 5.

Table 56 Estimates of bill and bond-based 5 year grossed up nominal average Market Risk Premiums

Period	BHM	NERA	Average	BHM	NERA	Average
	Arithmetic mean			Geometric mean		
1883-2014	6.6%	6.4%	6.5%	5.2%	5.0%	5.1%
1937-2014	6.2%	6.2%	6.2%	4.2%	4.3%	4.2%
1958 - 2014	6.6%	6.6%	6.6%	4.2%	4.2%	4.2%
1980 - 2014	6.3%	6.3%	6.3%	3.8%	3.8%	3.8%
1988 - 2014	5.8%	5.8%	5.8%	4.0%	4.0%	4.0%

Source: Brailsford, Handley, Maheswaran (2012) and ERA Analysis, December 2015.

712. The Authority in this instance is looking for a reasonable lower bound for its range. As noted, the Authority is inclined to the arithmetic mean as a preferred estimator. A lower bound informed by the lowest arithmetic mean estimate from Table 56 would be 5.8 per cent. However, the Authority considers that this lower bound may be too high, given possibility of upward bias in the arithmetic estimate, and the need to establish a range.

713. The Authority therefore exercises its judgment to adjust this bound down, informed by the lower estimates of the average MRP that are provided by the geometric means (Table 56). The Authority considers that 5.5 per cent provides a reasonable lower bound, being the average of the lowest arithmetic mean of 5.8 per cent and the highest geometric mean of 5.2 per cent.

714. The resultant estimate of 5.5 per cent implies an upward adjustment of the original lower bound for the MRP range set out in the Guidelines, which was 5 per cent. The Authority will apply the revised lower bound of 5.5 per cent to establish the overall range for the forward looking MRP for this Draft Decision.

715. For completeness, the Authority notes that the upper bound for the range of the MRP, informed by the historic estimates, would be given by the Wright estimate, which is the 10.83 per cent nominal return from Table 54, minus the current estimate of the risk free rate, which is 1.96 per cent. The resulting upper bound for the historic estimates given the inflation outlook at the current time would be 8.87 per cent, or 8.9 per cent rounded.

Range for the MRP

716. The Authority will adopt an *indicative* range for the 5 year forward looking MRP for this Draft Decision of 5.5 to 9.7 per cent. The:

- lower bound of the range is informed by the Ibbotson average excess premium; and
- upper bound of the range is informed by the upper bound of recent DGM estimates.

717. This range is wider than that informed by the historic estimates (5.5 to 8.9 per cent based on Ibbotson and Wright respectively), given that the upper bound of 9.7 per cent reflects Capital Research's 2012 DGM estimate shown in Table 55.

718. The Authority uses forward looking indicators and its judgment to assist in determining a point estimate for the MRP from within this historic range for input to the Sharpe Lintner CAPM.

Forward looking indicators (conditioning variables)

719. The Guidelines set out that forward looking indicators approach would be used to condition the point estimate of the MRP within the estimated range, for the five years of the access arrangement:[289]

> The Authority considers that a range of other information is relevant for determining the point estimate of the MRP… this additional information will be considered as to whether it implies a revision, upwards or downwards, to the midpoint of the MRP range.

720. In light of this the Authority now considers it preferable to take a non-parametric approach, estimating an upper and lower bound at each determination and considering the position of the MRP relative to the mid-point. Mechanistic calculation and application of distributions may not be robust due to issues associated with non-stationary and unrepresentative data series. There are also qualitative issues as to how forward looking data is viewed and interpreted by market participants.

721. The Authority notes that the mid-point of the *indicative* range of the MRP of 5.5 to 8.9 per cent (informed by the Ibbotson and Wright approaches) is 7.2 per cent.

722. For this Draft Decision, four forward looking indicators of market conditions for the next 5 years that are readily available and consistent with the date of the *indicative* estimate for the rate of return are adopted to inform the point estimate. These are:

- dividend yields on the All Ordinaries, a financial metric;
- interest rate swap spreads on 5 year bonds, which can be viewed as a type of term structure variable;
- default spreads, another term structure variable that makes forward looking expected returns explicit; and [290]
- the Australian Stock Exchange (ASX) 200 Volatility Index (**VIX**) which measures investors' perceptions of equity market risk.

Dividend yields

723. Bloomberg's dividend yield series provide one forward looking indicator. The dividend yields are the 'consensus' of analysts' expectations for dividends for the ASX All Ordinaries.[291]

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[289] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 216. The Authority undertook that step in the indicative example in the Guidelines in Step 4, but now considers that it is better placed in Step 2. However, the use of forward looking indicators is not a 'new development' (ATCO Gas Australia, *ATCO Gas Australia's Response to the ERA's Draft Decision*, 22 December 2014, Appendix 9.1, p. 22).

[290] The default spread was calculated as the difference between the 5 year AA Australian corporate Bloomberg fair value curve and 5 year Commonwealth Government Bond index. These series are the most liquid, complete and up to date default spread measures available to the Authority and so are considered the most efficient reflection of market price movements.

[291] The Authority notes that dividend yields contribute to the DGM estimates for the expected return on the market. Their use here is intended to provide an indication of forward earnings relative to the past, and

724. The dividend yields referred to above are expressed as equation (10) below.

$$Dividend\ Yields_0 = \left(\frac{D_0}{P_0}\right) \quad (10)$$

Where:

- D_0 is the latest net dividend paid; and
- P_0 is the latest price of the equity in question.

725. Recent expectations for dividend yields at the end of March 2015 were 4.1 per cent, just above the longer term average of 4.1 per cent (since 1 January 2000 – see Figure 14 below).

726. The Authority considers that dividend yields support an estimate for the forward looking 5 year MRP that is somewhat above the mid-point of its historic range.[292]

Figure 14 ASX All Ordinaries analyst consensus dividend yields

Source Bloomberg EQY_DVD_YLD_12M

Default and Interest Rate Swap Spreads

727. The 5 year interest rate swap spreads capture, among other things, the credit risk of financial institutions. The Interest Rate Swap (**IRS**) rate is the index rate at which financial institutions borrow and lend from each other. This rate is higher than the

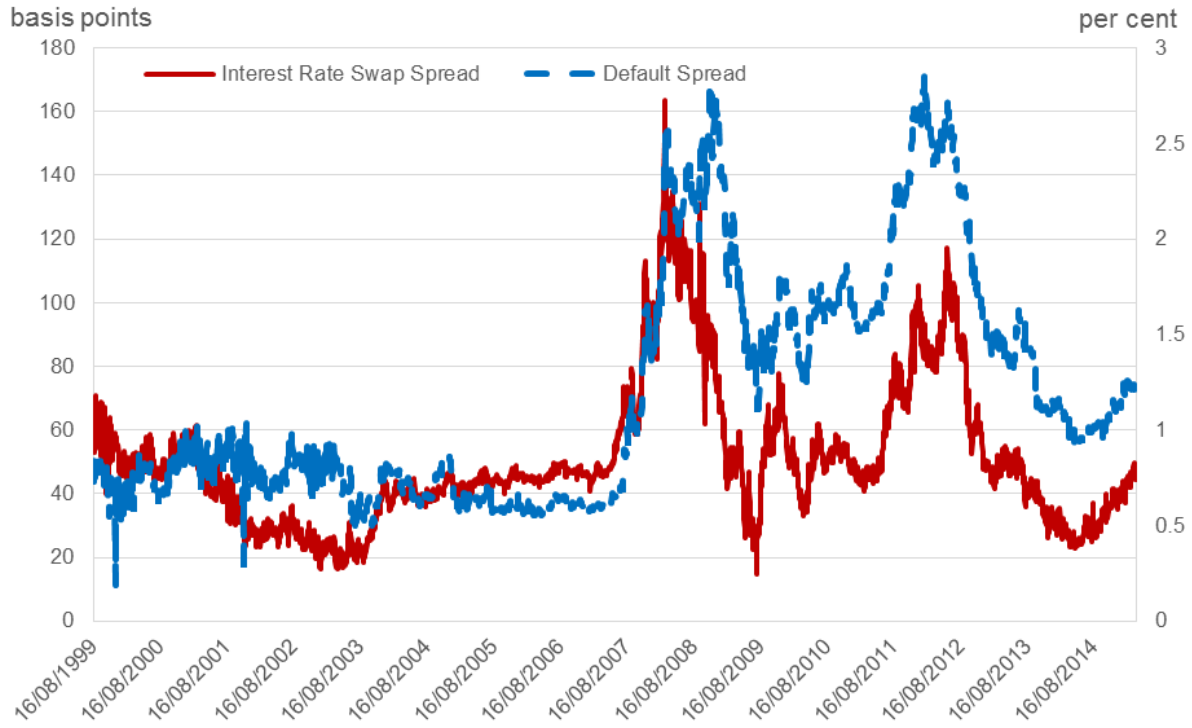
hence provide an indication of the forward looking MRP relative to the range derived from the historic estimates.

[292] The current dividend yields are at the 60th percentile of the historic observations in Figure 14.

CGS yield of an equivalent term with the 'spread' over the CGS capturing the credit risk of financial institutions.

728. Figure 15 below shows that the 5 year AA default and IRS spread move in a very similar fashion which tends to confirm that they are subject to similar market risk.[293]

Figure 15 5 Year interest rate swap versus 5 year default spread



Source: Bloomberg and ERA Analysis, December 2015.

729. The 5 year interest rate swap spread (Figure 15, LHS, basis points) appears to have returned to pre-2007 levels, but has recently begun to trend upward. The current spread, however, does not suggest that levels of risk in the financial sector are unusually high.

730. The default spread (Figure 15, RHS, basis points) has not returned to pre-crisis levels and also has been trending upward in line with the swap spread. This suggests that in the broader corporate sector (other than financials) levels of credit risk are still perceived to be relatively high, although still below the levels associated with 2008 to 2009 and 2011 to 2012. The current estimate – at 1.22 per cent – is above the mid-point of the range of more typical' observations, which is 0.5 to 1.7 per cent.[294]

731. The Authority considers that default spreads therefore support an MRP estimate somewhat above the mid-point of the historic range.

Stock Market Volatility Index

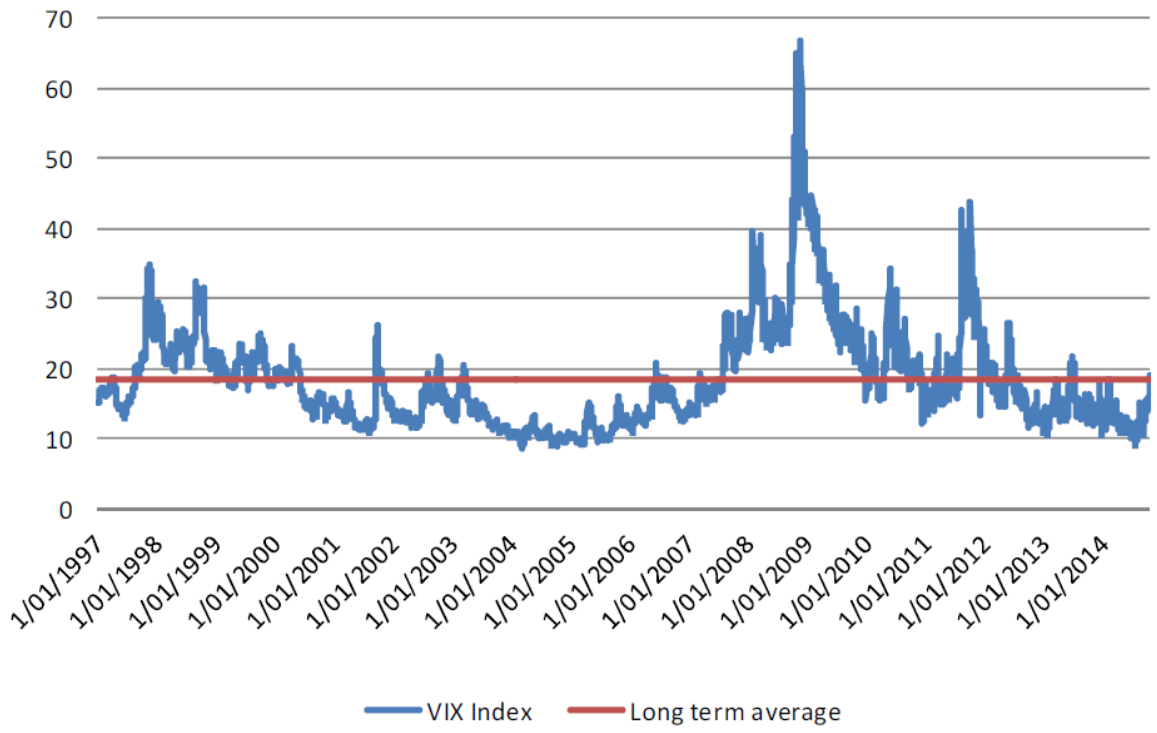
[293] The Authority notes that the majority of bonds that constitute the Bloomberg AA fair value curve are those issued by financial institutions. As at 18 March 2015, 89 per cent of the constituent bonds are issued by issuers classified as financials.

[294] The most recent estimate is at the 62nd percentile of all the observations in Figure 15.

732. The benefit of using stock market volatility indices is that it represents a different class of index to those discussed already. As outlined above, the IRS spreads and default spreads convey similar information while the DGM is an extension of dividend yields. Using different versions of similar indicators introduces the risk of double counting, or over-weighting measures that contain the same information. A volatility index of some variety provides a differentiated measure of risk as it is concerned with variance (uncertainty around return outcomes) as opposed to levels of return or yields. The VIX therefore is used as measure of forward looking risk in this Draft Decision.

733. Although useful for gauging future perceptions of risk stemming from forecast variability in returns, the Authority has access to only a limited history, dating back only to 2008. However, the AER has sourced a longer term series of the ASX 200 VIX index which allows for more meaningful historical comparison between the most recent level of the VIX and previous levels back to 1997. This series is reproduced in Figure 16.[295]

Figure 16 Implied Volatility (ASX200 VIX) Over Time



Source: Australian Energy Regulator [296]

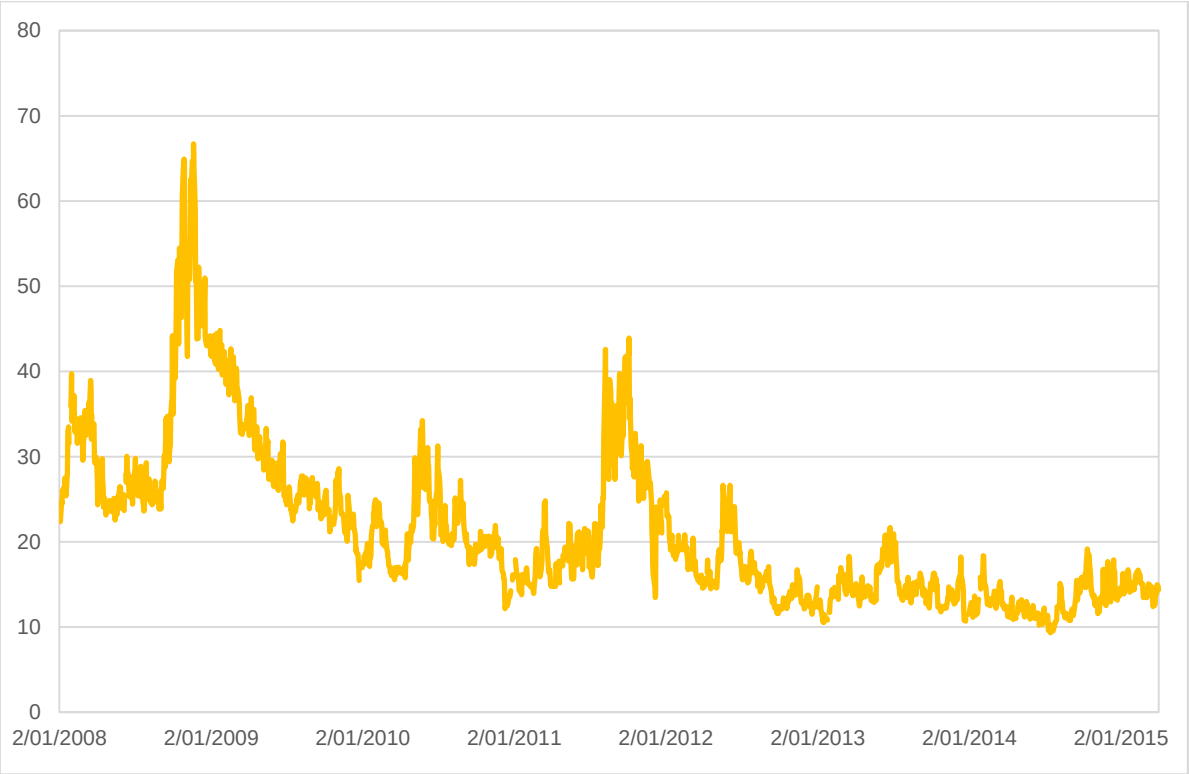
734. The series around 2014 reaches a level which is approximately on par with the low points observed over 2004 to 2005. More recently the series has begun to revert

[295] Australian Energy Regulator, *Jemena Gas Networks (NSW) Ltd Access Arrangement 2015-2020: Draft Decision*, Attachment 3: Rate of Return, November 2014, p. 205. The Authority is not able to access this proprietary data as it is no longer available. The Authority has been advised by the Australian Energy Regulator that the series prior to 2008 was sourced from Bloomberg as the CITJAVIX Index, which is no longer provided by Bloomberg. The AER's chart of this data is therefore reproduced here.

[296] The Authority has been advised by the Australian Energy Regulator that the series prior to 2008 was sourced from Bloomberg as the CITJAVIX Index, which is no longer provided by Bloomberg.

toward the long term average level observed. The series has been updated to 2 April 2015 in Figure 16 with data that is accessible to the Authority.[297]

Figure 17 Implied Volatility (ASX200 VIX): 2 January 2008 to 2 April 2015



Source: Bloomberg and ERA Analysis

735. This series suggest that the VIX is below the long term median value in the observed data in Figure 16 and Figure 17. This supports the choice of an MRP that is below the mid-point of the historic MRP range.

The point estimate of the MRP

736. The forward looking MRP for input to the Sharpe Lintner CAPM is unobservable. The Authority has therefore accounted for a range of information in order to estimate the MRP. That information includes:

- a range for the MRP that reflects historic excess returns;
  - which is combined with conditioning variables which indicate expectations for relative risk over the regulatory period – interest rate spreads, market volatility, as well as current expectations for dividend yields; and
- a range for the forward looking MRP that reflects the DGM model.

737. In considering that information for this Draft Decision, the Authority has concluded that the MRP can exhibit marked variation, depending on circumstances. Given that marked variation, the Authority considers that it should not unduly constrain the range for the MRP. The Authority therefore has re-estimated the range, widening the estimates to account for all recent relevant information. The lower bound has

[297] Without access to the underlying data for the full series, the Authority is unable to reproduce the exact percentile value for the most recent observation over the whole data range. However, close inspection of the combined series in Figure 16 and Figure 17 suggests that the 2 April 2015 outcome is somewhat below the 50th percentile.

increased in recognition that the MRP needs to be estimated with regard to the five year risk free rate. In addition, the Authority notes that the upper bound has increased to be consistent with the five year risk free rate, and also to account for the range of recent DGM estimates.

738. The resulting *indicative* estimated range for this Draft Decision is 5.5 per cent to 9.7 per cent, which spans:

- the range of the MRP implied by the historic data, which is 5.5 per cent to 8.9 per cent;
- the range for the MRP implied by recent estimates from the DGM, which is 5.6 per cent to 9.7 per cent.

739. With the range established, the Authority then exercises its judgment, to determine an *indicative* point estimate that is consistent with prevailing conditions in equity markets as at 2 April 2015 (which is the end of the *indicative* averaging period for this Draft Decision).

740. With regard to the historic estimates, the Authority draws on a range of forward looking indicators to assist its determination of the most reasonable point estimate of the MRP from within the estimated range:

- The VIX data indicate that the 5 year post-tax nominal MRP is somewhat below the mid-point of the historic MRP range:
- The spread data supports a forward looking estimate that is somewhat above the mid-point of the historic range.
- Dividend growth data also suggest an MRP point estimate that is somewhat above the mid-point of the range.

741. The conditioning data, taken together, suggest that the forward looking MRP should be somewhat above the mid-point range for the MRP using historical data.

742. In addition, the Authority notes that a forward looking MRP estimated using the DGM falls within a range of 5.6 per cent and 9.7 per cent, with the mid-point estimate of approximately 7.7 per cent. However, the Authority considers that it is widely accepted that a market return on equity (or the MRP) using the DGM tends to be over-estimated. In addition, at the same time, the Authority recognises that the DGM estimates need to be tempered to account for a range of issues which imply upward bias, as indicated above, in the resulting estimates of the MRP.

743. On balance, taking all the above mentioned information into account, the Authority exercises its judgment to determine an *indicative* estimate of the forward looking post-tax nominal MRP for this Draft Decision of 7.6 per cent, as reflecting the expectations of the market as at 2 April 2015.

744. With this estimate, the Authority has accounted for:

- the information provided by the forward looking indicators relative to their history, which suggest an MRP that is around the mid-point of the historic range;
- the implied MRP from a range of recent DGM estimates, which suggest that expected returns are between the mid-point and the upper bound of the overall range, noting;

- that the DGM outcomes do not exactly match the 5 year outlook adopted for this Draft Decision;
- the recognised shortcomings of the DGM approaches which lead to upward bias in the estimates; and
- differences in approach and vintage, which render some estimates more relevant than others.

745. The Authority is satisfied that the resulting estimate meets the requirements of the NGL and NGR. In particular, the Authority is satisfied that the estimate for the MRP of 7.6 per cent reflects prevailing conditions in the market for equity funds and that it contributes to the achievement of the allowed rate of return objective, as required under NGR 87.

Step 3: Estimation of the return on equity using the Sharpe-Lintner CAPM

746. The Authority notes that GGT proposed to adopt an estimate of the 10-year risk free rate of return of 3.73 per cent, the MRP of 7.77 per cent, together with equity beta of 1.10. Based on these inputs adopted for the SL CAPM, GGT's calculations indicated that its rate of return on equity is 12.28 per cent.[298]

747. However, based on the reasoning set out above, the Authority is of the view that the appropriate return on equity for GGT in this Draft Decision is an *indicative* 8.04 per cent. This *indicative* estimated rate of return on equity is calculated using the Sharpe Lintner CAPM, with the *indicative* 5-year risk free rate at 1.96 per cent, the *indicative* MRP at 7.6 per cent, and the Authority's estimate of the equity beta for the GGP benchmark efficient entity of 0.8.

Step 4: Cross checking the estimate of return on equity

748. The Authority notes GGT's view that an absence of comparators, which can be shown to have a degree of risk similar to that of GGT in its provision of the reference service using the Covered Pipeline, makes the task of cross checking the return on equity difficult. The Authority also notes GGT's argument that GGT's estimate of the return on equity of 11.24 per cent is similar to the estimate of the return on equity for a listed networks business obtained using the dividend growth model (11.0 per cent), and consistent with an estimate of 12.28 per cent for the GGP with higher systematic risk.[299]

749. The Authority notes GGT's argument that GGT's estimated return on equity of 11.24 per cent is similar to the estimate of the return on equity for a listed networks business obtained using the dividend growth model (11.0 per cent). In addition, GGT considered that its proposed estimate of the return on equity of 11.24 per cent is also consistent with SFG's recent estimate of the market return using the Fama French model, which produced the estimate of 10.9 per cent.

750. The Authority is not convinced that GGT's crosscheck is sensible. This view is based on the observation that all studies, which GGT used as the crosscheck, were prepared by its consultant on the issue, the SFG. The Authority is of the view that

[298] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 118.

[299] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 119.

the crosscheck is only valid as long as the estimated return on equity is compared with various independent sources.

751. The Authority set out in the Rate of Return Guidelines that it would consider a range of other material as a test for reasonableness of the estimate derived in Step 3.[300]

Other evidence on the risk free rate

752. The estimate of the risk free rate is the *indicative* 20 day average of the 5 year yield on Commonwealth Government Securities. Similarly, the base rate for the return on debt is estimated from the *indicative* 20 day average of the 5 year interest rate swap. As these estimates are observed from the market, the Authority considers that they are robust.

753. The Authority notes that at 1.96 per cent, the CGS estimate is lower than the average of 5 year rates over recent decades, reflecting a concerted downward trend. The Authority considers that the prevailing 5 year CGS estimate is the best predictor for the next five years. On this basis, the Authority considers that 1.96 per cent as at 2 April 2015 is the best estimate for use in the Sharpe Lintner CAPM.

Other evidence on the market risk premium and the implied market return on equity

754. For this Draft Decision, the Authority has taken account of forward looking information to inform its estimate of the point MRP, including:

- a range for the MRP that reflects historic excess returns;
- forward looking conditioning variables – measures of risk based on interest rate spreads and market volatility, as well as current expectations for dividend yields; and
- a range for the forward looking MRP that reflects the DGM model.

755. The Guidelines noted that a range of other material is considered relevant which may provide a cross check for the estimate of the MRP and the resulting estimate of the return on equity:

- views of valuation experts and surveys;
- decisions of other regulators; and
- the relationship between the return on equity and the return on debt.

756. A threshold issue in any comparison involves ensuring that estimates are on a consistent 'apples with apples' basis. Key issues in this context involve:

- the term of the estimates; and
- the treatment of imputation.

Term of the estimates

757. As noted above, the Authority is of the view that the term over which the rate of return expectations should be assessed is 5 years, so as to match the regulatory

[300] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, Appendix 29 – Other relevant material.

period. This is consistent with the Authority's intention to account for the 'present value' principle.

758. The 5 year forward looking horizon contrasts with that of independent analysts. Independent analysts tend to adopt a longer horizon for their discount rates because they are typically valuing assets on the basis of the cash flows to perpetuity. In Australian financial markets, 10 year government bonds are among the most common 'long maturity' bonds, and thus traditionally have been used as a proxy for the long term return on debt to perpetuity. Similarly, analysts estimate the equity premia component over a longer term horizon, involving 10 years or more.[301]

759. A 10 year view tends to 'smooth' out the large, but infrequent spikes in expected risk premia that are more evident in shorter investment horizons. The implication is that risk premia under a 5 year approach are generally lower than the 10 year average, for much of the time. However, the 5 year estimates are more volatile than the 10 year estimates, as they are more sensitive to fluctuations in prevailing market conditions. Over time, the average of the many 5 year observations should converge toward the average risk premium observed under a longer perpetuity approach.

760. The Authority's 5 year estimates therefore are not directly comparable to the long run estimates commonly developed by independent analysts.

761. Lally endorses exactly this view when he responds to similar arguments for the Queensland Competition Authority (**QCA**) in the context of the risk free rate:[302]

> This line of argument presumes that the QCA is engaged in the same exercise as the valuers and therefore ought to be using the same parameter values. However the two exercises are fundamentally different, and this readily explains the difference in rates. The QCA resets the risk-free rate every few years (typically five years) and therefore need only be concerned with the prevailing risk-free rate for the next five years. By contrast these valuers are conducting DCFs for businesses with infinite-life cash flows and therefore would be interested in the prevailing term structure of risk-free rates for terms out to infinity. Since observed rates exist only out to ten years, these valuers would have to speculate upon the rest of the term structure, and then invoke an average rate if they used only one rate (as they do). Since the term structure is currently markedly upward sloping, the term structure beyond the five year term invoked by the QCA will be in excess of this regulatory rate and therefore the average rate invoked by the valuers over the entire term structure would be in excess of the five-year rate invoked by the QCA.

762. Seeking comparability, the Authority in the ATCO Gas Distribution System Draft Decision developed a rolling forward looking estimate of the 5 year return on equity for the market, derived using the sum of the 40 day averages of the 5 year government bond rate and the contemporaneous 5 year forward looking estimate of the MRP following an (indicative) fixed weights approach with the forward indicators.[303] It then took an average of this forward looking 5 year return on equity series for the 1993 – 2014 period, which was 10.9 per cent. This average estimate

[301] The DGM, for example, estimates the discount rate that equates the future stream of cash flows to the current share price.

[302] M. Lally, *Response to submissions on the risk free rate and the MRP*, 22 October 2013, p. 24.

[303] The rolling forward looking five year estimate of the MRP was derived by applying a weighted average from four 'normalised' forward looking indicators to the Authority's range in the Draft Decision for the MRP (5 – 7.5 per cent) (see Economic Regulation Authority, *Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 14 October 2014, pp. 174 – 176).

was then used for the purpose of comparing the Authority's estimates for the return on the market with that of independent analyst estimates.

763. The Authority notes that the 10.9 per cent estimate is similar in concept to the Wright estimate of the return on the market to perpetuity. To estimate the return on equity for the market to perpetuity, the Authority would apply an estimate of inflation consistent with the mid-point of the Reserve Bank of Australia's target range, which is 2.5 per cent, to its estimate of the long run real market return on equity, grossed up, which is 8.76 per cent.[304] The resulting nominal estimate of the return on equity for the market is 11.48 per cent (grossed up –Table 57).

Table 57 Average annual imputation credit yields and grossed up arithmetic average returns (nominal, consistent with the estimate of gamma 0.4)

	NERA	BHM	Average
Nominal returns excluding imputation yield (1883-2014)	12.00%	11.64%	11.82%
Nominal imputation credit yield (1988-2014)	0.91%	0.91%	0.90%
Grossed up nominal returns (1883-2014)	12.19%	11.83%	12.01%
Grossed up real returns (1883-2014)	8.94%	8.58%	8.76%
Expected inflation to perpetuity	2.50%	2.50%	2.50%
Grossed up forward looking return on the market to perpetuity	11.67%	11.30%	11.48%

Source: ERA Analysis (December 2015), NERA (2013), Brailsford, Handley and Maheswaran (2012)

764. With a long enough span of data however, the Authority expects that the average of the 5 year estimates will approach the long run average.

765. Therefore, the Authority remains of the view that its 5 year forward looking estimate is not directly comparable to the perpetuity estimates developed by independent analysts for valuing firms. It is more appropriate to compare the long term average estimate of the return on equity – such as the Wright estimate underpinning the Authority's estimate – with those of independent analysts.

Adjustments for imputation credits

766. A further consideration when comparing estimates relates to the treatment of imputation credits.

767. Longer term average return on equity estimates which include data before 1987 – such as the long term 128 year average historic estimates of Brailsford et al will tend to overstate the average observed 'market' return on equity under the current imputation credit regime (that is, the return observed in the market arising from dividends and capital gains).

768. This is because many investors in the post 1987 period receive a proportion of their required return on equity through imputation credits; yet this return is not observed in the market. The return through imputation credits therefore accounts for a proportion of the overall return on equity, all other things being equal. Hence the pre 1987 observed return on equity is not comparable to the post 1987 observed

[304] This is exactly the approach adopted by the Authority in its rail WACC decisions, where the estimate has a term to perpetuity (see Economic Regulation Authority, *Review of the method for estimating the Weighted Average Cost of Capital for the Regulated Railway Networks: Revised Draft Decision*, 28 November 2014, p. 93).

return; the latter will be lower due to part of the required return coming from imputation credits which cannot be observed in the market.

769. It is therefore important to 'gross up' any post 1987 observed market return to account for the impact of imputation credits, if the full return on equity is to be accounted for.

770. The amount of the gross up will depend on the assumptions relating to the impact of imputation credits in the Australian capital market. The assumptions adopted in grossing up the historic estimates for this Draft Decision are consistent with those used when estimating the gamma term.

771. As noted by Handley:[305]

> The Officer model typically used to inform returns on equity in Australia under the CAPM has one before company tax and four after company tax WACCs. The four after tax company tax WACCs each differ, based on whether the interest tax shield and the value of imputation credits are included or otherwise in the definition of the corresponding after tax cash flows.

772. Officer assumes the CAPM holds when returns are expressed on an 'after company but before personal tax basis'. As shown in (11):

$$X_E = X_E' + \gamma T\left(X_O - X_D\right) \qquad (11)$$

Where:

X_0 is the firm's operating income (free cash flow) that is ultimately distributed to X_D (that is, to debt claimants), X_E (equity claimants) and X_G (government claimant through the tax rate T);

$X_E' = (1-T)\left(X_O - X_D\right)$ is the cash dividend distributed to equity investors;

$T\left(X_O - X_D\right)$ is the amount of franking credits distributed to investors;

$\gamma T\left(X_O - X_D\right)$ is the proportion of the franking credits distributed to investors.

773. X_E is the 'grossed up' value of the returns to investors which includes the value of franking credits. It is consistent with the value on an 'after company before personal tax basis'. On the other hand, XE' is consistent with the value on an 'after company after some personal tax' basis.

774. The conventional approach to describing a return as 'after company tax' is somewhat misleading in an imputation setting, as company tax paid $T\left(X_O - X_D\right)$ consists of a mixture of personal tax $\gamma T\left(X_O - X_D\right)$ – being the part rebated against personal taxes – and the effective company tax $T\left(X_O - X_D\right)(1-\gamma)$ being the part that is not rebated against personal taxes.

[305] J.C. Handley, *Further comments on the historical equity risk premium*, Report for the Australian Energy Regulator, 14 April 2009, pp. 16-17.

775. The Officer CAPM for the Australian imputation tax system is as shown in (12):

$$E(R_E) = R_F + \beta \left[\mathrm{E}(\mathrm{R}_M) - R_F \right] \quad (12)$$

Where:

- $E(R_E)$ is the expected grossed up return on equity;
- R_F is the risk free rate of return;
- β is the equity beta of the firm; and
- $E(R_M)$ is the expected grossed up return on the market portfolio.

776. Officer assumes the CAPM holds when expected returns are expressed on an 'after company before personal tax basis' that is consistent with X_E.

777. The Authority's starting estimate of the return on equity is the vanilla $E(R_E)$, which can be derived using Officer's after tax case (iii).[306] The $E(R_E)$ is consistent with X_E, being the return observed in the market inclusive of imputation credits. As noted above, the Authority's longer term average of the estimates of $E(R_E)$ may be higher or lower than its current 5 year forward looking estimate, inclusive of imputation credits.

778. In the post-tax revenue model building block approach adopted by the Authority, the return on equity included in the rate of return weighted average cost of capital will be kE. The PTRM then explicitly accounts for the return to investors $\gamma T\left(X_O - X_D\right)$ as an adjustment to the cash flow allowance for tax within the model.

Views of valuation experts

779. Evidence of market analysts' views suggest that their expectations for the forward average market returns on equity are consistent with the longer term average of the forward looking return on equity underpinning the Authority's estimates.

780. An example is the recent WACC estimate by Grant Samuel used in discounting Envestra's cash flows, which was cited by SFG Consulting:[307]

781. Grant Samuel's estimate of the return on equity is informed by the Sharpe Lintner CAPM, with the risk premium and risk free rate then adjusted to have regard to a range of other evidence, including that from the Gordon Dividend Growth Model (**DGM**).[308]

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306 J.C. Handley, *Further comments on the historical equity risk premium*, Report for the Australian Energy Regulator, 14 April 2009, pp. 16-17.

307 ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 19, p. 84.

308 Grant Samuel, *Envestra: Financial Services Guide and Independent Expert's Report*, 3 March 2014, Appendix 3.

782. Grant Samuel's initial estimate for the *market* return on equity derived using the Sharpe Lintner CAPM is 10.2 per cent. Grant Samuel states that:[309]

> The CAPM is probably the most widely accepted and used methodology for determining the cost of equity capital. There are more sophisticated multivariate models which utilise additional risk factors but these models have not achieved any significant degree of usage or acceptance in practice. However, while the theory underlying the CAPM is rigorous the practical application is subject to shortcomings and limitations and the results of applying the CAPM model should only be regarded as providing a general guide.

783. This estimate is based on a long run historic MRP of 6 per cent, which is added to the prevailing 10 year risk free rate (at the time) of 4.2 per cent. Grant Samuel notes that it:[310]

> …has consistently adopted a market risk premium of 6% and believes that this continues to be a reasonable estimate. It:
>
> - is not statistically significantly different to the premium suggested by long term historical data;
> - is similar to that used by a wide variety of analysts and practitioners (typically in the range 5-7%); and
> - makes no explicit allowance for the impact of Australia's dividend imputation system.

784. The Grant Samuel estimate is defined as a 'classical', after tax rate that is based on the estimated nominal ungeared after tax cash flows.[311] On this basis, it is defined consistent with Officer's after tax case (iv).[312] In this case, the k_E is identical to the k_E in case (iii), being the total return on equity from all sources.

785. The Grant Samuel WACC CAPM estimate of 10.2 per cent ignores the impact of imputation credits.[313]

786. The Authority notes that the resulting estimate should be grossed up.

787. Appropriately configured – assuming that dividends provide around 4.5 per cent of the total 10.2 per cent yield – the grossed up return would be 10.97 per cent (utilising the Authority's estimate of gamma of 0.4).

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[309] Grant Samuel, *Envestra: Financial Services Guide and Independent Expert's Report*, 3 March 2014, Appendix 3, p. 1.

[310] Grant Samuel, *Envestra: Financial Services Guide and Independent Expert's Report*, 3 March 2014, Appendix 3, p. 6.

[311] The Authority notes that Grant Samuel's 'classical WACC' differs from the 'nominal vanilla WACC' estimate.

The classical WACC reduces the cost of debt to account for the impact of the tax shield (that is, the cost of debt component is D/V*(1-T)*Rd), whereas the nominal vanilla WACC ignores the impact of the tax shield as this is accounted for in the cash flows. However, both approaches adopt the same estimate for the return on equity component (that is, $E/V*k_E$ using Handley's terminology).

[312] J.C. Handley, *Further comments on the historical equity risk premium*, Report for the Australian Energy Regulator, 14 April 2009, pp. 16-17.

[313]. Grant Samuel, *Envestra: Financial Services Guide and Independent Expert's Report*, 3 March 2014, Appendix 3, p. 9:

In Grant Samuel's view, however, the evidence gathered to date as to the value the market attributes to franking credits is insufficient to rely on for valuation purposes. More importantly, Grant Samuel does not believe that such adjustments are widely used by acquirers of assets at present… Accordingly, it is Grant Samuel's opinion, that it is not appropriate to make any adjustment.

788. The Grant Samuel estimate was made at a time when the 10 year risk free rate was 4.2 per cent. The prevailing rate is closer to 2.6 per cent. Adjusting the grossed up Grant Samuel for this change would yield an estimate of the grossed up market return on equity using the Sharpe Lintner CAPM of 9.4 per cent.

789. Grant Samuel ultimately assess an overall equity *market* return to be in the range of 10.7 to 15.2 per cent, an estimate that is higher than its CAPM-based estimate, which is 10.2 per cent, as noted above. The higher range accounts for:

- first, estimates from other return on equity models, such as the Gordon DGM;
- second, for Grant Samuel's view that equity investors have re-priced risk since the global financial crisis (lifting the MRP above 6 per cent); and
- third, that bond rates are at unsustainably low levels (which Grant Samuel therefore 'normalise' by increasing the risk free rate from the observed current value around 4 per cent to 5 per cent).[314]

790. The resulting grossed up range is 11.47 to 15.97 per cent, using the Authority's assumptions on the dividend yield and on gamma, set out above.

791. The Authority considers that a comparison estimate for the return on the market to perpetuity, such as that undertaken by Grant Samuel, is the long run average of its return on equity estimates, of around 11.48 per cent. The Authority notes that this estimate is above the Grant Samuel estimate based on the Sharpe Lintner CAPM, which is less than 10 per cent. It also lies in the grossed up Grant Samuel range.

792. The Authority does not consider it appropriate to adjust up the risk free rate to a higher rate, as is done by Grant Samuel. Therefore, a more relevant lower bound for the Grant Samuel estimates is the Sharpe Lintner CAPM adjusted estimate of 9.4 per cent, with the range then 9.4 to 16.0 per cent (grossed up). The Authority's considers that its comparable perpetuity estimate is then well within the Grant Samuel range.

793. The Grant Samuel estimates therefore give the Authority no cause to revise its estimate of the return on equity, or its current estimates for the MRP.

794. The survey by Ernst & Young of other analysts' estimates gives results that are broadly consistent with the Grant Samuel view. Ernst & Young note that in 2012, independent market experts' market cost of equity estimates averaged 10.7 per cent. Ernst & Young also notes that independent experts typically do not assign a value to imputation credits, and that adjustment for this outcome would raise the estimate of independent brokers.[315,316] Grossed up using the Authority's assumptions, the estimate would equate to 11.47 per cent, which is close to the Grant Samuel estimate. Again, this outcome would give the Authority no cause to revise its estimate of the return on equity, or its current estimates for the MRP.

795. On this basis, the Authority is satisfied that its current estimate, albeit based on a different term, is reasonable.

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[314] Authority estimate based on Grant Samuel data, assuming a nominal risk free rate of 5.0 per cent.

[315] ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 35, pp. 14-15.

[316] ATCO Gas Australia, *Access Arrangement Information: 1 July 2014 – 31 December 2019*, 3 April 2014, Appendix 35, p. 23.

Views of other regulators

796. As noted in the Rate of Return Guidelines, the Authority will consider other regulators' estimates to check outcomes of its own decisions.

Australian Energy Regulator

797. The AER's return on the market is derived using the Sharpe Lintner CAPM, with point estimates informed by a range of relevant information and models.

798. The AER has the view that a longer term 10 year perspective is appropriate, based on the view that equity investors have long term investment horizons.[317]

799. In line with this view, the AER adopts a different term for the risk free rate in the Sharpe Lintner CAPM. Specifically, in its recent draft Jemena decision, the AER adopted:[318]

- a term for the return on equity of 10 years, with:
  - the risk free rate based on the estimated CGS yield, of 3.55 per cent;
  - a point estimate for the MRP of 6.5 per cent, from within an estimated range of 5.1 to 7.8 per cent; and
  - an equity beta of 0.7;
- giving a 8.1 per cent return on equity for the benchmark efficient entity; which is consistent with a resulting overall estimate of the return on the market of 10.1 per cent.

800. The range estimate of the AER for the MRP is lower than the Authority's. This reflects the AER's judgment based on a range of information, including:

- historical excess returns – which the AER determine are in the range of 5.1 to 7.8 per cent based on the BHM data;
- the AER's DGM estimates range from 6.6 (two stage DGM) to 7.8 (three stage DGM).

801. The lower range for the MRP also incorporates the AER's estimate of gamma (which was 0.5 at the time, which will make the MRP higher) and the use of the 10 year risk free rate (which will tend to make the MRP lower than the Authority's).

IPART

802. The Independent Pricing and Regulatory Tribunal (**IPART**) uses an average of a current 40 day and 10 year term for the risk free rate.

803. IPART proposes to adopt an estimate of the MRP which is informed by a range that is based on a range for historic estimates (estimated at 5.5 per cent to 6.5 per cent) and a range based on other current market data approaches – including using DGMs – which fall in the range 7.4 per cent to 8.8 per cent, giving an overall range

[317] S. Pratt and R. Grabowski, *Cost of Capital: Applications and Examples*, 4th edition, 2010, pp. 118–120; A. Damodaran, 'What is the risk free rate? A search for the basic building block', December 2008, pp. 9-10. Lally, M., The risk free rate and the present value principle, 22 August 2012. cited in Australian Energy Regulator, *Rate of Return Guidelines, Explanatory Statement,* December 2013, p. 49.

[318] Australian Energy Regulator, *Draft decision: Jemena Gas Networks (NSW) Ltd: Access arrangement 2015–20,* Attachment 3: Rate of return, November 2014.

for the MRP of 6.0 per cent to 8.7 per cent (as at February 2015). The mid-point of the assessed range – 7.2 per cent (as at February 2015) – may then be adjusted to account for strong contrary evidence.

804. Given an estimated mid-point risk free rate as at February 2015 of 3.8 per cent, IPART's return on the market is estimated to be around 12.0 per cent.[319]

805. The Authority considers that the IPART estimate is comparable to its own estimate, albeit based on a somewhat different method and judgements.

Other regulators' decisions

806. Other recent decisions by regulators for the MRP range from 6.0 to 6.5 per cent (Table 58).

Table 58 Other regulators' recent decisions

Regulator	Decision date	Sector	MRP (%)
QCA	August 2014	General	6.5
ESCV	June 2014	Water	6.0
NTUC	April 2014	Electricity	6.0

Source *Australian Energy Regulator, Draft decision: Jemena Gas Networks (NSW) Ltd: Access arrangement 2015–20, Attachment 3: Rate of return, p. 3-205.*

Conclusions with regard to other regulators' estimates

807. In accounting for this evidence relating to the views of other regulators, the Authority considers, first, that its estimate of the risk free rate is appropriate. It is consistent with the term of GGT's regulatory period, which is five years. This issue was discussed extensively in the Rate of Return Guidelines. It is also consistent with the use of the Australian domestic CAPM, set out in the Rate of Return Guidelines. No material presented by GGT, nor the views presented in the approaches of other regulators, has changed the Authority's view.

808. Second, with regard to the MRP, the Authority considers that its estimated range – of 5.5 per cent to 9.7 per cent – is comparable to other regulators, including the AER. The Authority considers that the evidence shows that the Authority has similar metrics relating to the MRP and the return on equity as compared to other regulators, albeit when compared on a consistent longer term basis.

Consistency of the return on equity with the return on debt

809. The estimated debt risk premium for the 2015 calendar year in this Draft Decision is 2.51 per cent above swap. The margin of the 5 year swap rate to the 5 year CGS rate used for the return on equity is 0.467 per cent, implying a total risk premium for the return on debt above the CGS rate of 2.98 per cent.

810. The Authority's estimate of the MRP is 7.6 per cent. With a beta of 0.8, together with the risk free rate of 1.96 per cent as at 2 April 2015, the equity risk premium for the benchmark efficient entity in this Draft Decision is therefore 8.04 per cent.

[319] Authority analysis, based on IPART, *Fact sheet – WACC update*, August 2014.

811. The Authority considers that the resulting difference in the premiums – around 2.87 percentage points, being the difference between the return on equity of 8.04 per cent and the cost of debt of 5.172 per cent – is reasonable, given the risk nature of the benchmark efficient entity.[320]

Beta

812. The Authority notes that GGT proposed its equity beta of 1.10 which is based on SFG's analysis on option pricing to determining the return on equity for GGT.

813. The Authority considers that the range for beta of 0.3 to 0.8 derived from the Australian benchmark comparator sample is reasonable. The Authority notes that this range allows a selection of a point estimate that is comparable to that for the benchmark efficient entity operating in Australia. Taking account of all relevant information relating to the Australian market, the Authority considers that the resulting point estimate from the estimated range will provide a better estimate than one that is informed by information from overseas markets.

814. That said, the Authority notes that the Australian Energy Regulator conducted its analysis informed by a range of international energy networks.[321] The evidence from that analysis points to a wide range of empirical estimates, with estimates both below and above the Authority's point estimate. The AER reported estimates of equity beta from its analysis using international companies span a range of 0.45 to 1.3. In considering this information, the Authority notes there are issues with regard to re-levering international estimates, which may render them unreliable, given the underlying differences in conditions in the countries of origin.[322]

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[320] The Authority notes DBP's submission suggesting that the elasticity of the return on equity to the return on debt should be 6, based on Merton's model (Dampier Bunbury Pipeline, *DBP Submission to ATCO Draft Decision*, 7 January 2015, p. 3). The Authority is currently investigating these claims as part of its response to DBP's access arrangement proposal.

The Authority has concerns that the outcomes are very sensitive to the input parameters and to any associated interpretation of the evidence.

In particular, the Authority considers that the evidence assembled by SFG in its Figures 1, 2 and 3 suggests that the elasticity in the Australian context should be 7 or higher, given an average term of debt for the benchmark firm of 10 years (Dampier Bunbury Pipeline, *Proposed revisions DBNGP Access Arrangement 2016-2020*, 31 December 2014, Supporting Submission 12, Appendix L, pp. 15-16).

Re-running SFG's calculations with an elasticity of 7 and the return on debt used for ATCO Final Decision gives the following. The current spot debt risk premium for 2015 used for this decision is 2.041 per cent (see paragraph 939 below). The associated estimated cost for the benchmark firm of issuing new (10 year) debt in March 2015 was therefore 4.75 per cent (given the swap rate of 2.71 per cent for 10 year debt from the RBA's data). Applying an elasticity of 7 to that figure would give a return on equity for the benchmark firm around 11.2 per cent, with an implied MRP of 12.2 per cent (based on an 'adjusted spread' of 1.22, an equity risk premium of 7*1.22=8.54 implied by the Merton relationship, and a resulting implied MRP = 8.54/0.7 given the Authority's decision on beta in ATCO Final Decision).

Considering input sensitivity, if the spread rose to 2.2 per cent, the implied MRP would be 13.8 per cent. The Authority notes that more than 50 per cent of monthly observations of the spread to swap of BBB band bonds have exceeded 220 basis points since January 2010, based on the Reserve Bank Data (see Reserve Bank of Australia, Aggregate measures of Australian corporate bond spreads and yields, Statistical Table F3, accessed July 2015).

The Authority considers that these numbers are unsupportable. The implied MRP of 12.2 per cent is well outside the range for the MRP considered reasonable, and used for ATCO Final Decision. The value is also extremely sensitive to inputs such as the credit spread.

The Authority has therefore not used this cross check method in ATCO Final Decision.

[321] Australian Energy Regulator, *Draft Decision: Jemena Gas Networks (NSW) 2015-20,* November 2014, p. 3-263.

[322] G. Partington, *Report to the AER: Return on equity (updated)*, April 2015, p. 74.

815. In conclusion, the Authority has considered the information on equity betas for utilities operating in overseas jurisdictions. The Authority has determined that these estimates are likely to provide a less reliable estimate of beta than that derived from the domestic comparator sample and the Authority's risk assessment of the GGP. The Authority therefore does not rely on the overseas estimates either for establishing the range, or for determining the point estimate of beta. Nevertheless, the Authority considers that its domestic range and point estimate of beta is not inconsistent with the reported range. The Authority therefore is satisfied that the beta estimate it has determined is robust and fit for purpose, and will therefore contribute to the achievement of the allowed rate of return objective.

Step 5 – Determine the return on equity

816. Taking into account all of the relevant information, the Authority is of the view that an indicative expected return on equity of 8.04 per cent is appropriate as an estimate for the forward looking 5 year return on equity for the benchmark efficient entity, as at 2 April 2015:

Estimated return on equity = 1.96 per cent + 0.8*(7.6 per cent) = 8.04 per cent

817. This is based on the forward looking 5 year estimate from the Sharpe Lintner CAPM. The cross checks set out in Step 4 confirm that this estimate is reasonable.

818. The Authority considers that the estimate is commensurate with the efficient equity financing costs of the benchmark efficient entity with a similar degree of risk as that which applies to the Service Provider in respect of the provision of Reference Services prevailing at this time. On this basis, the Authority considers that the estimate meets the allowed rate of return objective and the requirements of the NGR and NGL more broadly.

Return on debt

819. GGT submitted that using the 'on-the-day approach' set out in the Rate of Return Guidelines to estimate the return on debt would:[323]

- lead to a cost of debt lower than the cost of debt an efficient service provider would currently incur given debt issuing practices over the past 10 years; and
- may be superior in terms of productive efficiency, but is not superior in terms of allocative efficiency, as the latter is a matter of 'costs from which the prices to be charged by the regulated firm have been determined, and the structures of those prices (they are likely to be multi-part prices, and not simple prices equated to marginal costs)'.

820. GGT therefore proposes to estimate the cost of debt by means of a 10 year trailing average, with:[324]

- the debt risk premium to be based on an average of credit spreads reported by the Reserve Bank of Australia – for non-financial corporations with a credit rating in the BBB band and a term to maturity of 10 years – for the three months from April to June in each relevant year of the trailing average; combined with

[323] Goldfields Gas Transmission Pty Ltd, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal – Supporting Information*, 15 August 2014, p. 132.

[324] Goldfields Gas Transmission Pty Ltd, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal – Supporting Information*, 15 August 2014, p. 135.

- an on the day estimate of the 10 year risk free rate based on Commonwealth Government Securities, based on the 40 day average preceding 30 June in each relevant year of the trailing average; plus
- an annual margin of 0.15 per cent per annum to cover debt raising (0.125 per cent per annum) and hedging costs (0.025 per cent annum).

821. GGT proposes that the trailing average be updated annually during the access arrangement period, such that:[325]

- the first update is proposed to take place immediately prior to the commencement of second regulatory year in the access arrangement period, and subsequent updates at approximately 12 month intervals after that first update; and
- when the trailing average estimate of the return on debt is updated, the earliest estimate will be dropped from the average, and an estimate for the current year will be added.

822. In its recent ATCO GDS Final Decision, the Authority amended the approach for estimating the return on debt that it had set out in the Rate of Return Guidelines. The Authority in the GDS Final Decision:[326]

- revised its position with regard to the term for the DRP, accepting 10 years;
- adopted an 'extended bond yield' approach for estimating the DRP, incorporating bonds issued internationally, among other changes; and
- adopted a 'hybrid trailing average', which utilises an 'on the day' estimate of the risk free rate in combination with a simple 10 year trailing average of the DRP, without any transition.

823. These changes address many of the concerns outlined by GGT in its proposal. In particular, the acceptance of the trailing average approach for the DRP will address part of GGT's concerns about whether there is adequate recompense for a staggered portfolio. (The issue of adequate recompense for the risk free rate is discussed further below.)

824. However, the Authority takes issue with the following aspects of GGT's proposal for estimating the return on debt:

- the 10 year term used for estimating the risk free rate;
- the use of Commonwealth Government Securities as the proxy for estimating the risk free rate;
- the use of a 10 year trailing average for estimating the annual allowance for the risk free rate;
- the use of the Reserve Bank of Australia (**RBA**) credit spread data for estimating the DRP;
- the estimates of the hedging costs.

825. Each of these issues is addressed in what follows.

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[325] Goldfields Gas Transmission Pty Ltd, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal – Supporting Information*, 15 August 2014, p. 135.

[326] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, as amended 10 September 2015*, p. 289.

The term of the risk free rate

826. As noted in the detailed discussion on the risk free rate commencing at paragraph 524 above, the Authority does not accept the proposed 10 year term for the estimate of the risk free rate.

827. The Authority therefore requires that the term of the risk free rate be 5 years.

The proposed 10 year trailing average of the risk free rate

828. GGT proposes a *full* trailing average for estimating the return on debt. A full trailing average means here that it utilises a trailing average for both the risk free rate and the DRP (as opposed to a *hybrid*, which incorporates a trailing average for just the DRP component). GGT's principal reason for this position is that the on the day approach does not provide the service provider reasonable opportunity to recover the cost of its debt:[327]

> An on-the-day approach to estimation of the return on debt may lead to reference tariffs which better reflect the forward-looking cost of investing in pipeline capacity, and which signal to gas consumers the transmission component of the opportunity cost of gas use. That may be in the interests of consumers. But if the reference tariffs are insufficient to provide the service provider with the opportunity to recover its efficiently incurred costs of providing reference services, they will impair the continued and efficient provision of pipeline services, and they will not motivate a service provider's future efficient investment in the pipeline used for reference service provision...
>
> GGT has therefore adopted a trailing average approach to estimation of the return on debt for the Covered Pipeline.

Acceptance of the trailing average approach for the DRP

829. As noted above, the Authority accepted the *hybrid* trailing average variant of the trailing average approach in its most recent decision on the ATCO GDS Final Decision. The hybrid trailing average approach fixes the risk free rate at the start of the access arrangement period ('on the day'), while incorporating a trailing average for annual estimate of the DRP.

830. In reaching that decision, the Authority concluded that the hybrid trailing average and the current 'on the day' approach have strengths and weaknesses. Broadly speaking, both approaches:[328]

- allow for hedging of the risk free rate at the start of the regulatory period, so are not distinguished in this regard; and
- are not distinguished in terms of debt raising costs and hedging costs.

831. The Authority determined that the key differences between the hybrid trailing average and the current on the day approaches relate to the outcomes for the DRP. In particular:[329]

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[327] Goldfields Gas Transmission Pty Ltd, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal – Supporting Information*, 15 August 2014, p. 134.

[328] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems,* as amended 10 September 2015, p. 321.

[329] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, as amended 10 September 2015*, p. 321.

- With regard to efficiency, there is not enough data to determine the statistical properties of the DRP – whether it exhibits a random walk or is mean reverting – hence it is not possible to be definitive about prediction performance:
  - however, there is some evidence from the available data that the 'on the day' approach for the DRP performs at least as well as the trailing average for the DRP in prediction terms for the year ahead, and may be superior;
  - the on the day approach appears to deliver a DRP that is closer to the prevailing rate over the next 12 months much of the time, thereby providing for superior signals for investment by the benchmark efficient entity when it is annually updated;
  - trailing average approaches can be weighted for new capex, overcoming this shortcoming, albeit at the cost of some complexity.
- In terms of signalling efficient use by upstream and downstream users, there is some evidence that the on the day approach performs at least as well as, and potentially better than, the hybrid trailing average DRP.
- With regard to 'minimising differences', the trailing average approach to estimating the DRP can be replicated exactly by the firm, whereas the 'on the day' approach to the DRP cannot.[330] Under the Authority's current approach, the firm is required to manage the ups and downs of prevailing rates, with its cost of debt sometimes exceeding the regulated return on debt, and sometimes undercutting it. On that basis, the hybrid trailing average approach is superior.
- To the extent that the trailing average may be matched by the regulated firm, it potentially may lower credit risk, and hence cost, as compared to the on the day approach. However, over time, on average, there are likely to be limited differences between the various approaches with regard to this consideration. Nevertheless, this consideration adds further support for the hybrid trailing average approach.
- Trailing average approaches can achieve the present value condition exactly at any point in time, whereas the Authority's previous approach only approximates the condition, on average, over the longer term. Again, this provides support for the hybrid trailing average approaches.

832. The Authority considered that the hybrid trailing average approach may perform slightly less well on efficiency grounds than the on the day approach, although there was not strong evidence for this. On the other hand, the hybrid trailing average approach performs better in terms of 'minimising differences' and the present value condition. The simple hybrid trailing average approach also performs best with regard to regulatory costs.[331]

833. Overall, weighing up the strengths and weaknesses, the Authority concluded that the hybrid trailing average approach is slightly preferable to its old approach in terms of meeting the requirements of the NGL and NGR, including the allowed rate of return objective and the requirements of NGR 87 more generally. In coming to that

[330] Performance in terms of 'minimising differences' is relevant, given that that NGR 87(11)(a) requires the Authority to have regard to 'the desirability of minimising any difference between the return on debt and the return on debt of a benchmark efficient entity'.

[331] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems,* as amended 10 September 2015, p. 321.

conclusion, the Authority was mindful of the very limited evidence separating the approaches in terms of their outcomes for economic efficiency.

834. The Authority therefore determined to adopt a hybrid trailing average approach, annually updated, for estimating the return on debt.

835. The key question with regard to this decision then becomes whether to accept GGT's proposal for a full trailing average (which incorporates a trailing average for the risk free rate) or to require GGT to adopt a hybrid trailing average, consistent with the Authority's approach set out in the ATCO GDS Final Decision.

Hybrid or full trailing average?

836. The key difference between the hybrid and full trailing average relates to the treatment of the risk free rate:

- under the hybrid trailing average, the risk free rate is set once, based on the rate prevailing at the start of the regulatory period;
- under the full trailing average, an n-year trailing average of past estimates of the risk free rate is applied (with n generally taken to be 10, consistent with the observed average term of debt issuance of typical infrastructure businesses);
- under the transitional approach to the full trailing average, as applied by the Australian Energy Regulator, a 10-year trailing average is phased in over 10 years, with the on the day risk free rate applying in the first year, with 1/10 of that rate replaced with the prevailing rate in each subsequent year, such that the full 10-year trailing average is only achieved after 10 years.

837. The Authority considers that the hybrid trailing average offers advantages over the full trailing average, in that it:

- does not require the benchmark efficient entity to unwind previous hedging arrangements relating to the risk free rates, and hence avoids the need for the transitional approach; and
- does not require estimation of the risk free rate at each annual anniversary of the averaging period, for inclusion in the annual update of the trailing average.

838. With regard to the need to unwind previous hedging arrangements the Authority considers the evidence is that it has been common practice for regulated entities to hedge the risk free rate component of the return on debt at the start of each regulatory period. While not a universal practice, the majority of regulated entities hedge the risk free rate. The exceptions are those who appear to have been taking positions seeking to lower their cost of debt below the regulated rate:[332]

> While many NSPs fully or largely hedge the base rate to the regulatory period, some carry partial trailing average fixed rate exposure, floating rates or a mixture of the two…
>
> Some companies reflect an almost identical base rate profile to that assumed in AER's Basic Approach to EFP [efficient financing practice], i.e. fixed base rates only matching the regulatory period. However, other companies display a partial trailing fixed rate component mixed with a large portion to match the regulatory period. These do not use a smoothly staggered fixed base rate approach.
>
> A small number of companies keep some floating base rate exposure, and there is evidence of this being combined with a partial trailing fixed rate component…

[332] Chairmont Consulting, *Financing Practices Under Regulation: Past and Transitional*, 13 October 2015, pp. 42 to 44.

> Some firms have taken what appear to be inefficient or speculative decisions, or a combination of both by introducing base rate risk. This is a natural part of a competitive industry and is a positive sign that benchmark regulation allows room for individual enterprises to manoeuvre. A competitive industry should expect to see winners and losers amongst participants.

839. Similarly, Lally has concluded that:[333]

> In conclusion, under the previous regime, it seems to have been the general practice of private-sector firms to use interest rate swaps to hedge the base rate component of the cost of debt and this creates a strong presumption that this was efficient behavior. Furthermore, this conclusion is strengthened by the fact that using these swaps seemed to reduce expected interest costs and also reduced risk (in the sense of reducing mismatches between the allowed base rate for the cost of debt and that incurred).

840. To the extent that regulated entities have hedged the risk free rate over past regulatory periods, it would not be appropriate to provide a full trailing average of the risk free rate, as this would not match the return for the regulated entity on its debt portfolio. Specifically, there would likely be significant over- or under-recompense, depending on the differences between actual risk free rates over time and those applying at the start of each past regulatory decision (to which the hedged rate would be fixed). This violates the present value condition.

841. On that basis, if the full trailing average approach was accepted, there would need to be time for the regulated entity to unwind previous hedging positions. Concurrently, the regulated cost of debt would need to move away gradually from the on the day approach, so as to avoid under or over-recompense. In that case, the appropriate approach would be to provide for the phased transitional approach to the full trailing average. This is the method adopted by the Australian Energy Regulator, who account for the following reasons:[334]

> We are not satisfied that adopting a backwards looking trailing average (Option 4) is reasonable or would contribute to the achievement of the allowed rate of return objective. This is because it:
>
> - has the potential to create a bias in regulatory decision making that can arise from the selection of historical data after the results of that data is already known.
> - would exaggerate a mismatch between the allowed return on debt and the efficient financing costs of a benchmark efficient entity over the life of its assets. This means that over the life of the assets a benchmark efficient entity is likely to materially either over- or under-recover its efficient financing costs.
> - does not approximately match the allowed return on debt with the efficient financing costs of a benchmark efficient entity over the 2016–20 period as it transitions its financing practices to the trailing average approach. Given a benchmark efficient entity will already have financing practices in place it entered into in the past, it needs time to unwind these practices and gradually adopt practices that match the trailing average approach. This transformation cannot occur instantly and does not avoid practical difficulties with the use of historical data. However, we are satisfied that this is a relatively minor issue compared to the above points.

842. For the reasons outlined above, the Authority rejects GGT's proposal to base the risk free rate estimate on an historic, full trailing average estimate.

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[333] M. Lally, *Review of Submissions on Transition Issues for the Cost of Debt*, 21 October 2015. p. 26.

[334] Australian Energy Regulator, *Preliminary Decision: Jemena distribution determination: 2016 to 2020: Attachment 3 − Rate of return*, October 2015, p. 3-165.

843. Having rejected GGT's approach for estimating the risk free rate, the Authority is required to determine a preferred treatment of the risk free rate for this Draft Decision. The Authority considers that its choice is between two options – the hybrid trailing average (which is the on the day risk free rate updated every five years at the start of the regulatory period), or the phased transition to a full trailing average (which uses the on the day risk free rate initially, then phasing to a full trailing average of risk free rates over an appropriate n-year period).

844. Most salient, the Authority's requirement for the 5 year term for the risk free rate is predicated on the understanding that the benchmark efficient entity will be able to hedge the risk free rate of any debt it raises. With hedging, a 5 year term for the risk free rate, commensurate with the regulatory period, is appropriate as – given the typical term structure of interest rates – allowing a 10 year term for the risk free rate would over-compensate the benchmark efficient entity which undertook hedging (see risk free rate section above).

845. The Authority considers that the hybrid trailing average approach is amenable to the 5 year term for the risk free rate. Provided that the benchmark efficient entity is able to hedge its debt to the 5 year regulated rate, then the present value condition is met under the hybrid trailing average, and differences between the return on debt and the cost of debt of the benchmark efficient entity are minimised.

846. However, the Authority recognises that the benchmark efficient entity may be of a size where it was unable to hedge the whole debt portfolio efficiently within a specified averaging period, as the swaps requirement might 'move the market'. In that case, the Authority considers that a proportion of the Regulated Asset Base (**RAB**) debt may not be able to be hedged efficiently.

847. In response, the Authority would consider allocating a proportion of the debt to the hybrid approach, and a proportion to the full trailing average:

- the hybrid proportion would be based on the on the day 5 year risk free rate;
- the full trailing average proportion would be based on the 10 year risk free rate, and would be phased in over a 10 year transition period.

848. At the next access arrangement, the proportion would be reviewed. However, irrespective, the existing trailing average tranche from the prior access arrangement would continue to be phased in, with five years remaining for the transition for that component. A new trailing average component *may* commence at the start of the next access arrangement, with a 10 year transition for that tranche, if there was evidence that the proportion of debt requiring hedging, for that next access arrangement, could not be accommodated without moving the market.

849. The proportions to be applied would require evidence as to what part of the debt portfolio reasonably could not be hedged, without driving up the cost of debt. The Authority considered this issue in the Rate of Return Guidelines, concluding that it had not been presented with concrete evidence of impediments to hedging the risk free rate for typical gas pipeline debt portfolios.[335] The Authority therefore would

[335] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 68. The Authority notes that Chairmont argued that transacting $2 billion of swaps in 20 days, in normal circumstances would not move the market price of swaps. Extending the length of the averaging period, to as much as 60 days, could be one means to ensure that the ability to hedge even a large portfolio was retained.

require evidence on this aspect from any service provider that was proposing the full trailing average.

850. Otherwise, the Authority considers that it should require the hybrid trailing average, as it meets the requirements of the NGL and NGR, consistent with the conclusions summarised at paragraphs 830 to 833 above.

851. In this context, the Authority's notes that the GGP RAB, at just under $400 million, has an associated debt portfolio of around $240 million. This debt portfolio is not of a size that would create any issues for hedging within the averaging period. The threshold requirement for a proportion of the return on debt to be based on the full trailing average is not met. The Authority therefore considers that basing return on debt on the hybrid trailing average approach would meet the requirements of the NGL and the NGR, neither under- nor over-compensating the benchmark efficient entity.

852. For the above reasons, the Authority requires that GGT change its proposed approach to estimating the cost of debt to be consistent with the hybrid trailing average approach.

853. This required hybrid trailing average approach is outlined in what follows. The approach to the return on debt is identical to that adopted for the recent ATCO Gas Distribution System. Therefore, the Authority *illustrates* the numerics of the return on debt outcomes by using the ATCO estimates. (It may be noted that the ATCO Gas Distribution System estimates are for the 20 day averaging period ending 2 April 2015. The same *approach* as outlined below will be applied for the Final Decision, albeit updated, with the update based on the 40 days averaging period proposed by GGT, which the Authority has no problem with – see paragraph 547 above.)

The hybrid trailing average approach

Key features of the hybrid trailing average approach

854. An estimate of the return on debt based on a hybrid trailing average will:

- be comprised of the sum of a debt risk premium and a base risk free rate, combined with a margin for administrative and hedging costs:

  Return on Debt = Risk Free Rate + Debt Risk Premium + Debt raising costs + Hedging costs

- estimate the risk free rate once, based on an averaging period at the start of the regulatory period (implying the 'on the day' approach for the risk free rate);
- adopt a 10 year term for the DRP – following Lally's recommendations with regard to achieving the present value principle (or NPV=0 condition), estimate the DRP consistent with the average term at issuance, which the Authority in the Draft Decision determined was 10 years;
- annually update the estimate of the DRP, just prior to the start of each regulatory year, based on the updated hybrid trailing average estimate of the DRP;
- the annually updated hybrid trailing average will feed through into each annual tariff variation.

855. Having determined to adopt the hybrid trailing average approach for this Draft Decision, the remaining key details of the approach are now considered:

- the averaging periods for the DRP estimates;
- the method for estimating the base rate and the resulting point estimate for this Draft Decision;
- the term of the DRP;
- the number of years in the trailing average for the DRP;
- the method for weighting for the trailing average;
- the need for a transition;
- the credit rating for the benchmark efficient entity;
- the method for estimating the DRP and the resulting point estimate for this Draft Decision;
- the method for estimating the other debt raising and hedging costs and the resulting point estimates for this Draft Decision;
- the method for annually updating the return on debt in tariffs, so as to account for the annual update of the DRP component.

The averaging period of the DRP estimates

856. The averaging period for the base risk free rate estimate contributing the *indicative* estimate of the return on debt for this Draft Decision is the 20 days ending 2 April 2015 (on the issue of 20 versus 40 days for the averaging period, see paragraph 853 above).

857. However, with annual updating of the DRP trailing average, it is necessary to adopt a different approach to the averaging period for the DRP. The annual update process requires additional averaging periods for the forward looking estimates of the DRP for 2016, 2017, 2018 and 2019.

858. First, the Authority developed a forward looking indicative estimate for the DRP – for the period in 2015 that falls after 2 April 2015 – which was estimated over the 20 day averaging period ending 2 April 2015. Prior to that date, the Authority will use RBA monthly data in the trailing average DRP estimates.[336]

859. For the DRP update estimates for 2017, 2018 and 2019, the averaging period for the forward looking DRP would be based on a reasonably short period that is as close as practicable to the start of each of the calendar years to which it will apply, while still allowing sufficient flexibility to conduct debt operations without moving the market. The period also needs to give sufficient time for the Authority to consider and approve the annually updated tariffs prior to their subsequent application date on 1 January in each of the specified years.

860. For those reasons, the Authority considers that choosing the averaging period in the window between two months and seven months prior to the regulatory period is preferred. The five month period is considered sufficient to ensure that the 40 day averaging period cannot be inferred by other market participants

[336] Ultimately, for the Final Decision – which is expected to occur in the middle of 2016 – a similar composite estimate for the DRP for 2016 will be developed. That estimate will be based on the RBA historic monthly data up to the nominated averaging period

861. The Authority therefore will require that the nominated averaging period occur in the period 1 June to 31 October in each year, which is reasonably close to the following 1 January update. Hence the averaging period for 2017 would be in the window 1 June 2016 to 31 October 2016, providing the updated DRP for inclusion in the 1 January 2017 tariff variation.

862. The Authority considers that adopting a consistent length for the averaging period – therefore of the same length as that used for the risk free rate – has clear advantages for internal consistency. This will be important when the averaging period for the two estimates coincide, for example when setting the rate of return prior to the next access arrangement.

863. The averaging periods for the future annual updates should be nominated in advance, with the dates then remaining confidential. This is to ensure that the resulting estimates are not biased by opportunistic behaviour. The Authority will require GGT to nominate the averaging periods for 2017 to 2019 as soon as practicable around the time of release of the Final Decision (which is expected to occur in the first half of 2016). The Authority does not require that the nominated averaging period for each of the three years be identical periods, only that they occur in the period 1 June to 31 October.

864. In summary, averaging periods are required for each year of the regulatory period, in order to facilitate the annual update of the DRP for the tariff variations to occur on 1 January in 2017, 2018 and 2019. The Authority requires GGT to nominate all three averaging periods, consistent with the following averaging period criteria, as soon as possible. Each of the three averaging periods;

- is required to be consecutive business days (GGT have proposed 40 days, although as noted the *indicative* estimate for this Draft Decision is based on 20 days);
- needs to fall in the period between 1 June and 31 October – in the year prior to the year which the resulting forward looking estimate of the DRP first contributes to the hybrid trailing average estimate of the return on debt;
- does not need to be over the same dates as that in other years.

The method for estimating the base rate and the resulting point estimate

865. GGT has proposed use of Commonwealth Government Securities as the proxy for the risk free rate. However, the Authority has recently moved to consider the swaps rate as being the appropriate proxy rate for the estimate of the return on debt.

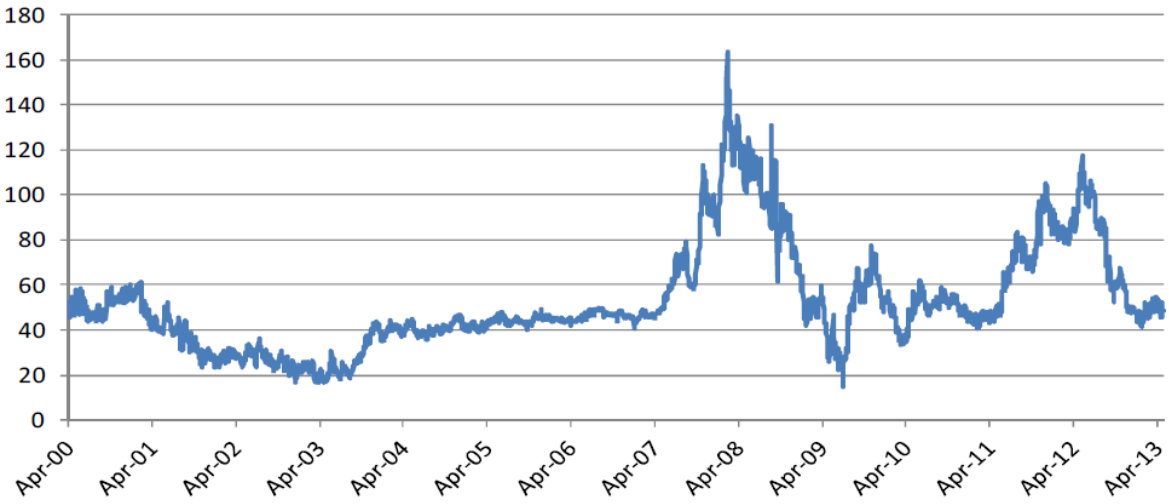
866. Interest rate swaps are derivative contracts, which typically exchange – or swap – fixed-rate interest payments for floating-rate interest payments. They provide a means to hedge and manage risk. Investment and commercial banks with strong credit ratings are swap market-makers.

867. A swap has two 'legs', one floating and one fixed. The floating rate is generally referenced to either the Bank Bill Swap Rate (**BBSW**) or the Bank Bill Bid Rate (**BBSY**).[337] There is usually a difference or spread between the rate on CGS and

[337] BBSW is the average mid-rate for Australian Dollar bills of exchange having various tenors which appear on the Reuters Screen BBSW Page at approximately 10.10am Sydney time on the relevant Payment Date. BBSY is the Australian Bank Bill Swap Bid Rate, being the average bid rate for Australian Dollar bills of exchange having various tenors which appear on the Reuters Screen BBSY Page at approximately 10.10am Sydney time on the relevant Payment Date (Westpac, *Interest Rate Swap*, accessed 17 March 2015, pp. 6 and 15).

that of swaps (for example, the 5 year swap spread to CGS is shown in Figure 18). The difference reflects the higher risk associated with the counterparty involved in a floating swap transaction, for a particular credit rating, as compared to the lower risk of the government-backed CGS.

Figure 18 5 year swap spread 2000-2013



Source Chairmont Consulting, Comparative Hedging Analysis, 12 June 2013, p. 17.

868. The Authority considered this issue in the Guidelines:[338]

> As set out by Chairmont Consulting in its June 2013 report to the Authority, the difference between a CGS risk free rate and a swap rate of similar term is called the Spread of Swap (**SS**). However, it should not matter which rate is used for determining the overall return on debt. If debt risk premiums are estimated consistent with the chosen base – whether that base be the CGS risk free rate or BBSW – there should be no difference in the resulting build up of the overall return on debt. The two approaches just represent 'two different ways of splitting up the total interest rate', with:[339]

$$Yield = R_F + SS + DRP_s \qquad (13)$$

Where

R_F is the CGS risk free rate;

SS is the spread of swaps to the CGS rate; and

DRP_s is the debt risk premium to the underlying swaps rate base.

869. The Authority considered a move to using swap rates for the risk free rate when estimating the return on debt at the time of the Guidelines. Such an approach would align with typical hedging practices. However, the Authority had concerns that

[338] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 83.

[339] Chairmont Consulting, *Comparative Hedging Analysis*, 12 June 2013, p. 14.

available IRS market data on swap rates for longer maturities – such as beyond 6 months – are less reliable than short term swaps rate.

870. The Authority noted that using observed market transactions of swap rates will result in estimates of the risk free rate that are biased upward. This is a consequence of the possible counter-party credit risk present in IRS, and the implicit premium paid by those hedging when entering into a swap.[340] This approach also relies on the assumption that longer maturity swap markets are sufficiently liquid.

871. Therefore, the Authority considered that it was more appropriate to retain the use of CGS as the proxy for the risk free rate, as the longer dated rates may be more robustly estimated from CGS data. The Authority noted that such an approach would ensure that firms have 'reasonable opportunity' to recover their cost of debt.

872. The Authority considered that firms base their hedging on the swap rates and that the risk-free rate is generally lower than the relevant swap rate. On this basis, the Authority was of the view that using a risk-free rate as a base rate would allow regulated businesses to hedge a small part of the Authority's estimate of the DRP, together with the risk-free rate.[341]

873. GGT in its submission on the Discussion Paper expressed a preference for retaining the CGS yield as the base, in preference to swaps, on the basis that they are easily accessed on the RBA website.[342]

874. The Authority however is now of the view that – having adopted the hybrid trailing average approach – the benefits associated with using CGS are less important, given that the benchmark efficient entity may exactly replicate a hybrid trailing average based on the swaps rate.

875. Therefore, for the purposes of estimating the return on debt, the Authority will use the 5 year swap mid-rate, as published on Bloomberg (Last Price), over the relevant averaging period for each regulatory year. The Authority considers that this will simplify the understanding of the estimate, but remain entirely consistent with the underlying CGS rate that is used more broadly for this decision. The difference will be the spread between the two.

The term of the DRP

876. The Authority in the ATCO Gas Distribution Decision accepted a 10 year term for its estimate of the DRP, following clarifying advice from Lally, and evidence that the average term at issuance of debt by the benchmark efficient entity is 10 years.[343] This is consistent with GGT's proposal.

The credit rating for the benchmark efficient entity

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340 Hull J.C (2009), *Options, Futures and other Derivatives*, Seventh Edition, Pearson Prentice Hall, p. 169.

341 This arises because the debt risk premium estimated by the Authority, against a CGS base, will be larger than the debt risk premium over and above the swap rate. Then, to the extent that firms use the swaps market to hedge movements in the base, some of the Authority's estimate of the debt risk premium will also be hedged. The additional amount hedged will be the spread of swaps.

342 Goldfields Gas Transmission Pty Ltd, *GGT submission on Authority return on debt discussion paper*, 25 March 2015, p. 4.

343 Economic Regulation Authority, *Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 14 October 2014, p. 189.

877. The Guidelines proposed a credit rating in the BBB/BBB/BBB+ band for the benchmark efficient entity.

878. GGT has accepted this rating for the purposes of estimating the return on debt.[344] Therefore, the BBB/BBB/BBB+ band will be retained for this Draft Decision.

The method for developing the estimator of the DRP

879. The Authority has evaluated two approaches for estimating the 10 year DRP:

- the RBA credit spread estimates, as proposed by GGT; and
- the Authority's revised bond yield approach, which was augmented to allow estimation of a yield curve.

The RBA's corporate credit spread

880. The RBA's estimates of corporate credit spreads, at the targeted tenor of 10 years, are available for the A-rated and BBB credit rating bands.[345]

881. The RBA credit spreads are estimated with respect to both contemporaneous estimates of the return on Commonwealth Government Securities and Bank Bill Swap rates, at various target tenors.[346] They provide one potential approach to estimating the debt risk premium for the BBB band, at 10 year target tenor.

882. A starting point for the RBA's estimation approach is the development of the samples of Australian corporate bonds that are used to estimate the spreads for the A and BBB credit rating bands respectively. The RBA adopts the following selection criteria to filter the corporate bonds for each of the respective benchmark samples:[347]

- a credit rating of A-rated band or BBB-rated band;
- a remaining term to maturity of 1 year or longer;
- an amount at issuance of A$1 million or greater;
- inclusion of bonds denominated both in Australian dollars and foreign currencies; including US dollars and Euros;
- inclusion of bullet bonds and bonds with embedded options, such as callable bonds; and
- all bonds identified by Bloomberg that were outstanding after 1 January 1990 and were issued by Non-Financial Corporates (**NFCs**) incorporated in Australia.[348]

[344] Goldfields Gas Transmission Pty Ltd, *Goldfields Gas Pipeline: Access Arrangement Revision Proposal Supporting Information*, 15 August 2014, p. 135.

[345] Reserve Bank of Australia, *Interest rates: aggregate measures of Australian corporate bond spreads and yields*, Table F3.

[346] Reserve Bank of Australia, '*New Measures of Australian Corporate Credit Spreads', Bulletin*, December quarter 2013.

[347] Reserve Bank of Australia, '*New Measures of Australian Corporate Credit Spreads', Bulletin*, December quarter 2013.

[348] Non-financial corporations are identified based on their classification by Bloomberg in a group other than banking, commercial finance, consumer finance, financial services, life insurance, property and casualty insurance, real estate, government agencies, government development banks, governments regional or local, sovereigns, supranationals and winding-up agencies.

883. Once the benchmark sample is developed, the RBA estimates the aggregate credit spreads for A-rated and BBB-rated Australian NFCs given the desired target tenor, based on the weighted average of the Australian dollar equivalent credit spreads over the swap rate. The method is applied to the cross-section of bonds in the sample that have the desired credit rating.

884. The RBA estimates are determined by the Gaussian Kernel method. This approach assigns a weight to every observation in the bond sample – informed by the distance of the observation's residual maturity from the target tenor – according to a Gaussian (normal) distribution centred at the target tenor.[349] The RBA notes that this method recognises that the observed spreads on bonds with residual maturities close to the target tenor contain more information about the underlying spread at that tenor than spreads on bonds with residual maturities further away. The RBA also argues that:[350]

> The advantage of the Gaussian Kernel over parametric methods that have been popularised in the literature on the estimation of government yield curves, is its simplicity. Also, it does not impose a particular functional form on the credit spread curve but allows the observed data to determine its shape.[351]

885. Formally, the Gaussian Kernel average credit spread estimator $S(T)$ at target tenor T (say, 5 years) for a given broad rating (say, BBB-rated bonds) and date is given by (16):

$$S(T) = \sum_{i=1}^{N} w_i(T;\sigma) \times S_i \qquad (14)$$

Where

$w_i(T;\sigma)$ is the weight for the target tenor T of the i^{th} bond in the sub-sample of bonds with the given broad rating; and

S_i is the observed spread on the i^{th} bond in the sub-sample of N bonds with the given broad rating.

σ (sigma), which is measured in years, controls the weight assigned to the spread of each observation based on the distance between that bond's residual maturity and the target tenor. Sigma is the standard deviation of the normal distribution used to assign the weights. It determines the effective width of the window of residual maturities used in the estimator, with a larger effective window producing smoother estimates.

[349] Reserve Bank of Australia, *'New Measures of Australian Corporate Credit Spreads'*, *Bulletin*, December quarter 2013, p. 20.

[350] Reserve Bank of Australia, '*New Measures of Australian Corporate Credit Spreads*', *Bulletin*, December quarter 2013, p. 20.

[351] A number of estimation methods were investigated. These methods produced very similar estimates of credit spreads across tenors and broad credit ratings. These methods included a range of parametric models estimated by least squares regressions applied to the cross-section in each period. In particular, the Nelson and Siegel (1987) method was examined in detail owing to its wide use in practice for estimating government yield curves (BIS 2005); this method has also been adapted for the estimation of corporate bond yield and spread curves (Xiao 2010). However, the RBA notes that in its sample these models displayed spurious statistical properties, producing very high model fit but largely statistically insignificant coefficients. Other studies have also found evidence of possible over-fitting of the data using parametric methods, particularly in the case of the Nelson and Siegel model.

886. The weighting function is as follows in (15).

$$w_i(T;\sigma) = \frac{K(T_i - T;\sigma) \times F_i}{\sum_{j=1}^{N} K(T_j - T;\sigma) \times F_j} \quad (15)$$

Where

$K(T;\sigma)$ is the Gaussian Kernel function giving weight to the i^{th} bond based on the distance of its residual maturity from the target tenor $(|T_i - T|)$.

F_i is the face value of the i^{th} bond.

887. The Gaussian Kernel may then be defined as below in (16).

$$K(T_i - T;\sigma) = \frac{1}{\sqrt{2\pi}\,\sigma} \exp\left[-\frac{(T_i - T)^2}{2\sigma^2} \right] \quad (16)$$

888. The Gaussian Kernel method provides for a degree of flexibility in weighting the observations around the target tenor through the choice of the value of the smoothing parameter, σ.

889. The RBA then selects a smoothing parameter of 1.5 years for both A-rated bonds and BBB-rated bonds.

890. The RBA concluded that the Gaussian Kernel method produces effective weighted average tenors that are very close to each of the target tenors. The exception is the 10 year tenor, where the effective tenor is currently 8.6 years. The RBA argues that this difference reflects the dearth of issuance of bonds with tenors of 10 years or more.

891. The Authority considers that the estimates developed by the RBA are not the best means to deliver on the allowed rate of return objective.

892. First, the Authority is of the view that there is a need for consistency in the term estimates (that is, the estimates for the target tenors). The Authority notes that the RBA approach does not necessarily achieve this outcome, particularly at the 10 year target tenor. As noted above, the RBA method produces an estimate that is 8.6 years. The Authority recognises that methods are available to adjust the target tenor, which while less than ideal, are able to circumvent this problem.

893. Second, the Authority notes that the RBA estimates are only available for the BBB and A bands. However, Australian economic regulators, including the Authority, have adopted various other combinations of credit ratings for their regulatory decisions. The Authority considers it should not be constrained in its credit rating evaluation by a limited set of estimates of the related debt risk premia, as this may not be consistent with the requirements of the NGR, or the allowed rate of return. If the Authority determined to use a different credit rating it would use a different bond

sample (as indeed it does for its rail decisions). The Authority considers that this flexibility is important.

894. Third, the RBA estimates are reported as the month-end estimates of the debt risk premium using relevant swap rates or CGS rates. The resulting estimates are less than ideal because Australian regulatory practice is to adopt an average over a period between 20 or 40 trading days, so as to avoid significant fluctuation of the estimates on any particular day. The Authority recognises that interpolation may be used to approximate daily rates, but considers that its own estimation will not require approximation, which has statistical advantages (see paragraph 897 below).

895. On this basis, the Authority remains of the view that it is more appropriate to develop its own yield estimates. To this end, the Authority revised its bond yield approach with two additions: (i) the benchmark sample was extended to recognise the importance of Australian bonds denominated in foreign currencies; and (ii) various curve fitting techniques are adopted to allow the estimation of the debt risk premium at various tenors.

Revised bond yield approach

896. The revised bond yield approach allows for the specification of bond selection criteria for a given credit rating band. A regulator or Network Service Provider (**NSP**) employing the approach therefore has the flexibility to assess the impact of employing criteria that differ to (or are the same as) that used by the RBA. In a scenario where few bonds are available under a given set of criteria, less restrictive criteria can be specified to produce yield estimates that can serve as a robustness check.

897. The Authority views the interpolation of a point estimate between two 1 day estimates to approximate 20 or 40 day averages to be less representative of yields prevailing in the averaging period in question and subject to a higher degree of statistical noise. Two observations represent a very small sample and it is entirely possible that the two observations could differ substantially to those prevailing throughout the averaging period.

898. Additionally, the Authority considers its approach to be more transparent than using RBA corporate credit spreads because the sample of bonds underlying the bond yield approach estimates are published.

899. The Authority is of the view that the revised bond yield approach:

- provides flexibility in sampling bonds within a particular credit rating bands;
- directly addresses the issue of the effective tenor of the Reserve Bank of Australia (**RBA**) corporate credit spread estimates being less than 10 years; and
- is more robust to anomalous market yields by virtue of using 20 to 40 days of yield observations than using methods based on one day of observations;

Extending the benchmark sample for the bond yield approach

900. In its bond yield approach discussion paper in December 2010, the Authority considered the trade-off between the ‘market relevance’ and the ‘accuracy’ of the approach to be adopted in estimating the proxy for the cost of debt/the debt risk

premium for a benchmark sample of Australian corporate bonds.[352] The Authority considered that a bond price (or its observed yield) is determined by the markets, not by the companies or the regulators. As a result, the Authority was of the view that relying on market data will provide the best means of estimating the proxy for the cost of debt. This means that observed bond yields play a fundamental role in the method of estimation.

901. In addition, the Authority places emphasis on market relevance. This takes account of the fact that new bond issuers consider the prevailing market conditions prior to the issuance of the bonds. In particular, issuers will consider issuing longer term bonds in a 'normal' market situation, whereas shorter term bonds may be more appropriately issued during very unstable market conditions. As a result, the observed yields of bonds currently traded in the market will reflect the nature of the prevailing market conditions prior to the issuance of the bonds.

902. The Authority notes that firms are increasingly choosing to issue Australian bonds denominated in offshore markets and currencies.[353] As long as the majority of bond issuances of the various markets and currencies can be captured, then the associated outcomes are 'market relevant', and ideally should be included in the benchmark sample.

903. The decision to issue bonds in the Australian or overseas financial markets lies with businesses. There may be a cost advantage in issuing bonds overseas taking into account all possible risks associated with the process such as exchange rate risk. Alternatively, it may be more convenient to issue longer term bonds and/or bonds with larger amounts at issuance in overseas markets given the Australian financial market is generally considered a smaller market in comparison with the US, European, and UK markets.

904. An initial search on the Bloomberg terminal, as at 18 June 2014, indicated that Australian corporate bonds are largely denominated either in Australian dollars, US dollars (**USD**), Euros, or British pounds (**GBP**).

Table 59 Australian corporate bonds denominated in various currencies

Currency	No of bonds	Percentage	Amount (in relevant currency)	Exchange rate as at 18 June 2014	Amount (in A$)	Percentage
AUD	74	39%	20,531,775,500	1.0000	20,531,775,500	21%
CAD	2	1%	521,370,000	1.0148	513,766,259	0.52%
CHF	3	2%	492,910,000	0.8399	413,995,109	0.42%
EUR	14	7%	10,805,920,000	0.6893	15,676,657,479	15.81%
GBP	12	6%	6,196,342,000	0.5504	11,257,888,808	11.36%
JPY	2	1%	109,813,500	95.4700	1,150,241	0.0012%
NZD	3	2%	771,090,000	1.0778	715,429,579	0.72%
SGD	1	1%	217,903,000	1.1704	186,178,230	0.19%
USD	78	41%	46,539,000,000	0.9337	49,843,632,859	50.28%
Total	**189**	**100%**	**86,186,124,000**		**99,140,474,063**	**100%**

Source: Authority analysis based on data obtained from Bloomberg and the RBA (for exchange rate), June 2014

[352] Economic Regulation Authority, *Measuring the debt risk premium: bond-yield approach*, 30 November 2010.

[353] Reserve Bank of Australia, *'New Measures of Australian Corporate Credit Spreads'*, *Bulletin*, December quarter 2013, p. 16.

905. The above table indicates that if only Australian corporate bonds denominated in Australian dollars are included in the benchmark sample, then only 39 per cent (in terms of number issued) and 21 per cent (in terms of value at issuance) of bonds are covered. However, when foreign currencies such as USD; Euros; and GBP are included, the benchmark sample captures relevant information relating to 93 per cent of all debt (in terms of the number of bonds issued) and 98 per cent of all debt (in terms of the amount at issuance).

906. It is clear then that the majority of Australian corporate bonds are denominated in foreign currencies.[354] Furthermore, overseas markets have assumed greater importance for the longer end of the yield curve.

907. In conclusion, the Authority considers that Australian corporate bonds denominated in selected foreign currencies should be included in the benchmark sample, given the changing nature of debt markets, and the clear trend to foreign issuance. Doing so will increase the sample size of the benchmark sample, which leads to a more robust estimate of the DRP.

908. The Authority will include Australian bonds denominated in USD; Euros; and GBP in the benchmark sample under its revised bond yield approach. The Authority notes that as at August 2014, bonds denominated in AUD; USD; Euros and GBP covered the majority of debt issued by Australian corporates. Should the debt market evolve in the future and other currencies play a more significant role, the choice of currencies may need to change. The Authority considers that provided the bond sample covers at least 90 per cent of both the number of bonds and the amount at issuance, then its estimates are likely to be sufficiently representative of actual debt issuing practices.

909. As a further consideration, the Authority notes that it is standard practice to exclude firms operating in the financial sector, because these firms have a different capital structure.[355] Exclusion of bonds issued by firms in the financial sector may reduce the sample size. However, given the approach to include bonds denominated in foreign currencies, this reduction in the sample size does not have an effect on the robustness of the estimates.

910. In summary, the Authority considers that it is appropriate to include Australian corporate bonds denominated in key foreign currencies in the benchmark sample, as well as domestic issuance in Australian dollars. The Authority also considers it appropriate to exclude bonds issued by financial entities.

911. The revised bond yield approach criteria are outlined in Table 60.

[354] Reserve Bank of Australia, *'New Measures of Australian Corporate Credit Spreads'*, *Bulletin*, December quarter 2013, p. 17.

[355] The Authority notes that the RBA estimates exclude financial sector bonds.

Table 60 Bonds in Draft Decision Sample with Country of Risk other than Australia

Criteria	Authority's approach
Remaining term	>= 2 years
Amount at issuance	N/A
Denominated currency	AUD, USD, EUR and GBP
Industry of issuers	Non-financial corporates only
Country of Risk	Australia
Maturity Type	Bullet, Callable and Putable
Exclude	Perpetual, inflation linked, called instruments
Consolidate	Duplicate issues

Source Bloomberg and ERA Analysis, December 2015.

912. The country of risk criteria ensures that yields and credit spreads estimated on the bonds issued are reflective of risks primarily linked to economic and financial market conditions in Australia. Perpetual, inflation linked and called instruments are excluded. This is because these instruments appear infrequently in sampling and require additional complexity in calculating yields that are comparable to those of the other instruments. The additional benefit of including such instruments does not justify the additional complexity of including them. Duplicate issues such as those that are reported by Bloomberg as both privately placed and publically issued are excluded to avoid double counting their yields in the sample.

913. The sample of bonds as at 2 April 2015 includes 92 instruments which are outlined in Appendix 6. These bonds are used for the purpose of developing the indicative DRP estimate.

Techniques to estimate the debt risk premium

914. The Authority in the Draft Decision investigated methods for the purpose of estimating the cost of debt at tenors beyond 5 years.

915. The Authority notes that there are different curve fitting techniques that could be used for this purpose. However, the following three techniques are widely used:

- the Gaussian Kernel;
- the Nelson-Siegel methodology; and
- the Nelson-Siegel-Svennson methodology.

916. Each of these techniques is discussed in turn below.

Gaussian Kernel

917. This methodology was discussed in detail above under the discussion of the RBA's approach.

918. For the Authority's Gaussian Kernel estimates, bond issue amounts expressed in foreign currencies are converted to Australian dollar amounts before being applied

as weights in the Gaussian Kernel estimates.[356] Consequently, where a bond is issued in a foreign currency the weighting in the Gaussian Kernel estimates uses the principal amount converted into an Australian dollar amount. The currency conversion uses the closing exchange rate on the date of the bond's issue.

The Nelson-Siegel methodology

919. The Nelson-Siegel methodology assumes that the term structure of the yield curve has the parametric form shown in (17):

$$y_t(\tau) = \beta_{0t} + \beta_{1t}\frac{1-e^{-\lambda\tau}}{\lambda\tau} + \beta_{2t}\left(\frac{1-e^{-\lambda\tau}}{\lambda\tau} - e^{-\lambda\tau}\right) \quad (17)$$

Where

$\hat{y}(\tau)$ is the credit spread (debt risk premium) at time t for maturity τ ; and

$\beta_{0t}, \beta_{1t}, \beta_{2t}, \lambda$ are the parameters of the model to be estimated from the data.

920. The Nelson-Siegel methodology uses observed data from the bond market to estimate the parameters $\beta_{0t}, \beta_{1t}, \beta_{2t}, \lambda$ by using the observed yields and maturities for bonds. With the estimated parameters $\beta_{0t}, \beta_{1t}, \beta_{2t}, \lambda$, a yield curve is produced by substituting these estimates into the above equation and plotting the resulting estimated yield $\hat{y}(\tau)$ by varying the maturity τ. $\hat{y}(\tau)$ has the interpretation of being the *estimated* yield for a benchmark bond with a maturity of τ for a given credit rating.

The Nelson-Siegel-Svennson methodology

921. The parametric from of the Nelson-Siegel-Svennson curve used by the Authority is that specified in Svennson's 1994 paper.[357] The notation for this parametric form is shown in equation (18).

$$\hat{y}_t(\tau) = \beta_{0t} + \beta_{1t}\frac{1-e^{-\tau/\lambda_1}}{\tau/\lambda_1} + \beta_{2t}\left[\frac{1-e^{-\tau/\lambda_1}}{\tau/\lambda_1} - e^{-\tau/\lambda_1}\right] + \beta_{3t}\left[\frac{1-e^{-\tau/\lambda_2}}{\tau/\lambda_2} - e^{-\tau/\lambda_2}\right] \quad (18)$$

Where

$y_t(\tau)$ is the credit spread (debt risk premium) at time t for maturity τ ; and

$\beta_{0t}, \beta_{1t}, \beta_{2t}, \beta_{3t}, \lambda_1, \lambda_2$ are the parameters of the model to be estimated from the data.

[356] ATCO Gas Australia, *Response to the Authority's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 9.2, p. 72.

[357] L. Svennson, *Estimating and Interpreting Forward Interest Rates: Sweden 1992-1994*, Institute for International Economic Studies, University of Stockholm, Seminar Paper No 579, p. 6.

922. The Nelson-Siegel-Svennson methodology is estimated in the same way as the Nelson-Siegel method, except uses a different parametric form.

Using the Authority's revised bond yield approach to estimate the regulated debt risk premium

923. On the basis of the above considerations, the Authority will use its revised bond yield approach for the purpose of estimating the regulated DRP.

924. To estimate the regulated DRP, the Authority:

- extends the benchmark sample under the bond yield approach to: (i) include Australian corporate bonds denominated in domestic currency (**AUD**) and foreign currencies including USD; Euros; and British pounds; and (ii) exclude bonds issued by financial sectors including banks, duplicates, inflation linked, called and perpetual instruments;
- converts the yields into hedged Australian Dollar equivalent yields inclusive of Australian Swap rates;
- averages AUD equivalent bond yields across the averaging period for each bond (for example, where a 20 trading day averaging period applies, each bond will have a single 20 day average yield calculated for it);
- estimates yield curves on this data – applying the Gaussian Kernel, Nelson-Siegel and Nelson-Siegel-Svennson techniques;
- uses the simple average of these 3 yield curve's 10 year cost of debt estimate to arrive at the market estimate of the 10 year cost of debt;[358]
- estimates the regulated debt risk premium for the purposes of estimating the regulated cost of debt.

925. The following sections summarise these steps in more detail.

Step 1: Determining the benchmark sample

926. The criteria set out in the Rate of Return Guidelines to determine the benchmark sample in the Authority's bond yield approach have been revised. The following characteristics will be applied to select corporate bonds to be included in the benchmark sample:[359]

- credit rating of each bond must match that of the benchmark efficient entity, as rated by Standard & Poors;
- time to maturity of 2 years or longer;
- bonds issued where the country of risk is Australia (except by the financial sector[360]) and denominated in AUD; USD; Euros; and GBP;[361]

[358] The Authority intends to adopt the average, because there is no strong evidence to suggest that one approach outperforms the others. It is likely that the average will show less variability under a range of prevailing conditions.

[359] Economic Regulation Authority, *Discussion Paper – Measuring the Debt Risk Premium: A Bond Yield Approach*, December 2010, p. 11.

[360] As classified by Bloomberg Industry Classification System level 1.

[361] Country of risk is based on Bloomberg's methodology using four factors listed in order of importance; management location, country of primary listing, country of revenue and reporting currency of issuer. This criteria allows for the largest sample of bonds that reflect an Australian risk premium.

- inclusion of both fixed bonds[362] and floating bonds;[363]
- inclusion of both bullet and callable/ puttable redemptions;[364]
- at least 50 per cent of observations for the averaging period is required (that is, 20 yield observations over the required averaging period of 40 trading days are required);[365] and
- are not called, perpetual, a duplicate or inflation linked.

927. The inclusion of the last criteria in paragraph 926 above ensures the exclusion of duplicates, called, perpetual and inflation linked instruments. Employing these criteria in the Bloomberg search function ensures a consistent sample with that employed by the Authority.

928. The sample of bonds as at 2 April 2015 – used for the 2015 estimate – includes 92 instruments which are outlined in Appendix 6.

Step 2: Conversion of yields into AUD equivalents

929. Under the finalised approach for conversion of yields into Australian dollar equivalents only hedged Australian dollar equivalents yields (as opposed to spreads) are reported. The spread to an Australian dollar swap is calculated as a single estimate based on the observed cost of debt on the entire sample of bonds, as opposed to downloading individual swap spreads.

930. The Authority's finalised approach for conversion into Australian dollar equivalents does not require estimates of a conversion factor as it utilises Bloomberg Swap Manager facilities directly. The Authority believes this approach is transparent and replicable - anyone with access to a Bloomberg terminal can enable the functionality will get the same hedged Australian dollar equivalent yield for any given bond, provided they use the same date, currency, payment frequency and deal type. Further details of the approach are outlined in Appendix 3.

Step 3: Averaging yields over the averaging period

931. Under the finalised approach for conversion of yields into Australian dollar equivalents only hedged Australian dollar equivalent yields (as opposed to spreads) are reported. The averaging period (in the *indicative example* used for this Draft Decision being 20 days) results in 20 hedged Australian dollar equivalent yields for

[362] This is a long term bond that pays a fixed rate of interest (a coupon rate) over its life.

[363] This is a bond whose interest payment fluctuates in step with the market interest rates, or some other external measure. Price of floating rate bonds remains relatively stable because neither a capital gain nor capital loss occurs as market interest rates go up or down. Technically, the coupons are linked to the bank bill swap rate (it could also be linked to another index, such as LIBOR), but this is highly correlated with the RBA's cash rate. As such, as interest rates rise, the bondholders in floaters will be compensated with a higher coupon rate.

[364] A callable (putable) bond includes a provision in a bond contract that give the issuer (the bondholder) the right to redeem the bonds under specified terms prior to the normal maturity date. This is in contrast to a standard bond that is not able to be redeemed prior to maturity. A callable (putable) bond therefore has a higher (lower) yield relative to a standard bond, since there is a possibility that the bond will be redeemed by the issuer (bondholder) if market interest rates fall (rise).

[365] The Authority notes that there is a tendency for fewer bonds to be available on the long end of the yield curve. If circumstances arise where this criteria results in a paucity of bonds such that curve fitting is impractical the Authority may exercise judgement to determine whether exclusion of bonds based on this criteria is appropriate.

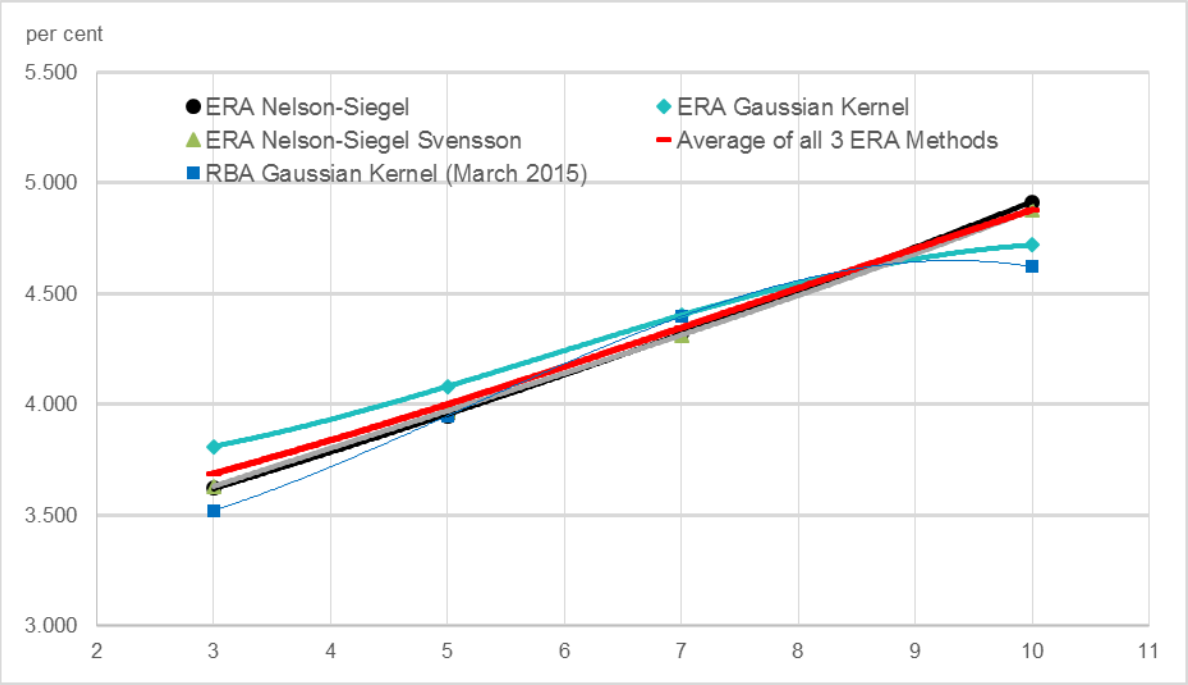
each bond. The days are based on Australian eastern states trading days and are counted back from and include the determination date for the DRP calculation.

932. The observations on these days are then averaged to create one 20 day average observation for each bond. The spread to an Australian dollar swap is calculated as a single estimate based on the observed cost of debt estimated using all three techniques on the entire sample of bonds.[366]

Step 4: Apply curve fitting techniques

933. The results of the three curve fitting techniques applied to the sample of bonds listed in Appendix 6 are plotted in Figure 19.

Figure 19 Estimated Effective Annual Spot Yield Curves for the Cost of Debt for the Averaging Period up to 2 April 2015



Source: Bloomberg, Reserve Bank of Australia and Authority Analysis

934. The parameters and constraints for the fitted curves are reproduced in Table 61 and Table 62.

[366] As opposed to downloading individual swap spreads.

Table 61 Nelson-Siegel-Curve Fitted Parameters and Constraints

Parameter	Value	Constraints
β_{0t}	10.43797	> 0
β_{1t}	-7.13218	
β_{2t}	-6.70704	
$\beta_{0t} + \beta_{1t}$	3.30579	> 0
λ_1	0.15734	> 0

Source: Authority Analysis, December 2015.

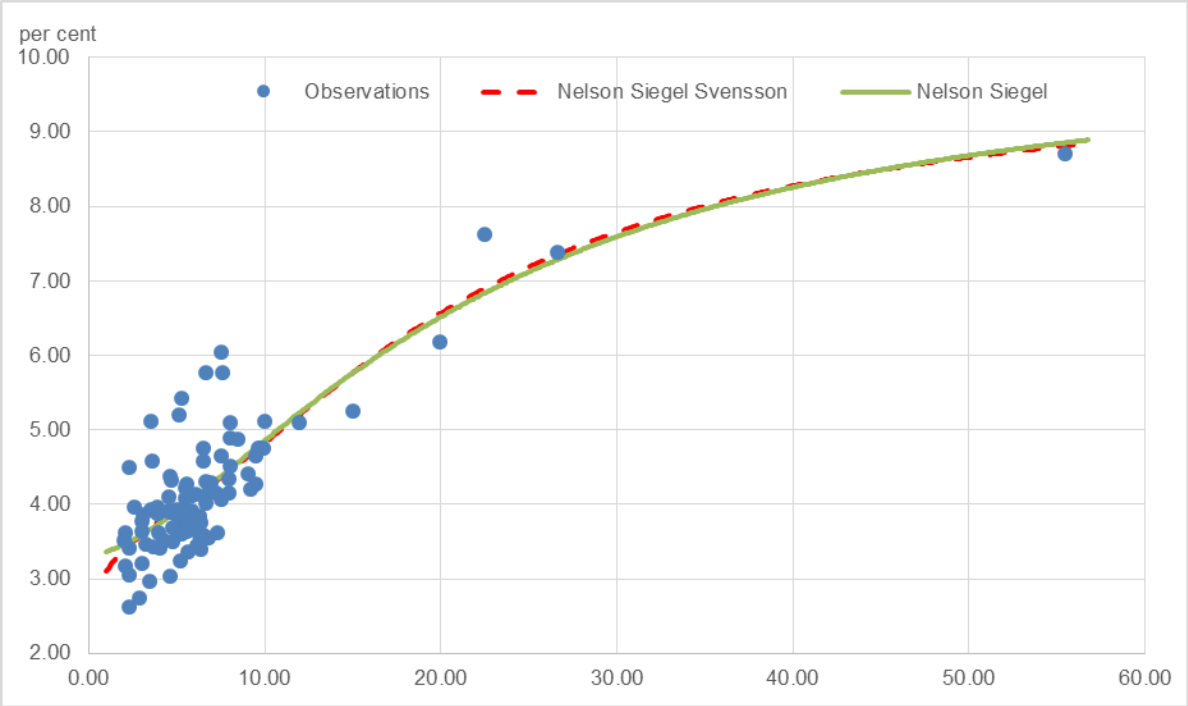
Table 62 Nelson-Siegel-Svennson Curve Fitted Parameters and Constraints

Parameter	Value	Constraints	
β_{0t}	10.20747	0 =<	=< 15
β_{1t}	-7.53168	-15 =<	=< 30
β_{2t}	2.94275	-30 =<	=< 30
β_{3t}	-14.29823	-30 =<	=< 30
λ_1	2.50000	0 =<	=< 2.5
λ_2	4.61199	2.5 =<	=< 5.5

Source: Authority Analysis, December 2015.

935. A graphical representation of the curves and the data points they were fitted on is shown in Figure 20.

Figure 20 Fitted Nelson-Siegel and Nelson-Siegel-Svennson, Curves



Source: Bloomberg and Authority Analysis, December 2015.

936. The curve in Figure 19 representing the average of all three estimates employs a different Authority 10 year Gaussian Kernel estimate to that depicted on the Authority Gaussian Kernel estimate curve. The 10 year Gaussian Kernel estimate employed in the average of all three methods has been calculated setting the target tenor such that the *effective tenor* equals 10 years. This changes the 10 year Gaussian Kernel estimate from 4.720 to 4.841 per cent; an increase of 16.1 basis points. The specific yields at each tenor for the various methods are shown in Table 63.

Table 63 Estimated effective annual spot yields at each tenor for the cost of debt as at 2 April 2015

Years	3	5	7	10
RBA Gaussian Kernel (March 2015)	**3.520**	**3.948**	**4.397**	**4.622**
Authority Gaussian Kernel	3.811	4.082	4.404	4.720
Authority Gaussian Kernel with 10 Year Weighted Tenor Correction				4.841
Authority Nelson-Siegel	3.622	3.949	4.325	4.915
Authority Nelson-Siegel Svennson	3.630	3.971	4.313	4.881
Average of all 3 Authority Methods	**3.688**	**4.001**	**4.347**	**4.879**

Source: Bloomberg, Reserve Bank of Australia and Authority Analysis, December 2015.

Step 5: Estimate the regulatory debt risk premium

937. For the purposes of calculating the 10 year DRP for the period 2015 in this Draft Decision the Authority will use the 10 year cost of debt estimate of 4.879 per cent based on the average of all three methods, estimated as at 2 April 2015.

938. The 20 day average of the 10 year Australian dollar swap rate as at 2 April 2015 expressed as an annual effective yield was 2.838 per cent.[367]

939. Subtracting the 10 year swap rate of 2.838 per cent from the 10 year cost of debt gives a spread to swap of 2.041 per cent. The Authority will therefore apply a DRP of 2.041 per cent as the spot estimate for the 2015 year for the purposes of the Draft Decision.

940. The foregoing method will be used to annually update the forward looking DRP, consistent with the 'automatic formula' requirement of NGR 87(12). The automatic formula is set out at Appendix 8.

Method of applying weights

941. The trailing average estimate of the DRP weights the past 10 years of estimates of the annual DRP, consistent with the average term of debt issued by the benchmark efficient entity and its staggered debt portfolio.[368]

942. The resulting 10 year trailing average is proposed to be updated annually, adding in the most recent estimate of the DRP, according to its weight, and dropping the estimate from 10 years ago. This replicates the cost of debt for the benchmark efficient entity under a strategy whereby it rolls over 10 per cent of its debt each year.

943. The weights for a simple hybrid trailing average DRP estimate would be 10 per cent for each year's estimated of the DRP over the most recent relevant 10 years.

944. The benchmark efficient entity could then replicate a simple 10 year trailing average by issuing one tenth of its debt each year. While a simplification of likely practice in reality, this would closely proxy the cost of debt under the observed financing strategies of benchmark efficient entities.

945. However, the Authority also considered whether to overlay capital expenditure weights on this simple trailing average. The Authority's consideration of this additional weighting component is discussed in the section on 'Capex Weights, at paragraph 951 below.

The simple equally weighted trailing average

946. A first step in developing weights is to establish the formula for the equally weighted trailing average. This develops the weights to each of the DRP annual estimates for the nine past regulatory years, plus the 'current' estimate, that would contribute to the hybrid trailing average DRP estimate for each current regulatory year.

947. The following equation in (19) specifies the formula for estimating the simple equally weighted 10 year trailing average of the DRP to apply in any regulatory year:

[367] The 20 day average coupon for 'ADSWAP10 Curncy' was 2.818 per cent which is paid semi-annually.

[368] Analysis in the Rate of Return Guidelines supported a term at issuance for the benchmark efficient entity of around 10 years. (Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, December 2013, p. 39).

$$TA\,DRP_0 = \frac{\sum_{t=0}^{-9} DRP_t}{10} \quad (19)$$

Where

$TA\,DRP_0$ is the equally weighted trailing average of the DRP to apply in the following year as the annual update of the estimate used in the current year; and

DRP_t is the DRP estimated for each of the 10 regulatory years t = *0, -1, -2…. , -9*.

948. All years are in the same year convention as year *0*. For example, if year *0* is the next regulatory year 2016 for which the $TA\,DRP_0$ is being calculated, t = *-9* is the calendar year 2007 because 2016 is a calendar year in this Access Arrangement. Using the same logic if year *0* is regulatory year 2014-15, t = *-9* is the financial year 2005/2006.

949. So for example, in (20) the DRP trailing average estimate for the calendar 2016 regulatory year will be:

$$\begin{aligned} TA\,DRP_{2016} = {} & 0.1 \times DRP_{2016} + 0.1 \times DRP_{2015} + 0.1 \times DRP_{2014} \\ & + 0.1 \times DRP_{2013} + 0.1 \times DRP_{2012} + 0.1 \times DRP_{2011} \\ & + 0.1 \times DRP_{2010} + 0.1 \times DRP_{2009} + 0.1 \times DRP_{2008} \\ & + 0.1 \times DRP_{2007} \end{aligned} \quad (20)$$

950. In terms of the notation used by the Australian Energy Regulator (but in the Authority's case applying just to the DRP trailing average), the foregoing TA DRP for the 2016 calendar year may be written as follows in (21):[369]

$$\begin{aligned} {}_{2015}kd_{2016} = {} & 0.1 \times {}_{2006}R_{2007} + 0.1 \times {}_{2007}R_{2008} + 0.1 \times {}_{2008}R_{2009} \\ & + 0.1 \times {}_{2009}R_{2010} + 0.1 \times {}_{2010}R_{2011} + 0.1 \times {}_{2011}R_{2012} \\ & + 0.1 \times {}_{2012}R_{2013} + 0.1 \times {}_{2013}R_{2014} + 0.1 \times {}_{2014}R_{2015} \\ & + 0.1 \times {}_{2015}R_{2016} \end{aligned} \quad (21)$$

Capex weights

951. Weighting the trailing average to account for new capex can ensure that the marginal cost of investment for new capex reflects the Authority's most recent forward looking estimate of the prevailing DRP. This efficiency consideration is a key concern of the Authority, given the requirements of the NGL and NGR.

952. However, the approach adds complexity. That said, the Authority notes that QTC and DBP have demonstrated how a spreadsheet calculation relating to weights

[369] Australian Energy Regulator, *Draft Decision: Jemena Gas Networks (NSW) 2015-20*, November 2014, Attachment 3, p. 3-288.

could be implemented for a Post Tax Revenue Model (**PTRM**) capex weights approach.

953. The Discussion Paper released by the Authority earlier in 2015 incorporated PTRM capex weights as part of the 'alternative' hybrid trailing average option set out by the Authority.[370] Submissions on the Discussion Paper provided mixed support for the mooted capex weights approach:

- ATCO made no comment on the capex weights;[371]
- GGT in its submission on the Discussion Paper stated that 'in advance of a draft decision on the GGP Access Arrangement revisions proposal, GGT maintains the position set out in the Supporting Information, that it is appropriate to use a simple trailing average to estimate the return on debt';[372]
- DBP on the other hand supported the capex weights approach, with caveats.[373]

954. The Authority considered a potential approach for including a PTRM capex weights overlay for the ATCO Final Decision. In its evaluation of whether to accept the simple hybrid trailing average approach, the Authority determined that there are costs and benefits associated with the capex weighting overlay (see Appendix 7).

955. First, the Authority notes the potential benefits of capex weights in aligning the marginal cost of investment for the benchmark efficient entity with the forward looking estimate of the prevailing rate. However, in deciding to adopt the trailing average approach for this Draft Decision, the Authority has recognised the difficulty of distinguishing between the on the day and the trailing average approaches with regard to prediction performance.[374] While there is some evidence for the on the day approach in the available data, it is very limited. This outcome is relevant; if the annually updated trailing average performs as well as the annually updated 'on the day' approach in predicting the forward looking DRP, then there would be no gain in adopting capex weights.

956. Second, the Authority notes the potential for actual capex undertaken by the service provider to diverge from forecast capex. This might be in response to changing financial conditions, and therefore may be an efficient response. For example, the DRP might rise sharply for a period, causing the service provider to delay a capital expenditure program.

957. However, the capex weights method would lock in a sharply higher return on debt into the trailing average for the remainder of the regulatory period, which did not reflect actual costs.

958. PTRM weightings also could feasibly add incentives to game the capex estimates and their timing under some circumstances. For example:

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370 Economic Regulation Authority, *Estimating the return on debt: Discussion paper*, 4 March 2015.

371 ATCO Gas Australia, *Re: Estimating the return on debt: ATCO Gas Australia's response to the Authority's Discussion Paper*, 25 March 2015, Attachment.

372 Goldfields Gas Transmission, *GGT submission on Authority return on debt discussion paper*, 25 March 2015, p. 1.

373 Dampier Bunbury Pipeline, *Estimating the Return on Debt: Response to Authority Discussion Paper of 4 March 2015*, 25 March 2015, p. 10.

374 As noted above at paragraph 823, this recognition has led the Authority to accept the hybrid trailing average approach over the on the day approach, both annually updated.

- if the DRP was expected to rise over the initial part of the access arrangement period, then there would be an incentive to shift scheduled capex to that period in the forecasts, all other things equal;
- where the expected increase in the DRP did not eventuate as expected, but instead was delayed, it could pay the service provider to defer some of the scheduled initial period capex to the end of the access arrangement, knowing that the weighting would be 'trued up' for actual capital expenditure at the next access arrangement reset through the capex weights adjustment (see Appendix 7).

959. Third, the Authority notes the significant complexity involved in developing a capex weights overlay within the PTRM. It creates the need for a complex series of adjustments at each access arrangement revision, which increases the potential for error (see Appendix 7).

960. In conclusion, the Authority has carefully considered the PTRM weights approach, given its potential ability to improve the efficiency of the incentives for new capex. On balance, however, the Authority is not convinced that limited evidence for the benefits of the capex weighted approach outweigh the clear regulatory costs in terms of the additional complexity.

961. Therefore, the Authority has determined not to include capex weights in the DRP trailing average.

The need for a transition

962. A transition would gradually phase in the hybrid trailing average approach. A transition consistent with the 'QTC method' would, for the DRP component:

- provide for 100 per cent weight to the prevailing estimate of the DRP in year 1;
- in year 2, provide for 90 per cent weight to the prevailing estimate of the DRP in year 1, and 10 per cent weight to the annually updated (prevailing) estimate of the DRP in year 2;
- in year 3, provide for 80 per cent weight to the prevailing estimate of the DRP in year 1, and 10 per cent weight to each of the annually updated (prevailing) estimates of the DRP in years 2 and 3 respectively;
- and so on;
- until at year 10, the trailing average is estimated with equal 10 per cent weights for each of the 10 annual updates of the DRP;
- at year 11, the year 1 estimate of the DRP drops off, and is replaced by the year 11 annual update;
- at year 12, the year 2 estimate of the DRP drops off, and is replaced by the year 12 annual update;
- and so on ad infinitum.

963. GGT did not propose a transition as part of its trailing average approach.

964. In its Discussion Paper, the Authority proposed a 10 year transition period phasing in the full trailing average would:[375]

- enhance confidence in the predictability of the regulatory regime;
- facilitate data collection for implementing the trailing average, as historic data would not be required;
- remove the potential for gaming of the regulatory regime by service providers (with the specified trailing average approach established through a fixed principle and to apply for 10 years).

965. The Authority also noted that a transition could allow firms time to adjust arrangements from the previous regulatory regime (on the day), where firms would have undertaken hedging arrangements to align the cost of debt closely to the regulated rate, consistent with the approach adopted by the AER:[376]

> As discussed in chapter seven, we consider that an efficient financing practice of the benchmark efficient entity would be to minimise the expected present value of its financing costs over the life of its assets subject to managing the associated financial risks (and subject to the regulatory regime). On this basis we have concluded that the benchmark efficient entity would have likely entered into hedging contracts to manage its interest rate risk in the current regulatory control period (that is, under the 'on the day' approach). Further, we consider that holding a (fixed rate) debt portfolio with staggered maturity dates to align its return on debt with the regulatory allowance is likely to be an efficient financing practice of the benchmark efficient entity under the trailing average portfolio approach. To achieve this the benchmark efficient entity would need to unwind its existing hedging contracts and issue new (fixed rate) debt over a transition period to gradually accumulate a portfolio that matches the trailing average regulatory return on debt allowance. Consistent with this, we consider that post transition the benchmark efficient entity is not likely to engage in an active debt management strategy using swaps.

966. ATCO's consultant CEG submitted that adopting a transition would 'fail to compensate the benchmark efficient entity for its estimated future costs consistent with its trailing average debt risk premium (DRP) costs incurred over the last 10 years'.[377]

967. CEG further argues that:[378,379]

- if the benchmark efficient debt management strategy in the past was the hybrid (as accepted by the AER); and
- if the Authority is proposing to adopt the hybrid as the benchmark efficient strategy in the future; then
- there is no need to transition to the hybrid – it should be implemented immediately because it simply reflects benchmark efficient costs.

968. The Authority recognises that a key reason for a transition would be to allow firms time to unwind hedging positions in the event that, like the AER, a full trailing average was being adopted. That is, the transition would be important for the risk

[375] Economic Regulation Authority, *Estimating the return on debt: Discussion paper*, 4 March 2015.

[376] Australian Energy Regulator, *Explanatory Statement Rate of Return Guideline*, December 2013, p. 141.

[377] ATCO Gas Australia, *Re: Estimating the return on debt: ATCO Gas Australia's response to the Authority's Discussion Paper*, 25 March 2015, Attachment, p. 11.

[378] ATCO Gas Australia, *Re: Estimating the return on debt: ATCO Gas Australia's response to the Authority's Discussion Paper*, 25 March 2015, Attachment, p. 12.

[379] DBP make similar points (Dampier Bunbury Pipeline, *Response to Authority Discussion Paper of 4 March 2015*, 25 March 2015, pp. 16-18).

free rate component of the return on debt. However, with the hybrid trailing average, there is no need to transition for the risk free rate, as the same hedging strategy could continue.

969. With regard to the DRP, the concern would be if the previous on the day arrangement had resulted in the regulated firm receiving a regulated return on debt that significantly exceeded the actual DRP financing costs of the firm. Network users could reasonably expect to have a period of 'unders' to compensate for such a period of 'overs' – as this is the nature of the on the day approach. The concern in moving to a trailing average approach would be that users would be denied such an opportunity to recover over payments. Further, reintroducing historic estimates might have the effect of consumers overpaying twice (for example, if the spike in the DRP that occurred in late 2008 during the GFC was incorporated in the trailing average), particularly as it is possible that an efficient debt financing strategy would have been forced to raise debt on the market at that time.

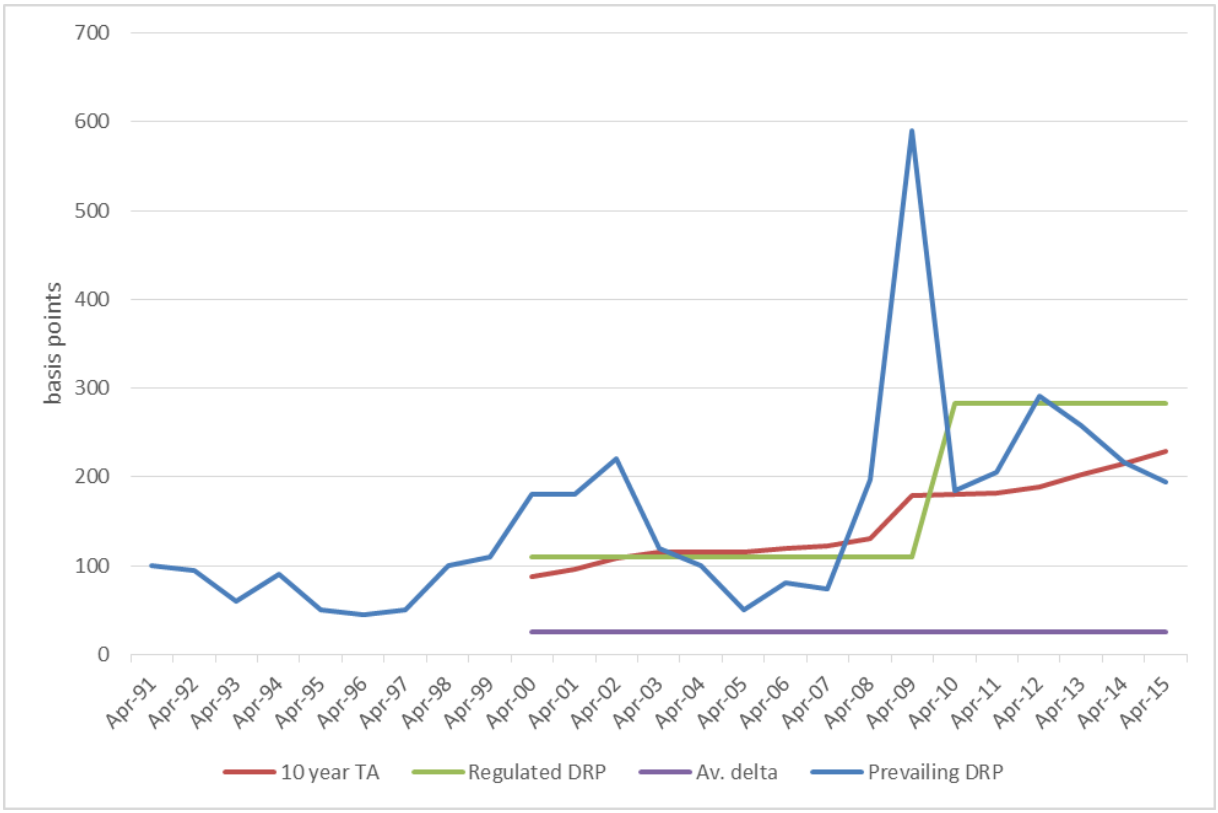
970. To examine this issue, the Authority has constructed a 10 year trailing average series for each of the GGT's access arrangement periods, and compared the resulting 10 year trailing average DRP with the actual regulated DRP (Figure 21).[380] The benchmark efficient entity's assumed actual DRP costs is based on the RBA's credit spread on 10 year BBB bonds to the 10 year spread to swap back to 2005, and then a range of *indicative* estimates for the period prior to that, back to 1991.[381] This is compared to the regulated DRP that was granted – on the day – for each of the two access arrangements AA1 and AA2. [382]

[380] This assumes that the benchmark efficient entity would have hedged the risk free rate component.

[381] The Authority notes that Chairmont Consulting have concluded that the 'history of Australian BBB bond data is inadequate to measure over and under compensation over the life of energy assets' (see Chairmont Consulting, *Financing Practices Under Regulation: Past and Transitional*, 13 October 2015, p. 12). However, the Authority considers that its estimates presented here offer some indicative information, which is better than none.

[382] The averaging period is assumed to be the month of April in each year, as this is closest to the averaging period used for estimating the return on debt for each of the access arrangement periods.

Figure 21 Comparison of BBB trailing average DRP and the GGP regulated rate



Source *Reserve Bank of Australia, Aggregate measures of Australian corporate bond spreads and yields: non-financial bonds, September 2015 (accessed 3 November 2015); Macquarie Investment Management, The changed nature of credit investment, December 2012, p. 15; Authority analysis, December 2015.*

971. The results, while only indicative, indicate that there was possibly a small over-payment up to the start of AA3, of around 26 basis points per annum on average for the whole period from 2000 through 2014. However, the Authority does not consider that this amount is significant, particularly given the indicative nature of the estimates. Furthermore, other factors, such as the spread of the BBSW to the risk free rate and hedging costs, have not been taken into account. Overall, the Authority concludes that this (limited) evidence does not support the occurrence of a significant under or over payment on the DRP or the return on debt.

972. For these reasons, the Authority is prepared to accept that it is more appropriate to move directly to the hybrid trailing average approach, without any phasing in transition.

973. In doing so, the Authority recognises that there is no change required in hedging arrangements between the previous approach and the hybrid trailing average approach, as both involve a single estimate of the risk free rate, set once at the start of the regulatory period. For the DRP, however, it is likely that the benchmark efficient firm would have adopted a portfolio of debt with a ten year average term, and that the firm would have been reasonably recompensed over the past three access arrangements, without being excessively compensated.

Estimates of the DRP prior to the current on the day estimate

974. The Authority has determined to adopt the simple hybrid trailing average of the DRP. The trailing average requires annual estimates of the DRP for past years – back to

2005 – to combine with the Authority's forward looking annual estimates of the DRP (the first of which – as at 2 April 2015 – is set out above).

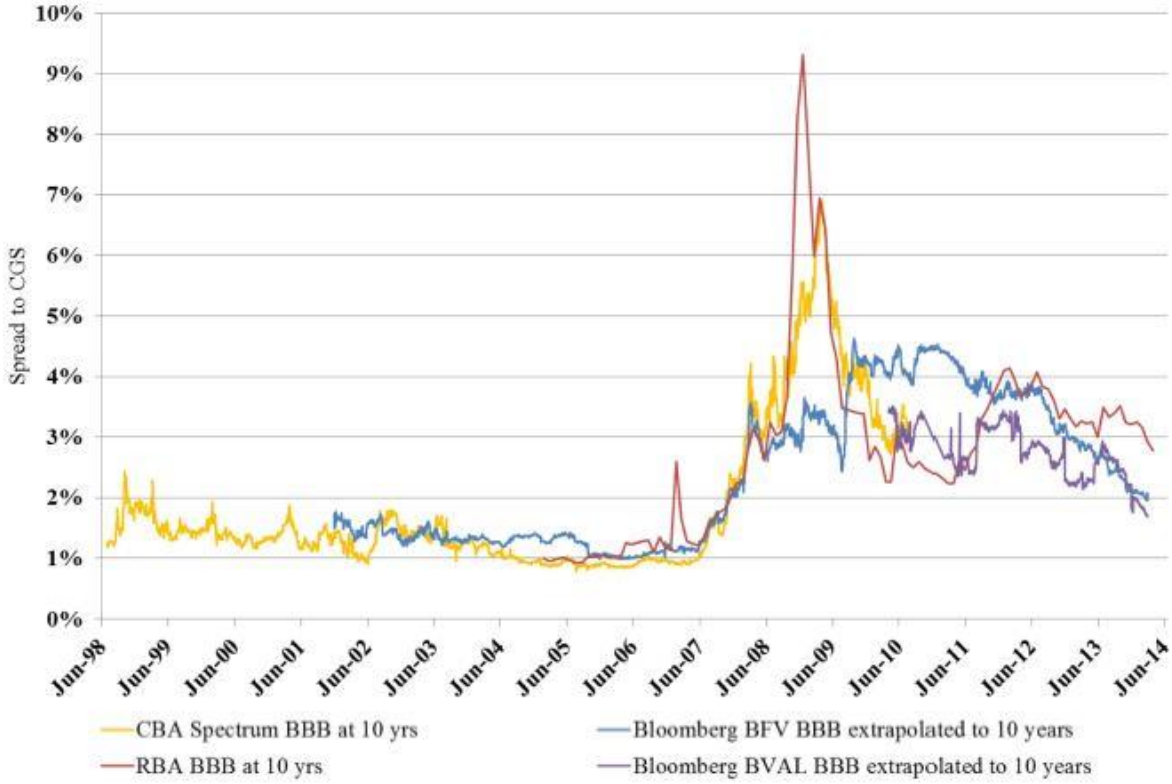
975. The Authority endeavoured to obtain historic bond data to estimate the historic annual DRP estimates through its revised bond yield approach. However, while the Authority was able to access historic BBB credit band bond yields from Bloomberg back to 2005, the resulting bonds did not provide a large enough sample to estimate the return on debt in all years.[383]

976. The Authority therefore has determined to adopt a third party source for the DRP estimates in past years, for incorporation in the trailing average to be used in this Draft Decision. A number of potential options are available which could provide historic estimates of the DRP:

- the RBA's credit spread estimates;
- Bloomberg's Fair Value Curves (**FVC**) estimates; and
- Bloomberg's Valuation Service (**BVAL**) estimates.

977. The Authority notes that these sources give different estimates for the period in question (Figure 22).

Figure 22 Estimates from alternative historical DRP data series (spread to CGS)



Source: Competition Economists Group, Memorandum to ActewAGL, 24 May 2014, p. 5.

978. The Bloomberg BVAL data does not go back past 2010 so does not provide a consistent series over the entire period. The Authority considers that it should overlook this series for this reason.

[383] The RBA have been able to acquire larger sample sizes by combining UBS historic bond data with the Bloomberg historic bond data.

979. It is clear from the relative performance of the two remaining series – the RBA and Bloomberg BFC series – that there is considerable variation in the estimates post June 2008, leading to uncertainty as to the best data series to adopt. An option to overcome this issue could be to average the two series. However, given the Authority's intention to use an annual average of the available data for the whole year of each of the past nine years (see below), and also to adopt a simple weighting scheme for each of those nine years (see below), there are limited differences between adopting one or the other series, or an average of the two.[384]

980. The Bloomberg BFC also does not include foreign bonds, which raises a clear point of departure from consistency with the Authority's preferred approach. The RBA data does not suffer from this omission.

981. A further advantage of the RBA data is the smaller extrapolation that is generally required (commonly between 1 and 2 years) as opposed to the three or more for the BFC (which only goes to tenors of 7 years in more recent times).

982. The Authority therefore considers that adopting the RBA series is fit for purpose for estimating past DRP returns, particularly given the uncertainties, and that averaging the two series is unlikely to deliver any material improvement to the historic estimates.

983. Over time, the historic RBA estimates will be progressively replaced in the trailing average by the Authority's own forward looking estimates.

Use of the RBA estimates

984. The RBA data provides an available source of historic credit spreads for 10 year non-financial corporate bonds.

985. Issues that arise in using the RBA estimates are:

- the averaging period to apply – whether to align with that adopted for the current 2015 estimate or some other averaging period;
- whether to apply capex weighting to the historic estimates; and
- the extrapolation issue – estimating the DRP to match the 10 year term assumed for this Draft Decision.

986. These issues are discussed in what follows.

Aligning with the averaging period dates

987. GGT's proposed revised access arrangement covers the period 1 January 2015 to 31 December 2019 (the AA3 period).

988. The *indicative* averaging period dates for the Authority's current forward looking return on debt estimate, made prior to the release of this Draft Decision, were the 20 business days from 6 March to 2 April 2015. The resulting 'current' ('t=0')

[384] This may be confirmed by simple inspection of the areas between the RBA series and the FVC series – unders tend to offset overs. CEG confirm this, noting 'that even though the RBA and Bloomberg estimates differ materially through some periods in the last 10 years these differences tend to cancel each other out – with the RBA estimates being higher in some periods and the Bloomberg estimates higher in other periods. The net difference over the period January 2005 to October 2014 is only 6 basis points – with the Bloomberg average being higher' (ATCO Gas Australia, *Response to the Authority's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 9.2, p. 63).

estimate will be included in the trailing average estimate to apply for the 2015 calendar year.

989. An issue arises whether the historic DRP estimates for inclusion in the hybrid trailing average should be based on the same averaging period in each of the historic years, that is for example, aligning with the 6 March to 2 April period. This would require interpolation of the RBA monthly estimates to allow a corresponding annual estimate to be made in each previous year. However, those dates may not relate to business days in past years. It may also result in changing estimates for the historic years in the trailing average, depending on whether the averaging period changes.

990. A better alternative is to average the 12 available months of RBA data, such that the estimated DRP reflects the average DRP in whole of each past year. The Authority prefers the latter approach for the following reasons.

991. First, the Authority in this instance is not trying to develop an estimator for the year ahead. Rather, it is trying to develop an estimate for the past, which can be actual outcomes. That points to use of the whole year average.

992. Second, it is not clear when the benchmark efficient entity raised its capital in the past. For the future, the benchmark efficient entity could align its debt issuance with the averaging periods for issuing new debt. However, in the past, it may have issued debt at any time of the year. Accordingly, the best estimate of the DRP relating to debt raised at an unknown point in a past year will be the annual average.

993. The Authority therefore intends to adopt the annual average of the DRP estimate from the RBA data. Each annual DRP estimate will be derived as the RBA 10 year BBB spread to swap, extrapolated to 10 years (see below for a summary of the method for extrapolating the RBA data), for the year which ends concurrent with the final year in the trailing average.[385]

Composition of the hybrid trailing average estimates of the DRP

994. The Authority's has determined to adopt the simple equally weighted ten year trailing average for this Draft Decision, which may be recalled has the following automatic formula (refer to paragraph 947):

$$TA\ DRP_0 = \frac{\sum_{t=0}^{-9} DRP_t}{10} \qquad (22)$$

Where

$TA\ DRP_0$ is the equally weighted trailing average of the DRP to apply in the following year as the annual update of the estimate used in the current year; and

DRP_t is the DRP estimated for each of the 10 regulatory years t = *0, -1, -2…. , -9*.

[385] So for example, for the 2015 calendar year, the 9 historic averages to be included in the trailing average estimate would be for the 2014, 2013 and so on back to 2006 calendar years.

995. For the 2015 calendar year estimate (which is used as the return on debt for this Draft Decision), the following estimates are included in the trailing average:

- t=-9: January to December 2006 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-8: January to December 2007 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-7: January to December 2008 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-6: January to December 2009 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-5: January to December 2010 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-4: January to December 2011 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-3: January to December 2012 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-2: January to December 2013 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-1: January to December 2014 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=0: January to December 2015 : weighted average comprising 25% (interpolated daily) RBA DRP estimates for the period January to March 2015 and 75% the Authority's current (t=0) DRP estimate (interpolated daily to the prior RBA 31 March 2015 estimate).

996. The Authority's 2 March 2015 estimate contributes to the t=0 estimate in the 2015 DRP hybrid trailing average, for that period that falls after March 2015 (prior to that date, RBA actual data is available).

997. This estimate is used to estimate the return on debt for the Draft Decision for calendar year 2015, 2016, 2017, 2018 and 2019.

998. Ultimately, in the Final Decision, to occur in the first half of 2016, the 1 January 2015 to 31 December 2015 estimate will be based on the RBA actual data reported for 2015, with estimates for 2016 forward being superseded by the 2016 Final Decision estimate. The Final Decision 2016 estimate will have a similar format to that outlined above for calendar 2015 for this Draft Decision. That is, it will be a weighted average composite of actual RBA data and the Authority's 'on the day' estimates of the DRP made using the extended bond yield approach.

999. For 2017, the Authority will estimate the t=0 DRP estimate, based on the nominated 40 trading days in the five month window 1 June to 31 October 2016, as per the averaging period requirement. For the 2017 calendar year, the Authority will adopt the following estimators:

- t=-9: January to December 2008 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-8: January to December 2009 : simple average of (interpolated daily) RBA DRP estimates for the period;

- t=-7: January to December 2010 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-6: January to December 2011 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-5: January to December 2012 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-4: January to December 2013 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-3: January to December 2014 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-2: January to December 2015 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-1: January to December 2016 : weighted average of:
  - the monthly RBA DRP estimates for the period up to the nominated averaging period; and
  - the Authority's 2016 (t=0) DRP estimate (interpolated daily to the prior RBA); with
  - the averaging weights determined by the proportion of the calendar year contributed by each monthly estimate (for example, 3/12 RBA : 9/12 the Authority's 2016 DRP estimate);
- t=0: January to December 2017 : 100% the automatic formula (t=0) DRP estimate.

1000. For 2018, the Authority will estimate the t=0 DRP estimate, based on the nominated 40 trading days in the five month window 1 June to 31 October 2017, as per the averaging period requirement. For the 2018 calendar year, the Authority will adopt the following estimators:

- t=-9: January to December 2009 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-8: January to December 2010 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-7: January to December 2011 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-6: January to December 2012 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-5: January to December 2013 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-4: January to December 2014 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-3: January to December 2015 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-2: January to December 2016 : weighted average of:
  - the monthly RBA DRP estimates for the period up to the nominated averaging period; and

- the Authority's 2016 (t=0) DRP estimate (interpolated daily to the prior RBA); with
- the averaging weights determined by the proportion of the calendar year contributed by each monthly estimate (for example, 3/12 RBA : 9/12 the Authority's 2016 DRP estimate);

- t=-1: January to December 2017 : 100% the automatic formula (t=-1) DRP estimate;
- t=0: January to December 2018 : 100% the automatic formula (t=0) DRP estimate.

1001. The last annual update for the AA4 period will occur as part of the 1 January 2019 tariff variation. For 2019, the Authority will estimate the t=0 DRP estimate, based on the nominated 40 trading days in the five month window 1 June to 31 October 2018, as per the averaging period requirement. For the 2019 calendar year, the Authority will adopt the following estimators:

- t=-9: January to December 2010 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-8: January to December 2011 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-7: January to December 2012 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-6: January to December 2013 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-5: January to December 2014 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-4: January to December 2015 : simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-3: January to December 2016 : weighted average of:
  - the monthly RBA DRP estimates for the period up to the nominated averaging period; and
  - the Authority's 2016 (t=0) DRP estimate (interpolated daily to the prior RBA); with
  - the averaging weights determined by the proportion of the calendar year contributed by each monthly estimate (for example, 3/12 RBA : 9/12 the Authority's 2016 DRP estimate);
- t=-2: January to December 2017 : 100% the automatic formula (t=-2) DRP estimate;
- t=-1: January to December 2018 : 100% the automatic formula (t=-1) DRP estimate;
- t=0: January to December 2019 : 100% the automatic formula (t=0) DRP estimate.

1002. A summary of the automatic formulas for the trailing average calculations, and the actual estimate of the DRP for 2015, are set out in Appendix 8.

Method of estimating the 10 year term DRP from the RBA data

1003. The Gaussian Kernel method used by the RBA for estimating the return on debt results in the effective tenor of the DRP estimates varying between years, depending on the sample of bands and their relative weighting in the estimate. In recent times, the actual effective tenor of the estimates has been less than the specified tenor of ten years.

1004. The Authority has overcome this problem in its own estimates by targeting the effective Gaussian Kernel estimate to be a true 10 year term (see paragraph 936 above).

1005. To be as consistent as possible, the Authority has adjusted the RBA estimates from their effective tenors to be the targeted 10 year tenor. The method follows the simple extension technique laid out by Lally.[386] It utilises the slope of the yield curve between the two observed tenors (say the effective 7 and 10 year tenor spread to swap estimates, or '7e' and '10e' tenors respectively), to linearly extrapolate the spread to swap at an exact 10 year tenor. The formula used by the Authority is analogous to that set out by Lally as follows:[387]

$$RBA(10) = RBA(10e) + Base(10) - Base(10e) + \left[\frac{DRP(10e) - DRP(7e)}{10e - 7e}\right](10 - 10e) \qquad (23)$$

Where

$$RBA(10) = Base(10) + DRP(10)$$

$$DRP(10) = RBA(10e) - Base(10e) + \left[\frac{DRP(10e) - DRP(7e)}{10e - 7e}\right](10 - 10e)$$

$$DRP(10) = DRP(10e) + (10 - 10e)/(10 - 7e) \times [DRP(10e) - DRP(7e)]$$

1006. The Authority also interpolates the monthly RBA estimates to daily estimates. This is the same approach adopted by ATCO's consultant CEG in its estimates of the trailing average. The formula for achieving this step shown in (24):

$$y_t = yield_{start} + \left(\frac{yield_{end} - yield_{start}}{Date_{end} - Date_{start}}\right) x\ (t - Date_{start}) \qquad (24)$$

Where

y_t is the interpolated yield for any given date t;

$yield_{start}$ is the first available yield in any given month;

$yield_{start}$ is the last available yield in any given month;

$Date_{start}$ is the date when first yield was available;

[386] M. Lally, *Implementation Issues for the Cost of Debt*, 20 November 2014, p. 38.

[387] M. Lally, *Implementation Issues for the Cost of Debt*, 20 November 2014, p. 39.

$Date_{end}$ is the date when the last available yield is available; and

t is the date for which the yield is being interpolated.

1007. The Authority also annualises the RBA resulting annual data, as the RBA estimates may be generally interpreted as semi-annual rates. To do this, RBA basis point estimates are converted to percentage point numbers and then annualised:

$$\text{Effective annual rate} = 100^* (1 + \text{yield in basis points}/100/200)^2 - 100$$

The estimate of the DRP for 2015

1008. Utilising the RBA monthly data and the Authority's t=0 (2 April 2015) estimates of the DRP delivers the following results for the annual estimates of.

- The estimate of the simple trailing average DRP for calendar year 2015 is 2.502 per cent (Appendix 8, paragraph 84).

1009. More detail on the automatic formulas and contributing DRP estimates to these trailing averages are set out in Appendix 8.

Debt raising and hedging costs

1010. In the Guidelines, the Authority provided an allowance for debt raising costs of 0.125 per cent and hedging costs of 0.025 per cent. GGT proposed these costs in its initial proposal.

1011. In its March 2015 Discussion Paper, the Authority noted that the debt raising cost estimate of 0.125 per cent was generally accepted.

1012. With regard to hedging costs, the Discussion Paper stated:[388]

> The current spread cost of the 10 year swap is around 10 bps, half of which would be incurred by the service provider – therefore the total cost of the two swaps required at the current time could approach 2 by 5 bps, or 10 bps. Two swaps would also be required subsequent to cover the amount of any increase in debt associated with capital expenditure over the course of the regulatory period.
>
> To calculate this amount for inclusion in revenue, it would be simplest to provide a single allowance for swaps in the operating expenditure cash flows. The swaps allowance could be based on the swap spread, as outlined above, multiplied by the closing debt balance in the final year of the forecast regulatory period.

1013. In response to the Discussion Paper, ATCO's consultant CEG took issue with these statements. CEG suggests that banks will price interest rate swap contracts based on the prevailing swap bid spread plus execution spread and risk spread costs. CEG considers a hedging allowance of 23 bppa is appropriate, at the upper end of the following range, given that many issues are in foreign currency:[389]

> Based on the evidence surveyed above, swap transaction costs have been estimated to be in the order of 15.5bppa to 23bppa – consistent with the QCA's stated range of 15bppa to 20bppa. The lower/upper end of this range is based on the swap costs estimated by Evans & Peck/UBS and are themselves based on domestic/foreign debt issues.

[388] Economic Regulation Authority, *Estimating the return on debt: Discussion paper*, 4 March 2015, p. 23.

[389] ATCO Gas Australia, *Re: Estimating the return on debt: ATCO Gas Australia's response to the Authority's Discussion Paper*, 25 March 2015, Attachment, p. 9.

Debt raising costs

1014. The Guidelines considered the estimate of debt raising costs of 0.125 per cent per annum in depth. The Guidelines noted that the debt raising cost estimate covered:[390]

- gross underwriting fee: including management fees, selling fees, arrangement fees and the cost of an underwriter for the debt;
- legal and road show fee: this includes fees for legal documentation and fees involved in creating and marketing a prospectus;
- company credit rating fee: a credit rating is generally required for the issue of a debt raising instruments, a company is charged annually by the credit rating agency for the services of providing a credit rating;
- issue credit rating fee: a separate credit rating is obtained for each debt issue;
- registry fee: the maintenance of the bond register; and
- paying fee: payment of a coupon and principal to the security holder on behalf of the issuer.

1015. GGT has no issue with this estimate, so this is adopted for the purpose of this Draft Decision.

Hedging costs

1016. Interest rate swaps are derivative contracts, which typically exchange – or swap – fixed-rate interest payments for floating-rate interest payments. They provide a means to hedge and manage risk. Investment and commercial banks with strong credit ratings are swap market-makers.

1017. Hedging costs involved in converting from typical 10 year fixed debt to the regulated 5 year fixed rate will involve four legs:

- swapping 10 year fixed for a base floating rate at the time of issuance – paying floating and receiving 10 year fixed;
- swapping the base floating rate at the time of the regulatory reset for 5 year fixed – receiving floating and paying 5 year fixed.

1018. For each set of two legs, the following costs may be incurred:

- a credit and capital charge – relates to the risk of the counterparty, and will depend on the credit rating and the potential default loss;
- an execution charge – compensates the swap intermediary for the costs associated with transacting the swap.

1019. The benchmark efficient entity would potentially engage in four different transactions in hedging the base of its portfolio of debt:[391]

- 5-year floating to fixed AUD swaps at start of AA for full amount of debt portfolio;

[390] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 199.

[391] Chairmont Consulting, *ERA Hedging Costs in the Cost of Debt*, 13 May 2015.

- bond issuance potentially made up of three different issue types and hence requiring three different swap considerations:
- foreign currency bonds – requiring a cross-currency swap into floating AUD;
- fixed-rate AUD bonds – requiring a fixed-float AUD swap;
- floating rate AUD notes – no swap will be required.

1020. The QCA has been awarding swaps costs for swapping from 10 year fixed debt to shorter term (typically, although not always) 5 year fixed debt, since 2010, utilising estimates made by Evans & Peck. The most recent cost estimate is 13 basis points per annum (bppa) (Table 64).

Table 64 Hedging transactions costs for four legs, BBB credit rating

Estimate	10 year fixed to floating (basis points per annum)	Floating to 5 year fixed (basis points per annum)	Total (basis points per annum)
Evans & Peck[a] (12 January 2015)	8.0	5.0	13.0
UBS[b] (November 2014)			23
Jemena[c] (June 2013)			7.9 – 9.4

Source *a) Evans & Peck, reported in Incenta, WACC parameters for GAWB Price Monitoring Investigation 2015-20 – Draft Report, February 2015, p. 32 (swapping 10 for 5; $250 m debt; BBB; to mid-rate; as at 12 January 2015);*

b) UBS, reported in Transgrid, Revised revenue proposal, 13 January 2015, Appendix R, p. 6 (BBB+ credit rating).

c) Jemena, Rate of Return Guidelines – Consultation Paper: Submission, 21 June 2013, p. 22 (BBB+ credit rating).

1021. Other recent estimates include those reported by Jemena and UBS (Table 64).

- The Jemena range is based on quotes from two separate banks for BBB+ swaps for 10 year fixed to 5 year fixed.[392]
- The UBS estimate is comprised of the AUD interest rate swap credit, capital and execution costs for a BBB+ rated entity (quoted at 5 basis points) and cross-currency interest rate swap credit, capital and execution costs for a BBB+ rated entity (quoted at 18 basis points).[393]

[392] As part of its investigation of this issue, the Authority approached a local bank, which confirmed estimates similar to Jemena's, as at March 2015, for a swap of 10 year fixed for 5 year fixed debt.

[393] The Authority does not include other swaps costs estimated by UBS. The tracking risk and deferral cost estimates are 'a quantification of risks associated with an inability to fully hedge to the regulatory allowance even when using swaps' (ATCO, *Re: Estimating the return on debt: ATCO Gas Australia's response to the Authority's Discussion Paper*, 25 March 2015, Attachment, p. 8.).

1022. ATCO's consultant CEG, using evidence from Table 64, estimates a range for hedging costs of 15.5 to 23 bppa, based on an Evans & Peck estimate from 4 February 2013 and the UBS estimate (in Table 64):[394]

> Based on the evidence surveyed above, swap transaction costs have been estimated to be in the order of 15.5bppa to 23bppa – consistent with the QCA's stated range of 15bppa to 20bppa. The lower/upper end of this range is based on the swap costs estimated by Evans & Peck/UBS and are themselves based on domestic/foreign debt issues. To the extent that foreign issued debt is relied on then somewhere towards the upper end of this range is appropriate.

1023. However, the Authority does not agree with this estimate. The Authority engaged Chairmont to advise on the costs of undertaking swaps. Chairmont estimates the following costs for each of the components, based on the data in Table 64 and its own enquiries:[395]

- 5-year swaps at the start of the AA. The different submissions provide a range of estimated costs, i.e. Evans and Peck (2015) 5bp; UBS <5bp; Jemena <5bp (i.e. less than half of the total 8-10bp, as a 5-year swap costs less for capital and credit charges). This suggests approximately 4bppa is appropriate. This is also supported by informal discussions held by Chairmont with two banks in late 2014.
- Cross-currency swaps. There was only one estimate provided and that was by UBS which reported 18bp. Chairmont's discussions with the banks suggest that this estimate is at the high end of costs and is likely to overstate a swap in relation to a new issuance. It is important to understand that banks tend to be more aggressive on swap pricing when linked to other business. A lower level of 10bp appears to be reasonable, so for further calculation a mid-point of 14bp is used.
- 10-year AUD fixed-floating swaps. The submissions are Evans and Peck (2015) 8bp; UBS 5bp; Jemena and Authority (implied) 5-7bp. Taking a mid-point such as 6bp appears reasonable for this component.

1024. Only a proportion of debt is raised overseas, thereby requiring overseas credit and executions costs. For example, CEG present evidence that regulated energy companies had around 65 per cent of debt issued in AUD in 2013, with the remainder in foreign currencies.[396,397] Further, CEG identifies that 24 per cent of debt amounts outstanding is already floating, typically bank loans.[398]

1025. On the basis that CEG's estimates remain valid, the Authority calculates the weighted cost of hedging, using Chairmont's estimates set out above, as the sum of:

- 5 year swap floating for fixed for the full amount of debt = 4 bppa x 100 per cent = 4.0 bppa; plus
- 10 year cross currency swaps for (100 – 65 =) 35 per cent of debt issuance = 14 bppa x 35 per cent = 4.9 bppa;

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394 ATCO Gas Australia, *Re: Estimating the return on debt: ATCO Gas Australia's response to the Authority's Discussion Paper*, 25 March 2015, Attachment, p. 9.

395 Chairmont Consulting, *Authority Hedging Costs in the Cost of Debt*, 13 May 2015.

396 Competition Economists Group, *Debt strategies of utility businesses*, June 2013, p. 23.

397 This proportion exceeds that of issuance of corporate bonds by Australian corporates, more generally (see Table 59 at p. 274, which reports that only 20 per cent of corporate bonds were issued in AUD as at June 2014).

398 Competition Economists Group, *Debt strategies of utility businesses*, June 2013, p. 22.

- 10-year fixed-float AUD swaps for (65 – 24=) 41 per cent of debt issuance = 6 bppa x 41 per cent = 2.5 bppa.

1026. That sum gives a total cost of hedging of 11.4 bppa (rounded to the nearest bppa).

1027. Accordingly, the Authority will allow 11.4 bppa as the costs of hedging for this Draft determination.

The estimate of the return on debt for this Draft Decision

1028. The Authority's estimate for the return on debt for the 2015 calendar year (which is applied from 1 January 2015 to 31 December 2015 and also utilised for the other years of the tariff model) is 5.172 per cent. The estimate is the sum of:

- the on the day 5 year swap rate of 2.431 per cent;
- a hybrid trailing average debt risk premium of 2.502 per cent;
- debt issuing costs of 0.125 per cent; and
- hedging costs of 0.114 per cent.

1029. The Authority's estimate of the DRP for 2015 and for 2016 will be revised for Final Decision. The automatic formula for updating the estimate of the DRP – which will then occur for 2017, 2018 and 2019 consistent with the requirements of NGR 87(12) – is set out at Appendix 8.

Rate of return

1030. The Authority's resulting *indicative* estimate for the overall post tax nominal rate of return for the 2015 calendar year is 6.32 per cent (Table 65):

- this *indicative* rate of return is applied from 1 January 2015 to 31 December 2019 in the tariff modelling for this Draft Decision in order to provide *indicative* tariffs.

1031. The Authority's estimate of the rate of return will be revised in the Final Decision for the 2015 and 2016 calendar years (that Final Decision is expected to be released around the middle of 2016). The estimated rate of return for 2016 will apply in the tariff modelling for that Final Decision for 2017 through to 2019. The 2017 through to 2019 rates of return would then be progressively annually updated through the remaining years of AA3. The resulting revised rate of return will be included in the relevant tariff variations which occur in each calendar year.

1032. The process for implementing the annual update is as follows:

- For each annual update for 2017, 2018 and 2019, the Authority will estimate the updated DRP following the relevant annual averaging period, recalculate the rate of return, and then notify GGT of the outcomes as soon as practicable. This will allow GGT to check the rate of return estimate, prior to its incorporation in the proposed annual tariff variation to occur on 1 January in each year and each subsequent quarterly tariff variation in that year.
- Following that notification, GGT is required to respond on any issues as soon as practicable, in order to allow the updated DRP and rate of return estimates to be finalised prior to submission by ATCO of its proposed annual tariff variation.

- In the event that there is a disagreement on the DRP annual update estimate, the Authority will work with GGT to ensure that any misapplication of the automatic formulas in Appendix 8 of this Draft Decision are corrected in a timely manner.
- The updated annual rate of return based on the correct application of the DRP automatic update formulas is to be utilised for each relevant quarterly tariff variation.

Table 65 Rate of return for the Draft Decision

WACC as at 02 Apr 2015	for 2015
Nominal Risk Free Rate	**1.96%**
Real Risk Free Rate	0.07%
Inflation Rate	**1.90%**
Debt Proportion	60%
Equity Proportion	40%
Debt Risk Premium (10 year trailing average)	**2.502%**
5 year IRS (effective yield)	**2.431%**
Return on Debt; 5 year Interest Rate Swap Spread	0.467%
Return on Debt; Debt Issuing Cost (0.125%) + Hedging (0.114%)	0.24%
Return on debt	**5.172%**
Australian Market Risk Premium	**7.6%**
Equity Beta	**0.8**
Corporate Tax Rate	30%
Franking Credit	40%
Nominal After Tax Return on Equity	**8.04%**
Nominal After Tax WACC	**6.32%**
Real After Tax WACC	4.34%

Source ERA analysis, December, 2015

Required Amendment 9

The Authority requires that the rate of return be consistent with the estimates set out in Table 65 of the Draft Decision. The *indicative* nominal post tax rate of return for 2015 is 6.32 per cent (this estimate will be revised for the Final Decision).

The Authority requires an annual adjustment to be applied to the debt risk premium to be incorporated in each subsequent tariff update during the third access arrangement period. The first annual update will apply for the tariff variation for the 2017 calendar year, and should be determined based on the automatic formula set out in Appendix 8 of the Draft Decision. The resulting annual adjustment to the rate of return should be incorporated in the Annual Tariff Variation.

The Authority requires that GGT nominate, as soon as practicable, the averaging period for each annual update applying in 2017, 2018 and 2019. The averaging periods for each year must be a nominated 40 trading days in the window 1 June to 31 October in the year prior to the relevant tariff variation, which will allow estimation of the updated DRP for inclusion in the relevant annual tariff variation. The nominated 40 trading day averaging period for each of the four years do not need to be identical periods, only that they occur in the period 1 June to 31 October in each relevant year, and are nominated prior. The nominated averaging periods will remain confidential.

For each annual update for 2017, 2018 and 2019, the Authority will estimate the updated rate of return following the relevant annual averaging period and then notify GGT of the outcomes as soon as practicable. Following that notice, GGT is required to respond on any issues as soon as practicable, in order to allow the updated estimate to be finalised prior to submission by GGT of its proposed annual tariff variation within the required timeframe.

Gamma

1033. The Authority is required by the NGR to estimate the value of gamma, a parameter in the building block revenue model.

1034. The gamma parameter accounts for the reduction in the effective corporate taxation that is generated by the distribution of franking credits to investors. As a general rule, investors who are able to utilise franking credits will accept a lower required rate of return, before personal tax, on an investment that has franking credits, compared with an investment that has similar risk and no franking credits, all other things being equal.

Regulatory requirements

1035. Rule 87A of the NGR requires that the estimated cost of corporate income tax of a service provider for each regulatory year of an access arrangement period (ETC_t) is to be estimated in accordance with formula (25).

$$ETC_t = (ETI_t \times r_t)(1-\gamma) \qquad (25)$$

Where

ETC_t is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of reference services if such an entity, rather than the service provider, operated the business of the service provider;

ETI_t is the estimated taxable income for the regulated entity;

r_t is the expected statutory income tax rate for that regulatory year as determined by the AER [Authority]; and

γ is the value of imputation credits.

1036. Rule 87A accounts for the ability of imputation credits to reduce the effective corporate tax rate for equity investors.

1037. In determining the value of imputation credits, the Authority is required to account for the national gas objective, the National Gas Law (including the revenue and pricing principles) and the NGR.

GGT's Proposed Revisions

1038. In the Rate of Return Guidelines, the Authority estimated gamma (γ) as the product of the distribution rate F and the estimate of the utilisation rate θ (theta), consistent with the approach set out in the Rate of Return Guidelines (formula 26):[399]

[399] This follows the analysis by Monkhouse in relation to the impact of imputation credits on the effective tax rate of companies. See equation 2.5 in P. Monkhouse, The valuation of projects under the dividend imputation tax system, *Accounting and Finance*, 36, 1996, p. 192; Goldfields Gas Pipeline, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1.

$$\gamma = F \times \theta \quad (26)$$

1039. Under this Monkhouse formulation, gamma depends on the degree to which imputation credits are distributed and the degree to which investors utilise those credits that are distributed.

1040. Contributing to the estimate of gamma, the Rate of Return Guidelines adopted an estimate for the distribution rate, F, of 0.7. The 0.7 rate was based on Australian Taxation Office (**ATO**) data showing around 70 per cent of cumulative imputation credits created had been distributed.

1041. For the utilisation rate, the Rate of Return Guidelines adopted a range of 0.35 to 0.55.[400] This estimated range was based on the results of Dividend Drop Off (**DDO**) studies.

1042. The resulting range for gamma adopted for the Rate of Return Guidelines – given by the product of distribution rate and the range for the utilisation rate – was 0.25 to 0.385.

1043. GGT accept the formula for gamma set out above.

1044. With regard to the distribution rate, GGT:[401]

> …is of the view that:
>
> (a) the finding of the Tribunal that the evidence supports an estimate of the payout ratio of 0.70 is important to confirmation that an estimate of 0.70 is currently appropriate when applying rule 87A; and
>
> (b) the Tribunal decision was made prior to the November 2012 amendments to the NGR which introduced rule 87A, and the question of whether or not there is a basis for departing from the finding of the Tribunal is not the criterion which should now be applied in determining an estimate of the payout ratio.

1045. However, despite this concern, GGT still proposes an estimate for the distribution rate of 0.7, on the basis that 'the evidence adduced by the ERA and reported in the Explanatory Statement supports' it.[402]

1046. GGT does not agree with the Authority's estimate of the utilisation rate. GGT considers that the estimate should be derived on the basis of a particular dividend drop off study. GGT considers that SFG Consulting's 2011 study provides a basis for the estimate, as it has been accepted by the Australian Competition Tribunal (**ACT**) and as it adjusts observed dividend drop offs for the change in the overall market return. GGT draws on SFG's 2014 update of that study for its estimate of

[400] Monkhouse in his 1993 exposition stated that 'the symbol θ is used throughout to represent a 'utilisation factor'' (P. Monkhouse, The cost of equity under the Australian dividend imputation tax system, *Accounting and Finance*, November 1993, p. 5).

[401] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 154.

[402] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 155.

gamma.[403] GGT therefore proposes to use the value of 0.35 for the utilisation rate reported in that study.[404]

1047. GGT's proposed estimate for gamma is therefore 0.25, being the product of a distribution rate of 0.7 and a utilisation rate of 0.35.

Submissions

1048. Two submissions were received on the Issues Paper – from BHP Billiton and Santos. Neither submission commented on the issue of the estimate of gamma.

Considerations of the Authority

1049. The Authority's has recently re-examined its method for estimating the gamma parameter. That review has resulted to the Authority adopting a different estimate to that set out in the Rate of Return Guidelines.[405]

1050. In revising its position, the Authority has taken into account:

- considerations relating to theoretical framework for estimating gamma;
- the Authority's prior position, set out in the Rate of Return Guidelines, which accounted for stakeholder input and a range of consultants' reports, among other things;
- GGT's submission on gamma, including the 2011 and 2014 reports by its consultant SFG;[406]
- Lally's November 2013 report to the AER;[407]
- Lally's November 2013 report to the Queensland Competition Authority, and his responses to submissions to the QCA on that report;[408]
- the conclusions of the AER in responding to Lally's report, set out in its rate of return guidelines;[409]
- a 2013 report on tax statistics by Hathaway commissioned by the Energy Networks Association;[410]

[403] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1 (SFG Consulting, *An appropriate regulatory estimate of gamma*, 21 May 2014, referenced at p. 154).

[404] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1 (SFG Consulting, *An appropriate regulatory estimate of gamma*, 21 May 2014, referenced at p. 159.

[405] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems, as amended 10 September 2015*, p. 413.

[406] SFG Consulting, Dividend drop-off estimate of theta, 21 March 2011; SFG Consulting, An appropriate regulatory estimate of gamma, 21 May 2014.

[407] M. Lally, *The estimation of gamma*, 23 November 2013.

[408] M. Lally, *Review of submissions to the QCA on the MRP, risk-free rate and gamma*, 12 March 2014.

[409] Australian Energy Regulation, *Explanatory Statement – Rate of Return Guideline*, December 2013.

[410] N. Hathaway, *Imputation credit redemption ATO data 1988–2011: Where have all the credits gone?*, September 2013.

- the conclusions of the QCA in its recent cost of capital determination, which also considered the foregoing material, as well as additional material with regard to the estimation of gamma;[411]
- ATCO's submission on the Authority's Gas Distribution System Draft Decision, including the report by its consultant, SFG, given that the Draft Decision was made after GGT's initial proposal was received by the Authority;[412]
- a report for the Queensland Resources Council by McKenzie and Partington;[413]
- a report on gamma by Associate Professor John Handley for the Australian Energy Regulator.[414]

1051. The Authority notes that experts differ in their interpretation of the best approach to estimating gamma in the regulatory setting. This is particularly the case with regard to the value of the utilisation rate. The Authority also notes that the Australian Competition Tribunal views the estimate of gamma as an 'ongoing intellectual and empirical endeavour'.[415]

1052. GGT has raised a range of issues with regard to the Authority's position set out in the Rate of Return Guidelines. These are considered in what follows. The Authority also responds to SFG's views on the Authority's revised position on gamma –as set out in its ATCO Gas Distribution System Final Decision – so as to allow due process for GGT, given the delays in the release of this Draft Decision.

Definition of the domestic capital market

1053. In reconsidering its estimate of gamma, the Authority takes account of the definition of the capital market used for determining the allowed rate of return, which was set out in the Rate of Return Guidelines. In particular, the Authority has adopted a domestic CAPM, while allowing for the presence of foreign investors:[416]

> In summary, the Authority's position is that the boundary should account for the full domestic data set, including any direct influences on the cost of capital for Australian domiciled firms. This may include the influence of international investors in Australian markets for equity, or the influence of international lenders supplying debt finance directly to Australian firms.

1054. Therefore, to maintain internal consistency, the Authority considers that the estimate of gamma needs to take into account the presence of international investors in the Australian domestic capital market.

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411 Queensland Competition Authority, *Final decision: cost of capital: market parameters*, August 2014.

412 ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014.

413 M. McKenzie and G. Partington, *Report to the Queensland Resources Council: Review of Aurizon Network's draft access undertaking*, 5 October 2013.

414 J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014.

415 Australian Competition Tribunal, *Application by Energex Limited (Gamma) (No 5) [2011] ACompT 9*, 12 May 2011, paragraph 45.

416 Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, December 2013, p. 30.

Interpretation of gamma

1055. The equation set out in paragraph 1038 interprets the value of franking credits in the context of the Officer CAPM framework, as extended by Monkhouse to cover a non-perpetuity setting.[417]

1056. The Authority considers that the benefit arising from imputation credits can be interpreted as the proportion of franking credits received that are utilised by the representative investor.[418]

1057. GGT's consultant SFG considers this interpretation to be misplaced.[419]

1058. SFG has stated that the Authority has committed two errors:[420]

> a) It has misinterpreted the advice provided in the Lally (2013) report to the AER. The ERA interprets that report as supporting its conceptual definition of theta and its use of the equity ownership approach and tax statistic redemption rates to estimate theta. However, as set out in detail in Section 10 below, Lally (2013 AER) provides no such support. That is the ERA has erred in its interpretation of the Lally (2013 AER) report; and
>
> b) Irrespective of what might be contained in the Lally (2013) report to the AER, the regulatory task requires theta to be estimated as the value of distributed credits – as explained in Sections 2 and 5 of this report. The ERA now proposes to perform a different task and has erred in that respect.

1059. The key challenge to the Authority's revised view of gamma therefore relates to the estimate of the utilisation rate. The Authority deals with this first, in what follows, then discusses the distribution rate, before drawing the material together to provide for an overall estimate of gamma.

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[417] Officer assumes all dividends and imputation credits are fully paid out each period. Monkhouse allows some retained earnings and imputation credits (R.R. Officer, The Cost of Capital of a Company under an Imputation Tax System, *Accounting and Finance*, May 1994; P.H.L. Monkhouse, The Valuation of Projects Under the Dividend Imputation Tax System, *Accounting and Finance*, 36, 1996.) Handley notes that this assumption is unrealistic, such that any estimate of gamma that ignores retained credits will be an underestimate (J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 13):

> It is well understood that the value of a retained imputation credit is less than the value of a distributed imputation credit due to the delay in distribution – but the difficult question is how much less. Unfortunately the answer is we just don't know as there is currently no empirical evidence on the value of a retained credit. Any value attributable to credits retained in a period would be reflected in the observed capital for that period but there no known method to identify that component. I continue to find the suggestion that retained imputation credits are worthless to be implausible.
>
> … Estimates of gamma using the traditional approach will therefore be downward biased to the extent that retained imputation credits have value. Although it is not possible to reasonably estimate the magnitude of the bias, its direction is clear.

[418] Economic Regulation Authority, *Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System,* 14 October 2014, p. 210.

[419] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1, p. 9 (SFG Consulting, An appropriate regulatory estimate of gamma, 21 May 2014).

[420] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 16.

Utilisation rate

1060. The Authority considers that the benefit of imputation credits will rely on the proportion of franking credits received that are utilised by the representative investor. The estimate of this proportion is the utilisation rate, theta (θ).

1061. The Authority notes that the utilisation rate is a market-level parameter, meaning that the same value applies to all firms.[421]

1062. Individual investors have differing utilisation rates; investors who are able to fully use tax credits are assigned a value of one whilst investors who cannot are assigned a value of zero. These individual utilisation rates may be weighted to produce the required market-level utilisation rate θ. Therefore θ 'is a complex weighted average over all investors holding risky assets, where the weights involve each investor's investment in risky assets and their risk aversion'.[422]

1063. To this end, the Authority's previous estimation approach for estimating theta – using DDO studies – may not correctly estimate the required utilisation rate required, as, among other things:

- The required utilisation rate is a complex weighted average determined by the value of equity that investors hold and their relative wealth and risk aversion.
- Dividend drop off studies only estimate the value weighted utilisation rate around just two days, the cum-dividend and ex-dividend dates. As a consequence, they provide an estimate of the utilisation rate with a value weighting that reflects the composition of investors around the cum and ex dividend dates, not the weighted average across the entire market over an entire year, as required.
- There are significant econometric challenges in estimating the utilisation rate from dividend drop off studies. Trading around the ex-dividend date reflects a variety of different incentives and price movements. Dividend drop off studies may not accurately separate out the effect of the taxation incentive associated with imputation credits on the share price change.

1064. For these reasons, the Authority has determined to place limited weight on the DDO estimates, and on the range of applied market value estimates more generally.

1065. The Authority instead considers other approaches to estimating the utilisation rate.[423]

1066. In response, SFG has argued that the Authority is in error in interpreting theta (and hence gamma) as the utilisation rate, rather than in terms of the value to the representative investor.[424]

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[421] M. Lally, *The Estimation of Gamma,* Report for the AER*,* November 2013, p. 11.

[422] M. Lally, *The Estimation of Gamma,* Report for the AER*,* November 2013, p. 11; M. Lally. and T. van Zijl, 'Capital Gains Tax and the Capital Asset Pricing Model', *Accounting and Finance,* vol.43, 2003, pp. 187-210.

[423] Economic Regulation Authority, *Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 14 October 2014, Appendix 8.

[424] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 16.

1067. First, SFG points to the revised language of NGR 87A, which states that 'gamma is the value of imputation credits', rather than the previous term 'utilisation of imputation credits'. SFG acknowledges that the Australian Energy Market Commission did not provide a detailed explanation about the changed language in its Final Determination, but considers that its apparent intention was to be clear that imputation credits did not rely on utilisation.[425] The Authority notes that the AER sought clarification from the AEMC on the reason for the change, which was unable to provide 'any further insight'.[426]

1068. Second, SFG has argued that the parameter *U* in the following equation from Lally's analysis, specifically within the term IC_1U, is defined as the *value* that investors attribute to imputation credits:[427]

$$S_0 = \frac{Y_1 - Tax_1 + IC_1U + S_1}{(1 + E[\widehat{R}])} \qquad (27)$$

Where

U is the utilisation rate or value that investors attribute to imputation credits;

Y_1 is the expected cash flows over the first year to equity holders (net of all deductions except company taxes);

Tax_1 is the expected company taxes over the first year;

S_0 is the current value of equity;

S_1 is the expected value in one year;

$E[\widehat{R}]$ is the equilibrium expected rate of return on equity;

IC_1 is the distributed imputation credits over the first year.

1069. However, the Authority notes that Lally quite clearly states in context that U in the equation is a market level parameter, derived as a complex weighted average over all investors holding risky assets:[428]

> So, relative to the standard form of the CAPM, the Officer CAPM and the associated cash flows requires three additional parameters: the ratio of market-level imputation credits to the value of the market portfolio (ICm/Sm), the ratio of firm-level imputation credits to firm level company tax payments (IC/TAX) and the utilisation rate (U). The second of these parameters is called the "distribution rate" and the product of the last two is called "gamma".
>
> The utilisation rate referred to here is a market-level parameter, i.e., the same value applies to each firm. Individual investors also have utilisation rates: one for those who

[425] Goldfields Gas Transmission, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1, p. 63 (SFG Consulting, An appropriate regulatory estimate of gamma, 21 May 2014).

[426] Australian Energy Regulator, *Draft Decision on Jemena Gas Network 2015–20 Access Arrangement*, Attachment 4 Value of imputation credits, p. 4-37.

[427] The source of this equation is M.Lally, *The Estimation of Gamma, Report for the AER,* November 2013, p. 9; cited by Goldfields Gas Pipeline, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1, p. 11 (SFG Consulting, *An appropriate regulatory estimate of gamma*, 21 May 2014). Lally uses *U* for the utilisation rate, rather than θ.

[428] M. Lally, *The Estimation of Gamma, Report for the AER*, November 2013, p. 10.

> can fully use the credits and zero for those who can't. Consequently it might be presumed that U is some type of weighted average over investors. Although Officer (1994) provides no clarification on this matter, because his derivation of the model is intuitive rather than formal, Lally and van Zijl (2003, section 3) provide a formal derivation of a generalisation of Officer's model (with the Officer model being a special case), in which variation of utilisation rates across investors is recognised. In this derivation, they show that U is a complex weighted average over all investors holding risky assets, where the weights involve each investor's investment in risky assets and their risk aversion. Individual investors' levels of risk aversion are not observable. Accordingly it is necessary to (reasonably) act as if risk aversion is uncorrelated with utilisation rate at the investor level, in which case the weights reduce to investors' relative investments in risky assets, i.e., U is a value-weighted average over the utilisation rates of individual investors.

1070. Third, SFG considers that there is a material difference between the utilisation rate (the proportion of credits that are redeemed at the tax office) and the value of those credits to shareholders.[429]

1071. In this context, SFG contends that DDO method is only useful for measuring the *value* of distributed credits, not the value of the utilisation rate, and hence is 'irrelevant' for estimating the proportion of distributed credits that are redeemed.[430]

1072. SFG's core argument is that there is a cost for an investor to obtain and redeem a credit.[431] SFG considers that:[432]

- some credits that are distributed are never redeemed, for example because;
  - the investors are non-residents;
  - the 45 day rule precludes it;
- record keeping creates administrative costs;
- there is a time delay in obtaining the benefit;
- imputation credits are taxed at their face value;
- as resident investors adjust their portfolio to hold domestic shares for imputation, their portfolios will become less diversified, at a cost;
- a rational investor would increase the concentration of domestic shares in their portfolio until the marginal benefit of imputation is zero.

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[429] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1, p. 13 (SFG Consulting, An appropriate regulatory estimate of gamma, 21 May 2014). See also ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 19. SFG consider that it would be a clear error to conclude that theta should be interpreted as a redemption rate because of econometric issues involved in estimating the value of distributed credits (ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 17). The Authority notes that its interpretation does not turn on issues associated with DDO studies.

[430] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 17.

[431] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 21.

[432] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 22.

1073. The Authority has noted these points, but considers:

- analysis by the Australian Energy Regulator of tax statistics demonstrates that the amount of credits utilised is very close to the amount of credits that have been received;[433]
- the effects of the time value of money are likely to be minimal, given the period of delay;
- there is no empirical evidence on the diversification effect of imputation credits, and no clear theoretical position for the effect either.[434]

1074. In addition, transactions and other costs are unlikely to materially affect redemption of imputation credits, as investors are required to report franked dividends and eligible imputation credits, such that the incremental cost of these other costs to shareholding is likely to be small. More importantly, the Authority notes in this context Handley's view that the correct estimate of an after-company-before-personal-tax value of a distributed imputation credit should value credits before administrative costs, personal taxes and diversification costs.[435]

1075. The Authority's view then is that these considerations do not detract from the fact that some investors will redeem credits, and thus have a utilisation rate of 1, and other investors in the Australian share market will not redeem credits, and will thus have a utilisation rate of 0. In the Authority's view, there is no case here that the utilisation rate is not a complex weighted average across all investors, both domestic and international. That complex weighted average depends on risk aversion, wealth, and given the foregoing, the cost of redeeming credits. Therefore the Authority is of the view that approaches that directly inform the degree of utilisation of imputation credits will provide relevant information. Those approaches include the domestic ownership share of equity, and taxation statistics on the proportion of redeemed imputation credits.

1076. SFG's has a further argument that the complex weighted average interpretation can only be consistent with perfectly segmented or perfectly integrated capital markets – and that this is not consistent with the Authority's definition of a domestic capital market with the presence of foreign investors:[436]

> However, the ERA's definition of theta in terms of the proportion of credits that are redeemed is not consistent with any theoretical model. The theoretical models that involve "a complex weighted average over all investors" only apply to two special cases:

[433] Australian Energy Regulator, *Draft Decision on Jemena Gas Network's 2015-20 Access Arrangement*, November 2014, p. 4-46.

[434] The Authority notes that diversification will depend on investor's wealth and risk preferences. It may be that investors respond to the presence of imputation by holding more, less or the same value of Australian equities, depending on preferences.

[435] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 46.

[436] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1, p. 14 (SFG Consulting, An appropriate regulatory estimate of gamma, 21 May 2014). See also *ATCO Gas Australia, Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 26. The Rate of Return Guidelines stated that 'the Authority's position is that the boundary should account for the full domestic data set, including any direct influences on the cost of capital for Australian domiciled firms. This may include the influence of international investors in Australian markets for equity…' (Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 30).

a) The case where Australia is perfectly segmented from world capital markets; and

b) The case where Australia is perfectly integrated into world capital markets.

1077. SFG then argues that there is no theoretical model that is consistent with the Authority's definition of the boundaries of the domestic market for estimation purposes, which include the presence of foreign investors to the extent that they invest domestically. In this context, SFG considers that the Authority's definition of the market is not a 'closed system', citing Lally in support:[437]

> Lally (2013 AER) notes that there is a special case in which the proportion of imputation credits that are redeemed would be an appropriate estimate of the value of imputation credits that is reflected in the share price. He considers a class of models that includes Monkhouse (1993) and Lally and van Zijl (2003). These models all consider a setting in which there is a single market in which the m investors jointly own all of the n assets. In these models there is a closed system – there are no assets outside the market that are available to the m investors inside the market and there are no investors outside the market who can buy any of the n assets inside the market. That is, these models only apply in a closed system where the m investors collectively own all of the n assets and nothing else.
>
> The models then derive an equilibrium by solving a market clearing condition. This involves noting that: a) All of the m investors must invest all of their wealth across the n assets and nothing else; and b) All of the n assets must be owned entirely by the m investors and no one else
>
> Each of the m investors will hold a different amount of each of the n assets according to their wealth, their risk aversion and their tax status. Other things equal, wealthy investors will hold more of each asset than poor investors, highly risk averse investors will tend to hold safer portfolios, and investors who are eligible to redeem imputation credits will hold relatively more of the stocks that distribute larger amounts of those credits.
>
> Because there is a closed system in which the m investors collectively own all of the n assets and nothing else, it is possible to derive the relative amount of each asset that each investor will want to hold. This will be a function of the investor's relative wealth, risk aversion and tax status. The relative demand for each asset will determine its equilibrium price and the equilibrium return that investors will require for holding it. Again, it is very important to emphasise that none of these equilibrium calculations can be performed unless the system is closed such that the m investors collectively own all of the n assets and nothing else.
>
> These models also make the assumption that a dollar of redeemed credits has the same value as a dollar of cash dividends.

1078. This is a pivotal issue. SFG has acknowledged that:[438]

> In this [closed system] case, there is equality between:
>
> a) The extent to which imputation credits are capitalised into stock prices; and
>
> b) The weighted-average redemption rate.

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[437] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 27. See also Goldfields Gas Pipeline, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1, p. 73 (SFG Consulting, An appropriate regulatory estimate of gamma, 21 May 2014).

[438] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 28. See also Goldfields Gas Pipeline, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1, p. 72 (SFG Consulting, An appropriate regulatory estimate of gamma, 21 May 2014). See also

> That is, there are two equivalent ways of determining the value of imputation credits, but only if the pre-requisite conditions and assumptions of the model hold. Importantly, under these special assumptions value and redemption will be equal. That is, redemption rates can be used to estimate value under these special assumptions. That is, these models do not say that redemption is the right interpretation and value is the wrong interpretation – the value interpretation is always the correct one. The only contribution of these models is to identify the special cases in which the redemption rate would provide an estimate of value.

1079. However, contrary to SFG's position, the Authority considers that there is no ambiguity regarding the presence of foreign investors, or that the Australian market is anything other than a system of *n* assets with *m* investors. The interpretation is that some of the *m* investors in that system are foreigners. To assume somehow that we cannot draw a boundary around the full Australian capital market, reflecting the actual situation with regard to the *n* assets and *m* investors in that market, and then derive a wealth and risk weighted average of those investors' redemption of credits, seems odd. SFG appears to be saying that the Australian capital market will not be able to find equilibrium prices because foreign investors are present in that market.

1080. Handley concurs with the Authority's view. Importantly, he rejects the idea that the CAPM requires that the *m* investors hold no other assets in any other market, only that they price domestic assets in isolation of other assets. He puts it thus:[439]

> The starting point for a CAPM is a given set of *n* assets and a given set of *m* investors who hold them. It is then assumed that this set of investors will trade this set of assets among themselves in order to form their optimal portfolios – with the decision criteria of each investor being to maximize his utility of end-of-period wealth, which in turn is defined over the set of *n* assets. The CAPM makes no explicit assumption about any other assets or any other investors but if there are other assets or investors then it is implicitly assumed that these do not matter for the purposes of determining the prices of the *n* assets under consideration (otherwise they should be in the model). This means that other assets held by other investors do not matter. It also means that other assets held by the *m* investors do not matter. This is just a form of market segmentation. By definition the system is closed because what matters for pricing purposes – the *n* assets and *m* investors – are in the model and any other assets or investors being outside the model are ignored.
>
> This is precisely the assumption that one implicitly makes when using the CAPM in practice. Once you choose a benchmark market then you define the set of assets and investors that are relevant for pricing purposes – in other words, by choosing a particular proxy for the market, one is saying that this is the best model for estimating expected returns on assets within this market. The model is closed in the sense that it is implicitly assumed to be segmented. If one disagrees with this assumption then the solution is to bring the other assets and investors into the model.
>
> … SFG's comments are based on a faulty premise – that the *m* investors can own no other assets. This is an assumption of SFG but is not an assumption of the CAPM. In the current context, it is not assumed that investors in the domestic market hold no other assets but rather it is assumed that investors in the domestic market price domestic assets in isolation of any other assets they may or may not hold. For this purpose, investors in the domestic market consist of domestic investors to the extent that they hold domestic assets and foreign investors to the extent that they hold domestic assets – this is the set of *n* assets and the set of *m* investors who hold those *n* assets. Foreign assets held by these domestic investors, foreign assets held by these foreign investors and foreign assets held by other foreign investors are outside the model.

[439] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 22.

1081. This position is opposed by Lally, in the context of the Officer model, who notes that regulators include foreign investors, to the extent that they invest in the Australian market, to reflect the empirical reality of their existence, but that:[440]

> …this involves use of a model (the Officer CAPM) that assumes that national markets for risky assets are segmented along with the definition for a parameter (*U*) that is inconsistent with this model. Expressed more technically, the Officer model arises from the portfolio choices of a group of investors whose portfolio choices are limited to the Australian risk free asset (whose rate is determined exogenously) and Australian risky assets, and their portfolio choices determine the prices and hence the expected rates of return on these risky assets. Thus foreign investors, who by definition can hold both Australian and foreign risky assets, have no place in such a model. In addition, if Australian investors have access to foreign assets, the appropriate CAPM will reflect that fact and the equilibrium prices of Australian assets will differ.

1082. But Handley points out:

> Lally (2013) adopts an unnecessarily narrow interpretation of segmentation in suggesting that foreign investors should be excluded completely. But once you choose a proxy for the market portfolio you define not only the set of assets that are relevant for pricing purposes but you also define the set of investors that are relevant for pricing purposes – in other words, it is a joint assumption. Lally's suggestion that we include the full set of *n* assets but only a subset of the of *m* investors not only contradicts the starting point of the CAPM but also does not accord with the reality that foreign investors are present in and influence the pricing of assets in the domestic market. This notion of (complete) segmentation – that only domestic assets are held by domestic investors – is an assumption of Lally but is not an assumption of the CAPM.[441]

1083. The Authority considers that Handley's views relating to segmentation in the CAPM model are sensible. While it is reasonable to consider that Australian and foreign investors' holdings of Australian assets may be influenced by the prices of assets in overseas markets, a globally integrated market is not used for estimating the rate of return.[442] The Authority explicitly rejected such an approach in the Rate of Return Guidelines.[443] While utilisation rates may change as investors in Australian capital markets change their portfolio holdings and the proportion of foreign investors changes, *at any given point in time* the utilisation rate will be a complex weighted average of the *m* investors' utilisation rates.[444]

1084. It becomes clear then – consistent with SFG's view noted in paragraph 1078 – that the term '*value* of franking credits' and '*proportion* of the tax paid at the company

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[440] M. Lally, *The Estimation of Gamma, Report for the AER,* November 2013, p. 14.

[441] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 22.

[442] The Authority notes that the observed rate of return in a globally integrated capital market is lower than that of the partially segmented domestic capital market – indeed this is a key point of Lally's analysis for the 'conceptual goal posts'. In a full globally integrated market, the value of imputation credits would continue to be a complex weighted average over all investors, but clearly very close to zero. For a detailed discussion of this issue, and Lally's analysis with regard to the relationship between observed rates of return and the value of imputation credits, see Economic Regulation Authority, *Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 14 October 2014, p. 448.

[443] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 28.

[444] Handley further notes in this context that (J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 8):

> An implication of SFG's assertion is that one could validly use a "domestic" version of the CAPM say to price U.S. stocks only if you assume that investors in the U.S. stock market hold no other assets except U.S. stocks. Such an assumption would be clearly implausible.

level [which] is really a withholding of personal tax' are interchangeable terms for gamma.[445] From the shareholders' point of view 'distributed imputation credits are valuable to the extent that they can be used (or utilised or redeemed) to reduce personal taxes and/or have credits refunded'. Officer described gamma in both ways. Handley considers that Officer's central idea is the identification of personal tax component of the company tax paid.[446] The relevant value of an imputation credit is the after-company-before-personal-tax value.[447]

1085. Handley notes that the debate about value and utilisation is a largely sterile one:

> …the relevant measure of utilisation value is that value as determined by the market – in other words it is not the utilisation value of a credit to any single investor or the utilisation value to any single class of investors that we want but rather the utilisation value to the market as a whole. In contrast, much of the current debate appears to incorrectly suggest that market value and utilisation value are alternative concepts for this purpose.

1086. Handley observes that Officer concluded that the grossed up return to a company would include returns for capital accumulation, dividends and imputation. The returns to imputation may be expressed as $\frac{\gamma C_t}{p_{t-1}}$ where C_t is imputation credits distributed during the period and the share price p_{t-1} is the price at the start of the period. Handley quotes Officer as defining this component as the 'value of tax credits expressed as a rate or proportion of the initial value of the share'.[448] With Monkhouse's extension to a non-perpetuity setting, set out at paragraph 1038, then 'γ continues to be used to refer to the personal tax proportion of company tax paid – equivalently the utilisation value of generated imputation credits while theta, is used to refer to the utilisation value of distributed imputation credits and is commonly called the utilisation rate'.[449]

1087. Handley notes that the utilisation rate will reflect the value of imputation credits to the market as a whole, which may be difficult to observe. In this context, Handley reiterates the key messages made by Lally, that:[450]

- the per dollar utilisation value of imputation credits embedded in equilibrium asset prices, theta, is common across all assets in the market; and
- theta may be interpreted as a complex weighted average of investor utilisation rates.

1088. The Authority endorses Handley's view that use of the CAPM and interpretation of theta as the utilisation rate (equivalent to the value of imputation credits) is entirely consistent with its definition of the domestic capital market.

1089. The Authority considers that, consistent with this interpretation, the 'most important approaches to estimation in order of importance to be the equity ownership

[445] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 9.

[446] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 9.

[447] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 7.

[448] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 10.

[449] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 11.

[450] J.C. Handley, Advice on the Value of Imputation Credits, 29 September 2014, p. 20. For a summary of Lally's views, see Economic Regulation Authority, Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System, 14 October 2014, Appendix 8.

approach, the historic credit utilisation rate approach and dividend drop-off studies (being the most relevant within the class of implied market value studies)'.[451] However, the Authority agrees that 'all approaches are subject to substantial uncertainty and so the estimate of theta is imprecise'.[452]

1090. The Authority agrees that there is considerable uncertainty surrounding the estimation of the utilisation rate. The Authority therefore considers that a range of approaches is desirable to determine the estimate.

1091. The Authority agrees with Handley that the equity ownership and tax statistics on utilisation of imputation credits provide key evidence for the utilisation rate. The Authority has also considered DDO estimates and the 'conceptual goal posts' of Lally. In what follows, these estimates are considered.

Equity share ownership

1092. The equity ownership approach can provide for an estimate of the utilisation rate that is consistent with Officer CAPM. This is because the majority of domestic investors will be eligible to redeem imputation credits (and therefore have an implied utilisation rate of 1), while foreign investors will not be eligible (with an implied utilisation rate of 0). The proportion of domestic ownership of capital investments therefore provides a simple and transparent estimate of the utilisation rate.

1093. The resulting estimate does not account for the required risk weighting of utilisation rates. However, the Authority is not aware of any means to incorporate such a consideration.[453] Therefore, the Authority accepts that current estimates of domestic investors' equity ownership share provide relevant information for determining the value of the utilisation rate.[454]

All equity – listed and unlisted

1094. The Authority estimates the domestic equity share ownership proportion of listed and unlisted equity at 0.7. That estimate is based on:

- evidence from the AER, based on 2007 evidence from the Australian Bureau of Statistics (**ABS**), that 71 per cent of Australian equity is held by domestic investors;[455]
- updated ABS evidence from the QCA support a foreign ownership share (listed and unlisted) of around 30 per cent, depending on the period chosen.[456]

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[451] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 31.

[452] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 32.

[453] Lally observes that ignoring risk weighting may be reasonable if it is assumed that individual investors' risk aversion is uncorrelated with their utilisation rate (see M. Lally, *The Estimation of Gamma*, Report for the AER, 23 November 2013, p. 11).

[454] Queensland Competition Authority, *Final Decision: cost of capital: market parameters*, August 2014, p. 98. The Authority notes that Hathaway has recently examined this data, finding figures closer to 0.8. However, as noted by the AER: 'Given they are the primary authors of this data, the ABS reported figures might be considered more reliable.' (Australian Energy Regulator, *Explanatory Statement – Rate of Return Guideline*, December 2013, p. 172).

[455] Australian Bureau of Statistics, *Feature article: Foreign ownership of equity,* Available at: http://www.abs.gov.au/ausstats/abs@.nsf/featurearticlesbytitle/EDEB646A92BF2BFBCA2579B8000DF20B?OpenDocument

[456] Queensland Competition Authority, *Final Decision: cost of capital: market parameters*, August 2014, p. 98.

1095. SFG cautions that the estimates in unlisted equity may be unreliable, quoting the original ABS feature article from June 1992 to this effect.[457] However, the Authority notes that:

- SFG omitted to include a sentence in the ABS quote that 'Alternative information sources and methodologies for deriving these estimates are being investigated.'[458] The feature article is more than 20 years old, and the ABS has continued to refine the data in the relevant catalogue over the years.
- The ABS has continued to publish the data, so it is reasonable to consider it relevant.
- The data quality warning was not repeated in the ABS feature article from 2007.

1096. The Authority is therefore not persuaded that the equity ownership estimates are undermined by data quality issues.

1097. SFG has also noted the use of 2007 ABS data, suggesting that updated estimates based on current ABS data should be used. SFG also suggests that any equity share ownership estimate should be restricted to privately owned equity, else the inclusion of government owned equity will cause a systematic bias in the estimate of foreign ownership.[459] The Authority has noted these points and derived an updated series of equity share ownership that excludes government entities.

1098. The Authority has also refined the equity share ownership estimates consistent with the method set out by the AER (Figure 23). The method:

- excludes from the calculation entities that are wholly owned by the public sector – including equity issued by the 'central bank', 'central borrowing authorities', 'national public non-financial corporations' and 'state and local public non-financial corporations';
- sums the equity held by those classes of domestic investor that are eligible to utilise imputation credits – 'households', 'pension funds' and 'life insurance corporations';
- sums the equity held by those classes of domestic investor that are not eligible to utilise imputation credits – 'state and local general government', 'national general government' and the rest of the world';
- determines the share of equity held by domestic investors eligible to utilise imputation credits as a proportion of the equity held by domestic investors that either use or waste imputation credits.[460]

[457] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 33. See also Goldfields Gas Pipeline, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Appendix 1, p. 85 (SFG Consulting, *An appropriate regulatory estimate of gamma*, 21 May 2014).

[458] Australian Bureau of Statistics, *International Investment Position Australia*, June 1992, Section 4.

[459] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 53.

[460] Australian Energy Regulator, *Draft Decision, Jemena Gas Network's 2015–20 Access Arrangement*, Attachment 4 Value of imputation credits, p. 4-55. The AER observes that the case for assuming that governments 'waste' the imputation credits they receive is not clear, but that the effect of the exclusion is immaterial on the final result.

1099. The resulting domestic ownership for listed and unlisted equity has tended to lie in the range between 55 and 65 per cent much of the time (Figure 23). The most recent share in June 2015 was 61 per cent.

1100. The Authority considers that the most relevant period for making an estimate is that since July 2000, when the current regime allowing refunds of excess credits for eligible investors came into effect. Over that period the share of domestic ownership in all equity has averaged 59 per cent.

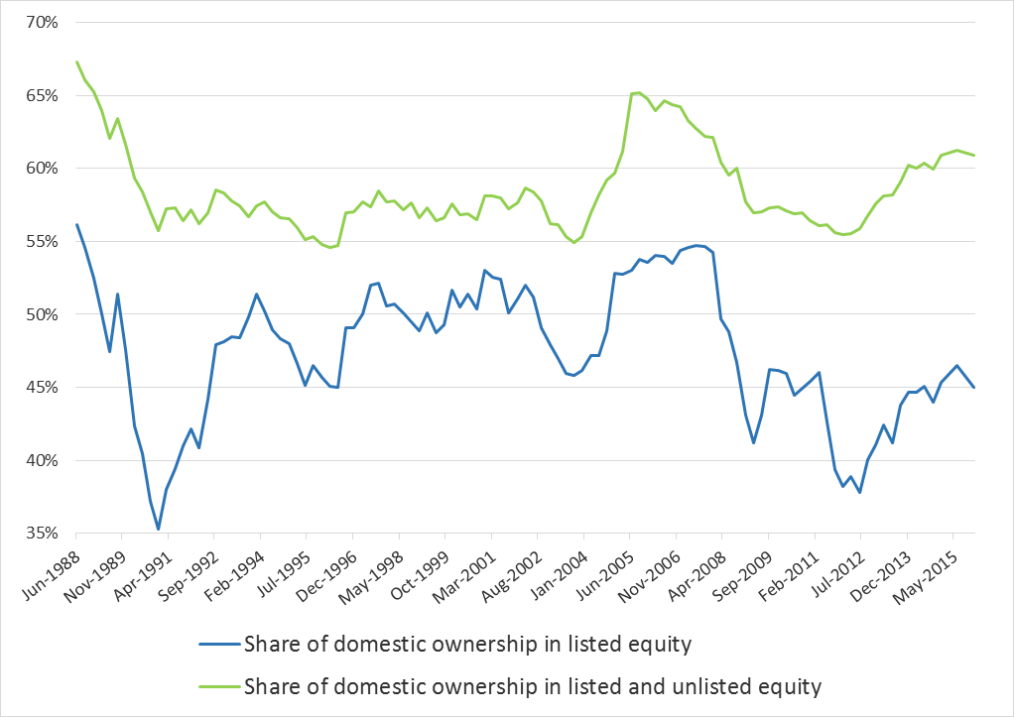
1101. The Authority notes that the estimate has fluctuated over time. The Authority therefore is of the view that it is reasonable to infer an estimate around 59 per cent for domestic ownership of listed and unlisted equity, based on the average since 2000. That estimate also happens to be close to the most recent observation, which is 61 per cent.

Listed equity

1102. The listed equity share has fluctuated around 50 per cent much of the time, moving in a range between 35 and 56 per cent in the observed data. The listed equity share is currently 45 per cent (based on recent ABS data for June 2015), and the average value since July 2000 has been 47 per cent (Figure 23).

1103. The Authority therefore is of the view that it is reasonable to infer an estimate of around 47 per cent for domestic ownership of listed equity, based on the average since June 2000.

Figure 23 Share of domestic ownership in listed and unlisted equities – excluding government ownership and refined to account for use of imputation credits



Source: Australian Bureau of Statistics, Australian National Accounts: Finance and Wealth, Catalogue 5232.0, Tables 47 and 48, June 2015, 24 September 2015; ERA analysis, December 2015.

Equity share ownership estimate of the utilisation rate

1104. The Authority estimates the utilisation rate of imputation credits as being in the range of 0.47 to 0.59 at the current time (based on the most recent ABS data for June 2015, and using the 'refined' approach), depending on whether the estimate is based on listed or all equity respectively.[461]

1105. The Authority notes that this is somewhat lower than Handley's estimate, which is that the corresponding range is 0.5 to 0.7, depending on whether listed or all equity is used.[462] The Authority notes that Handley's estimate is based on earlier ABS data (March 2014), and also took account of the estimate of Hathaway, that 'domestic investors held between 75 per cent and 81 per cent of Australian equity between 1988 and 2012'.[463] The Authority has not accounted for Hathaway's data, given its preference to focus on the estimates for the post-2000 period.

Taxation statistics

1106. Taxation statistics estimate the utilisation of imputation credits, which is a measure of the imputation credits redeemed by shareholders. The method uses ATO statistics to observe the proportion of distributed imputation credits that have been used by investors to reduce their personal taxation liabilities. The approach implicitly assumes that the value of a redeemed franking credit is equal to its face value, whilst an unredeemed franking credit has no value. It follows that the average value of a franking credit is equal to the proportion of franking credits redeemed.[464]

1107. The Authority noted in the Rate of Return Guidelines that two studies – performed by Hathaway and Officer (2004) and Handley and Maheswaran (2008) – have been considered by regulators in the past to estimate the required utilisation rate.[465]

1108. Hathaway and Officer (2004) examined national tax statistics in order to estimate the average value of redeemed imputation credits from 1988 to 2002.[466] They calculated that 71 per cent of company tax payments had been distributed as imputation credits on average and estimated that 40 to 50 per cent of the distributed credits were redeemed by taxable investors. Taking these two factors into account indicated to the authors that the statutory company tax rate is reduced by a proportion of 28 to 36 per cent. This suggested that the effective rate of company taxation is around 19 to 21 per cent. They estimated a value of gamma within a range of 0.38 to 0.44. However, they noted that some of their data is not reliable.[467]

[461] This range has changed from that estimated for the ATCO GDS Final Decision – which was 0.48 to 0.59 – due to the inclusion of the most recent data to June 2015 slightly reducing the lower bound.

[462] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 36.

[463] J.C. Handley, *Advice on the Value of Imputation Credits*, 29 September 2014, p. 35.

[464] NERA Economic Consulting, *The Value of Imputation Credits*, A report for the ENA, Grid Australia and APIA, 11 September 2008, p. 23.

[465] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, 16 December 2013, p. 212.

[466] N.J. Hathaway & R.R. Officer, *The Value of Imputation Tax Credits,* working paper, Melbourne Business School, 2004, p. 14.

[467] N.J. Hathaway & R.R. Officer, *The Value of Imputation Tax Credits,* working paper, Melbourne Business School, 2004, p. 14

1109. Handley and Maheswaran (2008) examined the reduction in individual tax liabilities due to imputation credits from 1988 to 2004.[468] Their study found that 67 per cent of distributed imputation credits were used to reduce personal taxes between 1990 and 2000, and this increased to 81 per cent over 2001-2004.

1110. In his advice to the AER, Lally observed that SFG has previously argued that taxation statistics can only provide an upper bound on the utilisation rate, as opposed to a point estimate.[469]

1111. Lally responds that as people who receive franking credits utilise them fully, SFG's view is incorrect, such that redemption rates can be used to provide a point estimate of the utilisation rate (which Lally refers to as *U*). Lally demonstrates this by defining u_i as the utilisation rate of investor i, and t_i to denote their marginal taxation rate.

N Lally identifies that the personal tax obligation of that investor due to dividends paid, after the taxes already paid by the company is as follows:[470]

$$Tax_i = (DIV + u_i IC)t_i - u_i IC \quad (28)$$

where

DIV is the value of the dividend; and

IC is is the imputation credits for that company in the relevant period.

1112. Lally notes that Australian investors can be assigned to two groups, those who can and cannot utilise franking credits. Given that the taxation for those who can utilise franking credits is as follows:

$$Tax_i = (DIV + IC)t_i - IC \quad (29)$$

1113. It follows that u_i = 1 for these investors.

1114. Therefore, as the utilisation rate is not less than 1 for these investors, taxation statistics can provide an accurate point estimate of U. Implicit in this analysis is the assumption that franking credits cannot be transferred between investors. Lally continues by observing the evidence presented by McKenzie and Partington, which indicates that even though legislation exists to prevent this, it can be overcome in some cases.[471] Lally further notes that if this practice is extensive, it may result in tax statistics overestimating the utilisation rate. The Authority considers that as the

[468] J. Handley and K. Maheswaran, "A Measure of the Efficacy of the Australian Imputation Tax System", *The Economic Record*, Vol. 84, No. 264, 2008, pp. 82-94.

[469] SFG Consulting, *Estimating Gamma,* Report prepared for QR National, 2012, p. 7; M. Lally, *The Estimation of Gamma,* Report for the AER, November 2013, p. 18; This argument was also previously accepted by the Authority as a consequence of the ACT decision (see Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, 16 December 2013, p. 212).

[470] M. Lally, *The estimation of gamma*, 23 November 2013, p. 18.

[471] M. McKenzie, and G. Partington, *Evidence and Submissions on Gamma,* report prepared for the AER, 2010.

legislation to transfer the credits exists to prevent this, it is likely to constrain this activity and as a consequence this is not considered a significant issue.

1115. Lally considered that the tax statistics approach lacks precision, but still preferred it as an estimate over implied market value studies.[472]

1116. The Authority notes that Hathaway has observed that large discrepancies exist in relation to franking credits when comparing ATO taxation data to that of ATO company financial data.[473] Hathaway urges caution in using ATO statistics for any estimates of parameters concerned with franking credits, until a reconciliation related to the actions of state owned enterprises is conducted, which may provide an explanation.

1117. Both the AER, and Lally observe that using taxation statistics may be inconsistent with the interpretation of gamma under the Officer framework, where the utilisation rate is required to satisfy the complex weighted average.[474] Taxation statistics produce an estimate of the utilisation rate that is weighted by the amount of imputation credits received, not by equity ownership or risk aversion. On balance, the AER noted that it considers taxation statistics have merit in informing the required utilisation rate, but given these criticisms, it does not propose relying solely on this in informing its judgement. The Authority agrees with these conclusions.

1118. The Authority notes that the AER recently set out a further review the evidence for the estimate based on tax statistics, drawing on and further considering views from the experts:[475]

- evidence assembled by Hathaway points to a range of 0.4 to 0.6 for the utilisation rate;
- based on the observation that the post-2004 taxation statistics data is more reliable than prior to that date:

> In this current work I only consider franking credit flows for the period for 2004 onwards and can provide a much more detailed insight into the flows and utilisations of franking credits for that period
>
> I would caution anyone, including the AER, against relying on those parts of my earlier reports which focussed on ATO statistics [up to 2004]. The data was then not as clear as it is today. I had to rely on separate analyses of ATO tax data and the ATO financial data. As I am now aware with the new data, there is an extremely large discrepancy between these two subsets of data. The missing link was the data on the flows of credits between companies which is now visible after the changes of 1 July 2002. I would recommend that the AER do not rely on that earlier report.[476]

- informed by two estimates for the period 2004 to 2011: 0.43 and 0.61, which reflect two alternative measures of the value of credits distributed, and two alternative estimates of the distribution rate;

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[472] M. Lally, *The estimation of gamma*, 23 November 2013, p. 4.

[473] N. Hathaway, *Imputation credit redemption ATO data 1988-2011, Where have all the credits gone?*, September 2013, p. 5.

[474] Australian Energy Regulator, *Better Regulation: Explanatory Statement for the Rate of Return Guidelines*, December 2013, p. 175.

[475] Australian Energy Regulator, *Draft Decision, Jemena Gas Network's 2015–20 Access Arrangement*, Attachment 4 Value of imputation credits, pp. 4-58 to 4-59.

[476] N. Hathaway, *Imputation credit redemption ATO data 1988–2011: Where have all the credits gone?*, September 2013, p. 6.

- the 0.43 estimate of the utilisation rate corresponds to estimates of the distribution rate of around 0.7;
- the 0.61 estimate of the utilisation rate corresponds to estimates of the distribution rate of around 0.5 respectively;
- with Hathaway's estimate of 0.43 based on post-2004 data being preferred as reasonable as it is consistent with an estimate of the distribution rate for 'all equity' of 0.7;[477]
- Handley considered that tax statistics provide a relevant estimate for the utilisation rate, concluding that a range of 0.4 to 0.6 is appropriate, based on the Hathaway material.[478]

1119. The Authority has reviewed this evidence and considers that the Hathaway study provides the best estimate of the utilisation rate derived from taxation statistics. On that basis, the Authority considers that a revised range of 0.4 to 0.6 is appropriate, and that a point estimate of 0.43 should be applied given the Authority's preference to base its estimates on 'all equity', with a distribution rate of 0.7.

1120. However, the Authority remains mindful of Hathaway's concerns with the ATO data, and the pointed caution about relying on it for estimating utilisation rates:

> Unfortunately, there are too many unreconciled problems with the ATO data for reliable estimates to be made about the utilisation of franking credits. The utilisation rate of franking credits is based on dividend data (from the tax office) and I have demonstrated that this data is questionable.[479]

Implied market value studies

1121. Implied market value studies include:

- simultaneous price studies; and
- dividend drop off studies.

1122. In the Guidelines the Authority concluded that simultaneous price studies are not appropriate for estimating the utilisation rate at the current time.[480] The Authority notes that GGT has not contested this point.

1123. The range of DDO studies were considered at length in the Guidelines. The Authority considered the existing set of DDO studies. The Authority in the Guidelines adopted a range for the utilisation rate of 0.35 to 0.55, based on the results of studies by SFG and by the Economic Regulation Authority Secretariat.

1124. Since the Guidelines, the Authority has become aware of Lally's view that the regression coefficient on franking credits estimated in dividend drop off studies may not necessarily equate to the utilisation rate theta, given that the tax rate on gross dividends diverges from capital gains. Rather, Lally argues that the regression coefficient on franking credits may be constituted as a product of the utilisation rate

[477] Australian Energy Regulator, *Jemena Gas Network's 2015-20 Access Arrangement Draft Decision*, Attachment 4, p. 4-20.

[478] J. Handley, *Advice on the value of imputation credits*, 29 September 2014, p. 31.

[479] N. Hathaway, *Imputation credit redemption ATO data 1988–2011: Where have all the credits gone?,* September 2013, p. 39.

[480] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 214.

theta and the regression coefficient on the value of the dividend in determining the resulting share price drop off.[481] This is discussed in greater detail below.

1125. GGT's consultant SFG has provided the Authority with the following response with regard to its approach establishing a range for the DDO estimates:[482]

- econometric issues are not significant as to preclude use of DDO studies;
- DDO estimates measure the utilisation rate directly; no adjustment is required for the coefficient on dividends;
- the composition of investors around ex-dividend dates is representative of the long term providers of equity capital;
- greater reliance should be placed on the SFG DDO studies.

Econometric issues

1126. SFG notes that:

> The ATCO Gas Draft Decision raises a number of general econometric issues in relation to dividend drop-off analysis. Most of these issues have previously been considered by the ERA, with the ERA determining that they are not so severe as to impact on its total reliance on drop-off analysis for estimating theta.[483]

1127. The Authority agrees that econometric issues have not precluded it giving limited weight to the DDO studies. However, the Authority is of the view that:

- The required utilisation rate under the Officer framework is a complex weighted average determined by the value of equity that investor's hold and their relative risk aversion. Dividend drop off studies, however, only estimate the value weighted utilisation rate around just two days, the cum-dividend and ex dividend dates. As a consequence, they provide an estimate of the utilisation rate with a value weighting that reflects the composition of investors around the cum and ex dividend dates, not the weighted average across the entire market, as required.
- There are significant econometric challenges in estimating the utilisation rate from dividend drop off studies. Trading around the ex-dividend date reflects a variety of different incentives and price movements. Dividend drop off studies may not accurately separate out the effect of the taxation incentive associated with imputation credits on the share price change.

1128. The Authority notes that both Handley and Lally agree that the composition of investors around ex-dividend dates may not be representative of long term investors.[484] Lally also points out that ex-dividend movements can reflect a range of factors, including tax, transactions costs and preferences, such that it is not clear that tax arbitrage would necessarily exacerbate share price differentials around ex-dividend dates. The corollary is that it is not clear that DDO studies necessarily

[481] Note that Lally refers to θ by the equivalent symbol U (see M. Lally, *Estimating Gamma*, *Report for the QCA*, 25 November 2013, p. 21).

[482] ATCO, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 34.

[483] Goldfields Gas Transmission Pty Ltd, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 35.

[484] M. Lally, *The estimation of gamma*, 23 November 2013, p. 29; J. Handley, *Advice on the value of imputation credits*, 29 September 2014, p. 15.

over-estimate the utilisation rate. For the same reasons, there remain valid concerns as to what exactly DDO studies are measuring.

1129. The Authority therefore considers that this is a contentious area. It adds to the caution the Authority has in relying too much on DDO studies for estimating the utilisation rate.

DDO coefficient adjustment

1130. Econometric problems that exist with dividend drop off studies have been well explored by the Authority,[485] which has previously noted that this is the reason for the large divergence in empirical estimates of the utilisation rate using dividend drop off studies.[486] The Authority noted that any estimate of theta is essentially a function of the most influential observations, due to the extreme multicollinearity present in the data.

1131. This conclusion is supported by the AER, which has noted:

> Further, even if implied market value estimates were conceptually appropriate, there are significant limitations with the accuracy and robustness of such studies.[487]

1132. Lally further notes:

> The AER does not consider that these estimates are useful for a number of reasons. In respect of dividend drop off studies, these include evidence that trading activity around dividend ex-days is abnormal, that correction is required for market movements, and the sensitivity of results to data, outliers and model choices. More generally these problems include the difficulties in separating the values of franking credits and dividends in these studies, the wide range of empirical results from such studies, the possibility of bias from 'bid-ask bound', and the exposure of such estimates to the tax circumstance and transaction costs of tax arbitrageurs. Many of these problems are manifest in high standard errors in the estimates of the coefficients. I concur with all of these concerns, and I have additional concerns about these studies or their interpretation.[488]

1133. Lally also provides evidence that Australian regulators (including the Authority) and the ACT have consistently misinterpreted the results of dividend drop off studies for estimating the required utilisation rate. Lally observes that the coefficient of the regression equation in dividend drop off studies is generally assumed to be the utilisation rate, which Lally suggests is incorrect. Lally demonstrates this by first outlining the dividend drop off equation as follows:

$$P_{i,t-1} - P_{i,t}^{*} = \delta \mathrm{D}_i + \theta \mathrm{FC}_i + u_i \qquad (30)$$

Where

[485] D. Vo, B. Gellard, S. Mero. '*Estimating the Market Value of Franking Credits, Empirical Evidence from Australia', Conference Paper*, Australian Conference of Economists 2013.

[486] The Authority explored the econometric issues encountered in dividend drop off studies in the Explanatory Statement for the Rate of Return Guidelines, see: Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules,* Dec 2013, p. 216 and Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines* Dec 2013, Appendix 28.

[487] Australian Energy Regulator, *Better Regulation: Explanatory Statement for the Rate of Return Guidelines*, Dec 2013, p. 177.

[488] M. Lally, '*The Estimation of Gamma,* Report for the AER', November 2013, p. 20.

$P_{i,t-1}$ is the cum-dividend price;

$P_{i,t}^{*}$ is the ex-dividend price corrected for the market movement;

D_i is the cash dividend;

FC_i is the franking credit; and

u_i is the regression residual.

1134. Lally begins by noting that no distinction should be made regarding the cash dividend and franking credit if the franking credit can be fully utilised, e.g. a cash dividend of $10 and a franking credit of $2 is equivalent to a cash dividend of $12. That is, an investor should be indifferent between the decomposition of any gross dividend received to the extent the franking credit can be utilised.[489] Lally further observes that if all investors can utilise imputation credits, the required regression equation would be as follows:

$$P_{i,t-1} - P_{i,t}^{*} = \delta[\mathrm{D}_i + \mathrm{FC}_i] + u_i \qquad (31)$$

1135. In this circumstance, δ, recognises that the expected price change can differ from the paid out gross dividend,[490] as in reality, the tax rate applicable on the gross dividend can diverge from that of capital gains.[491] In order to incorporate the empirical reality of not all investors being able to utilise franking credits, Lally notes that the franking credit covariate should be multiplied by the coefficient U, to represent the average utilisation rate. The required equation is then as follows:

$$\begin{aligned} P_{i,t-1} - P_{i,t}^{*} &= \delta[\mathrm{D}_i + U.\mathrm{FC}_i] + u_i \\ &= \delta \mathrm{D}_i + U.\delta \mathrm{FC}_i + u_i \end{aligned} \qquad (32)$$

1136. Based on this analysis, it is apparent that $\theta = U.\delta$. Therefore, in order to derive the required utilisation rate, U, from dividend drop off studies, the estimated

[489] Gross dividend refers to the sum of the cash dividend and the franking credit, $\mathbf{G}_i = \mathbf{D}_i + \mathbf{FC}_i$

[490] The coefficient δ, is the gross drop-off ratio, see: Beggs D., and Skeels, C., 2006, 'Market Arbitrage of Cash Dividends and Franking Credits', *Australian Economic Papers,* vol 82, pp. 239 252. The estimated coefficient, $\hat{\delta}$, therefore measures the average change in stock price that occurs due to payment of $1 of gross dividend.

[491] The Authority notes that the theoretical model underlying dividend drop off studies is based on Elton, E.J and Gruber, M.J (1970), 'Marginal Stock Holder Tax Rates and the Clientele Effect', *Review of Economics and Statistics,* 52, 68-74. Under the assumptions of no stochastic uncertainty, no time value of money and no transaction costs, it can be shown that $\delta = \frac{(1-\mathrm{T}_d)}{(1-T_g)}$ where T_d is the tax rate applicable to the gross dividend, whilst T_g is the tax rate applicable on capital gains. It follows that $\hat{\delta}$ measures the divergence in tax rates applicable to the gross dividend and capital gains of the representative investor.

coefficient of the franking credit, θ, must be divided by the estimated coefficient of the cash dividend, δ, as follows, $U = \frac{\theta}{\delta}$.

1137. On this basis, the Authority accepts that it did not correctly estimate the required utilisation rate in the Rate of Return Guidelines. Re-estimating the required utilisation rate – from the two dividend drop off studies considered relevant – results in a utilisation rate of 0.4 from the SFG analysis,[492] and an upper bound of 0.69 from the ERA Secretariat's analysis.[493]

1138. However, SFG considers that the DDO coefficient does not need to be adjusted:

> In our view, this adjustment is not appropriate when estimating theta as the value of distributed imputation credits. When theta takes a value interpretation within the regulatory framework, what is required is an estimate of the price that investors would be prepared to pay for an imputation credit. This is because the allowed return for an investor will be reduced by theta for every dollar of imputation credits that is distributed to them. To preserve the appropriate return to investors, the regulatory framework must reduce the return to investors by an amount that is equivalent to the price investors would be prepared to pay for the credit. Dividend drop-off analysis is specifically designed to estimate the price that investors would be prepared to pay for imputation credits. It directly estimates the extent to which imputation credits are capitalised into the stock price. This is an estimate of how much the stock price has been bid up in relation to the imputation credit that is to be received. The standard dividend drop-off estimate of theta provides a direct estimate of the value of distributed credits.[494]

1139. SFG considers that the proposed adjustment leads to perverse outcomes. To illustrate, SFG sets up a hypothetical example comparing two different outcomes with $\delta = 1$ and $\delta < 1$, while requiring shareholders to be equally well off. Where $\delta < 1$, investors do not value dividends as highly as $\delta = 1$. SFG argues that to be equally well off with $\delta < 1$, the value for theta would have to fall, but that this would not be the outcome dividing through by a lower $\delta < 1$.[495]

1140. However, the Authority is not convinced by this argument, as it sets up a 'straw man'. It is not clear to the Authority why, if investors do not value dividends as highly, they would necessarily have exactly the same preferences and requirements of utility. It may be that they do not require to be as well off if $\delta < 1$, given that they do not value dividends as highly.

1141. SFG also considers that such an adjustment would be required throughout the regulatory process, as it is implicit in the Sharpe-Lintner CAPM that $\delta = 1$. SFG

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[492] SFG Consulting, *Dividend drop-off estimate of theta, Final Report*, 21 March 2011, p. 32. SFG's estimate is 0.35, which is 'paired with an estimate of the value of cash dividends in the range of 0.85 to 0.90'. Dividing 0.35 by 0.875 gives 0.4.

[493] Based on adjusting the range of 0.35 to 0.55 (using robust techniques) set out in D. Vo, B. Gellard, S. Mero. '*Estimating the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper*, Australian Conference of Economists 2013, final paragraph. The corresponding value of δ in that study for the upper bound (unrounded) value with no market correction of 0.53 was 0.77 (Table 5). Dividing 0.53 by 0.77 gives 0.69.

[494] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 36.

[495] Goldfields Gas Transmission Pty Ltd, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 36.

notes that Lally and van Zijl develop a more complex version of the CAPM with δ < 1.

1142. On this point, the Authority notes that both Handley and Lally have recommended such an adjustment. Handley for example observes:

> The key message here is that other stuff (such as taxes and risk) may need to be taken into account in interpreting dividend drop-off studies…
>
> Importantly, the regression coefficients δ and θ can be interpreted in this way only if there are no other factors such as differential personal taxes and risk reflected in the estimates. But the results of SFG clearly tell us that this is not the case. SFG estimate the value of cash dividends δ to be in the range of 0.85 to 0.90 but one would expect a coefficient of δ = 1 in the absence of differential personal taxes and risk, since by definition the (after-company-before-personal-tax) value of one dollar of dividends is one dollar. This means that the coefficient of θ = 0.35 does not represent the (after -company-before-personal-tax) value of one dollar of imputation credits but rather it represents the (after-company-before-personal-tax) value of one dollar of imputation credits and the impact of other factors, such as differential personal taxes and risk. We don't really need to concern ourselves with precisely identifying what these other factors are – it is sufficient to know that collectively they have reduced the estimates of the (after-company-before-personal-tax) values of one dollar of dividends and one dollar of imputation credits by 10 – 15% . Accordingly, we need to gross-up the SFG estimates of θ by 10 – 15% to correctly interpret the results of the study. In other words, the SFG studies suggest a utilisation rate of 0.39 – 0.41 rather than the 0.35 as claimed. This approach is equivalent to the "Lally Adjustment"… [496]

1143. The Authority therefore considers that it is appropriate to use the *adjusted figure* for the upper bound of the range for the estimate of the utilisation rate, based on applying the Lally adjustment to the upper bound of its own study. That gives an upper bound of 0.69. The Authority will also adopt the unrounded lower bound of 0.35, which reflects the results from the Authority's unadjusted estimates and also SFG's unadjusted finding.[497]

1144. The resulting range is 0.35 to 0.69. This range is reasonably wide, reflecting the uncertainty surrounding the estimates, and the conflicting views of the experts.

Composition of investors

1145. SFG questions the Authority's concern with the composition of investors around ex-dividend days. SFG considers that the Energy Networks Association:[498]

> …demonstrated that the empirical evidence shows that the increase in trading volume around ex-dividend dates is driven by a subset of investors who value imputation credits highly. These investors purchase shares to capture the dividend and imputation credit, causing a run-up in the cum-dividend price.[499]
>
> To the extent that this effect is material, it results in the dividend drop-off being higher than it would otherwise be, which in turn results in the estimate of theta being higher than it would otherwise be. That is, to the extent that the increase in trading volume around the ex-dividend date has an effect, it is likely to result in an over-estimate of theta.

[496] J. Handley, *Advice on the value of imputation credits*, 29 September 2014, p. 43.

[497] The Authority has adopted the unrounded range as it will apply the distribution rate for listed equity, of 0.8 (see paragraph 1158 below).

[498] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 37.

[499] The same point is made by McKenzie and Partington (2011), pp. 9-10.

1146. This point is addressed in paragraph 1128 above. The Authority considers that there remain valid concerns as to what exactly DDO studies are measuring, and that this is a contentious area. It adds to the caution the Authority has in relying too much on DDO studies for estimating the utilisation rate.

Relevance of the Authority's study

1147. SFG considers that the SFG DDO estimates are superior to the Authority's estimates, on the grounds that:[500]

- The Authority's estimates do not apply the 'standard market adjustment' to account for the overall movement of the market on the ex-dividend day. When the market correction is applied to the Authority's results, the outcome is very close to the SFG estimate of 0.35 for the market value of imputation credits.
- The mid-point of the Authority's range of 0.35 to 0.55 does not represent the best estimate, as the majority of estimates are below 0.45 – SFG considers that 0.4 is a better representation of the Authority's results;
- The SFG studies have been subject to intense scrutiny, including by the Australian Competition Tribunal, whereas the Authority's study has not.
- The SFG theta estimates 'have been shown to be stable and reliable in the face of a battery of stability and robustness checks, whereas the ERA expresses concerns about the stability and reliability of its own results'.

1148. The Authority considers that its studies have been subject to extensive scrutiny, including by regulators, experts, and GGT and SFG itself.[501]

1149. SFG considers that the ERA's study produces a theta estimate of 0.34 – when the same 'ex-day market correction is applied' as is undertaken by SFG in its study.[502] GGT considers that this 'supports the SFG estimate'.[503]

1150. SFG also disagrees with the Authority's contention that DDO studies have resulted in a wide range of estimates, or are sensitive to particular data observations.

1151. However, Lally has considered both studies in depth, noting:

> …despite using the same methodology and data filtering rules to data from an almost identical period (July 2001 to July 2012 versus July 2001 to October 2012), Vo et al (2013) and SFG (2013a) generate some quite dramatic differences in results. In particular, for models 3 and 4 with OLS, SFG estimate U at 0.15 and 0.33 respectively whilst Vo et al estimates it at 0.60 and -0.08 respectively. In addition Vo et al's standard errors on the franking credit coefficient are on average 50% larger than SFG's. In addition, using different (but reasonable) approaches to investigating the effect of removing outliers, the effect on the parameter estimates is quite different. For example, in respect of SFG's preferred approach involving model 4 and "robust regression", the effect on Vo et al's estimate of the franking credit coefficient from

[500] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, pp. 40-41.

[501] See for example, Australian Energy Regulator, *Draft Decision: Jemena Gas Networks 2015-20*, November 2014, Attachment 4, p.4-23.

[502] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 41.

[503] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, p. 219.

> progressively removing the 30 most extreme observations (in absolute terms), and rerunning the model after each deletion, is to generate estimates of this coefficient that (largely) progressively increase from 0.32 to 0.53 (ibid, Table 8 and Figure 15). The associated coefficients on cash dividends are not given but it could be presumed that the range in estimates for U would be at least as great as that for the coefficient on franking credits. Importantly, these 30 observations represent less than 1% of the total set of observations. By contrast, SFG progressively remove the 20 most extreme pairs of observations (the one that exerts the most upward effect on the franking credit coefficient and the one exerting the most downward effect) and find only trivial effect on the coefficient (SFG, 2013a, Figure 4).
>
> …in respect of the robust regression models used by both SFG and Vo et al, the latter authors rerun the models with various values of the "tuning constant" in the model, and obtain significantly different estimates of the coefficient on franking credits across the range of values for the tuning coefficient, for each of SFG's four models. For example, in respect of SFG's model 4, the estimated coefficient varies from 0.32 to 0.64 (Vo et al, 2013, Table 11 and Figure 19). Again, the associated coefficients on cash dividends are not given but it could be presumed that the range in estimates for U would be at least as great as that for the coefficient on franking credits.[504]

1152. The Authority has also been concerned about such differences, and agrees with Lally when he states that 'these differences undermine the credibility of results from all such studies'.[505] This is an important further reason why the Authority concluded that DDO studies of the utilisation rate are vulnerable to the dividend sample, parametric form of the regression equation and regression technique used, and is a further reason why the Authority places only limited weight on the estimated range.[506]

Distribution rate

1153. The Rate of Return Guidelines adopted an estimate for the distribution rate, F, of 0.7. The estimate was based on data for the cumulative payout ratio from ATO franking account balances, and related to listed and unlisted equity. The estimate has been widely accepted in recent times; the Australian Competition Tribunal for example concluded that a distribution ratio of 0.7 was supported by a range of evidence and submissions.[507]

Listed and unlisted equity

1154. There is considerable variation in estimates based on the ATO data. For example, estimates of the cumulative distribution rate from *franking account balances* in the tax statistics – from 1987 to 2011 – is 0.7.[508] However, a five year average of recent annual estimates constructed from net tax and *franked dividends distributed* is estimated by NERA Economic Consulting (**NERA**) to be 0.53.

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[504] M. Lally, '*The Estimation of Gamma,* Report for the AER', November 2013, p. 25.

[505] M. Lally, '*The Estimation of Gamma,* Report for the AER', November 2013, p. 25.

[506] D. Vo, B. Gellard, S. Mero. '*Estimating the Market Value of Franking Credits, Empirical Evidence from Australia' Conference Paper*, Australian Conference of Economists 2013.

[507] Australian Competition Tribunal, *Application by Energex Limited (Distribution Ratio (Gamma)) (No 3) [2010] ACompT9*, October 2010.

[508] Based on tax statistics estimates updated by NERA in 2013 and submitted by the Energy Networks Association as part of the Rate of Return Guidelines process (see NERA, *The Payout Ratio*, June 2013). In addition, a five year average of the most recent annual estimates, constructed by NERA from net tax and the change in the *franking account balance*, is 0.7.

1155. Hathaway finds similar variation in results. Hathaway identifies a large discrepancy between the franking account balance and the franked dividends data as a potential contributor.[509]

1156. However, it is generally accepted that the cumulative distribution rate provides a reasonable estimate. Handley summarises the position with regard to these studies as follows:

> ...the cumulative payout approach… has been used by NERA (2013) and Hathaway (2013) and is reasonably uncontroversial. SFG (2014 p.57) also supports this estimation methodology. Using data from the start of the imputation tax system on 1 July 1987 and covering the twenty-four tax years from 1988 to 2011, NERA estimates the cumulative payout ratio to be 0.69. Hathaway (2013) provides an estimate of 0.71 based on the eight year period from 2004 to 2011.[510]

1157. On this basis, the Authority considers it reasonable to conclude that the ATO data supports an estimate for the distribution rate across all equity, listed and unlisted, of around 0.7.

Listed equity

1158. Following the same cumulative payout ratio approach used by Hathaway and NERA for all equity, Handley developed an estimate for only listed equity, based on ATO tax data, of 0.8.[511]

1159. Lally has developed an alternative estimate of the distribution rate, based on the financial reports of the top 20 ASX200 firms, of 0.84.[512] SFG, however, is critical of this estimate, suggesting that it does not measure the distribution rate appropriately.

1160. In particular, SFG considers that:

- the regulatory framework and the Post Tax Revenue Model (**PTRM**) requires a distribution rate that is defined as the ratio of distributed credits to *corporate tax paid*; but that
- Lally has estimated the ratio of distributed credits to *imputation credits created*.[513]

1161. SFG suggests that large ASX firms pay a considerable amount of corporate tax overseas, which sets up a significant difference between the denominators of the two ratios.

1162. The Authority notes SFG's concerns. For that reason, the Authority has determined to rely on the Handley estimate alone, concluding that a reasonable estimate of the distribution rate for listed equity is 0.8.

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[509] N. Hathaway, *Imputation Credit Redemption: ATO data 1988-2011: Where have all the credits gone?*, September 2013, pp. 38-39.

[510] J. Handley, *Advice on the value of imputation credits*, 29 September 2014, p. 27.

[511] J. Handley, *Advice on the value of imputation credits*, 29 September 2014, p. 28.

[512] M. Lally, *Estimating Gamma*, Report for the QCA, 25 November 2013.

[513] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 10, p. 9. See also Goldfields Gas Pipeline, *Access Arrangement Revision Proposal: Supporting Information,* 15 August 2014, Appendix 1, p. 87 (SFG Consulting, *An appropriate regulatory estimate of gamma,* 21 May 2014).

Conclusions with regard to the distribution rate

1163. It is desirable to have an estimate of gamma that is internally consistent. The Authority notes that its preferred measures of the utilisation rate (refer below), are based on estimates derived using all listed and unlisted equity. As noted, the ATO data covers both listed and unlisted firms, giving estimates for listed equity and all equity.

1164. Therefore, the Authority will adopt a distribution rate of 0.7, consistent with the broad definition of all equity. Where it is required to adopt a distribution rate for listed equity, to allow consistency, the Authority will adopt a distribution rate of 0.8.

Estimate of gamma

1165. The Authority considers that three different approaches to estimating gamma are appropriate, based on the following methods for estimating the utilisation rate:

- the equity share approach;
- the taxation statistics approach;
- the DDO method.

The equity share ownership estimate

1166. The Authority's estimate of the utilisation rate based on the equity share ownership approach is either 0.48 (listed equity) or 0.59 (all equity – both listed and unlisted).

1167. Combining the utilisation rate estimate for listed equity, of 0.48, with the estimate of the distribution rate for listed equity, of 0.8, gives an estimate of gamma of 0.38.

1168. Combining the utilisation rate estimate for all equity, of 0.59, with the estimate of the distribution rate of all equity, of 0.7, gives an estimate of gamma of 0.41.

1169. The resulting range for gamma from the equity share ownership approach is 0.38 to 0.41.

1170. Rounding that range to one significant figure gives a point estimate of 0.4 for gamma – with both listed and all equity supporting the point estimate.

The taxation statistics estimate

1171. The Authority's estimate of the utilisation rate based on the taxation statistics approach is 0.43. Combining that estimate with the relevant estimate of the distribution rate of 0.7 (all equity) gives a point estimate of gamma of 0.3, at one significant figure.

The dividend drop off estimate

1172. As discussed above, the Authority's estimate of the utilisation rate from DDO studies is fairly broad, at 0.35 to 0.69, reflecting concerns with the robustness of the method.

1173. That range for the utilisation rate combines with an estimate of the distribution rate for listed equity of 0.8.[514] The resulting range for gamma is 0.3 to 0.5, rounded to one significant figure.

Estimate of gamma

1174. The Authority bases its estimate of gamma on the following, with estimates given most weight ranked first:

- the equity share ownership approach gives an estimate of gamma of 0.4;
- the taxation statistics approach gives an estimate of gamma of 0.3;
- the DDO approach gives a range for the estimate of gamma of 0.3 to 0.5.

1175. The resulting range for the Authority's estimate of gamma is 0.3 to 0.5.

1176. The Authority places most reliance on the equity share ownership approach. It suggests a point estimate for gamma of 0.4.

1177. Taxation statistics suggest that the estimate of gamma could be lower, at 0.3. However, the Authority does not place much weight on the estimate, or on its ability to inform a point estimate of the utilisation rate, given concerns about the robustness of the taxation data used for estimating the utilisation rate.

1178. Similarly, the DDO estimate suggests that the estimate of gamma could be higher or lower than 0.4, although the mid-point of the estimate range supports an estimate of 0.4. The Authority gives only limited weight to the estimated range, and to the point estimate, given its concerns with regard to the sensitivity of the estimates to the dividend sample, parametric form of the regression equation and regression technique used.

1179. Based on the foregoing, the Authority considers that the evidence supports a point estimate of the value of imputation credits of 0.4. Therefore, the Authority does not accept the value of 0.25 put forward by GGT.

1180. The Authority considers that the resulting estimate of 0.4 is consistent with its approach used elsewhere in this Draft Decision, and in particular the use of the value of imputation credits within the building block framework. The estimate is supported by a range of evidence, including relevant academic literature, and also the views of academic experts:

- the estimate is within the range set out by Handley for his preferred estimate of gamma, of 0.4 to 0.5;[515]
- the estimate is primarily based on the equity share ownership approach, which is Lally's second preference as a method for estimating gamma (after a strict Officer CAPM approach, which gives a value of 0.7 based on a utilisation rate of 1).[516]

1181. The Authority therefore considers that its estimate is fit for purpose, notwithstanding concerns with the data and the resulting robustness of the estimates. Importantly,

[514] The Authority considers that it was in error in the Guidelines and Draft Decision in applying an estimate of the distribution rate that was based on all equity. As the DDO estimates are (listed) market based estimates, they should be paired with an estimate of the distribution rate that is based on listed equity.

[515] J. Handley, *Advice on the value of imputation credits*, 29 September 2014, p. 3.

[516] M. Lally, *The Estimation of Gamma,* Report for the AER, 23 November 2013, p. 5.

the use of a range of approaches for estimating gamma assists in overcoming limitations associated with any particular study. This helps to ensure that the estimation method is consistent with accepted economic and financial principles, informed by sound empirical analysis. For these reasons, the Authority considers that its estimates meet the requirements of the National Gas Law and the National Gas Rules.

1182. In contrast, the Authority notes that GGT's proposed estimate was based on a single study, of questionable robustness. The Authority considers that GGT's proposed estimate does not provide the best estimate for the purposes of the National Gas Rules, and therefore requires that GGT amend its value for use in the building block model.

Required Amendment 10

GGT is required to adopt a gamma of 0.4.

Depreciation

Regulatory Requirements

1183. Rule 88(1) of the NGR provides that the 'depreciation schedule sets out the basis on which the pipeline assets constituting the capital base are to be depreciated for the purpose of determining a reference tariff'. Rule 88(2) of the NGR provides that the 'depreciation schedule may consist of a number of separate schedules, each relating to a particular asset or class of assets'.

1184. Rule 89 of the NGR specifies particular depreciation criteria and requirements for the calculation of depreciation. Rule 89 criteria are as follows:

> 89. Depreciation criteria
>
> (1) The depreciation schedule should be designed:
>
> (a) so that reference tariffs will vary, over time, in a way that promotes efficient growth in the market for reference services; and
>
> (b) so that each asset or group of assets is depreciated over the economic life of that asset or group of assets; and
>
> (c) so as to allow, as far as reasonably practicable, for adjustment reflecting changes in the expected economic life of a particular asset, or a particular group of assets; and
>
> (d) so that (subject to the rules about capital redundancy), an asset is depreciated only once (ie that the amount by which the asset is depreciated over its economic life does not exceed the value of the asset at the time of its inclusion in the capital base (adjusted, if the accounting method approved by the [ERA] permits, for inflation)); and
>
> (e) so as to allow for the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs.
>
> (2) Compliance with subrule (1)(a) may involve deferral of a substantial proportion of the depreciation, particularly where:
>
> (a) the present market for pipeline services is relatively immature; and

(b) the reference tariffs have been calculated on the assumption of significant market growth; and

(c) the pipeline has been designed and constructed so as to accommodate future growth in demand.

3) The [Authority's] discretion under this rule is limited.

1185. The Authority's discretion is limited under rule 89(3). Rule 40(2) of the NGR sets out the Authority's limited discretion powers. Rule 40(2) states that the regulator must not withhold its approval of an element of an access arrangement proposal if it is satisfied that the element complies with the applicable requirements of the NGL(WA) and is consistent with applicable criteria (if any) prescribed by the NGL(WA).

1186. Rule 40(2) of the NGR provides the following example:

> The [ERA] has limited discretion under rule 89. (See rule 89(3).) This rule governs the design of a depreciation schedule. In dealing with a full access arrangement submitted for its approval, the [ERA] cannot, in its *draft decision*, insist on change to an aspect of a depreciation schedule governed by rule 89 unless the [ERA] considers change necessary to correct non-compliance with a provision of the Law or an inconsistency between the schedule and the applicable criteria. Even though the [ERA] might consider change desirable to achieve more complete conformity between the schedule and the principles and objectives of the *Law*, it would not be entitled to give effect to that view in the *decision* making process.

1187. Rule 90 of the NGR specifies that a full access arrangement must contain provisions governing the calculation of depreciation for establishing the opening capital base for the next access arrangement period. The provisions must resolve whether depreciation of the capital base is to be based on forecast or actual capital expenditure.

1188. The National gas objective is defined in section 23 of the NGL(WA) as:

23. National gas objective

The objective of this Law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

1189. Revenue and pricing principles are defined in section 24 of the NGL(WA).

24. Revenue and pricing principles

(1) The revenue and pricing principles are the principles set out in subsections (2) to (7).

(2) A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in—

(a) providing reference services; and

(b) complying with a regulatory obligation or requirement or making regulatory payment.

(2) A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides. The economic efficiency that should be promoted includes—

(a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services; and

(b) the efficient provision of pipeline services; and

(c) the efficient use of the pipeline.

(5) A reference tariff should allow for a return commensurate with the regulatory and commercial risks involved in providing the reference service to which that tariff relates.

(6) Regard should be had to the economic costs and risks of the potential for under and over investment by a service provider in a pipeline with which the service provider provides pipeline services.

(7) Regard should be had to the economic costs and risks of the potential for under and over utilisation of a pipeline with which a service provider provides pipeline services.

GGT's Proposed Changes

1190. GGT has proposed to continue using the straight-line depreciation method with historical cost accounting to depreciate the GGP Regulatory Asset Base (**RAB**). Under Schedule 1 of the *Gas Pipelines Access (Western Australia) Act 1998 - National Third Party Access Code for Natural Gas Pipeline Systems* (**Code**), GGT has applied straight-line HCA depreciation on the historical cost of its RAB since its first access arrangement.

1191. Straight-line depreciation with HCA starts with the initial historic value of an asset/asset class, and for each year of the economic life, subtracts from the initial value of the asset/asset class, the initial (unadjusted, historic) value of the asset/asset class divided by the economic life. Straight-line depreciation with HCA recovers relatively more depreciation in real terms in the earlier years of an asset's life.

1192. In contrast, straight-line depreciation with Current Cost Accounting, also known as indexed straight-line depreciation, indexes the closing value of the asset/asset class to inflation (bringing it each year to 'current cost'). That current cost is divided by the remaining economic life to determine the annual depreciation. Straight-line depreciation with CCA recovers depreciation more evenly over an asset's life on a real basis.

1193. Under rule 88 of the NGR, GGT has proposed a separate depreciation schedule for each of the eight depreciable asset classes in the RAB.

1194. Table 66 lists GGT's proposed RAB asset classes and economic lives.

Table 66: GGT's Proposed Asset Classes and RAB Asset Lives (AA3)

Asset class	Economic life (years)
Pipeline and laterals	70
Main line valve and scraper stations	50
Compressor stations	30
Receipt and delivery point facilities	30
SCADA and communications	15
Cathodic protection	15
Maintenance bases and depots	50
Other assets	10

Source: Goldfields Gas Transmission, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Table 2.

1195. Table 67 shows GGT's proposed annual depreciation for each asset class over the third access arrangement period.

Table 67: GGT's Proposed Depreciation (AA3)

$ million nominal	2015	2016	2017	2018	2019
Pipeline and laterals	6.811	6.811	6.860	6.888	6.893
Main line valve and scraper stations	0.207	0.207	0.207	0.221	0.221
Compressor stations	2.622	2.680	2.716	2.746	2.746
Receipt and delivery point facilities	0.109	0.120	0.133	0.133	0.157
SCADA and communications	0.169	0.305	0.341	0.370	0.371
Cathodic protection	0.119	0.119	0.126	0.128	0.133
Maintenance bases and depots	0.178	0.210	0.223	0.223	0.223
Other assets	0.133	0.265	0.301	0.282	0.259
Total Depreciation	**10.348**	**10.717**	**10.907**	**10.991**	**11.003**

Source: Goldfields Gas Transmission, Access Arrangement Revision Proposal Supporting Information, 15 August 2014, Table 10.

Submissions

1196. In its submission in relation to the GGT proposal, BHP Billiton (**BHPB**) considers that straight-line depreciation of the RAB under HCA provides GGT with gains in comparison to other regulated businesses in Australia, the majority of which use the CCA method. BHPB considers that HCA results in faster depreciation and thus higher current tariffs.

Considerations of the Authority

1197. Australian regulators generally adopt CCA indexed straight-line depreciation of the regulatory asset base, which is equivalent to straight line depreciation in *real* terms.

1198. In line with the NGO, this 'standard' regulatory approach can be considered to be in the long term interests of consumers. This is because it results in a more even allocation of the return on and of capital in real terms over time, thereby:

- achieving efficient growth in the market for reference services over time in line with the requirements of rule 89(1)(a) of the NGR;
- providing efficient signals for utilisation of assets over the whole of their economic life, thereby further contributing to the achievement of the NGO and to the Revenue and Pricing Principles (**RPP**);[517]
- taking account of the interests of current and future customers over the economic lives of the assets;
- avoiding subsidies from current customers to future customers; and
- avoiding price shocks for customers when major assets reach the end of their effective life and are replaced.

1199. Indexed straight-line depreciation may be converted to nominal terms, as is done in the AER's PTRM that applies a CCA approach. This is achieved by the following:

- indexing the capital base;
- determining the associated straight-line depreciation for each asset; and then
- removing an amount so as to avoid a double count for inflation that would otherwise occur when a nominal rate of return is applied to an indexed asset base.[518]

1200. However, instead of CCA deprecation, GGT proposes to apply straight-line depreciation in *nominal* terms to the historical costs of the RAB assets. The proposed approach is consistent with the current HCA approach that was applied in the second access arrangement. HoustonKemp has advised GGT to continue using the straight-line depreciation method to depreciate the GGP RAB based on the Revenue and Pricing Principles (**RPP**).[519] HoustonKemp considers that the most appropriate depreciation approach for the GGP would provide it with the biggest chance of efficient cost recovery.

1201. The Authority notes that it has limited discretion under rule 89 of the NGR. Under rule 89 of the NGR, the Authority can only reject GGT's proposed HCA depreciation approach if:

- the proposed HCA depreciation approach is not consistent with the applicable criteria listed under rule 89(1) of the NGR, which includes ensuring that the depreciation schedule should be designed to:
  - promote efficient growth in the market for reference services; and
  - depreciate assets over their economic lives; or
- GGT's proposed depreciation approach does not comply with the applicable requirements of the NGL(WA).

[517] The efficient use of assets relate to the network assets themselves, as well as the assets of the upstream and downstream users of the network services.

[518] For a summary of the need to remove double counting for inflation when a nominal rate of return is applied to a nominal asset base, see section 2.2 in Queensland Competition Authority, *Financial Capital Maintenance and Price Smoothing*, February 2014.

[519] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014.

Genesis of the current approach

1202. The existing second access arrangement and the first access arrangement utilised the HCA approach for the depreciation of the RAB. The HCA approach was first accepted by the Authority in its 2005 Final Decision on the first access arrangement.[520] In that Final Decision the Authority considered that:

> '…the depreciation methodology used by GGT for the purpose of its submission is different to that generally used by Service Providers and approved by regulators under the Code. The more common approach has been a real or current cost accounting approach to straight-line depreciation, whereby the Service Provider is compensated for the effects of inflation on the "value" of the Capital Base through escalation of the closing value at the end of each regulatory period by the rate of inflation in that period to derive an opening value for the next regulatory period in "dollars of the day".[521]
>
> …Given that the level of use of the pipeline is related directly or indirectly to the level of mining activity in the Pilbara and Eastern Goldfields regions and that mines have finite but uncertain lives, the Authority accepted that it is not unreasonable to presume that the economic life of the pipeline could be circumscribed by a reduction in mining activity.[522]
>
> …The Authority was mindful that the historical cost accounting methodology used by GGT for the calculation of Total Revenue has the effect of accelerating depreciation and considers that there is no substantive justification in terms of expectations of a decline in the market for pipeline services. However, taking into account that the effect of this is to affect the time path of tariffs but not the present value of returns to GGT over the life of the pipeline, and that the required amendments to the Access Arrangement under this Amended Draft Decision result in a reduction in tariffs for the pipeline despite the accelerated depreciation, the Authority considered that the historical-cost, straight-line depreciation methodology used by GGT for the purposes of the tariff calculation described in its submission of 17 December 2002 complies with the requirements of the Code.[523]

1203. The Authority did not revisit these method issues in its 2010 decision reviewing the second access arrangement. It continued to accept GGT's proposed HCA approach.[524]

1204. The Authority notes that the treatment of depreciation under the former gas Code bears strong similarity to the requirements under the NGR (for the latter relevant quotes, refer to paragraph 1184 above). In particular, section 8.33 of the former gas Code required:[525]

> The Depreciation Schedule should be designed:
>
> (a) so as to result in the Reference Tariff changing over time in a manner that is consistent with the efficient growth of the market for the Services (and which may involve a substantial portion of the depreciation taking place in future periods,

[520] Economic Regulation Authority, *Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline*, 17 May 2005, p. 66.

[521] Economic Regulation Authority, *Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline*, 17 May 2005, p. 68.

[522] Economic Regulation Authority, *Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline*, 17 May 2005, p. 69.

[523] Economic Regulation Authority, *Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline*, 17 May 2005, p. 70.

[524] Economic Regulation Authority, *Draft Decision on GGT's Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline*, 9 October 2009, p. 70.

[525] National Third Party Access Code for Natural Gas Pipeline Systems, 11 July 2003, p. 122.

particularly where the calculation of the Reference Tariffs has assumed significant market growth and the Pipeline has been sized accordingly);

(b) so that each asset or group of assets that form part of the Capital Base is depreciated over the economic life of that asset or group of assets;

(c) so that, to the maximum extent that is reasonable, the depreciation schedule for each asset or group of assets that form part of the Capital Base is adjusted over the life of that asset or group of assets to reflect changes in the expected economic life of that asset or group of assets; and

(d) subject to section 8.27, so that an asset is depreciated only once (that is, so that the sum of the Depreciation that is attributable to any asset or group of assets over the life of those assets is equivalent to the value of that asset or group of assets at the time at which the value of that asset or group of assets was first included in the Capital Base, subject to such adjustment for inflation (if any) as is appropriate given the approach to inflation adopted pursuant to section 8.5A).

1205. However, the NGR goes further than the former gas Code, explicitly allowing for deferral of a substantial proportion of the depreciation where the market is immature and there is scope for significant uptake of unutilised capacity on the pipeline (per NGR 89(2) – see paragraph 1184).

1206. The NGR also provides only limited discretion for the regulator under NGR 89(3).

1207. In addition, more broadly, the Authority is now required to account for the NGO and the other requirements of the National Gas Law (**NGL**), including the Revenue and Pricing Principles, when making its decision. Section 28 of the NGL(WA) states:

28 Manner in which [Authority] must perform or exercise [Authority] economic regulatory functions or powers

(1) The [Authority] must, in performing or exercising an [Authority] economic regulatory function or power-

(a) perform or exercise that function or power in a manner that will or is likely to contribute to the achievement of the national gas objective.

(2) In addition, the [Authority]—

(a) must take into account the revenue and pricing principles—

(i) when exercising a discretion in approving or making those parts of an access arrangement relating to a reference tariff; or

(ii) when making an access determination relating to a rate or charge for a pipeline service; and

(b) may take into account the revenue and pricing principles when performing or exercising any other [Authority] economic regulatory function or power, if the [Authority] considers it appropriate to do so.

- For the purposes of subsection (2)(a)(ii), a reference to a "reference service" in the revenue and pricing principles must be read as a reference to a "pipeline service".

1208. The Authority therefore considers that it must evaluate the depreciation method in terms of its ability to contribute to the achievement of the NGO and the Revenue and Pricing Principles.

1209. Accordingly, in what follows, the Authority considers compliance of GGT's proposed method of depreciation with the requirements of:

- NGR 89;

- the NGO; and
- the Revenue and Pricing Principles.

1210. The Authority considers that the standard regulatory CCA depreciation method provides a clear alternative which meets all of the foregoing requirements. This method is also evaluated.

Compliance with requirements of NGR 89 (1) (b) - (e)

1211. The Authority considers that generally both the HCA and CCA depreciation approaches meet the requirements of NGR 89(1)(b) to (e), as both approaches:

- enable assets to be depreciated over their economic lives (NGR 89(1)(b));
- allow for adjustments reflecting changes in the expected economic lives of particular assets (NGR 89(1)(c));
- allow for assets to be depreciated only once (NGR 89(1)(d)); and
- allow for the service provider's reasonable needs for cash flow to meet financing, non-capital and other costs (NGR 89(1)(e)).

Compliance with requirements of NGR 89(1)(a)

1212. NGR 89(1)(a) requires that reference tariffs vary, over time, in a way that promotes efficient growth in the market for reference services.

1213. GGT contends in this context that the GGP serves a mature market that is not growing rapidly:[526]

- GGP has a small number of relatively large customers that operate in natural resource mining;
- GGP has operated at or near capacity for the last ten years;
- demand for GGP services is not forecast to grow materially;
- innovation of energy supply chains and development of compressed and liquefied natural gas are contributing to the limited growth of demand for GGP services;
- GGP capacity expansions have been through discrete investments to meet the needs of specific customers that underwrite these investments; and
- GGP capacity expansions have not formed part of the covered pipeline.

1214. Based on the above, HoustonKemp considers that the NGR rule 89(1)(a) is not relevant to evaluate the RAB depreciation approach that GGT should use:[527]

> Consistent with this outlook, in our opinion the market for reference services provided by the GGP can best be characterised as mature, with limited scope for future growth. A corollary of these circumstances is that the time profile of the future expected costs of providing services is unlikely to be important for the prospects for growth in the market for reference services. This conclusion has significant implications for the interpretation and application of rule 89(1)(a).

[526] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 44.

[527] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014, p. 11.

> The guidance provided by rule 89(1)(a) principally goes to the selection of a depreciation method that results in a time profile of reference tariffs that, in turn, promotes efficient growth in the market for reference services. However, in the absence of much or any scope for serving efficient growth in the market for reference services by means of the available covered capacity of the GGP, a wide range of depreciation methods is likely to be consistent with rule 89(1)(a).
>
> It follows that the evaluation of different potential depreciation methods for the GGP is unlikely to be assisted by looking beyond the ability of one method or another to promote efficient growth in the market for reference services. Rather, it is more helpful to turn to the wider-ranging revenue and pricing principles, which guide the application of the NGRs.

1215. In response, first, the Authority considers that it would be remiss to automatically assume that there is 'limited scope for future growth' on the pipeline over the course of its future life. That inference belies the trends of the last decade – where pipeline capacity and throughput has nearly doubled.

1216. In particular, iron ore operations have added significant new loads in the past few years to the northern section of the pipeline. It can be noted that production from the Pilbara's iron ore province, which is adjacent to the GGP, are at the very lowest end of the global iron ore cost curve. It follows that further expansions on the northern section, over the medium to longer term, cannot be ruled out. In addition, new loads may continue to take capacity elsewhere on the GGP; for example, the AngloGold Ashanti Independence Group gold joint venture is adding a significant load from January 2016 on the southern half of the pipeline.[528] In consequence, the Authority considers that the 'time profile of the future expected costs' remains important in promoting efficient (expansion) growth in the market for reference services.

1217. Second, the Authority considers that 'growth' should not be interpreted simply in a positive sense, as encouraging new capacity, but also in terms of the need to maintain existing capacity, by avoiding inefficient contraction (or 'negative growth') in the utilisation of existing capacity in the market for reference services.

1218. In this context, the Authority notes that GGT has suggested that it is having difficulty securing new customers for existing capacity – GGT states:

> The forecast of demand for capacity used in preparing this access arrangement revision proposal (section 4 above) recognises:
>
> (a) the difficulty GGT has encountered in finding a user for capacity made available by the failure of gold miner Apex Minerals at Wiluna; and
>
> [redacted]

1219. The Authority considers that a depreciation schedule which more evenly allocates the pipeline capital costs (both the return on and of capital) between current and future users will encourage efficient growth in the market for reference services, as it will result in more even tariffs, all other things equal. Importantly, such a deprecation schedule will also help to avoid contraction of demand on the pipeline in the first half of the pipeline's life. HCA, in contrast, drags forward revenue to the first half of the pipeline's life, thereby resulting in higher reference tariffs, all other

[528] See for example www.anglogoldashanti.com/en/Media/Presentations/InvestorAnalystvisitAugust2015.pdf, accessed 21 October 2015.

things equal. Those higher tariffs may unnecessarily discourage demand for reference services in the early years of the pipeline's life.

1220. HoustonKemp further states that higher upfront depreciation costs reduce long run average reference tariffs for end users. In this context, GGT suggests that the price of gas is expected to rise, and so falling gas transportation prices help to restrain price increases, promoting growth in the market.[529]

1221. However, again, GGT is making an assumption which may not be borne out in reality. In particular, the long term trend for the price of gas is not at all certain, as it will depend on the interaction of a range of factors, on both the supply and demand sides. Gas prices may fall back from current high levels in real terms, as lower cost sources of global supply become available, such as from tight gas. Other factors such as climate change policy may affect demand for gas in some applications, such as for urban power generation, reducing overall demand for gas, and eventually leading to global price declines. This suggests that drawing in the unknown future price of complements to the GGP, such as gas prices – as a means to justify higher network tariffs, now, from HCA – could be misleading.

1222. Ignoring such distractions, 'all other things equal', the requirements of NGR 89(1)(a) supports allocating costs in a way which does not distort either current or future demand for pipeline services, by apportioning the capital cost equally across all users, current and future, in real terms. In that case, tariffs based on CCA depreciation will reflect the real share of capital costs through time, promoting efficient growth in the market for reference services over time. Importantly, that efficient growth in the market for references services also includes considerations relating to avoiding unnecessary contractions in demand for pipeline capacity, particularly in times of downturn. In contrast, HCA depreciation, by dragging forward depreciation, distorts tariffs through time, thereby introducing the clear risk of inefficient growth in the market for reference services.

Compliance with requirements of NGR 89(2)

1223. HoustonKemp introduces the requirements of NGR 89(2) in the following way, linking it to 'the extent of departure from the ideal, LRMC-based tariff structure':[530]

> Setting reference tariffs such that the revenue per unit of service that must be recovered by them varies through time so as to reflect as closely as possible to LRMC of the relevant reference service will ensure that consumers face price signals that reflect the resource cost of providing reference services. This in turn encourages consumers to demand reference services only when the benefit to them exceeds the cost of provision. Such a time profile of reference tariffs will be allocatively efficient and promote efficient growth in the market for reference services.
>
> However, in circumstances whereby capital costs previously incurred need to be recovered, the total revenue per unit of service is likely to include a residual element that exceeds the forward-looking LRMC of providing a unit of service. This residual revenue requirement is affected by the return of capital building block element, the time profile of which will be affected by the choice of depreciation method.
>
> Determining a depreciation schedule that promotes efficient growth in the market for reference services then becomes a question of how to allocate this residual revenue

[529] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014. p. 48.

[530] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014, p. 9.

> requirement per unit of service through time, in a manner that minimises the extent of departure from the allocatively efficient, LRMC-based tariff.
>
> It follows that, to the extent there is scope for growth in the market for reference services, this will best be achieved by a depreciation schedule that results in a time profile of total revenue per unit of service that minimises the extent of departure from the ideal, LRMC-based structure of tariffs.
>
> This interpretation of rule 89(2) of the NGR is consistent with its implied reference to the time profile of revenue per unit of service when determining an appropriate depreciation method. In particular, rule 89(2) permits a deferral of depreciation, and so of total revenue to be recovered, when it is expected that the market for reference services will be larger in the future.

1224. However, the Authority considers that NGR 89(2) refers to the deferral of depreciation in the very early years of a pipeline which is at less than full capacity, such that the market for the existing capacity is 'relatively immature'. Such an approach ensures that the foundation customers do not bear a disproportionate share of the capital costs. HoustonKemp acknowledges this:[531]

> Rule 89(2) refers to three scenarios in which a substantial deferment of depreciation may be considered by reference to rule 89(1), ie, where:
>
> (a) the present market for pipeline services is relatively immature; and
>
> (b) the reference tariffs have been calculated on the assumption of significant market growth; and
>
> (c) the pipeline has been designed and constructed so as to accommodate future growth in demand.
>
> Each of these scenarios implies that a gas pipeline has a material amount of spare capacity available, and that this spare capacity is expected to be utilised in the future.
>
> In the event that any such spare capacity is taken up over time, the operation of the building block approach causes the revenue per unit of service (or the reference tariff) to fall through time – because the annual revenue requirement is allocated between a greater number of units served. To mitigate such a fall in the revenue per unit, rule 89(2) permits depreciation to be deferred such that total revenue rises as the market for reference services provided by a pipeline grows.
>
> To summarise, in our opinion each of the scenarios set out in rule 89(2) is more likely to apply to the circumstances of a relatively new gas pipeline with significant spare capacity, rather than an established gas pipeline with limited available capacity.

1225. Given that spare newly-constructed capacity is not, and has never been, an issue for the covered section of the GGP, the Authority considers that NGR 89(2) does not bear on the choice of HCA or CCA depreciation method.

Compliance with requirements of NGR 89(3)

1226. NGR 89(3) sets out that the Authority's discretion under the rule is limited, referring to NGR 40(2). NGR 40(2) states:

> **Limited discretion**
>
> (2) If the *Law* states that the AER's discretion under a particular provision of the *Law* is limited, then the AER may not withhold its approval to an *element of an access*

[531] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014, p. 10.

> *arrangement proposal* that is governed by the relevant provision if the AER is satisfied that it:
>
> (a) complies with applicable requirements of the *Law*; and
>
> (b) is consistent with applicable criteria (if any) prescribed by the *Law*.
>
> **Example:**
>
> The AER has limited discretion under rule 89. (See rule 89(3).) This rule governs the design of a depreciation schedule. In dealing with a full access arrangement submitted for its approval, the AER cannot, in its draft *decision*, insist on change to an aspect of a depreciation schedule governed by rule 89 unless the AER considers change necessary to correct non-compliance with a provision of the *Law* or an inconsistency between the schedule and the applicable criteria. Even though the AER might consider change desirable to achieve more complete conformity between the schedule and the principles and objectives of the *Law*, it would not be entitled to give effect to that view in the *decision* making process.

1227. The Authority considers that the proposed HCA approach is not compliant with the requirements of the National Gas Law, whereas the CCA approach is. This is discussed in what follows.

Compliance with the national gas objective

1228. GGP's access arrangements for the first and second access arrangement periods were governed by the former gas Code. In both access arrangements, GGT employed straight-line depreciation under the HCA approach. A key difference to the Code is that the NGL(WA) and NGR are governed by the national gas objective:

> The objective of this Law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long run interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

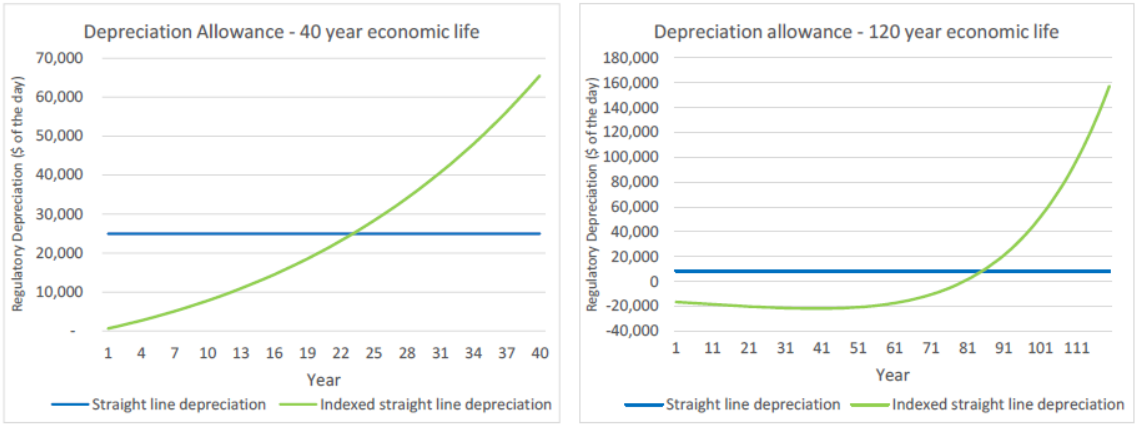
1229. As noted above, the Authority considers that the NGO, which seeks to ensure efficient investment in, and use of, pipeline services for the long-term interest of consumers, is an over-arching consideration for the evaluation of GGP's depreciation approach. Outcomes under the HCA and CCA methods of depreciation need to be compared in light of the requirements of the NGO.

1230. The Authority notes that HCA drags forward depreciation revenue in real terms from the second half of an asset's life to the first half. As a result:

- HCA leads to real subsidies from current consumers to future consumers, which is not in the long term interests of (all) consumers, counter to the requirements of the NGO.
- HCA depreciation schedules provide for price paths that may encourage inefficient utilisation of assets, that is, potential under-utilisation of the asset in the first half of its life, and potential over utilisation of the asset in the second half (to the extent that tariffs are lower than they would otherwise be). This is counter to the requirements of the NGO.
- HCA may result in an inefficient management of assets, as it creates incentives to manage assets based on reasons other than the efficient provision of reference services.

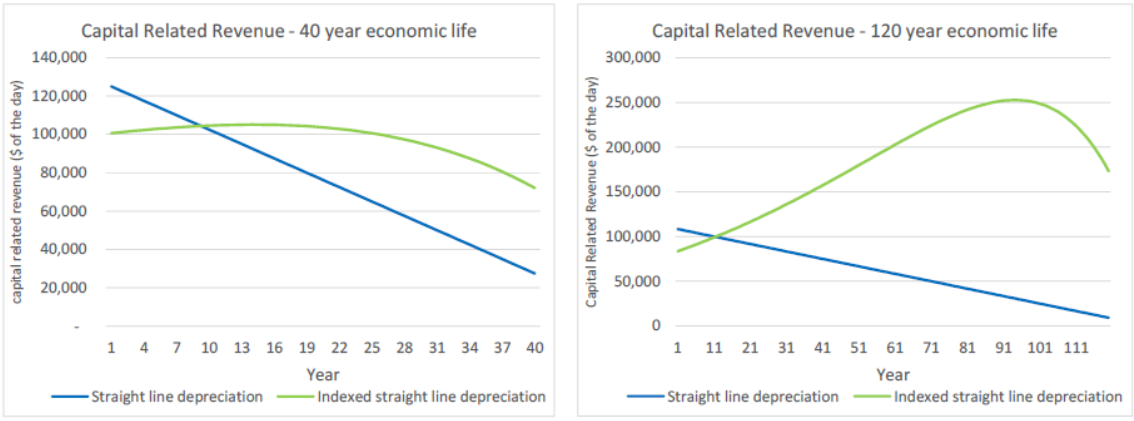
1231. HoustonKemp provides a heuristic chart comparing outcomes for revenue under HCA and CCA depreciation (Figure 24 and Figure 25).

Figure 24 HoustonKemp's nominal depreciation heuristic



Source *HoustonKemp Economists, Depreciation Methodology for the Goldfields Gas Pipeline, 25 August 2014, p. 6.*

Figure 25 HoustonKemp's nominal capital related revenues heuristic



Source *HoustonKemp Economists, Depreciation Methodology for the Goldfields Gas Pipeline, 25 August 2014, p. 7.*

1232. HoustonKemp concludes (our emphasis):[532]

> Figure [17] above illustrates the time profile of capital-related revenue allowance associated with the two depreciation methods, where capital related-revenue allowance is the sum of the depreciation and return on capital elements of the building block approach referred to in rule 76 of the NGRs.
>
> **Figure [17] shows that, despite initially lower capital-related revenues, when applied to a single asset, indexed straight line depreciation results in materially higher capital-related revenues in later years, as compared with those under straight line depreciation.**
>
> To summarise, the application of the building block approach means that a higher depreciation allowance, and so total revenues, in the early years of an asset's life, must be offset by a lower depreciation allowance and total revenues in the future.
>
> It follows that, all else being equal, the depreciation methodology has a potentially significant effect on the time profile of reference tariffs, the level of which is a function

[532] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014, p. 7.

of the total revenue allowance in any year, and the number of units of reference service to be provided in the same year.

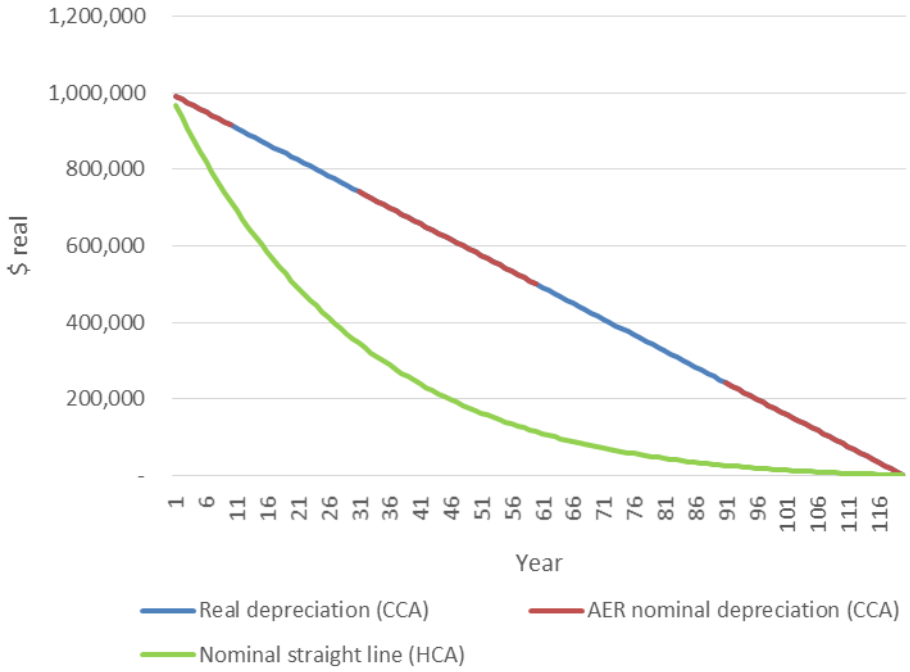
1233. The Authority agrees that the depreciation method has a significant effect on the time profile of reference tariffs.

1234. However, the Authority considers that HoustonKemp's analysis does not reflect the true picture in terms of the time profile, as it is in $ of the day, and therefore suffers from money illusion associated with the assumed rate of inflation. It is more telling to use real analysis, as this shows the true effect on the time profile of revenue being charged to users.

1235. Figure 26 to Figure 28 illustrate the corresponding *real* heuristic analysis in relation to how the HCA and CCA approach impacts on the revenue and cost distribution over time. These illustrations correspond almost identically to HoustonKemp's 120 year asset life nominal analysis in Figure 24 and Figure 25 above (the y axis values are different, but it is the pattern of depreciation and revenue over the 120 year period which matters in this instance). For the CCA method, two approaches are illustrated – a pure real valued revenue model, giving real values for depreciation, the residual RAB and revenue, and a nominal model with indexed depreciation, as per the Australian Energy Regulator's Post Tax Revenue Model (**PTRM**) method, with the relevant outputs then converted to real terms. For the HCA method, the nominal outputs are from a pure nominal model, which are then converted to their corresponding real values. This ensures the comparison is on a like with like real basis across all three methods.

1236. First, Figure 26 shows that in real terms, CCA provides for constant straight line real depreciation, whereas the HCA method accelerates depreciation in the early years in real terms (note that blue line, which is the value of residual RAB in a fully real model, lies exactly under the red line, which is the value of the residual RAB of an AER style nominal model with indexed depreciation – the two outcomes are identical in real terms on this metric).

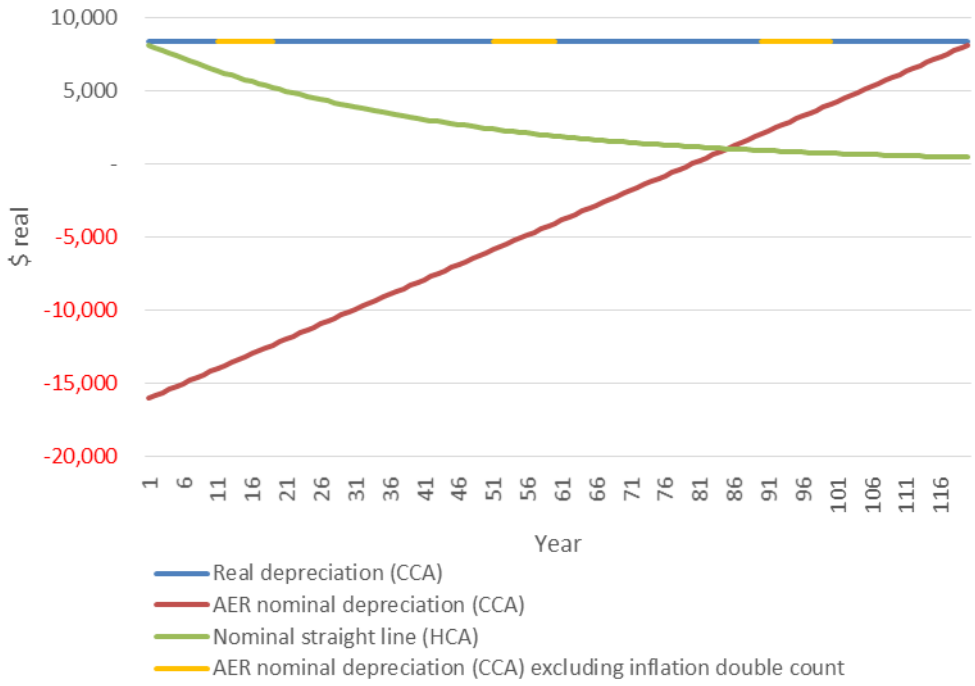
Figure 26 Illustrative closing Asset Value under HCA and CCA (real $)



Source ERA analysis, December 2015

1237. Second, Figure 27 illustrates the outcomes for the real value of depreciation in the three models. It may be noted that the AER style nominal model deducts the double count of inflation from the nominal value of depreciation, which results in negative real depreciation in real terms in the early years (both the with and without double count for inflation outcomes are included in Figure 27 in real terms).

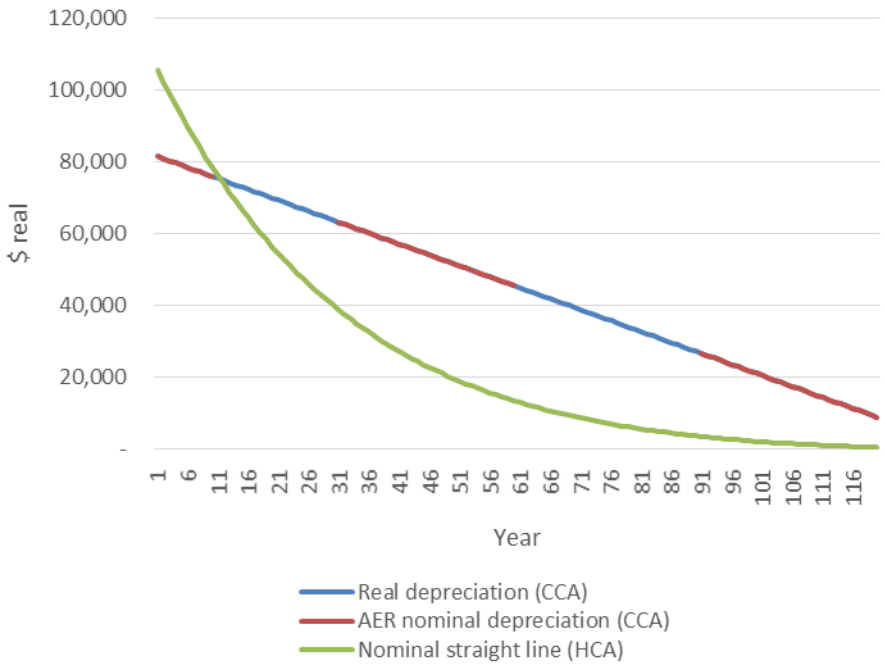
Figure 27 Illustrative depreciation under HCA and CCA (real $)



Source ERA analysis, December 2015

1238. Finally, and most importantly, Figure 28 illustrates how both depreciation methods result in a real revenue path that declines over time. However, the effect of HCA dragging forward the capital-related revenue relative to CCA in the early years is clearly illustrated (note that the blue line lies exactly under the red line – both the CCA cases are identical). Given the impact of discounting – whereby the early years give much of the net present value of a 70 year asset – the effect is very significant.

Figure 28 Illustrative total revenue under HCA and CCA (real $)



Source ERA analysis, December 2015

1239. Figure 28 illustrates how real capital charges are more evenly allocated between current and future consumers of pipeline services under CCA, as compared to HCA. The more even allocation is consistent with the requirements of the NGO, in that it does not lead to unjustified subsidies from future to current consumers.

1240. In this context, a significant consideration for the Authority is that CCA is an example of a method of economic depreciation, which was first identified by Hotelling.[533] Economic depreciation seeks to ensure that the written down value of the asset at any point in time is equal to the net present value of the cash flows it will generate in the future, thereby ensuring 'financial capital maintenance' for the investor. Therefore, economic depreciation maintains the asset value, at any point in time, consistent with that value that would obtain on the sale of the asset.

1241. This has important advantages in terms of efficient signalling of use, in that the capital charges that are included in the tariffs are consistent with the opportunity cost of the capital. It ensures normal remuneration of the employed capital, but without additional gains or losses to that capital at any point in time which might arise from depreciation that is not based on the opportunity cost.

1242. In this context, the Authority notes that the GGP should be able physically to deliver gas transportation services to the end of its useful life – providing appropriate

[533] H. Hotelling, A general mathematical theory of depreciation, *Journal of the American Statistical Association*, 20, 1925, pp. 340–53.

maintenance and replacement schedules are followed – thereby allowing full utilisation ot the capacity to the end of its scheduled life. That suggests that a depreciation schedule which leads to revenue through time that is reasonably flat will meet the requirements of the NGO, as it will treat current and future consumers equally.

1243. The Authority notes that the CCA approach allows for some front end loading of the revenue. However, the degree of front loading of revenue in Figure 28 will be ameliorated – in reality – to the extent that there are ongoing investments which are shorter lived than the main pipeline, but which are required to maintain throughput (for example, compressors, valving etc).

1244. Based on the above, the Authority considers that the CCA method of depreciation is consistent with the NGL(WA) and NGR, as it:

- provides signals for efficient use, which reflect the opportunity cost of the capital employed in the pipeline;
- discourages replacement investment before the end of the useful life of the assets; and
- balances the requirement for the service provider to have reasonable opportunity to recover the efficient costs of providing reference services, with the need to address the long term interests of consumers, including current and future consumers.

1245. On the other hand, the Authority considers that HCA unfairly discriminates against current consumers of natural gas on the GGP, to the benefit of future consumers. The Authority notes the following in relation to HCA:

- HCA accelerates depreciation markedly – with typical rates of return, HCA recovers around 80 per cent of the present value of the asset within 15 years, whereas CCA only recovers 65 per cent over the same timeframe;
- HCA therefore leads to highly significant real depreciation subsidies from current consumers to future consumers, which is not in the long term interests of (all) consumers.
- HCA may result in unnecessarily high prices in the short to medium term – these could discourage gas usage and upstream and downstream investment.
- HCA depreciation schedules provide for price paths that encourage inefficient utilisation of assets, that is, under or over utilisation of the asset at different times in its life cycle.
  - For example, under the HCA approach, there may be an incentive for a service provider to dispose of assets or ignore maintenance near the end of the useful life because the return on and of this asset would be relatively small and considerably lower at that time than under the CCA approach.
  - This may be facilitated by the artificially low tariffs induced by the HCA method near the end of the assets life. Downstream users may be induced to invest on the basis, only to find that such tariffs were unsustainable.
  - Under the HCA method, the early replacement of the asset would provide a higher return on and of the asset to the service provider than it was getting on the previous asset.

1246. For these reasons, the Authority considers that the HCA approach is not consistent with the NGO.

1247. The Authority considers that CCA is consistent with NGO for the following reasons:

- CCA allocates capital costs more evenly between current and future customers, resulting in price paths that reflect the opportunity costs of the pipeline. As a consequence, CCA:
  - avoids subsidies between current and future consumers, thereby ensuring outcomes that are in the long term interests of consumers with respect to price;
  - allows for efficient use of the pipeline by upstream and downstream consumers both now and in the future, thereby contributing to the efficient growth in the market of reference services;
  - signals efficient production and investment decisions by the service provider and consumers of natural gas, thereby contributing to the efficient growth in the market of reference services;
  - avoids price shocks for consumers, both for the forthcoming access arrangement period, and also at the end of the economic lives of major assets.
- CCA depreciation schedules encourage more efficient asset utilisation, which strengthens the long term security and reliability of gas supply.

Compliance with requirements of the Revenue and Pricing Principles

Revenue and Pricing Principle (2)

1248. GGT and its consultant HoustonKemp refer to the second Revenue and Pricing Principle. In this context, HoustonKemp states that:[534]

> We noted above that the assessment of a depreciation method in the particular circumstances of the GGP is unlikely to be assisted by the particular question of that which promotes efficient growth in the market for reference services. Rather, such an assessment is more likely to be assisted by the wider-ranging revenue and pricing principles, which guide the application of the NGRs in general. The revenue and pricing principles state that:[535]
>
> 'A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in —
>
> (a) providing reference services; and
>
> (b) complying with a regulatory obligation or requirement or making a regulatory payment.'
>
> Adopting these considerations, in our opinion, the depreciation method applied to the GGP in the revised access arrangement should be that which is likely to provide the most effective opportunity to recover the efficient costs incurred in providing the reference services, ie, the extent of capital investment in the GGP.

1249. With this in mind, GGT and HoustonKemp advise that the HCA method is consistent with the RPP, on the basis that it delivers efficient cost recovery. HoustonKemp argues that efficient cost recovery is equivalent to seeking to recover more costs when customers have a higher willingness to pay. In terms then of 'allowing service providers reasonable opportunity to recover at least the efficient costs' (per the second Revenue and Pricing Principle), HoustonKemp argues that – absent

[534] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014, p. 12.

[535] National Gas Law, National Gas (South Australia) Act 2008, clause 24(2). [HoustonKemp footnote]

significant growth in capacity (the 'mature market' argument outlined above) – then:[536]

> …In our opinion, the method for returning capital invested in the GGP, ie, depreciation, should seek to recover relatively more depreciation during periods when customers have a relatively high willingness to pay.

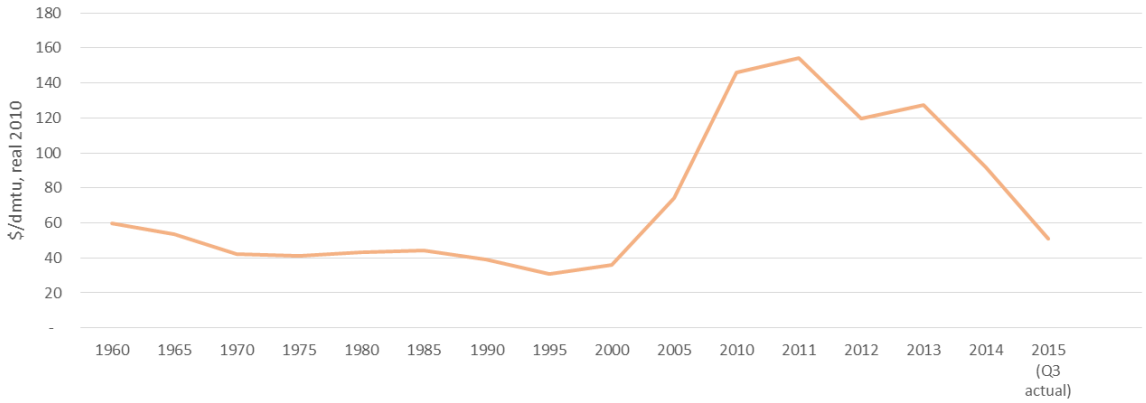
1250. HoustonKemp notes that GGT's major customers are large natural resource (iron ore, gold, lead and nickel) mining companies, contending the following:

- GGP customers currently have a higher 'willingness to pay' at the current time due to global resource price trends, with recent prices of iron ore, gold, nickel and lead higher than historical averages;
- recovering more revenue now from users in earlier years would:[537]

  > …amount to prudent management of the future risk that resource prices will not remain at their current historical highs, in which event the ability or willingness to pay for pipeline services will be reduced. In extreme, such an approach would reduce the risk of the GGP pipeline asset being stranded, through unanticipated shrinkage in the demand for reference services.

1251. HoustonKemp depicted natural resource prices until 2010 in real USD, which showed an increase compared to historical trends. In Figure 29 to Figure 31, the Authority has updated HoustonKemp's analysis to reflect available data, up to 2015. The Authority has also converted the estimates to real AUD, in indicative terms (through use of readily available purchasing power parity real exchange rates), which shows the dampening effect of bilateral AUD/USD real exchange rate movements over the past decade on prices in AUD terms.

Figure 29 Iron Ore Price Trend – Annual Average Prices 1960-2015

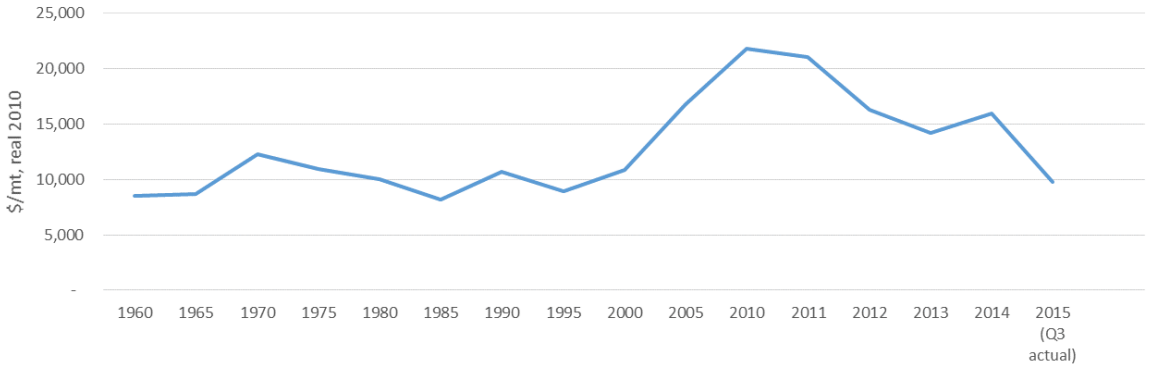


Source: Global Economic Monitor (Commodities), World Databank, The World Bank; ERA Analysis (2015 based on third quarter of 2015 and 2015 nominal to real conversion derived using the US GDP implicit price deflator series – see research.stlouisfed.org/fred2/series/GDPDEF). Conversion of real USD values to real AUD values estimated using the OECD's purchasing power parity exchange rate for the AUD/USD cross rate (see https://stats/oecd.org) and ERA estimates.

[536] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014, p. 12.

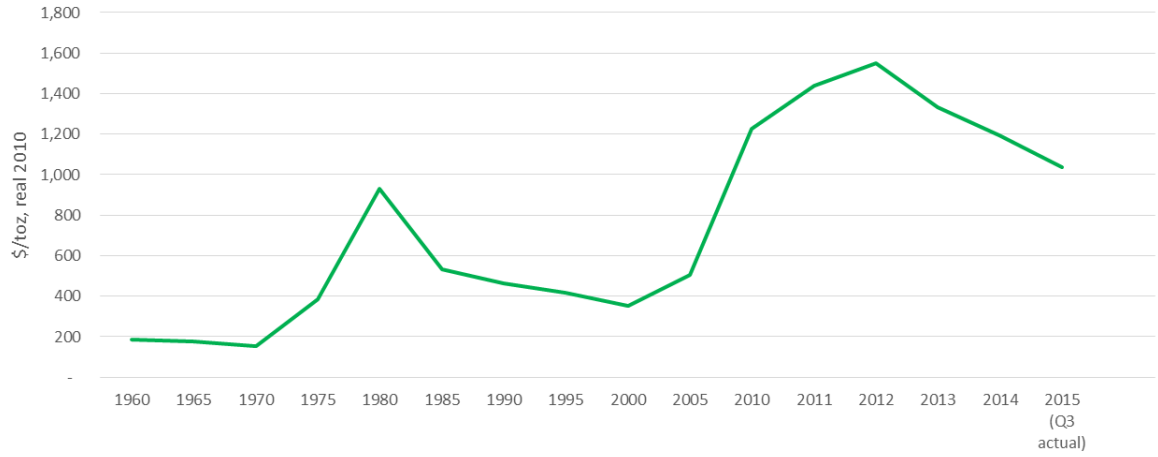
[537] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014, p. 13.

Figure 30 Nickel Price Trend – Annual Average Prices 1960-2015



Source: Global Economic Monitor (Commodities), World Databank, The World Bank; ERA Analysis (2015 based on third quarter of 2015 and 2015 nominal to real conversion derived using the US GDP implicit price deflator series – see research.stlouisfed.org/fred2/series/GDPDEF). Conversion of real USD values to real AUD values estimated using the OECD's purchasing power parity exchange rate for the AUD/USD cross rate (see https://stats/oecd.org) and ERA estimates.

Figure 31 Gold Price Trend – Annual Average Prices 1960-2015



Source: Global Economic Monitor (Commodities), World Databank, The World Bank; ERA Analysis (2015 based on third quarter of 2015 and 2015 nominal to real conversion derived using the US GDP implicit price deflator series – see research.stlouisfed.org/fred2/series/GDPDEF). Conversion of real USD values to real AUD values estimated using the OECD's purchasing power parity exchange rate for the AUD/USD cross rate (see https://stats/oecd.org) and ERA estimates.

1252. The Authority notes that natural resource prices have dropped significantly since 2010, consistent with the unwinding of the China boom. Prices for nickel and iron ore have fallen to levels approaching the average prices around the time the pipeline was built (1995 to 2000). The exception is the gold price, which remains more than double the price observed in 2000.

1253. In terms of the importance of the various commodities in supporting the contracting for the GGP's capacity:

- nickel is most important – contributing an estimated 54 per cent of the GGP's covered capacity;
- gold is important – contributing an estimated 26 per cent;
- iron ore is less important – contributing an estimated 15 per cent;
- other smaller loads relating to gas distribution in the townships, and electricity generation, contribute the remainder.

1254. Overall, it is clear that while the gold price is at relatively elevated levels, the nickel and iron ore prices are not. This suggests that the 'willingness to pay' argument has limited validity at the current time. Raising reference tariffs on this basis would clearly disadvantage nickel and iron ore producers at a time when they face a difficult global market.

1255. Furthermore, the 'willingness to pay' argument is predicated on an assumption about the trend in commodity prices going forward. However, no-one can foretell whether natural resource prices will increase, continue to decrease, or stabilize over the longer term future, which is commensurate with the life of the pipeline.

1256. Overall, the Authority concludes that the 'willingness to pay' argument has very limited relevance for its decision on the appropriate depreciation method. On the balance of the probabilities outlined above, the Authority considers that the analysis supports the CCA approach over the HCA approach, in terms of supporting 'reasonable opportunity'.

Revenue and Pricing Principle (3)

1257. The requirement under NGR 89(1)(a) to consider the efficient growth in the market for reference services, and the efficient utilisation of existing capacity, is also a clear requirement of the third Revenue and Pricing Principle in the NGL(WA), which requires that:[538]

> (3) A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides. The economic efficiency that should be promoted includes—
>
> (a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services; and
>
> (b) the efficient provision of pipeline services; and
>
> (c) the efficient use of the pipeline.

1258. This further reinforces the conclusions of the Authority with regard to NGR 89(1)(a) set above. The Authority considers that the arguments relating to the efficient growth in the market for reference services, and the requirements of the third Revenue and Pricing Principle, are entirely analogous.

1259. The requirements of third Revenue and Pricing Principle supports allocating costs in a way which do not distort either current or future demand for pipeline services, by apportioning the capital (depreciation) cost equally across all users, current and future, in real terms. In that case, tariffs based on CCA depreciation will reflect the real share of capital costs through time, thereby promoting efficient use of reference services over time. Importantly, that efficient use of references services also includes considerations relating to avoiding unnecessary contractions in demand for

[538] National Gas Law, Division 2.

pipeline capacity, particularly in times of downturn. In contrast, HCA depreciation, by dragging forward depreciation, distorts tariffs through time, thereby introducing the clear risk of inefficient use of reference services.

Conclusions with regard to the method for depreciation

1260. HoustonKemp concludes:[539]

> For these reasons, in our opinion there is no case for the application of a depreciation method that defers the recovery of depreciation towards later years in the economic life of the GGP. Further, rule 89(2) gives weight to this conclusion since none of the scenarios that it contemplates as being appropriate for a deferment of depreciation apply to the circumstances of the GGP, i.e., the GGP does not have significant spare capacity that is expected to be utilised in the future.
>
> … The particular circumstances of the GGP mean that the most appropriate depreciation method is that which results in a time profile of depreciation that recovers relatively more depreciation during periods when customers have a relatively high willingness to pay.
>
> Long term trends in the world price of the particular resources produced by mines served by the GGP reinforce that its customers presently have a relatively high willingness or ability to pay for gas transportation services.
>
> In section 3.1.3 we described that the principal difference between indexed straight line and straight line depreciation is that the former results in a depreciation time profile involving a substantial degree of deferral to later years. In contrast, straight line depreciation sets the annual allowance for depreciation so as to be equal in current price terms over the economic life of an asset. Straight line depreciation therefore recovers relatively more depreciation in the earlier years of an asset's life, as compared with indexed straight line depreciation.

1261. However, the Authority does not consider that HoustonKemp's arguments are compelling. Rather, the analysis of the Authority set out above makes clear that the HCA depreciation method does not meet the requirements of:

- NGR 89(1)(a)'
- NGO
- RPP (2).

1262. In contrast, for the reasons set out above, the Authority considers that the CCA depreciation method does meet all the requirements of the NGL(WA) and NGR.

1263. Therefore, the Authority requires that GGT amend its proposed approach, to adopt the CCA method of depreciation forthwith. In a nominal model, that method would be consistent with the method set out in Australian Energy Regulator's Post Tax Revenue Model.

Moving from HCA to CCA

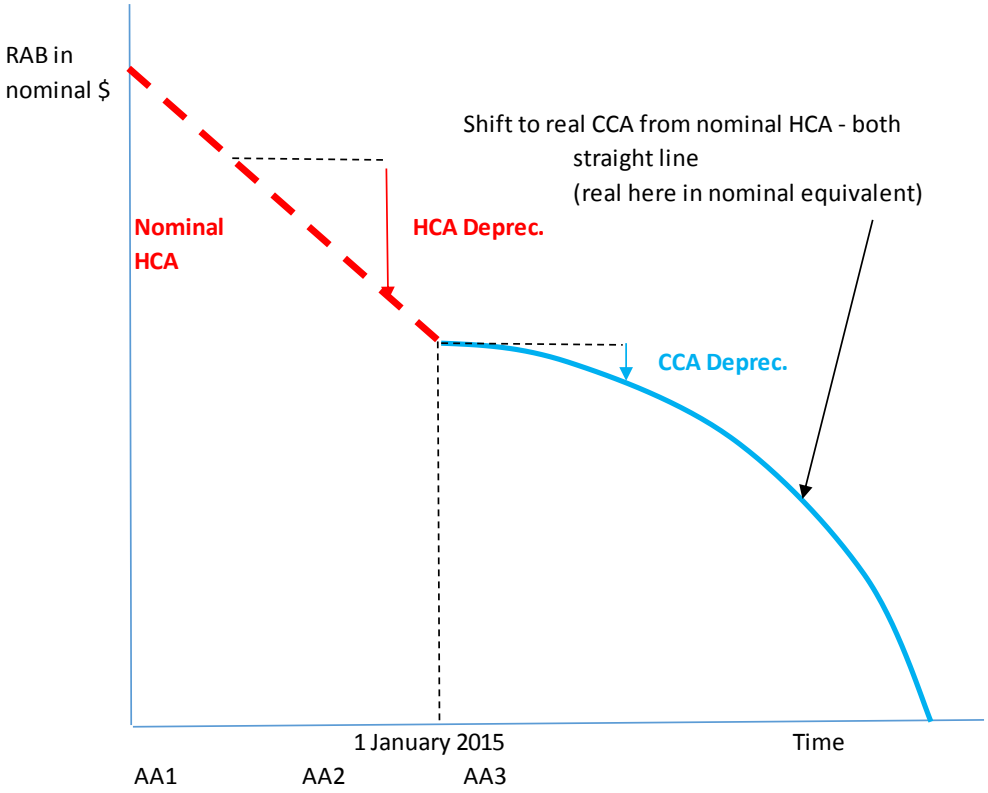
1264. The Authority only requires that the CCA depreciation method be applied from the commencement of the third access arrangement. It does not require a retrospective application of CCA. Therefore the depreciated value of the RAB at the end of the second access will be taken to be the current cost in that year. Indexation will only apply to that value, going forward to the third access arrangement.

[539] HoustonKemp Economists, *Depreciation Methodology for the Goldfields Gas Pipeline*, 25 August 2014, pp. 14-15.

1265. Moving from HCA to CCA in this way to change the depreciation approach will result in the following stylistic treatment of the depreciation of the RAB (Figure 32). The approach:

- ensures that the present value condition is met;
- is consistent with the requirements of NGR 89(1) – that the assets are depreciated only once over the economic life.

Figure 32 Moving from HCA to CCA depreciation



Source ERA analysis, December 2015

1266. The Authority notes that only 25 per cent of the historic cost of the GGP mainline has already been depreciated through the HCA method. A move to CCA will therefore reduce revenue and tariffs. It is estimated that the switch to depreciate the residual value of the RAB through CCA will reduce revenue over the third access arrangement period by some $30 million (2014 dollars) or 15 per cent. This illustrates the magnitude of the penalty imposed by HCA on current consumers of gas services on the GGP.

Depreciation for rolling forward capital base

1267. GGT has based the depreciation schedule for establishing the forecast opening capital base at 1 January 2020 on forecast capital expenditure. GGT has based depreciation from 2015 to 2019 on the following:

- depreciation on the initial capital base and the assets created by added capital expenditure from 2000 to 2014; and

- depreciation on assets expected to be created by capital expenditure forecast for 2015 to 2019.[540]

1268. GGT has added capital expenditure to the capital base at the end of the year in which it is forecast to be made, and applied depreciation the following year.

1269. GGT's actual capital expenditure for 2010 to 2014 was less than forecast. This has two 'excess return' effects over the course of that second access arrangement period:

- first, the return on capital was higher than it might otherwise have been, had the forecast capital been closer to the (lower) actual capital expenditure; and
- second, the amount of depreciation is more than it might otherwise have been (so-called 'over depreciation'), resulting in more revenue than if the forecast capital had been closer to the actual capital expenditure.

1270. The Authority considers that it is reasonable for GGT to retain some of this excess return, as it is consistent with incentive regulation. The potential for excess return encourages GGT to be prudent in its capital expenditure.

1271. However, the 'over-depreciation' in the roll-forward of the regulated asset base (**RAB**) – over the second access arrangement – needs to be corrected.[541] This is because it results in a RAB balance at the end of the period which is lower than it should otherwise be.

1272. GGT has applied an adjustment to address such over-depreciation, by 'writing up' the opening capital base at 1 January 2015 by an amount equivalent to the over-depreciation accumulated over the second access arrangement. This has the effect of restoring the RAB to its correct value. It ensures that the opening balances for all asset classes are non-negative.

1273. The approach means that GGT retains *both* of the excess return components outlined above.

1274. However, the Authority is of the view that this method for correcting the RAB over-rewards efficiency gains, to the extent that it allows the return on the capital expenditure savings to be retained, as well as a depreciation (return) of capital expenditure (which was not undertaken). The Authority considers that this is not in the long term interests of consumers.

1275. Accordingly, the Authority requires that an alternative approach be applied, where over-depreciated assets are 'written up' through a 'positive' depreciation amount in the first year of the third access arrangement (depreciation is usually a negative value entry in the roll forward, so as to reduce the RAB each year). The positive depreciation entry returns the asset class, and hence the RAB, to its correct value by the end of the first year of the third access arrangement period. At the same time, that depreciation entry recovers the over-depreciation for consumers, by reducing the building block revenue in the first year by a commensurate amount (this occurs because depreciation entries from the RAB roll forward are carried into the revenue building block calculation with the opposite sign).

[540] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement Information*, 14 August 2015. p. 9.

[541] At the extreme, there can be negative RAB balances in some asset classes.

1276. GGT will also receive a smaller return on capital in the first year of the access arrangement under the Authority's proposed approach, as opposed to GGT's proposed approach. That has the effect of recovering some of the excess return on capital which GGT received over the second access arrangement. However, it is unlikely to recover all of it, particularly if the forecast capital expenditure was expected early in the second access arrangement.

1277. The net effect is that the service provider retains some of the excess 'return on' capital from the second access arrangement. This provides sufficient incentive for efficiency gains, while not unduly penalising consumers. This will be more consistent with the requirements of the NGO.

1278. Finally, as per the Authority's required indexed straight line depreciation approach, the Authority also requires GGT to calculate the opening capital base for the GGP for the third access arrangement period by escalating it at the rate of inflation as measured by the Consumer Price Index (**CPI**) All Groups, Weighted Average of Eight Capital Cities.

Asset lives

1279. GGT has adopted the same regulatory asset lives that were approved by the Authority for the second access arrangement period, apart from SCADA and communications. For SCADA and communications, GGT has proposed revising the asset life from 10 years to 15 years, which was the asset life approved for this asset class for the first access arrangement period.

1280. The Authority accepts GGT's proposed regulatory asset lives.

Required Amendment 11

The Authority requires GGT to update the calculation of depreciation and the forecast capital base for the third access arrangement period as follows:

- Apply straight-line depreciation with the Current Cost Accounting approach to the regulatory asset base from 1 January 2015.
- Remove over-depreciation adjustment from the regulatory asset base and total revenue.
- Calculate the opening capital base for the GGP for the third access arrangement period by escalating it at the rate of inflation as measured by the CPI All Groups, Weighted Average of Eight Capital Cities.

Taxation

Regulatory Requirements

1281. Rule 76(c) of the NGR provides for the estimated cost of corporate income tax as a building block for total revenue.

1282. Rule 87A of the NGR elaborates on how to calculate the estimated cost of corporate income tax:

> 87A. Estimated cost of corporate income tax
>
> (1) The estimated cost of corporate income tax of a service provider for each regulatory year of an *access arrangement period* (ETCt) is to be estimated in accordance with the following formula:
>
> ETCt = (ETIt x rt) (1-ϒ)
>
> Where
>
> ETIt is an estimate of the taxable income for that regulatory year that would be earned by a benchmark efficient entity as a result of the provision of reference services if such an entity, rather than the service provider, operated the business of the service provider;
>
> rt is the expected statutory income tax rate for that regulatory year as determined by the [ERA]; and
>
> ϒ is the value of imputation credits.

GGT's Proposed Changes

1283. GGT has proposed to include the estimated cost of corporate tax as one of the building blocks used to determine the total revenue requirement for the GGP over the third access arrangement period.

1284. GGT has estimated the cost of tax in each regulatory year by multiplying an estimate of annual taxable income by the expected statutory income tax rate of 30 per cent.[542] GGT has noted that where appropriate, any estimated tax losses are carried forward to offset against taxable income. GGT has reduced its estimated amount of tax payable by the value of imputation credits.

1285. GGT has estimated annual taxable income as total net revenue, which would be the revenue earned by a benchmark efficient service provider in each regulatory year less expenses allowed for income tax purposes.[543] These expenses are:

- the cost of debt financing – the return on debt from the total revenue calculation;
- operating expenses – the forecasts of operating expenditure from the total revenue calculation; and
- tax depreciation – depreciation of the Tax Asset Base (**TAB**).

1286. GGT has estimated the TAB based on the historical costs of GGP assets that may be depreciated for tax purposes. GGT has calculated tax depreciation using a

[542] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information*, 15 August 2014, p. 152.

[543] GGT's revenue is based on the net cost of service

straight-line method. GGT states that it has used the asset lives determined by the ATO.[544] GGT's proposed tax asset lives are shown in Table 70.

1287. GGT has calculated the opening TAB as at 1 January 2015 as $63.170 million in nominal dollars. GGT calculates the TAB as follows:[545]

- Capital expenditure of $507.092 million in nominal dollars:
  - Pre-commissioning capital expenditure from second quarter 1994 to third quarter 1996 of $398.276 million in nominal dollars.
    - *plus*
  - Post-commissioning capital expenditure from fourth quarter 1996 to fourth quarter 2014 of $108.816 million in nominal dollars.
- *minus*
- Depreciation of capex from fourth quarter 1996 to fourth quarter 2014 of $443.923 million in nominal dollars.

1288. GGT proposed an estimated corporate income tax amount (net of imputation credits) of $25.818 million over the third access arrangement period. GGT's proposed value for imputation credits is noted in the Gamma chapter. GGT's updated estimated corporate income tax by year for the third access arrangement period is shown in Table 68.

Table 68 GGT's Proposed Estimated Cost of Corporate Income Tax (AA3)

Nominal $ million	2015	2016	2017	2018	2019	Total
GGT's Estimated Cost of Corporate Income Tax	0.591	3.677	9.994	10.132	10.030	34.424
Value of Imputation Credits	(0.148)	(0.919)	(2.498)	(2.533)	(2.507)	(8.606)
GGT's Proposed Estimated Cost of Corporate Income Tax Net of Imputation Credits	**0.444**	**2.758**	**7.495**	**7.599**	**7.522**	**25.818**

Source: Goldfields Gas Transmission Pty Ltd, Proposed Revised Access Arrangement Information, 28 August 2014, Table 16, p. 28.

1289. GGT has rolled forward the TAB for the third access arrangement period from 1 January 2015 to 31 December 2019 by adding forecast capital expenditure and deducting forecast tax depreciation as shown in Table 69.

[544] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information*, 15 August 2014, p. 152.

[545] Goldfields Gas Transmission Pty Ltd, *Model*, 15 August 2014. (in nominal dollars)

Table 69 GGT's Proposed Closing Tax Asset Base (AA3)

Nominal $ million	2015	2016	2017	2018	2019
Opening Tax Asset Base	**63.170**	**44.870**	**28.593**	**25.950**	**23.422**
Forecast Capital Expenditure	6.784	4.238	1.428	0.803	0.743
Forecast Tax Depreciation	(25.084)	(20.516)	(4.070)	(3.331)	(3.108)
Proposed Closing Tax Asset Base	**44.870**	**28.593**	**25.950**	**23.422**	**21.057**

Source: Goldfield Gas Transmission Pty Ltd, Tariff Model, August 2014.

Submissions

1290. BHPB submitted that the Authority is required to exercise its judgement and set an appropriate value for the tax asset base, similar to the setting of the initial capital base in light of the requirements of the NGL(WA) and NGR.[546] BHPB submitted that the NGR emphasises that all aspects of the calculation of the taxation allowance need to reflect benchmark assumptions. BHPB submitted that the starting TAB is always the cost of the assets, however, if they are subject to a transaction then the owner may be able to reset the TAB. Therefore, in order for the Authority to determine the TAB, it must first decide what is reasonable to assume about the history of the relevant assets.

1291. BHPB submitted that GGT's proposal that the "benchmark entity" be assumed to have been created (and begin depreciating) when the assets were first constructed (1996) would mean that all of the original pipeline assets will be fully depreciated for taxation purposes during the next access arrangement period (reflecting an assumed 20 year tax life). The proposal also implies ignoring:

- any of the transactions associated with the GGP assets since construction, some of which presumably would have permitted the Tax Asset Base to be reset at the transaction value; and
- the commencement of regulation as having an effect on the characteristics of the benchmark efficient entity.

1292. BHPB submitted that a more reasonable benchmark assumption for GGT's opening value for its TAB would be when the GGP became regulated in 2000. BHPB submitted that the date of commencement of regulation was important because it was at that date that the "investment value" in the GGP assets (i.e. the initial capital base) was determined for regulatory purposes, which was set substantially in excess of the depreciated historical cost of the assets at that time. It would be reasonable, for the TAB also to be assumed to have been reset at that date at the deemed investment value.

1293. BHPB suggested that the opening TAB at 1 January 2015 should be $168.36 million under its approach. BHPB states that even with its method of calculating the opening value of the TAB, GGT has still made a windfall gain in relation to taxation. This is because GGT has been compensated for taxation until this point in time, using a pre-tax WACC assuming that tax depreciation has been equal to regulatory depreciation over the period since 2000. If the TAB was calculated using regulatory

[546] BHP Billiton, *Public Submission In response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, pp. 7-10.

depreciation, the TAB would be equal to the opening capital base, which is $397 million.

1294. BHPB urged the ERA to consider how to prevent GGT from making such a material windfall gain from the transition to a post-tax WACC, and how to require it to develop a TAB that would contribute to the achievement of the NGO.

Considerations of the Authority

1295. GGP has transitioned from being regulated under the Code to the NGR. GGT has introduced an estimate of the cost of corporate income tax into the calculation of total revenue under rule 76 of the NGR.

1296. The Authority has assessed GGT's estimated cost of corporate income tax in accordance with rule 87A of the NGR, with consideration of the following:

- the estimate of the taxable income for each regulatory year that would be earned by a benchmark efficient entity as a result of the provision of reference services;
- the expected statutory income tax rate for each regulatory year; and
- the value of imputation credits.

Estimate of the Taxable Income

1297. GGT has estimated annual taxable income as total revenue, which would be earned by a benchmark efficient service provider, less expenses allowed for income tax purposes. These expenses are tax depreciation, the cost of debt financing and operating expenses. Tax depreciation is calculated on a separate TAB.

1298. Under rule 87A of the NGR, the estimated cost of corporate income tax is an estimate of the taxable income earned by a benchmark efficient entity. Rule 74 of NGR states that estimates must be:

- supported by a statement of the basis of the estimate;
- arrived at on a reasonable basis; and
- represent the best estimate possible in the circumstances.

Revenue

1299. GGT has based the revenue component of its taxable income calculation on the building block revenue for each year.[547]

1300. The Authority considers that smoothed tariff revenue is reflective of actual revenue received, whereas the building block revenue represents the cost of service. In accordance with rule 87A of the NGR, the Authority considers that the actual revenue received would be used by the efficient benchmark entity in lodging its assessment of taxable income to the ATO.

1301. The Authority considers that the revenue component in GGT's taxable income calculation should be based on the smoothed tariff revenue rather than the building block revenue.

[547] Goldfield Gas Transmission Pty Ltd, *Tariff Model*, August 2014.

Tax Depreciation

1302. The Authority has assessed GGT's tax depreciation methodology, derivation of its opening TAB and assumed tax asset lives below.

Tax Depreciation Methodology

1303. GGT has applied the straight-line depreciation method for determining the TAB. GGT proposes to continue using the straight-line method to depreciate the TAB over the third access arrangement period. However, GGT has not provided any justification for proposing this method.

1304. The Authority has assessed GGT's proposal to apply straight-line depreciation to its TAB. The Authority notes that under sections 40-65 of the *Income Tax Assessment Act 1997* (**ITAA97**), entities have a choice of two methods to work out the decline in value of a depreciating asset. The straight-line (prime cost method) or reducing balance (diminishing value) method.[548]

1305. The Authority notes that rule 87A of the NGR does not specify a particular method of depreciation to be used. The Authority notes that rule 87A specifies that the estimate of the taxable income is an estimate of the taxable income earned by a benchmark efficient entity.

1306. The Authority provided the following definition of the benchmark efficient entity in its gas rate of return guidelines:[549]

> An efficient 'pure-play' regulated gas network business operating within Australia without parental ownership, with a similar degree of risk as that which applies to the service provider in respect of the provision of reference services.

1307. The Authority considers that GGT's tax liabilities going forward should align with the tax liabilities of a benchmark efficient entity in accordance with rule 87A of the NGR. The Authority has considered whether a benchmark efficient entity would try to minimise its tax liability in the near term (using diminishing valued depreciation) or produce a relatively consistent tax depreciation amount (straight-line depreciation) over the tax life of the depreciable asset.

1308. The Authority previously considered in ATCO Gas Australia Pty Ltd's (**ATCO**) draft decision that a benchmark efficient entity would seek to minimise its tax liability in the near term, and therefore use the diminishing value depreciation method.[550] The Authority noted that if ATCO adopted a diminishing value tax depreciation method, then ATCO would be allowed higher tax depreciation expenses. This would lead to lower income tax payments in the near term. This outcome would be in line with the Authority's expectations for a benchmark efficient entity

1309. Jemena Gas Network, owner of the gas distribution network in New South Wales, also argued in its 2015-20 access arrangement proposal that a rational benchmark efficient entity could be expected to use the diminishing value method because it minimises near term tax liability.

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[548] ITAA 1997, s. 40-65.

[549] Energy Networks Association 2013, *Authority Consultation Paper – Rate of Return Guidelines, Attachment*, 28 February, 2013. p. 15.

[550] Economic Regulation Authority, *Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 14 October 2014. p. 249.

1310. In its response to the Authority's draft decision, ATCO rejected the Authority's required amendment to adopt the diminishing value method to calculate tax depreciation. ATCO did not accept the argument that the diminishing value method is the preferred method for the benchmark efficient entity. ATCO argued that although there is an incentive to maximise tax deductions where possible, it is not the only consideration that a benchmark efficient entity would need to consider. ATCO stated the following in its response:[551]

- application of diminishing value depreciation is not always consistent with tax minimisation and straight-line depreciation is also adopted by entities wishing to minimise tax;
- adoption of a straight-line depreciation methodology for the TAB is not solely motivated by price determination purposes;
- the use of a diminishing value approach for tax depreciation does not reduce the value of the tax asset to zero at the end of its effective life;
- ATCO has already adopted the straight-line method in determining its income tax liability;
- other independent regulators allow straight-line under the NGR;
- the Authority's recommendation is not in line with the national gas objective as the diminishing value method is likely to increase tax costs in future access periods;
- the benchmark efficient entity would not adopt a method where tax losses generated will not be taken into account when determining the gas price.

1311. The Authority notes that other regulators, namely the AER, allow service providers to adopt both straight line tax depreciation and diminishing value tax depreciation. For example, the AER has accepted Jemena Gas Networks proposal to use diminishing value tax depreciation in its next access arrangement period from 2015 to 2020. The AER has also accepted SP AusNet's proposal to use straight-line tax depreciation in its 2013 to 2017 access arrangement.

1312. Moreover, the Authority notes the following:

- Under rule 87A of the NGR, the taxable income of a benchmark efficient entity should be used rather than the actual tax returns of the service provider; and
- A benchmark efficient entity would seek to minimise its tax liabilities on a present value basis, which could be achieved by both straight-line and diminishing value tax depreciation.

1313. The Authority considers that a benchmark efficient entity could use either diminishing value depreciation or straight-line depreciation, based on its capital expenditure profile.

1314. The Authority accepts GGT's proposal to use straight-line tax depreciation.

[551] ATCO Gas Australia Pty Ltd, *Review of regulated tax asset base for regulated revenue purposes - addendum to the report of Vaughan Lindfield, Vaughan Linfield, Ernst & Young*, 21 November 2014.

Tax Asset Base

1315. GGT has established a TAB for the first time in its access arrangement proposal. GGT's rolled forward TAB of $63.170 million nominal dollars at 1 January 2015 includes an opening TAB of $398.276 million on 1 October 1996, in addition to $108.816 million of capital expenditure and $443.923 million of depreciation from the fourth quarter of 1996 to the last quarter of 2014.[552] GGT states that it has estimated the TAB based on the historical construction costs of the GGP that may be depreciated for tax purposes.

1316. BHPB's submission considers that an opening TAB of $168.36 million would be more reasonable. BHPB's calculation considers that:[553]

- GGT's TAB should be equal to its regulatory asset base;
- GGT's initial TAB should be depreciated from 2000 when the pipeline became regulated; and
- GGT's tax asset lives should be amended.

1317. BHPB submits that the starting TAB is always the cost of the assets; however, where assets are the subject of a subsequent transaction, then the owner may be able to reset the TAB at the acquisition price of the assets. BHPB submitted that for the Authority to determine the TAB for a benchmark entity, it must first decide what is reasonable to assume about the history of the relevant assets.

1318. The Authority's decisions to date align with the AER's methodology in determining a TAB in its "Transition of energy businesses from pre-tax to post-tax regulation" issues paper in June 2007.[554]

1319. The Authority agrees with the AER that the approach for determining the value of an opening TAB should;

- be done in light of the specific circumstances of each business;
- in principle, require a detailed examination of the companies' asset register; and
- where possible, the TAB should take into account the actual tax position of assets that constitute the RAB.

1320. The Authority has adopted the AER's proposed approach to setting the TAB by:

- taking the value of a firm's assets for tax purposes when it first became subject to tax;
- rolling these values forward to the date when a post-tax approach is to apply; and
- taking account of relevant tax depreciation rules, in addition to actual capital expenditure and disposals.

[552] Goldfield Gas Transmission Pty Ltd, *Tariff Model*, August 2014.

[553] BHP Billiton, *Response to ERA information request*, 2 February 2015.

[554] Australian Energy Regulator, *Transition of energy businesses from pre-tax to post-tax regulation*, June 2007.

1321. In general the Authority has calculated the value of the firm's assets for tax purposes by collecting the following information consistent with the AER's guidelines:[555]

- the date the business was first subject to tax;
- the tax value of assets at that date, in sufficient detail to distinguish RAB [regulatory asset base] assets from any non-RAB assets; and
- the vintage profile of the RAB assets when first subject to tax including any capital expenditure that took place prior to the commencement of regulation.

1322. This methodology was followed in the Western Power and ATCO decisions. In its final decision for the Western Power network the Authority choose to derive the opening TAB from the RAB rather than use Western Powers fixed asset registers as it contained capital contributions. [556] However, in its further final decision the Authority accepted Western Powers proposal to use its fixed asset registers as it removed the capital contributions. [557] In the ATCO decisions the Authority accepted ATCO's proposed opening TAB, which was based on its fixed asset register.[558] The Authority accepted that ATCO's opening TAB was depreciated from 30 June 2000, the date AlintaGas Networks (the former name of ATCO Gas Australia) was privatised. The Authority also accepted ATCO's proposal that for the purpose of calculating a regulated tax asset base, income tax consolidation adjustments which reset the tax bases of the regulated assets have been disregarded.

1323. The Authority understands that as GGT is a joint venture it does not have a fixed asset register. Therefore, the Authority has assessed GGT's opening TAB by taking into account the tax position of assets that constitute GGT's RAB.

1324. The Authority notes that GGT's proposed TAB value at 1 January 2000 does not match its opening RAB value. The Authority considers that this is due to the following:

- GGT's opening RAB value was a 'current cost' value while its opening TAB is a 'historic cost' value.
- GGT's proposed opening TAB only includes 'construction costs' whereas it's opening RAB cost includes capital recovery costs and non-depreciable assets.
- GGT proposes to start depreciating its TAB from 1 October 1996 when the pipeline started operating. GGT's RAB is depreciated from 1 January 2000 when the pipeline was first regulated.

1325. The Authority notes that GGT has proposed a 'historic cost' value of its TAB of $458.98 million in nominal dollars as at 1 January 2000. [559] GGT's opening RAB value on 1 January 2000 was a 'current cost' value of $513.651 million, in real dollars, 31 December 1999.[560]

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[555] Australian Energy Regulator, *Transition of energy businesses from pre-tax to post-tax regulation*, June 2007, p. 63.

[556] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network*, 5 September, 2012. p. 269.

[557] Economic Regulation Authority, *Further Final Decision on Proposed Revisions to the Access Arrangement for the Western Power Network*, 29 November 2012.

[558] ATCO Gas Australia Pty Ltd, *Draft Decision on proposed revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 14 October 2014, pp. 238-253.

[559] Goldfield Gas Transmission Pty Ltd, *Tariff Model*, August 2014.

[560] Goldfield Gas Transmission Pty Ltd, *Tariff Model*, August 2014.

1326. As noted above, GGT submits that its TAB value consists of the construction costs of the pipeline. GGT considers that these construction costs, and subsequent additions to them, are the amounts from which depreciation must be calculated for the purpose of estimating taxable income. GGT considers that unlike the costs of other assets which became subject to economic regulation in the late 1990s, the costs of constructing the GGP are known. GGT considers that in accordance with the AER's guidelines, judgement of the costs and effective lives for determining the decline in value of depreciating assets for the GGP is not required as the key components of taxable income are known. Further, GGT considers that there is no legal basis in the NGL(WA) and NGR to adjust the tax asset values, to take account of any benefits which may have been available to a service provider under the prior pre-tax framework.

1327. GGT has assumed that a benchmark efficient entity constructed the GGP, and has continuously operated the pipeline since initial construction and is the only entity which has owned the pipeline. GGT considers that Australian taxation law requirements and regulatory precedent have guided its estimation of the cost of corporate income tax and any estimate other than the costs of constructing the assets would not represent the best estimate possible in the circumstances under rule 74(2) of the NGR.

1328. GGT submitted that the initial capital base of its RAB is a regulatory construct, and is not relevant to the calculation of depreciation for the purpose of estimating taxable income.[561] GGT state that the initial capital base of the GGP was established in 2005, after the Authority gave consideration to the factors of section 8.10 of the Code.[562]

1329. The Authority considers that GGT is correct not to index the TAB for inflation. The Authority also considers that the opening TAB will not be the same as the opening RAB as the methodology for determining the TAB is not the same as the methodology used by the Authority to determine the opening RAB in 2005.

1330. The Authority notes that in making its determination on the opening RAB for the GGP, the Authority gave consideration to the range of factors required to be considered under section 8.10 of the Code, including:[563]

- a 'Depreciated Actual Cost" (**DAC**);
- a range of reasonable estimates of a Depreciated Optimised Replacement Cost ("**DORC**"); and
- a value determined under sections 8.10(f) and 8.10(g) of the Code, taking into account the economic depreciation of the pipeline in the context of the regime under which third-party tariffs were set prior to the commencement of the Code.

1331. The Authority accepts GGT's proposal that the opening TAB should only include construction costs and amounts for capital recovery and non-depreciable assets included in the opening RAB should not be included in the TAB as they are not depreciable for tax purposes. The Authority has assessed GGT's proposed construction costs and considers that they are consistent with the construction costs used in determining the opening RAB. Further the Authority accepts GGT's

[561] Goldfields Gas Transmission Pty Ltd, *Response to ERA 09*, 10 February 2015, p 1.

[562] National third party access code for natural gas pipeline systems – regulation 8.10

[563] Economic Regulation Authority, *Further Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline*, 14 July 2005, p. 11.

proposal to not reset the construction costs and considers that the ownership structure of a benchmark efficient entity should not affect the calculation of corporate income tax under rule 87A of the NGR.

1332. The Authority notes that GGT considers that 1 October 1996 is an appropriate start time for calculation of the decline in asset value as it is the date gas was first delivered into the pipeline.

1333. GGT consider that choosing a different start time than 1 October 1996 when the pipeline went into operation would be arbitrary, and would lead to depreciation and estimates of taxable income which were inconsistent with those required by Australian taxation law and not represent the best estimate possible in the circumstances under rule 74(2) of the NGR.

1334. BHPB submits that a more reasonable benchmark assumption would be that the GGP assets were either constructed or transacted at the time that the GGP became regulated in 2000. BHPB considered that the date of commencement of regulation was important because it was at that date that the "investment value" of the GGP assets (i.e. the initial capital base) was determined for regulatory purposes. The initial RAB was set substantially in excess of the depreciated historical cost of the assets at that time. According to BHPB, it would be reasonable to assume that the TAB was also reset to the deemed investment value at that date.

1335. The Authority considers that in accordance with the AER's guidance in paragraph 1321 the opening TAB should take the value of a firm's assets for tax purposes when it first became subject to tax, or in GGT's case when it would have been subject to tax. The Authority considers that for GGT this was when the pipeline came into operation on 1 October 1996. This decision is consistent with the Authority's decision on ATCO.

1336. BHPB considers that GGT has been compensated for taxation using a pre-tax WACC until this point in time, which is equivalent to assuming that tax depreciation has been equal to regulatory depreciation over the period since 2000. BHPB also considers that GGT enjoys a time value benefit from being able to depreciate assets more quickly for tax than had been assumed in the pre-tax WACC, but this would avoid tax depreciation deductions that had not been applied to date for regulatory purposes being assumed to merely vanish. BHPB urges the Authority to develop a tax asset base which would contribute to the achievement of the NGO.

1337. The Authority recognises that GGT has been compensated for taxation using the pre-tax WACC methodology. However, in line with the Authority's previous decision for Western Power, the Authority does not intend to make any adjustment upon transition to a post-tax approach for any additional allowance that may have been received as a result of previous regulatory decisions.[564] The Authority considers that this approach is consistent with guidance from the AER.[565]

1338. The Authority considers that GGT has included capital expenditure in the TAB on an incurred basis rather than on a commissioned basis.[566] The Authority notes that the ATO practice is that assets may only be included in the tax asset register on an

[564] Economic Regulation Authority, *Further Final decision on proposed revisions to the Access Arrangement for the Western Power Network*, 29 November 2012, pp. 38-39.

[565] Australian Energy Regulator, *Transition of energy businesses from pre-tax to post-tax regulation*, June 2007.

[566] Goldfield Gas Transmission Pty Ltd, *Tariff Model*, August 2014.

"as commissioned" basis. As a result, the Authority considers that the rolled forward TAB should include commissioned assets only. Given this the Authority considers that all capital expenditure in the TAB should be brought forward to the end of the calendar year. The Authority starts depreciating the capital expenditure the year after the capital expenditure was commissioned. This approach is consistent with the approach taken by the Authority in the ATCO final decision.

Tax Asset Lives

1339. GGT has used tax asset lives determined by both the Commissioner of Taxation, and in accordance with section. 40.105 of the *Income Tax Assessment Act (ITAA) 1997* as required by section 40.95 of the ITAA 1997.[567] GGT's TAB depreciates faster than the RAB, as tax asset lives are generally shorter than regulatory asset lives.

1340. Table 70 lists GGT's proposed tax asset lives for the TAB and the RAB by asset class, and compares them to the tax asset lives allowable under ITAA 1997 and prescribed in the Australian Tax Office Ruling TR2014/4.[568]

Table 70 GGT Proposed Tax and Economic Asset Lives and ATO Tax Asset Lives

Asset Category	GGT Proposed Asset Life for TAB	Asset Life as per ATO Ruling or ITAA1997[569]	GGT Proposed Asset Life for RAB
Pipeline and laterals	20	20	70
Main line valve and scraper stations	20	20	50
Compressor stations	20	20	30
Receipt and delivery point facilities	20	20	30
SCADA and communications	10	10	15
Cathodic protection	10	10	15
Maintenance bases and depots	20	20	50
Other depreciable assets	10	10	10

Source: GGT Tariff Model, Australian Taxation Office, Ruling 2014/4. Income Tax Assessment Act 1997 – Section 40.102.

1341. The Authority has reviewed GGT's proposed tax asset lives. The Authority considers that GGT's assumptions for its proposed tax asset lives are justified by current tax legislation and tax rulings.[570] As a result, the Authority accepts GGT's proposed tax asset lives.

[567] Goldfields Gas Transmission Pty Ltd, *Response to ERA 10*, 10 February 2015, p. 1.

[568] ITAA 1997, s. 40.102(5).

[569] Australian Taxation Office, Taxation Ruling TR 2014/4, 1 July 2014, and Income Tax Assessment Act 1997, Section 40.102.

[570] A capped effective life of 20 years is available for applicable assets in subsection 40-102(5).

The Cost of Debt Financing

1342. GGT has proposed $90.889 million for the cost of debt financing for the third access arrangement period. GGT has calculated the cost of debt by multiplying the debt portion, assumed at 60 per cent consistent with the assumption for the calculation of the rate of return, of its opening RAB each year by the nominal cost of debt (cost of debt risk margin plus nominal risk free rate).

1343. The Authority has amended GGT's proposed cost of debt financing to reflect its revised decision on the opening RAB for each year of the third access arrangement period as noted in the Projected Capital Base chapter of this Draft Decision, and the revised cost of debt risk margin and nominal risk free rate as noted in the Rate of Return chapter of this Draft Decision.[571] The Authority accepts GGT's proposed debt to equity ratio of 60 per cent as it is consistent with assumptions in the Rate of Return Guidelines.

1344. The Authority notes that GGT has used a capital base value which is the written down value using the historic cost depreciation method, for the purposes of determining the cost of debt financing used as the interest shield in the tax calculations. The broad effect of this approach is to reduce the RAB and the corresponding cost of debt financing, reduce the interest tax shield, increase taxable profit, and thus increase the tax cash flow that is recompensed in the building block model.

1345. This depreciation method is not consistent with the CCA depreciation approach used to determine the RAB for other purposes in the building block approach, as discussed in the Depreciation chapter of this Draft Decision. In particular, this debt shield approach is not consistent with the RAB used for the purposes of determining the revenue, through the application of the WACC or the allowance for deprecation. The latter calculation correctly uses the CCA depreciation method for determining the RAB.

1346. The Authority considers that the two approaches should be consistent, otherwise the taxation cash flows will not be correct or consistent with the approach used to determine revenue.

1347. The Authority requires that GGT use the RAB derived using the CCA depreciation method for determining the cost of debt financing used in the taxation calculations. The Authority requires GGT to amend its cost of debt financing to $61.055 million for the third access arrangement period.[572]

Operating Expenditure

1348. GGT proposed $132.019 million for forecast operating expenditure for the third access arrangement period as stated in Table 3. GGT proposed to use its forecast operating expenditure for each year of the period for the calculation of estimated taxable income.

1349. The Authority has decided to accept $112.204 million for operating expenditure for the third access arrangement period as stated in Table 4. As a result, the Authority

[571] See Table 39 for the Authority's approved RAB and Table 65 for the Authority's approved cost of debt risk margin and nominal risk free rate.

[572] Nominal dollars

has used its accepted operating expenditure for each year of the period for the calculation of GGT's estimated taxable income.[573]

Statutory corporate income tax rate

1350. GGT proposed to apply the current statutory corporate tax rate of 30 per cent to the annual estimates of taxable income net of any loss which has been brought forward to calculate the cost of tax.

1351. The Authority accepts GGT's proposed corporate tax rate of 30 per cent given that it is the current statutory company tax rate applied by the Australian Government and there is no current legislated change to the company tax rate.

Value of Imputation Credits (Gamma)

1352. GGT has proposed a value of 0.25 for gamma. Under the Australian imputation tax system, a franking credit is distributed to investors at the time dividends are paid, providing a potential offset to those investors' taxation liabilities. Gamma is the parameter that takes into account the value generated by the distribution of franking credits to investors. As part of the post-tax nominal framework, the value of gamma must be applied to calculate the net income tax allowance for the third access arrangement period.

1353. The Authority has assessed GGT proposed value of gamma in the Gamma Chapter of this Draft Decision and has decided that the value of gamma should be 0.4. As a result, GGT's estimated cost of corporate income tax has been determined net of the value of imputation credits based on a value of 0.4 of the annual estimated cost of taxable income.

Required Amendments

1354. The Authority considers that the revenue component in GGT's taxable income calculation should be based on the smoothed tariff revenue rather than the building block revenue.[574]

1355. The Authority has calculated taxable income as assessable income less tax deductible costs that are recognised by the ATO, as follows:

- Smoothed tariff revenue.
- *minus* Approved forecast operating expenditure.
- *minus* Depreciation of the TAB.
- *minus* Debt servicing costs,
- *equals* Estimated taxable income.

1356. The Authority requires that GGT update the rolled forward TAB to ensure that the TAB includes commissioned assets only. The Authority requires GGT to amend its cost of debt financing to $61.055 million and operating expenditure to $121.983 million for the third access arrangement period. The Authority has decided that the value of gamma should be 0.4.

[573] Nominal dollars

[574] Authority notes that AER bases taxable income on the net cost of service.

1357. Table 71 breaks down the calculation of the Authority approved estimated cost of taxable income. The Authority has updated GGT's estimated cost of taxable income tax based on the considerations discussed above.

Table 71 Authority Approved Calculation of Estimated Cost of Corporate Income Tax (AA3)

Nominal $ million	2015	2016	2017	2018	2019	Total
Revenue						
Tariff Revenue (smoothed)	70.747	59.166	40.197	40.197	40.197	250.503
Expenses						
Operating Expenditure	(21.848)	(21.816)	(22.405)	(22.589)	(23.546)	(112.204)
Debt Servicing Costs	(12.166)	(12.317)	(12.303)	(12.200)	(12.073)	(61.057)
Tax Depreciation	(25.081)	(25.317)	(4.717)	(3.148)	(2.958)	(61.221)
Taxable Income	11.653	-	0.488	2.260	1.621	16.021
Estimated Cost of Taxable Income (30 per cent of taxable income)	**3.496**	**-**	**0.146**	**0.678**	**0.486**	**4.806**

Source: ERA, GGP Tariff Model, December 2015.

1358. Table 72 shows the Authority's estimated cost of corporate income tax for the third access arrangement period.

Table 72 Authority Approved Estimated Cost of Corporate Income Tax (AA3)

Nominal $ million	2015	2016	2017	2018	2019	Total
Estimated Cost of Taxable Income	3.496	-	0.146	0.678	0.486	4.806
Value of Imputation Credits	(1.398)	-	(0.059)	(0.271)	(0.194)	(1.923)
Authority Approved Estimated Cost of Corporate Income Tax Net of Imputation Credits	**2.098**	**-**	**0.088**	**0.407**	**0.292**	**2.884**

Source: ERA, GGP Tariff Model, December 2015.

1359. Table 73 lists the Authority's estimated closing tax asset base by year over the third access arrangement period which was used to calculate tax depreciation.

Table 73 Authority Approved Estimated Closing Tax Asset Base (AA3)

$ million nominal	2015	2016	2017	2018	2019
Opening Tax Asset Base	69.474	49.237	27.259	23.271	20.362
Authority Forecast Capital Expenditure	4.844	3.340	0.729	0.239	0.409
Authority Forecast Tax Depreciation	(25.081)	(25.317)	(4.717)	(3.148)	(2.958)
Authority Approved Estimated Closing Tax Asset Base	**49.237**	**27.259**	**23.271**	**20.362**	**17.813**

Source: ERA, GGP Tariff Model, December 2015.

1360. The Authority has assessed GGT's proposed allocation of costs across the covered and uncovered pipeline in the Total Revenue between Reference Services and

Other Services chapter. As a result of this assessment, the Authority has made further reductions to GGT's proposed forecast Estimated Cost of Corporate Income Tax.

Required Amendment 12

The Authority requires GGT to update the calculation of the estimated cost of corporate income tax (net of imputation credits) as per Table 72.

The Authority requires that GGT:

- Base its taxable income calculation on the smoothed tariff revenue rather than on the building block revenue
- Update the rolled forward TAB to ensure that it includes commissioned assets only.
- Update its cost of debt financing to $61.055 million, operating expenditure to $112.204 and the value of gamma to 0.4.

Allocation of Total Revenue between Reference Services and Other Services

Regulatory requirements

1361. The allocation of the total revenue to reference services and other services for the purpose of reference tariff determination and, ultimately, for cost recovery, is governed by rule 93 of the NGR.

> 93. Allocation of total revenue and costs:
>
> (1) Total revenue is to be allocated between reference and other services in the ratio in which costs are allocated between reference and other services.
>
> (2) Costs are to be allocated between reference and other services as follows:
>
> (a) costs directly attributable to reference services are to be allocated to those services; and
>
> (b) costs directly attributable to pipeline services that are not reference services are to be allocated to those services; and
>
> (c) other costs are to be allocated between reference and other services on a basis (which must be consistent with the revenue and pricing principles) determined or approved by the AER [Authority].

1362. The National Gas Objective (**NGO**) in section 23 of the NGL(WA); the Revenue Pricing Principles 2 (**RPP2**) and 3 (**RPP3**) in section 24 of the NGL(WA) are also relevant.

> 23 National gas objective
>
> The objective of this Law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

24 Revenue and pricing principles

(2) A service provider should be provided with a reasonable opportunity to recover at least the efficient costs the service provider incurs in—

(a) providing reference services; and

(b) complying with a regulatory obligation or requirement or making a regulatory payment. (**RPP(2)**)

(3) A service provider should be provided with effective incentives in order to promote economic efficiency with respect to reference services the service provider provides. The economic efficiency that should be promoted includes—

(a) efficient investment in, or in connection with, a pipeline with which the service provider provides reference services; and

(b) the efficient provision of pipeline services; and

(c) the efficient use of the pipeline. (**RPP(3)**)

GGT's Proposed Revisions

1363. GGT has proposed to continue with the approach used to allocate total revenue to reference services approved by the Authority for AA2 in order to comply with section 8.38 of the Gas Code. This approach calculates total revenue as the sum of all costs associated with the services that are provided by covered assets, excluding incremental capital and operating costs associated with the services that are provided by uncovered assets.

1364. Specifically, GGT has proposed that total revenue is the total of the costs of offering to provide, and providing, the reference service, the negotiated services and services to the joint venturers using the Covered Pipeline[575] excluding:

- the capital costs of those parts of the pipeline system (a second compressor at Paraburdoo, in 2006, and compressors installed at Wyloo West and Ned's Creek in 2009) which are uncovered;
- the capital costs of the recent expansion for Rio Tinto Iron Ore and for BHP Billiton Iron Ore, pipeline expansion which GGT has elected be uncovered and in respect of which the ERA gave its consent to GGT's election on 30 May 2014; and
- the costs of operating and maintaining those parts of the GGP which are uncovered, and the costs of operating and maintaining the expansion for Rio Tinto Iron Ore and BHP Billiton Iron Ore.[576]

1365. GGT has therefore submitted that the total revenue for the Covered Pipeline should be the total of:

- the return on the projected capital base of the covered pipeline;
- depreciation of the assets comprising the covered pipeline;
- the cost of corporate income tax estimated using the forecast revenue from the provision of the reference service, negotiated services and services to the GGTJV participants using the Covered Pipeline; and

[575] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information,* 15 August 2014, p. 25.

[576] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information*, 15 August 2014, p. 25.

- the forecast costs of operating the covered pipeline.[577]

1366. GGT has submitted that its proposed approach for allocating total revenue for the purposes of determining reference tariffs, and ultimately cost recovery, is supported by:

- provisions in the NGR and the NGL(WA), which determine that an access arrangement is only for the covered pipeline; and
- the NGO and RPP, which focus on the achievement of outcomes that are allocatively efficient.

1367. The following sub-sections summarise the basis of GGT's support for a cost allocation methodology which requires that the covered services of the GGP bear all of the costs associated with covered assets even when those assets are also utilised to deliver other services provided by the GGP, including uncovered services.

Permissible under the NGL and NGR

1368. According to GGT, the NGL(WA) and the NGR retain the same distinction between covered and uncovered assets that applied under the Gas Code.[578] In particular, GGT has argued that the economic regulatory regime under the NGL(WA) and NGR applies only to services provided by covered assets, even though the NGR, in contrast to the Gas Code, does not contain a legal definition of 'pipeline services' that explicitly restricts consideration of services to only those provided by the covered assets.[579]

1369. As evidence that uncovered assets are irrelevant to the determination of total revenue, and hence cost recovery through the reference tariff determined for covered services, GGT has referred to the following provisions in the NGL(WA) or the NGR, which GGT has suggested are reinforcing if read in conjunction:

- Section 132 of the NGL(WA), which requires *a covered pipeline service* provider to submit a full access arrangement in respect of the services which that service provider provides or intends to provide in the circumstances specified by the rules.
- Section 2 of the NGL(WA), which defines:
  - covered pipeline service provider to mean a service provider that provides or intends to *provide pipeline services by means of a covered pipeline*; and
  - the AER [Authority] economic regulatory function or power to relate to the economic regulation of *pipeline services provided by means of, or in connection with, a scheme pipeline*.
- Rule 46 of the NGR, which requires the service provider must submit for the AER's approval an access arrangement *for the covered pipeline*.

[577] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information,* 15 August 2014, p. 25.

[578] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information*, 15 August 2014, p. 24.

[579] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information*, 15 August 2014, p. 25.

- Rule 48(1)(a) of the NGR, which requires *a full access arrangement to identify the pipeline to which the access arrangement relates (and this must be, on the basis of Section 46 of the NGR, the covered pipeline)*.
- Rule 48(1)(b) of the NGR, which requires *a full access arrangement* to describe the pipeline services that the service provider proposes to offer to provide by means of the pipeline (*and this must be, on the basis of Section 46 of the NGR, by means of the covered pipeline***)**.
- Rule 53(1) of the NGR, which provides for the AER to direct the service provider to submit *separate access arrangement proposals for different parts of the covered pipeline*.
- Rule 53(2) of the NGR, which provides for the AER to direct the services provider to submit *a consolidated access arrangement proposal for all the relevant covered pipelines*, if services are provided by two or more covered pipelines.
- Rule 70 of the NGR, which indicates that Part 9 of the *NGR Price and Revenue Regulations only applies in respect of a full access arrangement* (or access arrangement proposal) (*and this must be, on the basis of Section 46 of the NGR, for the covered pipeline***)**.[580]

1370. Furthermore, GGT has suggested that these provisions in the NGL and NGR are sufficient to demonstrate that rule 93 of the NGR provides only ~~a~~ methodology for allocating total revenue between 'reference services' and 'other services' that are covered by the access arrangement[581]

Consistent with the NGO and RPP and efficiency requirement

1371. GGT has submitted that its approach to the allocation of total revenue is consistent with the NGO and RPP, as required under section 100 of the NGR, which states:

> 100 General requirement for consistency
>
> The provisions of an access arrangement must be consistent with:
>
> (a) the national gas objective; and
>
> (b) these rules and the Procedures as in force when the terms and conditions of the access arrangement are determined or revised.

1372. In particular, GGT has asserted that its total revenue allocation proposal will promote economic efficiency because it:

- ensures that GGT has a reasonable opportunity to recover the efficient costs that are incurred in the provision of reference services on the covered pipeline; and
- provides GGT with the flexibility to charge prices for services on uncovered capacity that reflect marginal costs.[582]

[580] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information*, 15 August 2014, p. 24.

[581] As inferred, Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information*, 15 August 2014, p. 25.

[582] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information*, 15 August 2014, pp. 26-28.

1373. In support of this position, GGT has submitted the opinion of HoustonKemp Economists (**HoustenKemp**)[583] and Competition Economists Group (**CEG**). [584]

Support from HoustonKemp Economists

1374. In a report provided to the Authority by GGT, HoustonKemp has expressed its opinion that:

> … the NGRs are silent on how revenue should be allocated as between services provided by covered as distinct from uncovered pipelines.[585]

1375. With respect to the appropriate total revenue allocation for AA3, HoustonKemp has focussed on the consistency of GGT's proposal with the NGO and the RPP. In particular, HoustonKemp has suggested that the NGO and RPP have a unifying theme to promote investment outcomes that are, in particular, allocatively efficient, which it describes as achieved when:

> … the optimal set of goods and services is both produced and allocated so as to provide the maximum benefit to society.[586]

1376. HoustonKemp has submitted that GGT's total revenue allocation proposal does promote allocative efficiency because it ensures that the resulting reference tariff for the covered pipeline would, at its lower bound, provide sufficient revenue to recover the costs of providing reference services and would not, at its upper bound, exceed the efficient, standalone costs of providing those services.[587]

1377. HoustonKemp has argued that an alternative cost allocation methodology that results in tariffs outside of these upper and lower bounds would raise the potential for inefficient investment. Specifically, Houston Kemp has stated:

- if revenue from reference tariffs is insufficient to recover all costs caused by the provision and use of the relevant service, then future expansions in capacity will not occur even if users are willing to pay more than all the costs associated with expanding of pipeline capacity; whereas
- alternatively, if reference tariffs exceed the level at which existing users could procure the same service from an alternative provider but at a lower total cost, then this risks an inefficient outcome since alternative pipeline capacity may be developed that would have as its sole function the bypassing or drawing of users always from the existing capacity.[588]

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[583] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, HoustonKemp Methodology for Allocating Goldfields Gas Pipeline Costs*, 15 August 2014.

[584] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 3, CEG Competition Economists Group Cost Allocation for the Goldfields Gas Pipeline*, 15 August 2014.

[585] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, HoustonKemp Methodology for Allocating Goldfields Gas Pipeline Costs*, 15 August 2014, p. 4.

[586] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, HoustonKemp Methodology for Allocating Goldfields Gas Pipeline Costs*, 15 August 2014, p. 8.

[587] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, HoustonKemp Methodology for Allocating Goldfields Gas Pipeline Costs*, 15 August 2014, p. 6.

[588] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, HoustonKemp Methodology for Allocating Goldfields Gas Pipeline Costs*, 15 August 2014, p. 6.

1378. As a result, HoustonKemp has suggested that, compared to GGT's total revenue allocation methodology proposal, there is:

- no alternative cost allocation methodology that would result in a greater level of use and/or value to users of GGP's covered pipeline capacity; and
- no configuration of pipeline capacity that would result in a greater level of total value to users and producers.[589]

Support from Competition Economists Group

1379. CEG has noted that the appropriate total revenue allocation for covered services provided by the GGP was a significant consideration in the Authority's Draft and Final Decisions for AA2. Specifically, on the basis of its examination of the evidence, CEG has suggested that the Authority's Final Decision for AA2 'turned' on the specific definition of the 'Covered Pipeline' contained in section 10.8 of the Gas Code that precluded an allocation of joint costs to uncovered services. CEG has also noted that the Authority's Final Decision for AA2 was upheld by the Electricity Review Board (**ERB**) on appeal.[590]

1380. With respect to GGT's total revenue allocation proposal for AA3, CEG has focussed on the additional requirement under the NGL that the proposal must be consistent with the NGO and, hence, with investment outcomes that promote economic efficiency. On this basis, CEG has concluded that GGT's total revenue allocation is consistent with the NGO and the RPP (and, in particular, RPP(3)).[591]

1381. In particular, CEG has noted that a basic premise for economic efficiency is that users of services are charged a price for services that reflects the marginal cost of providing those services. Hence, CEG has argued that GGT's proposed total revenue allocation promotes economic efficiency because it provides GGT with the flexibility to set prices for uncovered services that will reflect only the long run marginal cost of services provided by uncovered expansions. As noted by GGT:

> If buyers are charged more than the true marginal cost for a particular service, they may be inefficiently deterred from consuming it (or consume a less than optimal quantity). This can therefore distort consumption decisions and, potentially, the incentives that businesses have to invest in additional capacity.

1382. According to CEG, the ability to provide users with uncovered expansions at incremental cost will promote the efficient use of, and investment in, the GGP since it:

- ensures that GGT's willingness to supply new uncovered services is not distorted by previously incurred sunk common costs;
- enables GGT to signal the marginal costs of the new investment to the prospective users;

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589 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, HoustonKemp Methodology for Allocating Goldfields Gas Pipeline Costs*, 15 August 2014, p. 6.

590 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, CEG Competition Economists Group Cost Allocation for the Goldfields Gas Pipeline*, 15 August 2014, p. 4.

591 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, CEG Competition Economists Group Cost Allocation for the Goldfields Gas Pipeline*, 15 August 2014, pp. 14-15.

- ensures that investments will not be abandoned simply because of the inclusion of a share of non-marginal sunk common costs; and
- avoids the situation in which customers inefficiently reduce their use of the pipeline because of the inclusion of non-marginal sunk costs.[592]

1383. CEG has argued that an alternative total revenue allocation that requires GGT to allocate a share of existing sunk costs to new users of uncovered services would artificially increase the price for uncovered services and could, conceivably, prevent mutually efficient investment from proceeding, thereby reducing the efficiency of the GGP. Specifically, CEG has concluded that:

> In contrast, allocating a share of the costs of the existing covered pipeline — costs which are not marginal — to uncovered expansions may not achieve any of these goals … it may distort investments in uncovered capacity and in the downstream markets that the infrastructure is used to serve. Specifically, investments may be cancelled, delayed or inefficiently scaled. This would not promote the efficient operation of the pipeline and would not be in the long term interest of consumers.[593]

1384. In relation to GGT's proposed total revenue allocation, CEG has noted:

> … when new customers have been added to the pipeline — most notably by way of uncovered expansions — the existing customers procuring covered services have not been attributed a reduced portion of the pipeline costs that are shared with those new customers. The existing customers continued to be allocated 100 per cent of the costs of the pipeline itself — even though the new customers are using it.[594]

1385. In this context, CEG has argued that GGT's proposed total revenue allocation embodies an efficient allocation of rights to the initial and future capacity of the GGP. That is, as explained by CEG, the value that a prospective owner places on its right to undertake an uncovered expansion will have consequences for the prices that are charged to users of initial capacity. In particular, if the future cost of serving new users incorporates an implicit payment to initial customers in the form of lower prices that requires higher prices for new users, then this could deter otherwise profitable business opportunities. As a result, CEG argues that it is efficient for users of initial capacity to pay a higher price.

1386. Hence, CEG has argued:

> When the investment in a pipeline is being contemplated, there will be a complex set of negotiations between customers and owners in relation to payment responsibilities, initial capacity rights, and rights to future capacity. There is an infinite variety of forms that these rights could take. However … the most efficient allocation or [sic] rights insofar as future uncovered expansions is concerned is that in which:
>
> - The pipeline owner receives the right to a cost allocation rule that allows it the flexibility to charge new users of uncovered expansions the marginal cost of those expansion, i.e., not including sunk common costs; and

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592 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, CEG Competition Economists Group Cost Allocation for the Goldfields Gas Pipeline*, 15 August 2014, p. 14.

593 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, CEG Competition Economists Group Cost Allocation for the Goldfields Gas Pipeline*, 15 August 2014, p. 14.

594 Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, CEG Competition Economists Group Cost Allocation for the Goldfields Gas Pipeline*, 15 August 2014, p. 4.

- The customers on foundation contracts forgo future lower prices as the pipeline is expanded to accommodate new users through initial prices that are lower than would otherwise have been the case.[595]

Submissions

1387. During the consultation period for the Draft Decision on AA3, the Authority received a submission from BHPB (**BHPB's initial submission**) that proposed an alternative to GGT's proposed allocation of total revenue. In response issues raised by this alternative approach, the Authority also received and considered late submissions received from GGT (**GGT's responding submission**) and from BHPB (**BHPB's further submission**).

1388. The following sub-sections provide more detail on BHPB's alternative approach to total revenue allocation, as well as relevant matters raised in GGT's responding submission and BHPB's further submission.

BHPB's alternative total revenue allocation

1389. In its initial submission, BHBP has proposed an alternative to GGT's proposed total revenue allocation which:

- calculates total revenue as the costs of covered and uncovered services provided by the GGP in its entirety; and
- under rule 93 of the NGR, allocates total revenue between covered services and uncovered services on the basis of
  - the costs that are directly attributable to those services; and
  - an even share of the 'other costs' that are incurred jointly by covered and uncovered services determined according to relative usage.[596]

1390. BHPB has submitted that there are important differences between the Gas Code and the NGL and NGR that 'compel' a different approach to the total revenue allocation for AA3 than was determined by the ERA for AA2.[597] According to BHPB, these are:

- the broader definition of 'pipeline service' contained in the NGL, which has removed a critical restriction on the Authority's determination for AA2; and
- the introduction of the NGO and RPP, which must govern the ERA's interpretation of the NGL and the NGR for AA3.[598]

1391. BHPB has submitted that the cost allocation methodology adopted under rule 93 of the NGR should ensure that users are treated fairly. Specifically, BHPB has suggested that:

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[595] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal; Supporting Information: Attachment 2, CEG Competition Economists Group Cost Allocation for the Goldfields Gas Pipeline*, 15 August 2014, pp. 12-13.

[596] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, pp. 3-5.

[597] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 4.

[598] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, pp. 4-5.

> A fair allocation of costs should allocate costs incurred jointly in providing both covered and uncovered services so as to avoid one group of users unfairly subsidising another group of users.[599]

1392. BHPB has provided the opinion of Incenta Economic Consulting (**Incenta**) in support of its alternative total revenue allocation on the basis that it is:

- supported by economic principles; and
- consistent with the NGO and RPP.

1393. Further, BHPB has submitted that an allocation of joint costs across covered and uncovered services is consistent with regulatory practice in other Australian jurisdictions and in New Zealand.

Permissible under the NGL and NGR

1394. In its initial submission, BHPB has revisited the Authority's Decisions for AA2 to examine both the economic and legal basis for these decisions. The relevant sections of BHPB's account are provided at Box 1.

1395. BHPB has noted that, whereas the Gas Code clearly defined 'Services', the NGL(WA) does not include a specific definition of 'Services' and only defines 'Pipeline Service' as 'a service provided by means of a pipeline'. BHPB has submitted that the omission of the word 'covered' from the definition of Pipeline Services in the NGL(WA), and its absence in rule 93 of the NGR, is significant for the Authority's determination in AA3.[600] BHPB has stated:

> … the qualification which was critical to the previous decisions by the ERA and ERB has been removed (i.e. pipeline services are not limited to the services provided by a 'covered' pipeline).[601]

Box 1: BHPB's revisits the total revenue allocation determined for AA2

In its initial submission, BHPB has summarised the Authority's Draft and Final Decisions for AA2, and the subsequent review of the Authority's Final Decisions by the ERB. As stated by BHPB:

> [In its Draft Decision for AA2], the ERA formed the view that, where costs were incurred in providing both reference and non-reference services, all of those costs should be incorporated into the total revenue, with no regard to the actual contracts in place … Otherwise a disproportionate share of costs would be recovered from users of the reference services (who would effectively be subsidising the users of the unregulated capacity expansions) …
>
> … However the ERA moved away from this position in its Final Decision … The ERA took a narrow interpretation of the relevant words in the Gas Code. The Gas Code provided that total revenue should be allocated as 'attributable to providing the Reference Services jointly with other Services'. … The ERA came to the view that the definition [in the Gas Code] of 'Services' (which specially used the word 'covered') was

[599] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 3.

[600] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 4.

[601] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 4.

> limited to services provided by means of a 'covered pipeline', and that the approach in the Draft Decision was not supported by the wording of the Gas Code.
>
> … The ERB again focused on the precise words of the definition of Services. The ERB concluded that, because of the use of the word 'covered in the definition of services, the relevant non reference services were not appropriately considered services provided by a 'covered pipeline' even if they shared common infrastructure with reference services.
>
> *Source:* BHPB Billiton, Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement, 27 November 2014, pp. 3-4.

1396. In particular, BHPB has argued that the removal of the word 'covered' from the definition of 'Pipeline Services' in the NGL(WA) requires a calculation of total revenue that includes the direct and joint costs of all services provided by GGP in its entirety, and not just covered services.. In this context, BHPB has stated:

> This conclusion is reinforced by the fact that the term 'covered' is used in a number of other places in the NGL/NGR, suggesting that the omission from this particular definition was intentional.[602]

1397. Based on this total revenue calculation, BHPB has suggested that the cost allocation methodology under rule 93(2)(c) of the NGR should allocate the joint costs included in the total revenue calculation between covered services and uncovered services according to their use.[603]

GGT's responding submission

1398. In its responding submission, GGT has suggested that, while substantially amending the regulatory framework, there is no compelling difference in the NGL or NGR to suggest that the total revenue calculation in the NGL(WA) or NGR is any different than under the Gas Code.[604] Hence, GGT has argued that:

> There is nothing in those amendments that would now permit total revenue to be calculated on a basis that incorporates the costs associated with the covered and uncovered capacity of the GGP, or for total revenue to be allocated as between services provided by the covered and uncovered capacity of the GGP.[605]

1399. In addition to provisions in the NGL outlined previously in the Supporting Information contained in the GGP Access Arrangement Revision Proposal and summarised at paragraph 1071, GGT's responding submission has suggested this position is supported by:

[602] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 4.

[603] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 2.

[604] Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, p. 2.

[605] Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, p. 2.

- explanatory materials relating to the introduction of the NGL;[606]
  - The relevance of these materials, as identified by GGT, is outlined in more detail at Box 1.
- section 18 of the NGL, which provides that an extension to, or expansion in, the capacity of the covered pipeline will not be treated as forming part of the covered pipeline (where an extensions/expansions policy or extension and expansion requirements so provide); [607] and
- rule 101 of the NGR, which provides that a full access arrangement must specify a reference service and any 'other' pipeline service that is likely to be sought by a significant part of the market and which the AER considers should be specified as a reference service (and, hence, could only legitimately be provided by the covered pipeline).[608]

1400. In addition, GGT has rejected BHPB's conclusions that the omission of the word covered in the definition of pipeline services in the NGL is intentional. Specifically, GGT has provided two examples in the NGL that refer broadly to 'pipeline services' but where the context clearly determines only services provided by means of the covered pipeline are relevant.

Box 1: From the Gas Code to the NGL and NGL—GGT's Examination of Explanatory Materials

GGT has referred to the second reading speech of the National Gas (South Australia) Bill and noted that the intention of the National Gas Law was to retain the structure of the Gas Code where economic regulation is only applied to 'covered pipelines' while implementing the Ministerial Council on Energy (MCE's) response to both the Productivity Commission Review of the Gas Access Regime and the Expert Panel on Energy Access Pricing.

GGT has submitted that:

- The Ministerial Council of Energy (**MCE**) response to the Productivity Commission's Review of the Gas Access Regime did not adopt the recommendation that section 3.16 of the Code be amended so that any expansion of a covered pipeline would covered. The MCE's response was that this issue would be addressed in the drafting of the National Gas Law and the National Gas Rules.
- The Expert Panel on Energy Access Pricing did not deal with the issue of extensions/expansions.
- The MCE explanatory material Legislative Package: Gas Legislative Framework set out the categories of pipeline and the key obligations' that applied to each under the National Gas Law. In respect of 'uncovered pipelines, it has noted that no

606 Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, pp. 3-4.

607 Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, p 2, p. 6.

608 Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, p. 5.

regulation applies (although coverage can be sought) and that access arrangements are not applicable to such pipelines.

- The first draft of the National Gas Law continued the arrangements in the Code that provided extensions/expansions to either form, or not form, part of the covered pipeline and to affect, or not affect, a reference tariff.
- The first draft of the rules continued the arrangements in the Code that provided for the extension and expansion requirements in an access arrangement to set out the basis upon which an extension or expansion is or is not to be treated as part of the covered pipeline and, if it is to be treated as part of the covered pipeline, the effect the extension or expansion may have on tariffs. While there was provision for an access arrangement to state the target revenue to be derived from reference services and for that to be based on a building block approach, the method for allocating cost was not determined other than the access arrangement information was to include the proposed approach to setting prices including the method to allocate costs and a demonstration of the relationship between costs and prices.

Source: Goldfields Gas Transmission Pty Ltd, Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation, 16 February 2015, pp. 3-4.

1401. These are:

(a) The definition of 'access arrangement' in section 2 of the National Gas Law provides that it is 'an arrangement of terms and conditions about access to pipeline services provided or to be provided by means of a pipeline'. It should be uncontroversial that an access arrangement can only deal with terms and conditions about access to pipeline services provided or to be provided by means of a covered pipeline.

(b) The definition of the term 'reference service' in section 2 of the National Gas Law which is defined as ' a pipeline service by, or determined or approved by the AER under, the Rules as a reference service', although only a pipeline service provided by a covered pipeline could properly be designated as a reference service.[609]

1402. Finally, GGT has indicated that, under the NGR, it is clear that only covered services are relevant to the calculation of total revenue. In particular, GGT has asserted that:

- under rules 77(1) and 77(2) of the NGR, the capital base is calculated by reference to the opening capital base of the covered pipeline as adjusted for specified matters including adding 'conforming capital expenditure made, or to be made, during the earlier access arrangement period', and expansions in uncovered capacity are irrelevant;[610]
- under rule 87A(1) of the NGR, taxable income for the relevant regulatory years is calculated as an estimate of taxable income would be earned as a 'result of the provision of reference services'; and [611]

[609] Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, p 2.

[610] Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, pp 7-8.

[611] Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, p 8.

- under rule 87(3) of the NGR, the rate of return is determined by reference to a benchmark efficient entity with a similar degree of risk that applies to the service provider in respect of the provision of reference services.[612]

BHPB's further submission

1403. In its further submission, BHPB has suggested that the Authority should not give weight to extrinsic materials provided by GGT in its responding submission, such as second reading speeches and other explanatory materials, which would seek to alter the ordinary meaning of the definition of 'Pipeline Services' in the NGL. BHPB has contended that:

> …The definition of pipeline services does not include the word covered. The ordinary meaning the text is clear — it refers to pipelines, not just covered pipelines. [613]

1404. In particular, BHPB has argued that GGT's reference to extrinsic materials is contrary to the correct approach to statutory interpretation that requires that a term used more than once in a statute should ordinarily be given the same meaning throughout.[614]

1405. In this context, BHPB has referred to rule 77(1) of the NGR as one example where the terms 'pipeline' and 'covered pipeline' have both been used and which clearly indicates that the term 'pipeline' is not ordinarily limited to the covered pipeline.[615]

1406. BHPB has concluded:

> If the legislature had intended the definition of 'pipeline service' to be limited to covered pipelines, it could have reflected this intention in the text by simply inserted the word 'covered' before the word 'pipeline', as is has done in various other rules. [616]

1407. In support of its position, BHPB has highlighted a recent confirmation by the Australian High Court that statutory construction must begin with a consideration of the statutory text and that legislative history and extrinsic materials cannot displace the ordinary meaning of words in the statutory text.[617]

1408. BHPB has also suggested that there is also a clear intention in the National Gas Access (WA) Act 2009 (NGL(WA)) to limit the use of extrinsic materials. Specifically, BHPB has cited:

> Clause 8(2) of Schedule 2 to the NGL(WA), which provides for the use of extrinsic materials to assist in the interpretation of the NGL and NGR in three circumstances:
>
> (a) if the provision is ambiguous or obscure to provide an interpretation of it;
>
> (b) if the ordinary meaning of the provision lead to a result that is manifestly absurd or unreasonable, to provide an interpretation that avoids such a result; or

[612] Goldfields Gas Transmission Pty Ltd, *Response to BHP's submission on Goldfields Gas Transmission's proposed revisions to the Access Arrangement for the Goldfields Gas Pipeline: cost allocation*, 16 February 2015, pp 7-8.

[613] BHP Billiton, *Response to GGT further submission*, 1 April 2015, p. 1.

[614] BHP Billiton, *Response to GGT further submission*, 1 April 2015, p. 1.

[615] BHP Billiton, *Response to GGT further submission*, 1 April 2015, p. 1.

[616] BHP Billiton, *Response to GGT further submission*, 1 April 2015, p. 1.

[617] BHP Billiton, *Response to GGT further submission*, 1 April 2015, p. 1.

(c) in any other case, to confirm the interpretation conveyed by the meaning of the provision.

Clause 8(4) of Schedule 2 to the WA NGL, which requires a determination for the consideration of extrinsic material, and the weight that should be given to such material, to have regard to:

(a) the desirability of a provision being interpreted as having its ordinary meaning; and

(b) the undesirability of prolonging proceedings without compensating advantage; and

(c) other relevant matters.[618]

Consistent with the NGO and RPP

1409. In its initial submission, BHPB has argued that the cost allocation methodology, determined under rule 93 of the NGR must be governed by the NGO and RPP. As stated by BHPB:

> The commentary around the introduction of the NGO … makes it clear that the NGO was designed to guide the interpretation of all aspects of the NGL/NGR by regulators, rule makers and review bodies (including courts) in the future. Accordingly it is key to interpreting the appropriate allocation of costs.[619]

1410. As a corollary, BHPB has argued that the cost allocation methodology determined for the GGP must focus on investment that is allocatively, productively, and dynamically efficient with a view to maximising the long term interests of consumers. Specifically, BHPB has stated:

> The explanatory material relating to the introduction of the NGO indicates that the primary focus when considering how to achieve the NGO is economic efficiency, as the promotion of economic investment 'will encourage productive, allocative efficiency and dynamic efficiency'. Maximising the long term interests of consumers is considered to be the ultimate goal but one which will be achieved by focusing on efficient investment.[620]

1411. BHPB has proposed a cost allocation methodology that distributes the joint costs that are incurred by all services provided by the GGP evenly across all services on the basis of relative use.

1412. As submitted by BHPB, an even distribution of the joint costs across covered and uncovered services will equalise the burden of recovering the 'residual' or 'sunk' costs of the initial investment, which is currently only recovered from covered services. Provided that GGT is able to recover an even share of the residual cost from covered and uncovered users, BHP has argued that this cost allocation methodology will improve economic efficiency by minimising efficiency losses created by prices for covered services in excess of marginal costs.[621]

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618 BHP Billiton, *Response to GGT further submission*, 1 April 2015, pp. 1-2.

619 BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 4.

620 BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 4.

621 BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 5.

1413. In this context, BHP has suggested that GGT's proposed total revenue allocation, and the support that is provided for GGT's proposal by HoustonKemp, ignores the potential for the changes to the average level of prices below standalone costs to affect economic efficiency and, hence, the possibility that an allocation of costs to uncovered services could improve efficiency.[622]

1414. While BHPB has not provided the Authority with substantive evidence that an even share of the residual cost based on relative use could be borne by users of uncovered capacity, BHPB has indicated that there is evidence that these costs are capable of being recovered. In particular, BHPB has submitted:

> A report previously prepared by NERA regarding past expansions of the GGP [undertaken over the life of AA1] establishes that the charges imposed on users of uncovered capacity under those expansions were higher than charges for covered services. It is reasonable to expect the situation to be the same in respect of the most recent expansions of the GGP [undertaken over the life of AA2], but this would need to be confirmed by the ERA.[623]

Support from Incenta Economic Consulting

1415. Incenta was asked by Herbert Smith Freehills, acting on behalf of BHPB, to examine whether it would be appropriate for the reference tariff for the GGP to be calculated on the basis that part of the costs which are incurred jointly by covered and uncovered services are recovered from uncovered services.[624]

1416. For the specific circumstances of the GGP, where covered assets can provide both covered and uncovered services, Incenta has indicated that the context for interpreting rule 93 of the NGR, which is used to allocate total revenue for the purpose of determining a reference tariff is that:

- The GGP provides both covered and uncovered services and a reference tariff is determined for covered services.
- The directly attributable costs in the NGR are the costs of assets or activities that are used either exclusively to provide covered services or exclusively to provide uncovered services and identified as the compressor equipment associated with the different trances of capacity.
- The 'other costs' are the joint costs associated with assets or activities that are shared between covered and uncovered services and identified as the main pipeline and associated measurement and control equipment.[625]

1417. On this basis of its analysis, Incenta has concluded that, under rule 93 of the NGR, total revenue should be allocated on the basis that:

> … the joint costs associated with providing the covered and uncovered services should be allocated between the two groups of services on the basis of:

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[622] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 6.

[623] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 5.

[624] BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 1.

[625] BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 4.

(a) The relative use of the assets that give rise to the joint costs by the covered and uncovered services, subject to

(b) Confirmation that the share of joint costs allocated to the uncovered services can in fact be recovered through the charges from those services.[626]

1418. Incenta has highlighted limitations in the support provided by HoustonKemp and CEG for GGT's proposed total revenue allocation. Specifically, Incenta has suggested that:

- HoustonKemp has ignored the possibility that reference tariffs in excess of marginal cost could dissuade utilisation of covered services and, hence, be a source of inefficiency for investment in the covered capacity of the GGP. As such, the potential for re-allocation of joint costs to uncovered services to reduce this *in*efficiency has been overlooked.[627]
- CEG has assumed that users of uncovered services can only pay a price that reflects the incremental costs of their services.[628]

1419. With respect to the assumption made by CEG, Incenta has stated:

> … Dr Hird [CEG] notes that he has been advised that the prices to users of existing tranches of uncovered expansions have been set at the incremental costs of those expansions. However, in relation to the 2006 and 2009 expansions, this advice does not appear to be consistent with the public information [in the NERA report] on these expansions.[629]

1420. In this context, Incenta has cited comments from the ERB Review of the Authority's Final Decision for AA2:

> BHPB supported its position by referring to the NERA Report, which states that the incremental costs of the Additional Compressors are below the Reference Tariff and yet the charges for Additional Services are higher than the Reference Tariff.[630]

1421. Incenta has concluded:

> … It would be appropriate for the Economic Regulation Authority to establish to its satisfaction whether GGP has been able to earn a surplus over the incremental cost for the various tranches of expansions to date, as well as the likely position in relation to future expansions.

1422. Incenta has indicated that the exact share of the joint costs that should be allocated to covered and uncovered services, and incorporated in a cost allocation methodology under rule 93 of the NGR, should be based on economic principles

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626 BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 3.

627 BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, pp. 17-18.

628 BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 19.

629 BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 *November 2014, p. 19.*

630 *BHPB Billiton, Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 20.

and efficiency considerations with regard to both utilisation of current capacity and investment in future capacity.

Economic principles

1423. For a regulated natural monopoly, Incenta has indicated that economic principles support a regulated price that:

- reflects the marginal cost for consumers of regulated services based on usage in order to provide incentives for consumers to voluntarily use services according to their value in excess of costs; and
- provides a revenue stream to the regulated business that is consistent with cost recovery which ensures both incentives and capacity for the continued provision and new investment in the regulated service.

1424. Noting the constraints imposed by significant sunk costs and economies of scale associated with investment in the GGP, which prevent marginal cost pricing from recovering the total cost of gas pipeline services, Incenta has suggested that the task of deriving an efficient price for regulated gas services typically involves:

- setting a component to prices that accurately signals to users the additional cost associated with their usage; and then
- seeking to recover the cost that cannot be recovered through efficient prices (the 'residual cost') in a manner that has the least effect on consumption, while acknowledging that the need to recover this residual cost nonetheless is likely to affect customer behaviour and so cause some inefficiency.[631]

1425. In this context, Incenta has indicated that an efficient cost allocation methodology would seek to recover proportionately less of the residual cost from users that are most responsive to price or, in the absence of differences in the price responsiveness between users, to recover an even spread of residual costs across all users.[632]

1426. For situations where an even spread of residual costs is appropriate, Incenta has indicated that:

> This … improves economic efficiency because economic principles suggest that the inefficiency from setting price above marginal cost increases at an increasing (non-linear) rate – this means that the total inefficiency across customers is minimised by equalising the burden that each bears over marginal cost.[633]

1427. With respect to the upper and lower bound constraints on allocative efficiency, identified by HoustonKemp additional constraints, Incenta has stated:

> … [the lower bound] is consistent with the need for prices to signal cost to ensure consumption/usage is efficient, as noted above. The second of these bounds [the

[631] BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 8.

[632] BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 9.

[633] BHPB Billiton, *Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 9.

upper bound] recognises that as the price is raised above (marginal) cost, different forms of inefficiency may be observed, namely:

(a) Consumption of the service may be deterred (i.e., price > customer value), even though the value to the customer exceeds the cost, which is consistent with the discussion in the previous section, or

(b) Consumption of the service may continue, but the price may be sufficiently high for the customer to bypass the regulated infrastructure and provide the service through duplicated infrastructure.[634]

1428. In examining the efficiency of outcomes under a cost allocation methodology that distributes the joint costs across covered and uncovered services, Incenta has suggested there are two implications:

> First, by allocating a portion of the joint costs to the uncovered services, the capacity is provided for the extent of residual cost – and potential inefficiency caused with respect to the covered services – to be reduced. Subject to meeting the principle below, allocating a portion of cost to the uncovered service would be expected to increase economic efficiency.
>
> Secondly, the extent of costs that are allocated to the uncovered service needs to be consistent with GGP recovering its costs overall in order to ensure that an impediment is not created to efficient new investment proceeding. This means that there needs to be confidence that the cost that are assumed to be recoverable from the uncovered services can in fact be recovered from those services.[635]

1429. In testing the extent to which users of uncovered capacity can bear a share of the joint costs that are incurred by all services provided by GGP, Incenta has suggested that an appropriate starting point would be an even distribution across all services on the basis of relative use.[636] Incenta has noted that this approach would be simple to implement and administer, and would also be consistent with the approach for allocating costs across covered and uncovered services in fixed line telecommunications (and summarised in Box 2). [637]

1430. Incenta has suggested that a determination on the extent to which joint costs can be borne by users of uncovered services, and indeed whether it is possible to recover the same share of costs (per unit of use of the mainline) across all users, will require analysis of the revenue received (or assumed to be received) from the sale of the uncovered services and the directly attributable costs associated with those services.[638]

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634 BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 9.

635 BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 10.

636 BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 11.

637 BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 11.

638 BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, pp. 10-12.

1431. In this context, Incenta has noted that while actual prices paid for uncovered services would provide a true reflection of the facts, this could lead to an objection that the regulatory regime had been extended to uncovered services particularly if any premium charged for uncovered services above the reference tariff leads to an increase in the amount of the joint costs that is assumed to be borne by those services. In this context, Incenta has suggested an alternative approach that assumes that the reference tariff (rather than the actual tariff) is charged for uncovered services on the basis of throughput.[639]

1432. Finally, Incenta has acknowledged an implicit assumption in its analysis, which is that the allocation of a share of the joint costs to users of the uncovered services will not affect the price that GGP is able to charge to users of those services and, rather, will only affect profit and ultimately the types of services that GGP chooses to provide users. In this regard, Incenta has observed:

> Given that the uncovered services are unregulated but only able to be provided by GGP, it would be expected that the tariff would reflect the alternative open to the gas users rather than GGP's own costs, in which case this assumption would be reasonable.[640]

Efficiency considerations

1433. With regard to the requirement for the cost allocation methodology to be consistent with NGO and RPP, Incenta has suggested that, in broad terms:

- the NGO sets out the outcome that is to be achieved; while
- the RPP specifies the mechanism by which that outcome is to be achieved.

1434. In achieving outcomes consistent with the NGO, Incenta has indicated that there are two requirements. These are

- to promote economic efficiency; and
- to pursue the long term interest of consumers.[641]

1435. Incenta has suggested that both HoustonKemp and CEG have focussed on the efficiency requirement without due regard to the long term interest of consumers. In contrast, Incenta has noted the potential for ambiguity, and even conflict, between these requirements if they are required to be read in conjunction. In particular, Incenta has stated:

> The difference between an objective that is focussed on achieving economic efficiency and one that is directed to the long term interests of consumers is how the regulator is required to regard transfers between classes of participants.
>
> A pure economic efficiency objective looks only at the aggregate benefit of all participants – consumers, producers, transmission businesses, distribution

[639] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 11.

[640] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report,* 27 November 2014, p. 12.

[641] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 14

> businesses, retailers – whereas the pursuit of the long term interests of consumers, on the face of it at least, gives priority to the interests of consumers[642]

1436. However, based on a view that the construction of the objective and the reconciliation of its two requirements will ultimately be a legal question, Incenta has expressed its opinion taking each of these requirements separately to conclude that a cost allocation methodology that distributes a share of joint costs to all services provided by the GGP under rule 93 of the NGR is:

- consistent with the NGO requirement to promote economic efficiency because it reduces the amount of the residual cost that is borne by users of the covered pipeline and any distortions that this creates with respect to the provision of covered services; and
- consistent with the NGO requirement to pursue the long term interests of consumers by allocating costs to the unregulated service because it would reduce the return that GGP would otherwise earn from the unregulated sales and transfer this to consumers of the regulated service via a reduction in the reference tariff. Provided that the reduction in return on uncovered assets did not remove GGP's incentive for investment in the pipeline, then the whole of this transfer would be treated as a benefit to consumers.[643]

1437. Incenta has indicated that a cost allocation methodology that distributes a share of joint costs to all services provided by the GGP is also consistent with RPP(2) and RPP(3) and, hence, the mechanisms for achieving of the NGO. In particular:

- With respect to RPP(2), Incenta has asserted that consistency does not require standalone costs to be recovered exclusively from users of the regulated service but, rather, that allocated costs should be limited to the amount that can be extracted from these services.[644]
- With respected to RPP(3), Incenta has noted that an efficient sharing of costs across all services will result in a reference tariff that is more reflective of the cost of providing the reference service and, hence, will promote efficient usage across the pipeline.[645]

Consistency with other regulatory regimes

1438. In its submission, BHPB has suggested that there is support from other regulators in Australia and New Zealand for a cost allocation methodology that efficiently distributes joint costs across regulated and unregulated services. Specifically, BHPB has asserted:

> It is clear from regulatory precedent that regulators consider it desirable that a contribution be made to the recovery of regulated costs from unregulated services where joint costs are present. While regulators have acknowledged that this cost

[642] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 14.

[643] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 15.

[644] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 16.

[645] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 16.

allocation would improve consumer welfare through a reduction in regulated prices, it has also been acknowledged that the sharing of such costs promotes economic efficiency more broadly by promoting the efficient use of services.

1439. As provided by BHPB in its initial submission and in a report by Incenta attached to that submission, Box 2 outlines examples of regulatory regimes in Australia and New Zealand that requires costs that are incurred jointly by regulated and unregulated services to be allocated across all of those services.

Box 2: Regulatory precedent in Australian and in New Zealand

BHPB's initial submission, and the report by Incenta attached to that submission, have provided examples and commentary on other regulatory regimes in Australia and New Zealand that require costs incurred jointly by regulated and unregulated services to be allocated across all services. These are:

- National Electricity Market
  - In 2012, as part of a rule change proposal by the Australian Energy Regulator, the Australian Energy Market Commission has amended the national electricity rules to require that, where a regulated asset also provides unregulated services, the annual revenue requirement to be recovered from the regulated services may be reduced by an amount that reflects the share of the cost that the network business is reasonably recovering through charges for the unregulated service.
- Australian Telecommunications Services
  - The framework for the economic regulation of Telstra's fixed line services is set out in Clause 6 of the Australian Competition and Consumer Commission's 2011 Final Access Determinations (Fixed Principles). Clause 6.14(c) of the Fixed Principles requires unregulated services to make a contribution to the cost recovery of regulated assets, where these are shared, on the basis of relative use by the various services.
- Australian airport terminals
  - Major airports in Australia are subject to a price monitoring regime administered by the ACCC. The ACCC's financial report guidelines require that airports allocate shared costs between aeronautical (regulated) and non-aeronautical (unregulated) services based on a 'relevant, reliable and verifiable factor' and provide 'relative use' as an example of such a factor.
- New Zealand Electricity Distribution, Gas Pipeline Services and Airports
  - The New Zealand economic regulator (Commerce Commission) has determined input methodologies (**IM**) for electricity distribution, gas pipeline and airport services that require an allocation of costs between 'cost directly attributable' (**CDA**) and 'costs that are not directly attributable' (**CnDA**). For businesses that provide regulated and unregulated services, depending on clearly defined causal factors, one of three cost allocation methodologies is appropriate:
    - (i) shared costs distributed evenly across all services;
    - (ii) shared costs are primarily borne by regulated services and allocated to unregulated services based on capacity to pay if investment in unregulated services would be affected under (i)
    - (iii) shared costs are borne by the regulated services if this results in a cost allocation that would not be materially difference to cost sharing (that is, when shared costs are insignificant).

- Incenta has suggested that causal factors in the application of the appropriate IM reflects the Commission's view that, at least over the longer-term, all services are expected to recover some proportion of shared costs on the basis of willingness to pay, and that it would be implausible for a service to have demand characteristics that could mean that no allocation was appropriate.

Source: BHPB Billiton, Public Submission In Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report, November 2014.

1440. In its report, Incenta has suggested that the cost allocation methodology determined by the Australian Energy Market Commission (**AEMC**) for the National Electricity Market (**NEM**) and by the Australian Competition and Consumer Commission (**ACCC**) for the Australian Telecommunications Services are particularly relevant to the consideration of an appropriate approach for GGP where regulated assets provide both regulated and unregulated services.

1441. In particular, Incenta has considered that the regulatory approach to cost allocation that has been determined by the AEMC for the NEM is relevant because it has required the AEMC to form a view that an allocation of a share of joint costs to unregulated services would meet the National Electricity Objective (**NEO**), which, according to Incenta is specified in almost identical terms to the NGO.[646] In this context, Incenta has highlighted the following statement by the AEMC in the *Economic Regulation of Network Service Providers and National Gas Amendment Price and Revenue Regulation of Gas Services, Directions Paper* published by 2012:

> The Commission considers that consumers should receive some benefit when assets used to supply regulated services are shared with other services, as consumers are funding the assets and bearing the risk if they are under-utilised. Using electricity assets for additional purposes should reduce the (average) costs of providing electricity services since the fixed costs are spread over a larger number of consumers. This promotes efficient use of electricity services with respect to price. This could be seen as a form of innovation which NSPs should be encouraged to achieve, where it does not have a negative effect on the service provided to electricity consumers. The regulatory framework needs to find the appropriate level of sharing of benefits so NSPs are rewarded for cost cutting and consumers benefit through lower prices.[647]

1442. Further, Incenta has considered that that the regulatory approach to cost allocation determined by the ACCC for the Australian Telecommunication Services is relevant because the regulated and unregulated services in the telecommunication services sector are almost identical in nature. Incenta has suggested that this is similar to the situation in the gas pipeline services sector and in contrast to the electricity market where regulated and unregulated services can be quite different (such as, for example, the use of electivity assets to deliver broadband internet services). In this context, Incenta has noted that, for a market where regulated and unregulated

[646] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 22.

[647] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 22.

services are similar, the ACCC has determined a cost allocation methodology based on relative usage is appropriate.[648]

1443. Incenta has also highlighted that both the AEMC and the New Zealand Commerce Commission have argued that outcomes under a cost allocation methodology that allocates a share of joint costs to unregulated services will reflect the likely observable outcome in competitive markets where benefits accrue to users of one service when assets are also used to provide other services.[649]

1444. As provided by Incenta,

- the AEMC has stated*:*

  In a competitive market, a business would seek ways to provide its customers with the lowest possible price, in order to retain its existing customers and gain new ones. One way to do this could be to make more efficient use of the business' assets by employing them for new services. This would increase the number of customers having access to the asset, and allow the business to spread the fixed costs of the asset over this greater number of customers, therefore reducing costs for consumers of the services.[650]

- while the New Zealand Commerce has indicated:

  Experts advising EDBs and GPBs (as well as Airports) unanimously agreed that in workably competitive markets firms would expect to recover some proportion of shared costs from all services in the longer term. As such, some benefits of efficiency gains would be shared with consumers of all types of services with shared costs.[651]

Considerations of the Authority

1445. The Authority notes that AA3 provides the first occasion for the Authority to review its Final Decision for the total revenue allocation to covered services determined for AA2 in the context of the new regulatory regime for gas pipeline services as provided under the NGL(WA) and the NGR.

1446. Under the Extension and Expansion Policies (**EEP**) in the access arrangements for AA1 and AA2, GGT has elected to undertake expansions in the capacity of the GGP through the installation of assets that are not covered in its current access arrangement,[652] and these assets will not be covered in the access arrangement for AA3.

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[648] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report,* 27 November 2014, p. 23.

[649] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, pp. 24-27.

[650] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 23.

[651] BHPB Billiton, *Public Submission in Response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement, Attachment — Incenta economic consulting report*, 27 November 2014, p. 27.

[652] Under the EEP in AA1, GGT could elect for any future expansions in the capacity of the GGP to be 'uncovered' based only on a notification to the ERA without a requirement for subsequent approval. In AA2, the EEP was amended to require an express determination by the ERA on any election by GGT for an uncovered expansion. Since AA1, the capacity has expanded three time: twice under AA1 and once under AA2.

1447. For AA3, the uncovered assets include:

- The installation of additional compressors at Parraburdoo, Wyloo West, Ned's Creek and Yarraloola.
- The installation of a new compressor station at Turee Creek.

1448. The Authority understands that the total capacity for the GGP is currently 200TJ/day of which:

- 109 TJ/day is provided by assets that deliver services that are covered by the terms and conditions of an access arrangement (**covered services**); and
- 91 TJ/day is provided by assets that deliver services that are not covered, or excluded, from the terms and conditions of an access arrangement (**uncovered services**).

1449. The Authority notes that the GGP is the only gas pipeline in Australia that has regulated assets which are used to deliver both covered and uncovered services. For this unique situation, there is currently no regulatory precedent in regard to the revenue allocation to covered services under the NGL(WA), the NGL or the NGR, although the Authority has noted the regulatory approaches that have been taken in other industry sectors as outlined in Box 2.

1450. In the absence of a legal precedent, and as required under Section 100 of the NGR, the Authority's interpretation and discretion on this matter must be significantly guided by the NGO and RPP as stated at paragraph 1362.

1451. On the basis of considerations outlined in more detail in the following sub-sections, the Authority has determined that a total revenue allocation to covered services under rule 93 that includes a Cost Allocation Method (**CAM**) that ensures the costs associated with covered assets used in the delivery of both covered and uncovered services (**joint costs**) are efficiently distributed across those services is not only permissible under the NGR but required under the NGO as guided by the RPP.

1452. Hence, the Authority rejects GGT's proposal for the total revenue allocation under rule 93 of the NGR which proposes that joint costs should be allocated only to covered services.

Revisiting the revenue calculation in AA2

1453. The Authority's Draft and Final Decision for AA2, and the subsequent review of the Final Decision by the ERB initiated through an appeal by BHPB, have been revisited by BHPB in its initial submission. Matters raised in relation to the Authority's determination for AA2, and which are also relevant to the Authority's determination for AA3, have also received significant attention in GGT's responding submission and also BHPB's further submission.

1454. The Authority notes that the allocation of total revenue for the purpose of a reference tariff determination and, ultimately for cost recovery of covered services, was considered carefully in its determination for AA2.

1455. In particular, for AA2, through the installation of additional compressors at Paraburdoo, Wyloo West and Ned's Creek that GGT elected to be uncovered by an access arrangement, the total capacity of the GGP was calculated as 158 TJ/day of which:

- 109 TJ/day was provided by assets that delivered **covered services**; and

- 49 TJ/day was provided by assets that delivered **uncovered services**.

1456. Unlike for AA3, [653] the Authority's consideration of the total revenue allocation for AA2 was governed by section 8.38 of the Gas Code, which was in the following terms:

> 8.38 Allocation of Revenue (Costs) between Services
>
> … the portion of the Total Revenue (referred to in section 8.4) a Reference Tariff should be designed to recover (which may be based on forecasts) should include:
>
> (a) all of the Total Revenue that reflects costs incurred (including capital costs) that are directly attributable to the Reference Service; and
>
> (b) a share of the Total Revenue that reflects costs incurred (including capital costs) that are attributable to providing the Reference Service jointly with other Services, with this share to be determined in accordance with a methodology that meets the objectives.

1457. In compliance with the Gas Code, the Authority's Final Decision for AA2 was that:

- Total revenue would reflect the capital and operating costs of providing covered services.
- All costs associated with the provision of covered services would be attributed to covered services, even if they were jointly incurred with uncovered services.
- Only incremental operating and capital cost associated with uncovered assets would be attributed to users of uncovered capacity.

1458. The Authority also notes that, while the total revenue allocation in the Final Decision for AA2 is reasonably aligned with GGT's current proposal for AA3, it does not reflect the position that the Authority initially formed in the corresponding Draft Decision. In contrast, the approach taken in the Draft Decision is closer to the alternative total revenue allocation as suggested by BHPB both for AA2 and AA3:

1459. In particular, the total revenue allocation determined in the Authority's Draft Decision for AA2 was that:

- Total revenue should reflect the capital and operating costs of all services provided by means of the covered pipeline, which includes uncovered services.
- The cost allocation methodology under Section 8.38 of the Gas Code should distribute joint costs evenly across all modelled capacity, with no regard to the actual contracts in place, and priced according to the reference tariff.

1460. The Authority's view prior to consultation on the Draft Decision for AA2 is reflected in the following statement:

> [GGT's cost allocation approach] … has the effect that Users of Reference Services and Negotiated Services [which are delivered through covered capacity], in addition to bearing the direct and shared costs of providing the Services, would also bear disproportionately the joint costs of providing Services by means of the Expansions of Capacity. On the other hand, the Users of the Services provided by means of the Expansions of Capacity would only be required to bear the direct cost of providing such Capacity and few of the shared costs of doing so

[653] Although the NGL(WA) was enacted on 1 January 2010, under Clause 30, sections 3, 8 and 10.8 of the Gas Code continue to apply to transitioned access arrangements until their next review.

> The Authority considers that such an arrangement would not provide for economically efficient recovery of costs incurred in providing Reference Services and nor would it provide for a fair and reasonable outcome as required by section 8.38 of the Code.[654]

1461. As observed by GGT and BHPB in their submissions, the Authority moved away from its Draft Decision for AA2 on the basis that the specific definition of 'Services' in the Gas Code could not support a broad definition of total revenue and could only support an allocation of the costs incurred by covered assets to covered services, even if these assets were also used to delivered uncovered services. It was on this same basis that the Authority's Final Decision for AA2 was upheld on Review by the ERB.

1462. The definition of Services in the Gas Code that was relevant to the position taken by the Authority in its Final Decision, and the ERB in its Review of that Decision, as defined in section 10.3 of the Gas Code is:

> (a) a service provided by means of a Covered Pipeline (or when used in section 1 a service provided by means of a Pipeline) including (without limitation):
>
> (i) haulage services (such as firm haulage, interruptible haulage, spot haulage and backhaul); and
>
> (ii) the right to interconnect with the Covered Pipeline, and
>
> a. Services ancillary to the provision of such services.[655]

Total revenue calculation in AA3

1463. The Authority accepts BHPB's position that, unlike the Gas Code, neither the NGL(WA) nor the NGR contain a definition of 'Services' that confines the Authority's considerations for AA3 unilaterally to services that are provided only by the covered pipeline. Further, the Authority notes that the definition of 'Pipeline Services' that is contained in the NGL(WA) does not explicitly contain that restriction either.

1464. However, the Authority considers that there is no ambiguity that a full access arrangement can only apply to reference services. Hence, it only applies to services that are provided by the covered assets of the GGP identified in Schedule A of the Gas Code and which remain covered under the NGL(WA) and NGR. For a full access arrangement to extend to services that are provided by uncovered assets, stakeholders should seek a coverage determination from the National Competition Council (**NCC**) through the appropriate legal process prescribed in the NGL(WA) and the NGR.

1465. The Authority has examined all of the relevant rules in Part 9 of the NGR that govern price and revenue regulation and, in particular, the total revenue calculation based on the building block approach, including rule 77 which governs the projected capital base. The Authority concludes that the total revenue calculation:

- includes all of the capital and operating costs of the covered gas pipeline system — identified as the mainline of the GGP and four compressors at Yarraloola, Ilgarari, Wiluna and Parburdoo (**initial compressors**); and
- excludes only the incremental capital and operating costs of uncovered expansions in capacity — identified as the additional compressors at

[654] ERA, *Draft Decision on GGT's Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline*, 9 October 2009, p. 125.

[655] Section 10.3 of the National Third Party Access Code for Natural Gas Pipeline Systems (Gas Code)

Paraburdoo, Wyloo West, Ned's Creek and a new compressor station installed at Turee Creek (**additional compressors**).

1466. The Authority notes that the calculation of total revenue under rule 76 of the NGR differs from the definition of total revenue submitted by BHPB which includes the costs of all services provided by the GGP in its entirety. However, it is close to the definition of total revenue that has been proposed by GGT, as it includes all of the costs that are directly attributable to the provision of covered services as well as the joint costs that are incurred in the provision of all services, including uncovered services.

1467. Hence, the Authority observes that a reference tariff determination based on the total revenue calculation under rule 76 will reflect all of the costs of covered assets even when a substantial proportion of those covered assets are utilised to deliver uncovered services.

1468. For the Authority, the acceptability of this outcome over the life of AA3 depends on whether:

- The NGL(WA) and NGR provide the Authority with the discretion to make an adjustment to the total revenue calculation that would allow reference tariffs for the GGP to only reflect the cost of covered services.
- An adjustment to the total revenue calculation is required under the NGO and RPP, which must necessarily guide the Authority's interpretation of, and discretion under, the NGL(WA) and the NGR.

1469. The Authority's consideration of these matters are outlined in the following sub-sections.

Permissibility under the NGL(WA) and NGR

1470. The Authority notes that, under rule 77 of the NGR, the projected capital base for AA3 is 'fixed' by reference to the opening capital base at the commencement of AA2 and this can only be adjusted for specified matters over the life of AA2 which include, for example, additions for conforming capital expenditure and subtractions for depreciation as well as for redundant or disposed assets.

1471. As a corollary, the Authority notes that there is currently no allowance under rule 77 that would permit an adjustment to the capital base to reflect that, due to GGT's election for an uncovered expansion, the proportion of the covered asset that is used to deliver covered services decreases while the proportion used to deliver uncovered services increases.

1472. As observed for GGP:

- At the start of AA1, 100 per cent of the mainline capacity was utilised to deliver covered services and zero per cent was utilised for uncovered services.
- At the start of AA2, 69 per cent of the mainline capacity was utilised to deliver covered services and 31 per cent was utilised for uncovered services.
- At the start of AA3, 55 per cent of the mainline capacity will be utilised to deliver covered services and 45 per cent will be utilised for uncovered services.

1473. In this context, the Authority is of the view that the absence of a mechanism to adjust the projected capital base for uncovered expansions under rule 77 tends to suggest

that the physical reality of a covered gas pipeline that would actually have the capacity to deliver both covered and uncovered services, like the GGP, was not fully contemplated under the NGL(WA) and the NGR despite this being a possibility under Section 2 of the NGL(WA) and rule 48(1)(g) of the NGR.

1474. In particular, the Authority notes that, in its *Review of the Gas Access Regime*, the Productivity Commission considered the implications of uncovered expansions for the determination of a reference tariff in an access arrangement. In particular, in coming to its recommendation that Section 3.16 of the Gas Code should unambiguously clarify that any expansion of a covered pipeline should also be covered, the Productivity Commission observed:

> The scope for regulatory error could increase because a service provider's reference tariffs would be based on the theoretical costs of a smaller pipeline (which excludes the uncovered expansion).[656]

1475. By contrast, the Authority considers that rule 93 of the NGR does provide the Authority with discretion to allocate the total revenue that is calculated under rule 76 (and other provisions that govern the building blocks) either towards (or away from) covered services. Specifically, this discretion is provided under rule 93(2)(c), which states that:

> … 'other costs' are to be allocated between reference and other services on a basis (which must be consistent with the revenue and pricing principles) determined or approved by the AER.[657]

1476. The Authority notes that neither the NGL(WA) nor the NGR defines 'other costs' and, as such, this term requires interpretation. In its interpretation, the Authority has had regard to costs that are clearly identifiable under rule 93(2)(a) and rule 93(2)(b) as *costs which are directly attributable to services provided by covered assets*. Conversely, the Authority considers that 'other costs' refers to *those costs which are* ***not*** *directly attributable to those services*. Hence, the Authority has interpreted 'other costs' to include the joint costs that are incurred by both covered and uncovered services and thus cannot, by definition, be directly attributable to any one service.

1477. Thus, the Authority determines that rule 93(2)(c) of the NGR allows it to make a determination on the CAM that is used to allocate the joint costs incurred by all services, either in full or in part, to covered services.

1478. The Authority notes that there is nothing in rule 93(2)(c) that requires joint costs to be allocated to covered services *in full*. The only guidance that rule 93(2)(c) provides is that the Authority's determination must be consistent with the RPP. The Authority also notes the general requirement under rule 100 that its determination must also be consistent with the NGO.

1479. In this regard, the Authority notes that, under clause 7 of Part 2 of Schedule 2 to the NGL(WA), in interpreting a provision of the NGL(WA), including a rule of the NGR, the Authority is required to prefer the interpretation that will best achieve the purpose of object of the NGL(WA).

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[656] Productivity Commission, *Review of the Gas Access Regime Inquiry Report*, 2004, p. 327.

[657] Rule 93(2)(c) of the National Gas Rules.

Consistency with the NGO and RPP

1480. Unlike for AA2, the Authority is required to ensure that the total revenue allocation in AA3 complies with the NGO and the RPP.

1481. The Authority considers that the NGO and the RPP are central to the micro economic reform of the gas access regulatory regime introduced in Western Australia by the NGL(WA) and the NGR. In particular, compared to the many and competing objectives contained in the General Principles listed in Section 8.1 of the Gas Code, the single overarching policy objective provided by the NGO, and the more specific operational guidance to achieve that policy objective provided by the RPP, improve the accountability and transparency of regulatory decisions.

1482. Significantly, the Authority notes that the RPP requires the total revenue allocation to covered services to be consistent with a reference tariff determination that reflects the 'efficient cost' of covered services.

1483. Due to the substantial fixed costs and economies of scale associated with some of the covered assets of the GGP that are required to deliver any and all services (for example, the mainline), the Authority notes that total revenue from tariffs across all services, in aggregate, must exceed their incremental costs in order to ensure the economic sustainability of operations over the longer term.

1484. In economics, there are three possible sources of inefficiency associated with tariffs that exceed the incremental costs of services, whether they apply to covered or uncovered services:

- Allocative inefficiency, which would occur if the range of services provided by the GGP is not aligned to the demand for those services, even when the users' willingness to pay is commensurate with the costs of supplying those services.
- Productive inefficiency, which would occur if expansions in capacity across the GGP do not fully exploit the economies of scale associated with sunk assets and production costs remain higher than otherwise might be the case.
- Dynamic inefficiency, which would occur if future expansions in capacity across the GGP are either insufficient to meet future demand for services or result in spare capacity that becomes, and remains, idle.

1485. The Authority considers that much of the debate between the economic consultants engaged by GGT (that is, HoustonKemp and CEG) and BHPB (that is, Incenta) has focussed on the correct interpretation of the 'efficient cost' of covered services. In particular, HoustonKemp and CEG have tended to focus their attention on the potential for a CAM that allocates all of the joint costs to covered services to improve the allocative efficiency of investment in uncovered services. However, the Authority notes that these consultants have paid less attention to the effect of this CAM on the allocative efficiency of investment in covered services, or indeed for the productive and dynamic efficiency of investment in the GGP in its entirety.

1486. To ensure that the total revenue allocation to covered services facilitates a reference tariff determination that reflects the efficient cost of covered services – as required by the RPP, which then ensures consistency with the NGO – the Authority determines that the CAM that allocates joint costs to covered services must seek to minimise the allocative, productive and dynamic inefficiencies across all services provided by the GGP in its entirety. It follows then that the CAM should take into account any efficiency trade-offs between covered and uncovered services.

1487. With regard to the total revenue allocation to covered services that has been proposed by GGT, which implicitly adopts the total revenue calculation under rule 76 that allocates nearly all of the joint costs to covered services, the Authority considers that there is a risk that the reference tariff determination for AA3 could be too high to be consistent with economically efficient outcomes as broadly defined.

1488. In particular, if the allocation of *all* joint costs to covered services results in a reference tariff that exceeds the efficient cost of covered services, then there is a risk that the use of covered services could be dissuaded and that existing covered capacity could become, and remain, idle. This could be the case, if existing and potential users withdraw their demand for covered services by substituting towards services provided by the uncovered capacity of the GGP and other fuels, scaling back operations, or re-locating.

1489. Further, if the use of covered services is dissuaded due to reference tariffs that are too high relative to their efficient cost, the Authority considers that the risk of inefficient investment outcomes under AA3 could be exacerbated in subsequent access arrangements in which even higher reference tariff determinations would be required to ensure that the total revenue could be recovered from covered services even when that capacity is underutilised. If this was the case, then there is the potential for perverse outcomes in which the reference tariff could be rising as demand for covered capacity falls.

1490. The Authority considers that the potential for covered capacity to become, and remain, under-utilised is evidenced by the following statement submitted by GGT:

> *The forecast of demand for capacity used in preparing this access arrangement revision proposal … recognises:*
>
> *(a) the difficulty GGT has encountered in finding a user for capacity made available by the failure of gold miner Apex Minerals at Willuna; and*
>
> [redacted]

1491. Given the risk of covered capacity becoming, and remaining, idle over the life of AA3, the Authority determines that only a share of the joint costs should be allocated to covered services in order to ensure that the reference tariff more closely reflects the efficient cost of those services, consistent with the RPP and achievement of the NGO.

1492. In making this determination, the Authority understands that GGT may be required to bear a share of the joint costs under AA3 that were previously borne by the reference tariff for covered services during AA2 and that this may lead to higher tariffs for uncovered services in the future. As a result, the Authority understands that there is a risk to the efficiency of investment in uncovered services. For example, if the share of joint costs allocated to uncovered services results in tariffs for those services that do not reflect their efficient costs, then there is a risk that GGT may not be able to expand uncovered capacity of the GGP sufficiently to ensure the full range of services that might otherwise be provided and, in particular, may have to abandon future investment projects that would only be worthwhile if financed at marginal cost.

1493. However, the Authority notes that the incremental costs of providing additional services on an existing pipeline with surplus capacity are likely to be substantially lower than for a pipeline that is operating at capacity (and, hence, which would

require an investment to expand its capacity through the installation of additional compressors or looping). Hence, the Authority considers that a total revenue allocation to covered services that includes a CAM that allocates joint costs across all services delivered by the GGP will minimise the burden of economic inefficiencies across all services provided by the GGP in its entirety — and, in particular, when compared to the burden of economic inefficiencies that may emerge as a result of the CAM proposed by GGT, in which all joint costs are allocated only to covered services.

Cost allocation methodology for AA3

1494. The Authority determines that where joint costs are currently included in the total revenue calculation under rule 76 in full, the total revenue allocation under rule 93(2)(c) should be based on relative capacity utilisation. In effect, this will ensure that the joint costs incurred by all services of the GGP are spread evenly across those services.

1495. In this context, the Authority notes that the tariff for an uncovered service will be determined through a negotiation between GGT and the user of those services. Hence, the tariff for uncovered services will be determined within the range of the incremental cost of providing that service and the opportunity cost associated with accessing alternative fuel sources.

1496. In this regard, the Authority reiterates the conclusion by Incenta at paragraph 1432:

> Given that the uncovered services are unregulated but only able to be provided by GGP, it would be expect that the tariff would reflect the alternatives open to the gas users rather than GGP's own costs.

1497. In this context, the Authority considers that there is at least circumstantial evidence that uncovered services could bear an even share of the joint costs allocated on the basis of capacity utilisation. If this is the case, then the cost allocation methodology determined by the Authority under rule 93(2)(c) is less likely to affect the tariff for uncovered services over the life of AA3, thereby reducing the risk of inefficient investment outcomes.

1498. This circumstantial evidence is based on publicly available information relating to the tariffs for uncovered services provided by past uncovered expansions in capacity as elected by GGT in 2006 and 2009. Specifically, on the basis of the NERA report, BHPB has concluded that the tariffs for uncovered services exceeded the reference tariff for reference services, which (then) included an allocation of nearly all of the joint costs. The ERB also commented on the NERA Report in its Review of the Authority's Final Decision:

> BHPB supported its position by referring to the NERA Report, which states that the incremental costs of the Additional Compressors are below the Reference Tariff and yet the charges for Additional Services are higher than the Reference Tariff.

1499. In terms of the evidence for the current tariffs that apply to uncovered services, the Authority notes:

- An ASX release by Duet Group on 16 January 2014 on a $100 million placement for the Fortescue Rive Gas Pipeline Project stated that FMG, which has higher production costs than either of BHPB or Rio Tinto, was prepared to pay an internal rate of return of 10.3 per cent.[658] Roughly estimated, this would

[658] Duet Group, *Fortescue River Gas Pipeline Project and $100m Placement*, ASX Release, 16 January 2014.

translate to a price for services from the Dampier Bunbury Natural Gas Pipeline (DBNGP) that is at least 10 to 15 per cent above its long run efficient costs.

- The price of diesel, which is the closest available fuel for users of the GGP, is more than $25 per GJ and this could be reasonably assumed to be approaching double the efficient price for GGP delivered gas, which would be inclusive of a gas commodity cost contributing around $8 per GJ and a pipeline cost contributing in the vicinity of $5 per GJ.

1500. The basis of the required amendments as a result of the cost allocation methodology determined by the Authority under 93(2)(c) are outlined in detail the following sub-sections.

Allocation of Total Revenue to Reference Services

1501. As noted in the Revenue Building Blocks chapter of this Draft Decision, the Authority assessed GGT's proposed total revenue taking account of the following components:

- Demand Forecast;
- Operating Expenditure;
- Opening Capital Base;
- Projected Capital Base;
- Rate of Return;
- Gamma;
- Depreciation; and
- Taxation.

1502. As a result of the Authority's assessment of GGT's proposed total revenue building blocks as per rule 76 of the NGR, the Authority does not approve GGT's proposed total revenue for the third access arrangement period. The Authority's approved Total Revenue by building block in nominal dollars is set out in Table 4.

1503. In the following sub-sections, the Authority has assessed GGT's expenditure forecasts with regard to allocating a share of the joint costs which were included in the expenditure to calculate Total Revenue, to reference services on the covered pipeline. This is consistent with rule 93(2)(c) of the NGR which requires that other costs are to be allocated between reference and other services on a basis determined or approved by the Authority. Apart from the demand forecast for reference services, the rate of return and the value of gamma, all other components for calculating Total Revenue have been adjusted to ensure an efficient allocation of total revenue to reference services.

Operating expenditure

Application of cost allocation methodology

1504. The Authority has determined that a number of GGT's proposed operating expenditure items are not directly attributable to reference services and, hence, should be jointly allocated to covered and uncovered services under rule 93(2)(c) of the NGR to ensure compliance with the NGO and RPP. Directly attributable costs for operating expenditure are fully allocated to covered services.

1505. The Authority has received advice from its technical consultant EMCa on joint operating expenditure and the proportion it considers should be allocated to the covered pipeline.

1506. EMCa recommended that joint costs should be allocated as follows:

- 54.5 per cent of expenditure should be allocated to the covered pipeline if the expenditure is shared based on capacity of 109 TJ/day on the covered pipeline against total contracted capacity on the GGP of 200 TJ/day;
- 76 per cent of expenditure should be allocated to the covered pipeline if the expenditure is shared and costs are based on field services costs supplied by GGT; and
- 75 per cent of expenditure should be allocated to the covered pipeline if the expenditure is shared and costs are based on a 3:1 ratio.

APA operations

1507. GGT's proposed spending on APA operations is explained in paragraphs 240 to 247. GGT has allocated 100 per cent of APA operating costs provided by APT Pipelines (WA) Pty Ltd to the covered pipeline except for the field services costs, which have a 76 per cent allocation to the covered pipeline.

1508. The Authority accepts EMCa's advice that GGT's proposal to allocate 76 per cent or 32 FTE (Full Time Equivalent) field services to the covered portion of the pipeline is reasonable.

1509. The Authority's technical consultant EMCa considers that GGT's proposal to allocate administration costs and engineering costs 100 per cent to the covered pipeline is not consistent with rule 93(2) of the NGR. EMCa consider it is reasonable that all customers of the GGP who utilise the transportation services provided by GGP should be allocated a proportion of the costs of providing the transportation service that they receive. EMCa considers that the administration and engineering costs are not avoided simply because the provision of supply to certain customers also required additional assets to be built.

1510. EMCa concludes the administration costs could be considered to relate to the capacity of the customer and are largely independent of the length over which the gas is transported. EMCa recommends that administration costs should be allocated based on capacity of 109 TJ/day on the covered pipeline against total contracted capacity on the GGP of 200 TJ/day.[659] This results in a ratio of 54.5 per cent allocated to the covered pipeline.

1511. EMCa recommends that engineering costs should be allocated based on the ratio of field service costs. This results in a ratio of 76 per cent allocated to the covered pipeline.

1512. The Authority considers that GGT's proposed cost allocation for APA operations expenditure is not in accordance with rule 93(2) of the NGR. The Authority has reviewed EMCa's recommendation to allocate administration costs based on capacity and to allocate engineering costs in line with the field service costs. The Authority accepts EMCa's recommendation and has decided that $49.237 million of GGT's forecast APA operations expenditure for the third access arrangement period

[659] Energy Market Consulting associates, *Final Report*, December 2014, p. 81.

should be allocated to reference services under rule 93(2)(c) of the NGR to ensure compliance with the NGO and RPP. Table 74 shows the Authority's cost allocation adjustment.

Table 74 Authority Approved APA Operations Expenditure Forecast (AA3)

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
Authority approved APA Operations under rules 91 and 74 of the NGR	**10.027**	**10.430**	**10.823**	**10.391**	**10.083**	**51.753**
Administration and business services (contracted capacity allocation 45.5%)	(0.153)	(0.153)	(0.153)	(0.153)	(0.153)	(0.767)
Engineering (field services allocation 24%)	(0.350)	(0.350)	(0.350)	(0.350)	(0.350)	(1.749)
Total reductions	(0.503)	(0.503)	(0.503)	(0.503)	(0.503)	(2.516)
Authority adjusted APA Operations under rule 93 of the NGR	**9.524**	**9.926**	**10.319**	**9.888**	**9.580**	**49.237**

Source: ERA, GGP Tariff Model, December 2015.

GGT Operations

1513. GGT's proposed spending on APA operations is explained in paragraphs 254 to 260.

1514. EMCa considers that GGT's proposal to allocate administration, APA operations recoverable, marketing, public relations and technical regulatory costs 100 per cent to the covered pipeline is not consistent with rule 93(2) of the NGR. As stated in paragraph 1509, EMCa considers it is reasonable that all customers of the GGP who utilise the transportation services provided by GGP should be allocated a proportion of the costs of providing the transportation service that they receive.

1515. As with the APA operations costs, EMCa concludes that administration, APA operations recoverable, marketing, public relations and technical regulatory costs could be considered to relate to the capacity of the customer and are largely independent of the length over which the gas is transported. EMCa recommends that these costs should be allocated based on contracted capacity on the GGP. This results in a ratio of 54.5 per cent allocated to the covered pipeline.

1516. EMCa recognised that the covered pipeline involves the significant costs relating to an access arrangement review and therefore recommends that technical regulatory expenditure should be allocated on a ratio of 3:1, with a 75 per cent allocation to the covered pipeline.

1517. The Authority considers that GGT's proposed cost allocation for GGT operations expenditure does not satisfy rule 93(2) of the NGR. The Authority accepts EMCa's

recommendation and has decided that $15.366 million of GGT's forecast APA operations expenditure for the third access arrangement period should be allocated to reference services under rule 93(2)(c) of the NGR to ensure compliance with the NGO and RPP. Table 75 shows the Authority's cost allocation adjustment.

Table 75 Authority Approved GGT Operations Expenditure Forecast (AA3)

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
Authority approved GGT Operations under rules 91 and 74 of the NGR	**3.354**	**3.354**	**3.354**	**3.354**	**3.354**	**16.770**
Administration (contracted capacity allocation 45.5%)	(0.724)	(0.724)	(0.724)	(0.724)	(0.724)	(3.618)
APA operations recoverable (contracted capacity allocation 45.5%)	0.449	0.449	0.449	0.449	0.449	2.245
Marketing (contracted capacity allocation 45.5%)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.026)
Public relations (contracted capacity allocation 45.5%)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Technical regulatory (contracted capacity allocation 45.5%)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Total reductions	(0.281)	(0.281)	(0.281)	(0.281)	(0.281)	(1.404)
Authority adjusted GGT Operations under rule 93 of the NGR	**3.073**	**3.073**	**3.073**	**3.073**	**3.073**	**15.366**

Source: ERA, GGP Tariff Model, December 2015.

APA Commercial Operations

1518. GGT's proposed spending on APA commercial operations is explained in paragraphs 268 to 275.

1519. EMCa considers that GGT's proposal to allocate administration, legal, marketing, public relations, GGT Regulatory costs and communications equipment lease & maintenance costs 100 per cent to the covered pipeline is not consistent with rule 93(2) of the NGR. As stated in paragraph 1509, EMCa considers it is reasonable that all customers of the GGP who utilise the transportation services provided by GGP should be allocated a proportion of the costs of providing the transportation service that they receive.

1520. EMCa considers that the costs are not avoided simply because the provision of supply to certain customers also required additional assets to be built. EMCa concludes the administration, legal, marketing, public relations, GGT Regulatory costs and communications equipment lease & maintenance costs administration

costs could be considered to relate to the capacity of the customer and are largely independent of the length over which the gas is transported. EMCa recommends that these costs should be allocated based on capacity of 109 TJ/day on the covered pipeline against total contracted capacity on the GGP of 200 TJ/day. This results in a ratio of 54.5 per cent allocated to the covered pipeline. EMCa recognised that the covered pipeline involves the significant costs relating to an access arrangement review and therefore recommends that GGT regulatory costs should be allocated on a ratio of 3:1, with a 75 per cent allocation to the covered pipeline.

1521. The Authority considers that GGT's proposed cost allocation for APA operations expenditure is not in accordance with rule 93(2) of the NGR. The Authority has reviewed EMCa's recommendations to allocate administration, legal, marketing, public relations, GGT Regulatory costs and communications equipment lease & maintenance costs administration costs. The Authority accepts EMCa's recommendation and has decided that $9.536 million of GGT's forecast APA commercial operations expenditure for the third access arrangement period should be allocated to reference services under rule 93(2)(c) of the NGR to ensure compliance with the NGO and RPP. Table 76 shows the Authority's cost allocation adjustment.

Table 76 Authority Approved APA Commercial Operations Expenditure Forecast (AA3)

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
Authority approved APA Operations under rules 91 and 74 of the NGR	**3.422**	**2.598**	**2.367**	**2.579**	**3.358**	**14.324**
Administration (contracted capacity allocation 45.5%)	(0.165)	(0.165)	(0.165)	(0.165)	(0.165)	(0.827)
Legal (contracted capacity allocation 45.5%)	(0.101)	(0.101)	(0.101)	(0.101)	(0.101)	(0.507)
Marketing reduction (contracted capacity allocation 45.5%)	(0.171)	(0.171)	(0.171)	(0.171)	(0.171)	(0.857)
Public relations (contracted capacity allocation 45.5%)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.010)
GGT Regulatory costs reductions (3:1 allocation of 25%)	(0.284)	(0.132)	(0.077)	(0.132)	(0.329)	(0.955)
Communications equipment lease & maintenance (contracted capacity allocation 45.5%)	(0.099)	(0.099)	(0.099)	(0.099)	(0.099)	(0.496)
Insurance (contracted capacity allocation 45.5%)	(0.227)	(0.227)	(0.227)	(0.227)	(0.227)	(1.137)
Total reductions	(1.051)	(0.899)	(0.844)	(0.899)	(1.096)	(4.788)
Authority adjusted APA Commercial Operations under rule 93 of the NGR	**2.371**	**1.700**	**1.523**	**1.680**	**2.262**	**9.536**

Source: ERA, GGP Tariff Model, December 2015.

Corporate Costs

1522. GGT's proposed spending on corporate costs is explained in paragraphs 286 to 293.

1523. EMCa considers that GGT's proposed allocation of corporate costs based on relative contracted capacity-distance relationship (in TJ.km/day) which results in a 69.2 per cent allocation to users of the covered pipeline does not satisfy rule 93(2) of the NGR. EMCa concludes that corporate costs could be considered to relate to the capacity of the pipeline. This results in a ratio of 54.5 per cent allocated to the covered pipeline.

1524. The Authority considers that GGT's proposed cost allocation for corporate costs expenditure is not in accordance with rule 93(2) of the NGR. The Authority has accepted EMCa's recommendation to allocate corporate costs based on capacity and has decided that $16.492 million per year of GGT's forecast for the third access arrangement period should be allocated to reference services and under rule 93(2)(c) of the NGR to ensure compliance with the NGO and RPP as shown in Table 77.

Table 77 Authority Approved Corporate Cost Forecast (AA3)

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
Authority approved Corporate Costs under rules 91 and 74 of the NGR	**4.237**	**4.237**	**4.237**	**4.237**	**4.237**	**21.183**
(Adjustment for uncovered pipeline 15.5% (45.5% - 30%)	(0.938)	(0.938)	(0.938)	(0.938)	(0.938)	(4.691)
Authority adjusted Corporate costs under rule 93 of the NGR	**3.298**	**3.298**	**3.298**	**3.298**	**3.298**	**16.492**

Source: ERA, GGP Tariff Model, December 2015.

1525. The Authority does not approve GGT's proposed operating expenditure for the third access arrangement period as submitted and does not approve GGT's proposed allocation of operating expenditure across covered and uncovered pipeline. Table 78 shows the Authority's required amendments for the third access arrangement period under rule 93 of the NGR.

Table 78 Authority's reduction of Operating Expenditure (AA3) for cost allocation under rule 93 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
Authority Approved operating expenditure under rules 91 and 74 of the NGR	**21.040**	**20.619**	**20.780**	**20.561**	**21.031**	**104.031**
APA Operations	(0.503)	(0.503)	(0.503)	(0.503)	(0.503)	(2.516)
GGT Operations	(0.281)	(0.281)	(0.281)	(0.281)	(0.281)	(1.404)
APA Commercial Operations	(1.051)	(0.899)	(0.844)	(0.899)	(1.096)	(4.788)
Corporate Costs	(0.938)	(0.938)	(0.938)	(0.938)	(0.938)	(4.691)
Total Reduction	(2.773)	(2.621)	(2.566)	(2.621)	(2.818)	(13.400)
Authority adjusted operating expenditure under rule 93 of the NGR	**21.040**	**20.619**	**20.780**	**20.561**	**21.031**	**104.031**

Source: ERA, GGP Tariff Model, December 2015.

1526. Table 79 summarises the Authority's approved operating expenditure by model category for the third access arrangement period in real dollars.

Table 79 Authority Approved Operating Expenditure Forecast by Model Category (AA3)

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	Total
Pipeline operations	10.776	11.177	11.570	11.139	10.831	55.493
Commercial operations	2.468	2.468	2.468	2.468	2.468	12.341
Regulatory Costs	1.450	0.778	0.602	0.759	1.341	4.930
Insurance	0.275	0.275	0.275	0.275	0.275	1.375
Corporate Overheads	3.298	3.298	3.298	3.298	3.298	16.492
Total Operating Expenditure	**18.268**	**17.998**	**18.214**	**17.939**	**18.213**	**90.631**

Source: ERA, GGP Tariff Model, December 2015.

1527. Table 80 summarises the Authority's approved operating expenditure by model category for the third access arrangement period in Nominal dollars.

Table 80 Authority Approved Operating Expenditure Forecast by Model Category (AA3)

Nominal $ million	2015	2016	2017	2018	2019	Total
Pipeline operations	11.189	11.827	12.475	12.238	12.125	59.854
Commercial operations	2.563	2.612	2.661	2.712	2.763	13.311
Regulatory Costs	1.506	0.824	0.649	0.834	1.501	5.313
Insurance	0.286	0.291	0.297	0.302	0.308	1.483
Corporate Overheads	3.425	3.490	3.556	3.624	3.693	17.788
Total Operating Expenditure	**18.968**	**19.043**	**19.638**	**19.709**	**20.391**	**97.749**

Source: ERA, GGP Tariff Model, December 2015.

Return on and Return of Assets for the Third Access Arrangement Period

1528. The Authority has separately considered the joint capital costs incurred by GGT over the previous access arrangement periods in order to calculate the return on and return of assets to be recovered from users of reference services for the third access arrangement period.

Opening Capital for Initial Capital Base and First Access Arrangement Period

1529. The Authority has determined that joint opening capital costs for the Initial Capital Base (**ICB**) and joint capital costs incurred during the first access arrangement period (**AA1**) should be allocated to covered services according to the proportions set out in Table 81, which are based upon the covered to total pipeline capacity of the GGP.

Table 81 Allocation Proportion of Joint Costs (ICB and AA1)

Asset Category	Allocation Proportion for Covered Services
Pipeline and laterals	109TJ/200TJ
Main line valve and scraper station	109TJ/200TJ
Compressor stations	No allocation
Receipt and delivery point facilities	109TJ/200TJ
SCADA and communications	109TJ/200TJ
Cathodic protection	109TJ/200TJ
Maintenance bases and depots	109TJ/200TJ
Other assets	109TJ/200TJ
Non-depreciable	109TJ/200TJ

1530. Table 82 shows the allocated joint capital costs for the ICB and allocated joint capital costs for the first access arrangement period, according to the proportions set out in Table 81. The Authority has determined that the allocated opening value of $227.121 million as at 1 January 2015 should be used in order to calculate the return on and return of assets to be recovered from users of reference services for the third access arrangement period.

Table 82 Authority's Adjustment for Allocation to Covered Services for ICB and AA1

Nominal $ million	2015
Closing Value 31 December 2014	394.384
Allocation to uncovered services	169.003
Opening Value 1 January 2015 – allocated to covered services	227.121

Source: ERA, GGP Tariff Model, December 2015.

Opening Capital for the Second Access Arrangement Period

Application of cost allocation methodology

1531. The Authority has determined that a number of GGT's proposed capital expenditure items are not directly attributable to reference services and, hence, should be jointly allocated to both covered and uncovered services under rule 93(2)(c) of the NGR to ensure compliance with the NGO and RPP. Directly attributable costs for capital expenditure are fully allocated to covered services.

1532. The Authority has received advice from its technical consultant EMCa on proposed conforming capital expenditure for the second access arrangement period and the proportion it considers should be allocated to the covered pipeline.

1533. The Authority has decided to allocate GGT's proposed conforming capital expenditure for the second access arrangement across the covered pipeline and uncovered assets in line with EMCa's recommended approach. If expenditure is directed towards both covered pipeline and other GGP assets, allocate justifiable proportion of the expenditure to the covered pipeline as follows:

- For expenditure directed to assets at compressor stations, apportion in accordance with the ratio of covered compressor assets to other compressor assets at the designated station; and
- For expenditure directed to assets that could be used in relation to the covered pipeline or other GGP assets, apportion 80 per cent of the expenditure to the covered pipeline (in line with the TJ/km ratio).

Compressor stations

1534. EMCa considers that GGT has not correctly apportioned the proposed capital expenditure across the covered pipeline and uncovered GGP assets for the following projects: purchase of a borescope, Yarraloola replacement ESD, fire and gas systems, Yarraloola lightning protection upgrade, Yarraloola hazardous area compliance, GGP hazardous area upgrade, Yarraloola hazardous area reclassification, Yarraloola capital spares, and Yarraloola spare parts storage. EMCa considers that an appropriate apportionment of expenditure to the covered pipeline would be 80 per cent for the purchase of borescope, based on the TJ/km ratio of the covered pipeline to uncovered GGP assets. This is because EMCa considers that this capital expenditure is shared across GGT. On the other hand, EMCa considers that an appropriate apportionment for the listed Yarraloola project expenditure to the covered pipeline would be 67 per cent. This percentage is based on the asset ratio at Yarraloola of covered pipeline assets to uncovered GGP assets.

1535. The Authority agrees with EMCa that proposed capital expenditure on compressor stations that is shared by both the covered pipeline and uncovered GGP assets should be apportioned across the two in accordance with rule 93(2) of the NGR. Therefore, the Authority considers that $1.703 million of compressor station capital expenditure during the second access arrangement period should be allocated to reference services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1536. Table 83 breaks down the Authority's capital expenditure for rule 79 of the NGR on compressor stations and the Authority's required adjustments as per rule 93(2) of the NGR by project.

Table 83 Authority Adjusted Capital Expenditure on Compressor Stations (AA2) per rule 93 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Compressor Stations - rules 74 and 79 of the NGR	**0.466**	**0.050**	**0.194**	**0.554**	**0.882**	**2.145**
Purchase of borescope	-	(0.010)	-	-	-	(0.010)
Yarraloola replacement ESD, fire and gas systems	-	-	-	(0.054)	(0.112)	(0.166)
Yarraloola lightning protection upgrade	-	-	-	-	(0.004)	(0.004)
Yarraloola hazardous area compliance	(0.021)	-	-	-	-	(0.021)
GGP hazardous area upgrade	-	-	(0.072)	(0.029)	-	(0.101)
Yarraloola hazardous area reclassification	-	-	-	(0.004)	(0.087)	(0.091)
Yarraloola capital spares	(0.042)	-	-	-	-	(0.042)
Yarraloola spare parts storage	(0.006)	-	-	-	-	(0.006)
Compressor stations – adjusted following rule 93 of the NGR	**0.397**	**0.040**	**0.122**	**0.466**	**0.679**	**1.703**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 3, p. 6 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

SCADA and communications

1537. EMCa considers that GGT has incorrectly apportioned expenditure on each of the five projects to the covered pipeline. EMCa considers that an appropriate apportionment of expenditure to the covered pipeline would be 80 per cent for GGP satellite communications upgrade and GGP UPS upgrade, based on the TJ/km ratio of the covered pipeline to uncovered GGP assets. Moreover, EMCa considers that an appropriate apportionment for Yarraloola (Supervisory Control and Data Acquisition (**SCADA**) communications upgrade to the covered pipeline would be 67 per cent. EMCa considers that an appropriate apportionment for Paraburdoo SCADA communications upgrade would be 33 per cent. EMCa has based the proportions on the respective ratios of covered pipeline assets to uncovered GGP assets at the two compressor stations.

1538. For the Replacement of SCADA of SCADA system master station project, EMCa considers that a proportion of the expenditure does not satisfy rule 93(2) of the NGR. EMCa considers that the expenditure should be allocated across the covered pipeline and uncovered GGP assets based on the ratio of reserved capacity of the covered pipeline to the total GGP pipeline reserve capacity, which was 80 per cent for the second access arrangement period. Thus, EMCa recommends that 20 per cent ($0.398 million) of proposed capital expenditure on the Replacement of SCADA system master station project for the second access arrangement period be allocated to uncovered services.

1539. The Authority agrees with EMCa and considers that $2.045 million of SCADA and communications capital expenditure during the second access arrangement period should be allocated to reference services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1540. Table 84 breaks down the Authority's capital expenditure for rule 79 of the NGR on SCADA and communications and the Authority's required adjustments as per rule 93(2) of the NGR by project.

Table 84 Authority Adjusted Capital Expenditure on SCADA and Communications (AA2) per rule 93 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
SCADA and communications – rules 74 and 79 of the NGR	**0.197**	**0.383**	**0.747**	**0.473**	**0.841**	**2.640**
GGP satellite communications upgrade	(0.039)	-	-	-	-	(0.039)
Replacement of GGP SCADA system master station	-	(0.077)	(0.149)	(0.066)	(0.105)	(0.398)
GGP UPS Upgrade	-	-	-	(0.014)	-	(0.014)
Yarraloola SCADA communications upgrade	-	-	-	(0.024)	(0.087)	(0.111)
Paraburdoo Clear SCADA	-	-	-	-	(0.033)	(0.033)
SCADA and communications – adjusted following rule 93 of the NGR	**0.157**	**0.306**	**0.598**	**0.369**	**0.615**	**2.045**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 5, p. 20 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Maintenance bases and depots

1541. EMCa considers that GGT has failed to demonstrate that it has correctly apportioned capital expenditure on these projects, which it considers are shared, across the covered pipeline and the uncovered GGP assets.

1542. For the Yarraloola accommodation project, EMCa considers that a proportion of the expenditure does not satisfy rule 93(2) of the NGR. EMCa considers that the expenditure should be allocated across the covered pipeline and uncovered GGP assets based on the ratio of reserved capacity of the covered pipeline to the total GGP pipeline reserve capacity, which was 80 per cent for the second access arrangement period. Thus, EMCa recommends that 20 per cent ($0.264 million) of proposed capital expenditure on the Yarraloola accommodation project for the second access arrangement period be allocated to uncovered services.

1543. Additionally, EMCa considers that a proportion of the expenditure on the Karratha maintenance base repairs, Karratha spare parts storage and Accommodation units (Paraburdoo and Leinster) does not satisfy rule 93(2) of the NGR. EMCa considers that a proportion of the expenditure on these projects should be allocated across the covered pipeline and uncovered GGP assets. EMCa recommends that $0.037 million of proposed capital expenditure across these three projects for the second access arrangement period be allocated to uncovered services.

1544. The Authority agrees with EMCa and considers that $1.204 million of maintenance bases and depots capital expenditure during the second access arrangement period should be allocated to reference services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1545. Table 85 breaks down the Authority's capital expenditure for rule 79 of the NGR on maintenance bases and depots and the Authority's required adjustments as per rule 93(2) of the NGR by project.

Table 85 Authority Adjusted Capital Expenditure on Maintenance Bases and Depots (AA2) per rule 93 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Maintenance bases and depots – rules 74 and 79 of the NGR	**0.096**	**0.000**	**0.000**	**1.320**	**0.089**	**1.505**
Karratha maintenance base repairs	-	-	-	-	(0.003)	(0.003)
Karratha spare parts storage	(0.003)	-	-	-	-	(0.003)
Yarraloola accommodation	-	-	-	(0.264)	-	(0.264)
Accommodation units (Paraburdoo, Leinster)	(0.016)	-	-	-	(0.015)	(0.031)
Maintenance bases and depots – adjusted following rule 93 of the NGR	**0.077**	**0.000**	**0.000**	**1.056**	**0.071**	**1.204**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 6, p. 24 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Other (depreciable) assets

1546. EMCa considers that GGT has incorrectly apportioned shared capital expenditure under office furniture, IT equipment, the GGP BM85 replacement program, Integrity Data Management Tool (**IDMT**) phase II, Hut LED lighting, and miscellaneous projects across the covered pipeline and uncovered GGP assets.

1547. The Authority agrees with EMCa and considers that $1.325 million of other assets capital expenditure during the second access arrangement period should be allocated to reference services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1548. Table 86 breaks down the Authority's capital expenditure for rule 79 of the NGR on other assets and the Authority's required adjustments as per rule 93(2) of the NGR by project.

Table 86 Authority Adjusted Capital Expenditure on Other Assets (AA2) per rule 93 of the NGR

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Other (depreciable) assets – rules 74 and 79 of the NGR	**(0.002)**	**(0.013)**	**0.000**	**0.488**	**0.903**	**1.376**
Office furniture						
IT equipment	-	-	-	(0.002)	-	(0.002)
GGT BM85 Replacement Program (32119)	-	-	-	(0.004)	-	(0.004)
IDMT Phase II (33266)	-	-	-	(0.028)	-	(0.028)
Hut LED lighting	-	-	-	-	(0.010)	(0.010)
Miscellaneous capital	-	-	-	-	(0.008)	(0.008)
Other (depreciable) assets – adjusted following rule 93 of the NGR	**(0.002)**	**(0.012)**	**0.000**	**0.455**	**0.884**	**1.325**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 7, p. 28 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Summary

1549. For the purposes of calculating the total revenue to be allocated to reference services, the Authority has decided that $6.492 million of capital expenditure should be allocated to covered services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1550. Table 87 breaks down the Authority's approved conforming capital expenditure for the second access arrangement period following the adjustment for rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

Table 87 Rule 93 of the NGR Adjusted Authority Approved Conforming Capital Expenditure (AA2)

Real $ million at 31 December 2013	2010	2011	2012	2013	2014	AA2
Pipeline and laterals	(0.090)	0.000	0.000	0.000	0.000	(0.090)
Main line valve and scraper stations	0.000	0.000	0.000	0.000	0.000	0.000
Compressor stations	0.397	0.040	0.122	0.466	0.679	1.703
Receipt and delivery point facilities	0.000	0.000	0.000	0.136	0.169	0.305
SCADA and communications	0.157	0.306	0.598	0.369	0.615	2.045
Cathodic protection	0.000	0.000	0.000	0.000	0.000	0.000
Maintenance bases and depots	0.077	0.000	0.000	1.056	0.071	1.204
Other (depreciable) assets	(0.002)	(0.012)	0.000	0.455	0.884	1.325
Non-depreciable assets	0.000	0.000	0.000	0.000	0.000	0.000
Authority Approved Conforming Capital Expenditure (AA2) – adjusted following rule 93 of the NGR	**0.539**	**0.334**	**0.720**	**2.482**	**2.418**	**6.492**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 7, p. 28 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Capital Expenditure Adjustment (AA2)

1551. For the purposes of determining the return on and return of assets to be recovered from users of reference services for the third access arrangement period, Table 88 shows the Authority's approved allocated joint costs to covered services and the Authority's approved allocated depreciation for capital expenditure incurred during the second access arrangement period.

Table 88 Net Capital Expenditure Adjustment for AA2

Nominal $ million	2010	2011	2012	2013	2014
Opening value	**0.000**	**0.498**	**0.226**	**(0.294)**	**0.661**
AA2 Capital expenditure	0.498	0.318	0.701	2.482	2.464
AA2 Depreciation	0.000	(0.591)	(1.220)	(1.528)	(1.731)
Closing value	**0.498**	**0.226**	**(0.294)**	**0.661**	**1.393**

Source: ERA, GGP Tariff Model, December 2015.

Opening Capital Base for the Third Access Arrangement Period

Application of cost allocation methodology

1552. The Authority has determined that a number of GGT's proposed capital expenditure items are not directly attributable to reference services and, hence, should be jointly allocated to covered and uncovered services under rule 93(2)(c) of the NGR to ensure compliance with the NGO and RPP. Directly attributable costs for capital expenditure are fully allocated to the covered services.

1553. The Authority has received advice from its technical consultant EMCa on proposed conforming capital expenditure for the third access arrangement period and the proportion it considers should be allocated to the covered pipeline.

1554. The Authority has decided to allocate GGT's proposed conforming capital expenditure for the third access arrangement across the covered pipeline and uncovered assets in line with EMCA's approach whereby.

- 100 per cent of expenditure is allocated to the covered pipeline if the expenditure is directly attributable only to covered assets; and
- if expenditure is directed towards both covered pipeline and other GGP assets allocate justifiable proportion of the expenditure to the covered pipeline as follows:
  - for expenditure directed to assets at compressor stations, apportion in accordance with the ratio of covered compressor assets to other compressor assets at the designated station; and
  - for expenditure directed to assets that could be used in relation to the covered pipeline or other GGP assets, apportion 70 per cent of the expenditure to the covered pipeline (in line with the TJ/km ratio).

Compressor stations

1555. EMCa considers that GGT has included costs for Unit 2 at Paraburdoo, which is not part of the covered pipeline. EMCa considers that the costs for this entire project does not satisfy rule 93(2) of the NGR. The Authority considers that the costs for the Paraburdoo GEA 2 major overhaul should not be allocated to the covered pipeline as it does not satisfy rule 93(2) of the NGR.

1556. The Authority considers that $1.642 million of compressor stations capital expenditure for the third access arrangement period should be allocated to reference services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1557. Table 89 breaks down the Authority's capital expenditure for rule 79 of the NGR on compressor stations and the Authority's required amendments as per rule 93(2) of the NGR by project.

Table 89 Authority Adjusted Capital Expenditure on Compressor Stations (AA3) per rule 93 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Compressor stations – rules 74 and 79 of the NGR	**0.595**	**0.753**	**0.000**	**0.155**	**0.218**	**1.722**
Paraburdoo GEA 2 major overhaul	0.000	(0.080)	0.000	0.000	0.000	(0.080)
Compressor stations – adjusted following rule 93 of the NGR	**0.595**	**0.673**	**0.000**	**0.155**	**0.218**	**1.642**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Maintenance bases and depots

1558. EMCa considers that the expenditure for the Karratha maintenance base rebuild has not been appropriately allocated between covered and uncovered assets. EMCa considers that 30 per cent of the costs on this project should be allocated to uncovered assets.

1559. The Authority agrees with EMCa that GGT has not appropriately allocated costs across the covered and uncovered assets for the maintenance bases and depots. The Authority considers that $0.343 million of maintenance bases and depots capital expenditure for the third access arrangement period should be allocated to reference services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1560. Table 90 breaks down the Authority's capital expenditure for rule 74 of the NGR on maintenance bases and depots and the Authority's required amendments as per rule 93(2) of the NGR by project.

Table 90 Authority Adjusted Capital Expenditure on Maintenance Bases and Depots (AA3) per rule 93 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Maintenance bases and depots – rules 74 and 79 of the NGR	**0.496**	**0.000**	**0.000**	**0.000**	**0.000**	**0.496**
Karratha maintenance base rebuild	(0.153)	0.000	0.000	0.000	0.000	(0.153)
Maintenance bases and depots – adjusted following rule 93 of the NGR	**0.343**	**0.000**	**0.000**	**0.000**	**0.000**	**0.343**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Other (depreciable) assets

1561. EMCa considers that the expenditure for the minor capital items project under other assets has not been appropriately allocated between covered and uncovered assets. EMCa considers that 30 per cent of the costs on this project should be allocated to uncovered assets.

1562. The Authority agrees with EMCa that GGT has not appropriately allocated costs across the covered and uncovered assets for other assets. The Authority considers that $0.597 million of other assets should be allocated to reference services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1563. Table 91 breaks down the Authority's capital expenditure for rules 74 and 79 of the NGR on other assets and the Authority's required amendments as per rule 93(2) of the NGR.

Table 91 Authority Adjusted Capital Expenditure on Other assets (AA3) per rule 93 of the NGR

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Other assets – rules 74 and 79 of the NGR	**0.460**	**0.077**	**0.049**	**0.034**	**0.034**	**0.655**
Minor capital items	(0.011)	(0.011)	(0.015)	(0.011)	(0.011)	(0.058)
Other assets – adjusted following rule 93 of the NGR	**0.450**	**0.067**	**0.034**	**0.024**	**0.024**	**0.597**

Source: GGT, AA3 Capital Expenditure Model, Email Response to EMCa05, and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Summary

1564. For the purposes of calculating the total revenue to be allocated to reference services, the Authority has decided that $8.789 million of joint costs should be allocated to covered services under rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

1565. Table 92 breaks down the Authority's approved conforming capital expenditure for the third access arrangement period following the adjustment for rule 93(2) of the NGR to ensure compliance with the NGO and RPP.

Table 92 Rule 93 of the NGR Adjusted Authority Approved Conforming Capital Expenditure (AA3)

Real $ million at 31 December 2013	2015	2016	2017	2018	2019	AA3
Pipeline and laterals	2.554	1.464	0.085	0.000	0.085	4.188
Main line valve and scraper station	0.000	0.513	0.000	0.000	0.000	0.513
Compressor stations	0.595	0.673	0.000	0.155	0.218	1.641
Receipt and delivery point facilities	0.230	0.000	0.417	0.000	0.000	0.647
SCADA and communications	0.330	0.349	0.125	0.028	0.028	0.860
Cathodic protection	0.000	0.000	0.000	0.000	0.000	0.000
Maintenance bases and depots	0.343	0.000	0.000	0.000	0.000	0.343
Other assets	0.450	0.067	0.034	0.024	0.024	0.597
Authority Approved Conforming Capital Expenditure (AA3) – adjusted following rule 93 of the NGR	**4.502**	**3.066**	**0.661**	**0.207**	**0.355**	**8.789**

Source: GGT, Access Arrangement Revision Proposal, Supporting Information: Attachment 5, Conforming Capital Expenditure 2010-2014, Table 7, p. 28 and EMCa, GGT's Proposed Revised Access Arrangement for GGP: Review of Technical Aspects of the Proposed Access Arrangement, Table 8, p. 35.

Return on and Return of Assets for the Third Access Arrangement Period

1566. For the purposes of determining the return on and return of assets to be recovered from users of reference services for the third access arrangement period, Table 93 rolls forward the capital value at the start of the forthcoming access arrangement period allocating the joint costs of capital expenditure during the third access arrangement period and the depreciation of the allocated capital value.

Table 93 Capital Value Allocated to Covered Pipeline (AA3)

Nominal $ million	2015	2016	2017	2018	2019
Opening Capital Value (start of period)	**228.514**	**230.607**	**227.220**	**220.954**	**213.864**
Inflation	4.342	4.382	4.317	4.198	4.063
Opening Capital Value (end of period)	232.856	234.989	231.537	225.153	217.927
Plus: Capital Expenditure	4.674	3.244	0.713	0.227	0.397
Less: Straight line CCA Depreciation	(6.923)	(11.012)	(11.295)	(11.516)	(11.660)
Authority Approved Closing Capital Value	**230.607**	**227.220**	**220.954**	**213.864**	**206.664**

Source: ERA, GGP Tariff Model, December 2015.

1567. Table 94 sets out the Authority's approved depreciation for the third access arrangement following the adjustments required under rule 93(2) of the NGR by asset class.

Table 94 Rule 93 of the NGR Adjusted Authority Approved Depreciation (AA3)

Nominal $ million	2015	2016	2017	2018	2019
Pipeline and laterals	6.851	7.106	7.264	7.403	7.544
Main line valve and scraper stations	0.205	0.214	0.230	0.234	0.238
Compressor stations	2.315	2.786	2.863	2.918	2.979
Receipt and delivery point facilities	0.078	0.110	0.112	0.130	0.132
SCADA and communications	(0.067)	0.268	0.296	0.305	0.247
Cathodic protection	(0.577)	0.067	0.069	0.070	0.071
Maintenance bases and depots	0.202	0.216	0.220	0.224	0.228
Other assets	(2.084)	0.244	0.243	0.234	0.222
Authority Approved Depreciation (AA3) – adjusted following rule 93 of the NGR	**6.923**	**11.012**	**11.295**	**11.516**	**11.660**

Source: ERA, GGP Tariff Model, December 2015.

Return on Closing Asset Value

1568. Table 95 sets out the Authority's approved return on asset for the third access arrangement, following the necessary adjustments under rule 93(2) of the NGR to the ICB and capital expenditure for the first, second and third access arrangement period.

Table 95 Return on Asset for the Third Access Arrangement Period (AA3)

Nominal $ million	2015	2016	2017	2018	2019
Return on Opening Asset Value (multiplied by WACC)	**14.444**	**14.577**	**14.363**	**13.967**	**13.518**

Source: ERA, GGP Tariff Model, December 2015.

Taxation

1569. The Authority determined the forecast estimated cost of corporate income tax as $4.806 million in Table 71.

1570. The Authority calculated taxable income as assessable income less tax deductible costs that are recognised by the ATO, as follows:

- Smoothed tariff revenue.
- *minus* Approved forecast operating expenditure.
- *minus* Depreciation of the TAB.
- *minus* Cost of debt financing,
- *equals* Estimated taxable income.

1571. Table 96 shows the Authority's approved calculation of estimated cost of taxable income under rule 93 of the NGR.

Table 96 Authority Approved Calculation of Estimated Cost of Corporate Income Tax (AA3)

Nominal $ million	2015	2016	2017	2018	2019	Total
Revenue						
Tariff Revenue (smoothed)	70.747	51.831	25.655	25.655	25.655	199.544
Expenses						
Operating Expenditure	(18.968)	(19.043)	(19.638)	(19.709)	(20.391)	(97.749)
Debt Servicing Costs	(7.091)	(7.156)	(7.051)	(6.857)	(6.636)	(34.791)
Tax Depreciation	(15.509)	(15.758)	(3.858)	(2.903)	(2.789)	(40.818)
Taxable Income	29.178	9.874	-	-	-	39.053
Estimated Cost of Taxable Income (30 per cent of taxable income)	**8.754**	**2.962**	-	-	-	**11.716**

Source: ERA, GGP Tariff Model, December 2015.

1572. Under rule 93(2) of the NGR the Authority determined that smoothed tariff revenue is $199.544 million as shown in Table 1. The Authority determined smoothed tariff revenue based on the total revenue allocated to the covered pipeline under rule 93(2) as shown in Table 99.

1573. The Authority's approved operating expenditure that should be allocated to the covered pipeline is $97.749 million as shown in Table 80. The Authority's determination for the amount of operating expenditure that should be allocated to the covered pipeline under rule 93(2) is set out in paragraphs 1489 to 1512.

1574. The Authority has determined that $34.791 million for the cost of debt financing should be allocated to the covered pipeline under rule 93(2) of the NGR. The Authority set out its methodology for calculating the cost of debt financing in paragraphs 1342 to 1347. The Authority determined its cost of debt financing based on the opening capital value for the covered pipeline under rule 93 of the NGR as shown in Table 93.

1575. The Authority determined that $40.818 million for tax depreciation should be allocated to the covered pipeline under rule 93(2) of the NGR. The Authority set out its tax depreciation methodology in paragraphs 1303 to 1341. The Authority determined its tax depreciation based on the opening capital base for the TAB for the covered pipeline under rule 93 of the NGR as shown in Table 98.

1576. Table 97 shows the Authority's estimated cost of corporate income tax for the third access arrangement period.

Table 97 Authority Approved Estimated Cost of Corporate Income Tax (AA3)

Nominal $ million	2015	2016	2017	2018	2019	Total
Estimated Cost of Taxable Income	8.754	2.962	-	-	-	11.716
Value of Imputation Credits	(3.501)	(1.185)	-	-	-	(4.686)
Authority Approved Estimated Cost of Corporate Income Tax Net of Imputation Credits	**5.252**	**1.777**	**-**	**-**	**-**	**7.029**

Source: ERA, GGP Tariff Model, December 2015.

1577. As stated in paragraph 1353 of the Taxation chapter of this Draft Decision the Authority has approved a value of 0.4 for gamma. Therefore, the Authority determines that $4.686 million for imputation credits should be deducted from the estimated cost of taxable income as shown in Table 97.

1578. Table 98 shows the Authority's TAB by year over the third access arrangement period which was used to calculate tax depreciation.

Table 98 Authority Approved Estimated Closing Tax Asset Base (AA3)

Nominal $ million	2015	2016	2017	2018	2019
Opening Tax Asset Base	48.055	37.219	24.705	21.560	18.883
Authority Forecast Capital Expenditure	4.674	3.244	0.713	0.227	0.397
Authority Forecast Tax Depreciation	(15.509)	(15.758)	(3.858)	(2.903)	(2.789)
Authority Approved Estimated Closing Tax Asset Base	**37.219**	**24.705**	**21.560**	**18.883**	**16.491**

Source: ERA, GGP Tariff Model, December 2015.

Required Amendments

1579. The Authority requires GGT to amend its total revenue allocated to reference services to be consistent with Table 99.

Table 99 Total Revenue Allocated to Reference Services

Nominal $ million	2015	2016	2017	2018	2019
Forecast Operating Expenditure	18.968	19.043	19.638	19.709	20.391
Return on Projected Capital Base	14.444	14.577	14.363	13.967	13.518
Regulatory Depreciation					
Depreciation	6.923	11.012	11.295	11.516	11.660
Inflationary Gain	(4.342)	(4.382)	(4.317)	(4.198)	(4.063)
Estimate Cost of Corporate Income Tax					
Corporate Income Tax	8.754	2.962	0.000	0.000	0.000
Imputation Credits	(3.501)	(1.185)	0.000	0.000	0.000
Authority Approved Total Revenue Allocated to Reference Services	**41.246**	**42.028**	**40.979**	**40.994**	**41.506**

Source: ERA, GGP Tariff Model, December 2015.

Required Amendment 13

The total revenue to be allocated for the calculation of reference tariffs for the third access arrangement period must be amended to reflect Table 99 of this Draft Decision.

Reference Tariffs

Regulatory requirements

1580. Rule 92 of the NGR sets out the requirements for the equalisation of revenues from tariffs charged with calculated tariff revenue.

92. Revenue equalisation

(1) A full access arrangement must include a mechanism (*a reference tariff variation mechanism*) for variation of a reference tariff over the course of an *access arrangement period*.

(2) The *reference tariff variation mechanism* must be designed to equalise (in terms of present values):

(a) forecast revenue from reference services over the *access arrangement period*; and

(b) the portion of total revenue allocated to reference services for the *access arrangement period*.

(3) However, if there is an interval (the **interval of delay**) between a revision commencement date stated in a full access arrangement and the date on which revisions to the access arrangement actually commence:

(a) reference tariffs, as in force at the end of the previous *access arrangement period*, continue without variation for the interval of delay; but

(b) the operation of this subrule may be taken into account in fixing reference tariffs for the new *access arrangement period*.

1581. Rule 95 of the NGR sets out the requirements for the determination of reference tariffs for transmission pipelines. Rule 95 also determines how total revenue is apportioned to reference services and to particular users or class of users.

95. Tariffs – transmission pipelines

(1) A tariff for a reference service provided by means of a transmission pipeline must be designed:

(a) to generate from the provision of each reference service the portion of total revenue referable to that reference service; and

(b) as far as is practicable consistently with paragraph (a), to generate from the user, or the class of users, to which the reference service is provided, the portion of total revenue referable to providing the reference service to the particular user or class of users.

(2) The portion of total revenue referable to a particular reference service is determined as follows:

(a) costs directly attributable to each reference service are to be allocated to that service; and

(b) other costs attributable to reference services are to be allocated between them on a basis (which must be consistent with the revenue and pricing principles) determined or approved by the [Authority].

(3) The portion of total revenue referable to providing a reference service to a particular user or class of users is determined as follows:

(a) costs directly attributable to supplying the user or class of users are to be allocated to the relevant user or class; and

(b) other costs are to be allocated between the user or class of users and other users or classes of users on a basis (which must be consistent with the revenue and pricing principles) determined or approved by the [Authority].

(4) The [Authority's] discretion under this rule is limited.

GGT's Proposed Revisions

Reference Service Tariff and Charges

1582. Section 4.1 of GGT's proposed revised access arrangement sets out the description of the reference service tariff charges and components. This corresponds to clauses 9.1, 9.2 and 9.4 of the current General Terms and Conditions:

- Toll Charge
- Capacity Reservation Charge
- Throughput Charge

1583. Section 4.2 of GGT's proposed revised access arrangement sets out the other charges that users may be required to pay:

- Overrun Charges
- Imbalance Charge

- Daily Variation Charges
- Charges in respect of Connection and Delivery Points:
  - Connection Charge
  - Additional Delivery Points during Term of Transportation Agreement

1584. Section 4.2 of the proposed revised access arrangement consists of the relocated clause 9.5 (Other Charges) of the current General Terms and Conditions and a revised and replaced clause 9.6 (Quantity Variation Charges). GGT notes that the current quantity variation charges have been replaced by the imbalance and overrun charges as described in section 4.2 of the proposed revised access arrangement.

1585. Section 4.3 of the proposed revised access arrangement sets out how the Capacity Reservation Charge and Throughput Charge are to be calculated where a user has more than one delivery point. Section 4.3 of the proposed revised access arrangement replaces and revises clause 9.7 of the current General Terms and Conditions.

1586. Section 4.4 of the proposed revised access arrangement sets the basis of charges. GGT has deleted clause 9.3 of the current General Terms and Conditions and has partially replaced it with a revised section 4.4 in the proposed revised access arrangement.

1587. Section 4.6 of the proposed revised access arrangement sets out what reference tariff is to apply should the revision commencement date for the fourth access arrangement date be later than 1 January 2020. GGT proposes that the tariff in effect at 31 December 2019 continue to apply to the provision of the firm service between 1 January 2020 and the later revision commencement date.[660]

1588. Section 4.7 of the proposed revised access arrangement sets out the manner in which tariffs, charges and amounts payable under the access arrangement are to be expressed, net of GST. Clause 9.11 of the current General Terms and Conditions has been relocated and simplified as section 4.7 of the proposed revised access arrangement.

1589. Section A of Schedule A to the proposed revised access arrangement sets out the details, tariff, rates and allowances for the covered pipeline. Section A replaces and revises some of the items in the Fourth Schedule: Statement of Tariffs and Charges in the current General Terms and Conditions.

1590. Sections A1 and A2 of Schedule A to the proposed revised access arrangement set out the Scheduled Reference Tariff Variation Mechanism. Sections A1 and A2 replace and revise Clause 9.8 of the current General Terms and Conditions and Schedule 1 to the current access arrangement. This is discussed in the Reference Tariff Variation Mechanism chapter of this Draft Decision.

1591. Section A3 of Schedule A to the proposed revised access arrangement sets out how GGT proposes to round amounts paid pursuant to Schedule A and the quantities of gas. Section A3 replaces and revises clause 9.10 of the current General Terms and Conditions.

1592. Section A4 of Schedule A to the proposed revised access arrangement sets out the addition and charges that a user will pay for amounts as a result of any Cost Pass-

[660] Clause 4.5 is discussed in the Reference Tariff Variation Mechanism chapter of this Draft Decision.

through event. Section A4 replaces and revises clause 9.9 of the current General Terms and Conditions.

Reference Tariff Structure and Components

1593. GGT submits that the reference tariffs should be determined using the capacity that a user seeking the firm reference service of the GGT access arrangement may be able to access. GGT states that it has included all of the capacity that it has forecast as becoming available during the third access arrangement period to determine its reference tariff. According to GGT, it has determined its proposed reference tariff by dividing the forecast total revenue by the total volume of the services forecast to be provided using the covered pipeline.[661]

1594. GGT submits that its method for calculating the reference tariff is consistent with rule 93 of the NGR and with the Authority's previous determination. GGT notes that, as it only offers a single reference service, the requirements under rule 95(2) of the NGR to allocate the total revenue across each of a number of such services does not apply.

1595. GGT proposes to retain the three-part reference tariff, which has been in place since the first access arrangement period for the GGP. The three part tariff comprises:

- toll charge (a price per GJ of contracted capacity (MDQ));
- capacity reservation charge (a price per GJ MDQ kilometre); and
- throughput charge (a price for GJ kilometre).

1596. GGT considers that the toll charge and capacity reservation charge are effectively access fees for recovering the fixed costs of the covered pipeline, whereas the throughput charge recovers variable costs.[662] GGT states that by structuring the capacity reservation and throughput charges as distance-related charges, it seeks to make the reference tariff reflective of the costs of the resources used to provide pipeline services to induvial users at different locations along the GGP.

1597. GGT notes that the reference tariffs in the preceding two access arrangement periods were established assuming allocation of the total revenue to the components of the reference tariff in the proportions shown in Table 100. GGT states that it has examined the mix of fixed and variable costs in the total revenue for the forthcoming access arrangement period, and has elected not to change the proportions shown in Table 100.

[661] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, pp 25-29.

[662] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 189.

Table 100 GGT Proposed Allocation of Total Revenue to Reference Tariff Components

Tariff Component	Proportion (%)
Toll Charge	11.3
Capacity Reservation Charge	72.2
Throughput Charge	16.5

Source: Goldfields Gas Transmission Pty Ltd, Access Arrangement Revision Proposal: Supporting Information, 15 August 2014, p. 189.

1598. GGT states that the toll charge of the proposed reference tariff has been calculated as the price during the forthcoming access arrangement period, which sets the value of the forecast revenue from the charge equal to 11.3 per cent of the present value of the total revenue. GGT notes that the discount rate used in calculating the present values of the forecast revenue and the total revenue is the proposed allowed rate of return of 9.64 per cent.

1599. GGT has calculated the capacity reservation charge as the price during the forthcoming access arrangement period, which sets the present value of the forecast revenue from the charge equal to 72.2 per cent of the present value of the total revenue.

1600. GGT has calculated the throughput charge as the price during the forthcoming access arrangement period, which sets the present value of the forecast revenue from the charge (as per GGT's proposed throughput forecast) equal to 16.5 per cent of the present value of the total revenue.

1601. GGT's proposed revised reference tariff for the covered pipeline is shown in Table 101. GGT states that its reference tariff, as presented in Table 101, is to vary over the course of the forthcoming access arrangement period in accordance with its proposed reference tariff mechanism. This is discussed further in the Tariff Variation Mechanism chapter of this Draft Decision.[663]

Table 101 GGT Proposed Revised Reference Tariff (Nominal $)

Tariff Component	Tariff
Toll Charge ($/GJ MDQ)	0.235806
Capacity Reservation Charge ($/GJ MDQ KM)	0.001459
Throughput Charge ($/GJ KM)	0.000442

Source: Goldfields Gas Transmission Pty Ltd Access Arrangement Revision Proposal: Supporting Information, 15 August 2014, p. 190.

Submissions

1602. The Authority has not received any submissions in relation to the structure of GGT's proposed reference tariff. The Authority notes that BHPB and GGT made submissions on the issue of cost allocation. The Authority addresses these in the Allocation of Total Revenue between Reference Services and Other Services chapter of this Draft Decision.

[663] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 190.

Considerations of the Authority

Reference Service Tariff and Charges

1603. The Authority notes that GGT has revised and relocated some clauses relating to the reference tariffs and charges, which were previously included in the general terms and conditions, into the main body of the proposed revised access arrangement.

1604. Table 102 maps out the revised proposed access arrangement clauses for reference tariffs and charges that have been revised and relocated from the current General Terms and Conditions. Section 4.5 of the proposed revised access arrangement and Sections A1 and A2 of Schedule A to the proposed revised access arrangement are discussed in the Reference Tariff Variation Mechanism chapter of this Draft Decision. Clauses 5 and 23 of the proposed revised terms and conditions are discussed in the Terms and Conditions Applying to Firm Services chapter of this Draft Decision.

1605. The Authority accepts GGT's proposal to include terms and conditions for pipeline services in section 4 of the proposed revised access arrangement. However, the Authority does not accept GGT's proposal to remove these terms and conditions from the terms and conditions applying to the reference tariffs and charges in Schedule D of the proposed revised access arrangement. The Authority considers this issue in more detail in the section below on Terms and Conditions Applying to Reference Tariff and Charges.

1606. Notwithstanding the required amendment to reinstate the terms and conditions that GGT has proposed to include in Reference Tariffs and Charges section of the access arrangement, the Authority has assessed these terms and conditions below.

Table 102 Relocated Reference Tariff Clauses

Proposed Revised Access Arrangement Reference/Terms and Conditions	Current General Terms and Conditions/Access Arrangement
4.1 Reference Service Tariff and Charges	9.1 Transportation Tariff and Charges
4.1 Reference Service Tariff and Charges	9.2 Transportation Tariff Components
4.1 Reference Service Tariff and Charges	9.4 Transportation Charges
4.2 Other Charges	9.5 Other Charges
4.2 Other Charges	9.6 Quantity Variation Charges
4.3 Multiple Delivery Points	9.7 Multiple Outlet Points
4.4 Basis of Charges	9.3 Basis of Charges
4.5 Reference Tariff Variation Mechanism	Access Arrangement - Section 5.3 and Schedule 1 Reference Tariff Adjustment Mechanism
4.6 Reference Tariff after 31 December 2019	-
4.7 GST	9.11 Goods and Services Tax
Section A of Schedule A to the proposed revised access arrangement	Fourth Schedule: Statement of Tariffs and Charges
Section A1 of Schedule A to the proposed revised access arrangement	9.8 Tariffs and Charges Adjustment for Inflation
Section A2 of Schedule A to the proposed revised access arrangement	Access Arrangement – Schedule 1 Reference Tariff Adjustment Mechanism
Section A3 of Schedule A to the proposed revised access arrangement	9.10 Rounding
Section A4 of Schedule A to the proposed revised access arrangement	9.9 Change in Imposts
Terms and Conditions Clause 5	9.13 Bond/Deposit
Terms and Conditions Clause 23	9.12 Charges When Flows are Restricted

Source: Goldfields Gas Transmission Pty Ltd, Proposed Revised Access Arrangement, 15 August 2014 Goldfields Gas Transmission Pty Ltd, Proposed Revisions to Access Arrangement – Appendix 3 – General Terms and Conditions, 30 March 2012. Goldfields Gas Transmission Pty Ltd, Proposed Revisions to Access Arrangement, 30 March 2012.

Section 4.1 Reference Service Tariff and Charges

1607. The Authority notes that GGT proposes to relocate reference tariffs and charges from clause 9.1, 9.2 and 9.4 of the current General Terms and Conditions to section 4.1 of the proposed revised access arrangement. The Authority accepts GGT's proposed section as stated in part 2 of Appendix 9 in this Draft Decision. The Authority also requires transportation charges and other charges to also be included in the proposed revised terms and conditions.

Section 4.2 Other Charges

1608. The Authority notes that GGT proposes to relocate other charges and quantity variation charges from clause 9.5 and 9.6 of the current General Terms and Conditions to section 4.2 of the proposed revised access arrangement. The Authority does not accept GGT's proposed section as stated in Appendix 9 of this Draft Decision. The Authority requires that GGT amend section 4.2 in accordance with the Authority's recommendations in Appendix 9 of this Draft Decision. The

Authority requires that other charges in section 4.2 of the proposed revised access arrangement be consistent with the proposed revised terms and conditions.

Section 4.3 Multiple Delivery Points

1609. The Authority notes that GGT proposes to relocate Multiple Outlet Points from clause 9.7 of the current General Terms and Conditions to section 4.3 of the proposed revised access arrangement. The Authority accepts GGT's proposed section as stated in part 2 of Appendix 9 of this Draft Decision. The Authority also requires that multiple delivery points be included in the proposed revised terms and conditions.

Section 4.4 Basis of Charges

1610. The Authority notes that GGT proposes to revise and relocate basis of charges from clause 9.3 of the current General Terms and Conditions to section 4.4 of the proposed revised access arrangement. The Authority does not accept GGT's proposed section as stated in Appendix 9 of this Draft Decision. The Authority requires that GGT amend section 4.4 of the proposed revised access arrangement in accordance with the Authority's recommendations in Appendix 9 of this Draft Decision. The Authority also requires that basis of charges be included in the proposed revised terms and conditions.

Section 4.6 Reference Tariff after 31 December 2019

1611. The Authority notes that GGT proposes to introduce a section that sets out the reference tariff that will apply should the revision commencement date for the fourth access arrangement date be later than 1 January 2020. The Authority does not reject the inclusion of this section. The Authority accepts that the existing tariff in effect at 31 December 2019 should continue to apply to the provision of the firm service between 1 January 2020 and the later revision commencement date. Additionally, the Authority considers that this section is consistent with rule 92(3) of the NGR.

Section 4.7 GST

1612. The Authority notes that GGT proposes to revise and relocate the Goods and Services Tax (**GST**) from clause 9.11 of the current General Terms and Conditions to section 4.7 of the proposed revised access arrangement. The Authority does not accept GGT's proposed section as stated in part 2 of Appendix 9 of this Draft Decision. The Authority requires that GGT amend section 4.7 of the proposed revised access arrangement in accordance with the Authority's recommendations in part 2 of Appendix 9 of this Draft Decision. The Authority requires that the GST in section 4.7 of the proposed revised access arrangement be consistent with the proposed revised terms and conditions.

Section A of Schedule A

1613. The Authority notes that GGT proposes to revise and relocate the Fourth Schedule to the current General Terms and Conditions to Schedule A of the proposed revised access arrangement. As stated below, the Authority does not accept GGT's proposed reference tariff for the fourth access arrangement period. The Authority requires GGT to amend the Toll Tariff, Capacity Reservation Tariff and Throughput Tarff in Section A of Schedule A in line with Table 103 below.

1614. For the reasons stated in Appendix 9 of this Draft Decision, the Authority does not accept the following rates and allowances:

- Authorised Overrun Rate
- Imbalance Rate
- Imbalance Allowance
- Daily Variance Rate
- Daily Variation Allowance

1615. The Authority requires that GGT amend the five rates and allowances in Schedule A to the proposed revised access arrangement in accordance with the Authority's recommendations in Appendix 9 of this Draft Decision.

1616. The Authority requires that all rates, allowances and charges be included in the proposed revised terms and conditions as stated in Appendix 9 of this Draft Decision.

Section A3 of Schedule A

1617. The Authority notes that GGT proposes to revise and relocate rounding from clause 9.10 of the current General Terms and Conditions to section A3 of Schedule A to the proposed revised access arrangement. The Authority accepts GGT's proposed section as stated in part 2 of Appendix 9 in this Draft Decision. The Authority also requires that rounding be included in the proposed revised terms and conditions.

Clause A4 of Schedule A

1618. The Authority notes that GGT proposes to revise and relocate change in imposts from clause 9.9 of the current General Terms and Conditions to section A4 of Schedule A. The Authority accepts GGT's proposed section as stated in part 2 of Appendix 9 in this Draft Decision.

Reference Tariff Structure and Components

1619. The Authority notes that GGT proposes to maintain the three part tariff structure as per the current access arrangement under the Code. Additionally, GGT proposes to also maintain the same proportions of total revenue to the three tariff components. As the Authority has received no submissions in relation to the structure of GGT's proposed reference tariff, the Authority approves GGT's proposal not to revise its tariff structure or proportions.

1620. As a consequence of the various required amendments in this Draft Decision, the Authority does not accept GGT's proposed reference tariff for the forthcoming access arrangement period. Table 103 presents the Authority's approved Draft Decision reference tariffs for the third access arrangement period, based on the various required amendments. GGT must amend its tariffs in line with Table 103.

1621. In calculating the approved reference tariffs for the third access arrangement period, the Authority has had regard to rule 92(3) of the NGR, and notes that there will be an interval (the interval of delay) between the revision commencement date and the date on which revisions to the access arrangement will commence. The Authority notes that, as a result of this interval, the reference tariffs in force at the end of the

second access arrangement period should continue without variation for the interval of the delay. However, in calculating the approved reference tariffs for the third access arrangement period, the Authority has factored this delay and calculated tariffs based on revised prices commencing on 1 July 2016 to ensure that GGT is no better or worse off as a result of the delay. The Authority's approved reference tariffs to begin on 1 July 2016, and to be adjusted in accordance with the approved tariff variation mechanism in the Access Arrangement, are listed in Table 103.

Table 103 Authority Approved Draft Decision Reference Tariff (Nominal $)

Tariff Component	Tariff
Toll Charge ($/GJ MDQ)	0.083075
Capacity Reservation Charge ($/GJ MDQ KM)	0.000446
Throughput Charge ($/GJ KM)	0.000163

Source: ERA, GGP Tariff Model, December 2015.

1622. The Authority's approved reference tariffs above in Table 103 have been designed to generate the total revenue allocated to reference services, consistent with rule 95(1) of the NGR, as demonstrated in Table 104 below.

Table 104 Authority Approved Reference Services Revenue (AA3)

$ million	NPV
Authority Approved Total Revenue Allocated to Reference Services	**172.699**
Authority Approved Reference Services Revenue	**172.699**

Source: ERA, GGP Tariff Model, December 2015.

Required Amendment 14

The Authority requires that GGT amend its Reference Tariffs and Charges section of the proposed revised access arrangement in accordance with paragraphs 1603 to1618

The Authority requires that GGT update its calculation of the reference tariff for the third access arrangement period, as per Table 103 of this Draft Decision.

Reference Tariff Variation Mechanism

Regulatory Requirements

1623. Rules 92 and 97 of the NGR set out requirements for an access arrangement to include a mechanism for variation of reference tariffs during an access arrangement period.

92. Revenue equalisation

(1) A full access arrangement must include a mechanism (*a reference tariff variation mechanism*) for variation of a reference tariff over the course of an *access arrangement period*.

(2) The *reference tariff variation mechanism* must be designed to equalise (in terms of present values):

(a) forecast revenue from reference services over the *access arrangement period*; and

(b) the portion of total revenue allocated to reference services for the *access arrangement period*.

(3) However, if there is an interval (the **interval of delay**) between a revision commencement date stated in a full access arrangement and the date on which revisions to the access arrangement actually commence:

(a) reference tariffs, as in force at the end of the previous *access arrangement period*, continue without variation for the interval of delay; but

(b) the operation of this subrule may be taken into account in fixing reference tariffs for the new *access arrangement period*.

97. Mechanics of reference tariff variation

(1) A *reference tariff variation mechanism* may provide for variation of a reference tariff:

(a) in accordance with a schedule of fixed tariffs; or

(b) in accordance with a formula set out in the access arrangement; or

(c) as a result of a cost pass through for a defined event (such as a cost pass through for a particular tax); or

(d) by the combined operation of 2 or more or the above.

(2) A formula for variation of a reference tariff may (for example) provide for:

(a) variable caps on the revenue to be derived from a particular combination of reference services; or

(b) tariff basket price control; or

(c) revenue yield control; or

(d) a combination of all or any of the above.

(3) In deciding whether a particular *reference tariff variation mechanism* is appropriate to a particular access arrangement, the [Authority] must have regard to:

(a) the need for efficient tariff structures; and

(b) the possible effects of the reference tariff variation mechanism on administrative costs of the [Authority], the service provider, and users or potential users; and

(c) the regulatory arrangements (if any) applicable to the relevant reference services before the commencement of the proposed reference tariff variation mechanism; and

(d) the desirability of consistency between regulatory arrangements for similar services (both within and beyond the relevant jurisdiction); and

(e) any other relevant factor.

4) A *reference tariff variation mechanism* must give the [Authority] adequate oversight or powers of approval over variation of the reference tariff.

5) Except as provided by a *reference tariff variation mechanism*, a reference tariff is not to vary during the course of an *access arrangement period*.

GGT's Proposed Changes

1624. GGT's reference tariff variation mechanism in the proposed revised access arrangement for the GGP comprises a scheduled reference tariff variation mechanism and a cost pass-through mechanism of the reference tariff.

Tariff Variation Mechanism

1625. GGT proposes to revise its current tariff variation mechanism, which it notes as satisfying the requirements of the Code, such that it will now also meet the requirements of the NGR.

1626. GGT's reference tariff variation mechanism provides for a quarterly variation of the reference tariff and an annual scheduled variation of the reference tariff.

1627. GGT notes that its proposed quarterly tariff variation mechanism replicates the quarterly tariff variation mechanism currently contained in clause 9.8 of the General Terms and Conditions in Appendix 3 to the GGP access arrangement. GGT proposes to move the quarterly tariff variation mechanism from the Terms and Conditions to Schedule A of the proposed revised access arrangement for the GGP.

1628. At the commencement of each quarter, GGT's proposed quarterly tariff variation mechanism replaces the inflation assumption, which is used in its access arrangement proposal, with "a measure of actual inflation obtained from the change in the Consumer Price Index six months prior and varies the reference tariff accordingly."[664]

1629. GGT submits that its annual scheduled tariff variation mechanism for the proposed revised access arrangement is similar in design to the reference tariff adjustment mechanism of Schedule 1 to the current access arrangement for the GGP. GGT states the following with respect to the mechanism:

- it effects the quarterly inflation adjustment of the reference tariff, in place of the quarterly adjustment discussed in paragraph 1627;
- it allows GGT the flexibility to vary the individual components of the reference tariff by up to 2 per cent, within a constraint on the overall revenue which might be earned at the reference tariff (Weighted Average Tariff Basket);
- it effects a change in the reference tariff following the annual adjustment of the return on debt; and
- it provides for the recovery, through a varied reference tariff, of regulatory costs which were unanticipated, and not taken into account at the time of submitting the access arrangement proposal.

1630. GGT notes that three of the four components of the tariff variation mechanism discussed in paragraph 1629 are components of the tariff adjustment mechanism in Schedule 1 of the current access arrangement. GGT states that it has added the fourth component to the proposed revised access arrangement to effect the annual update of the return on debt. This is further discussed in the Rate of Return chapter of this Draft Decision.

[664] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 192.

Notice Period for a Reference Tariff Variation

1631. GGT notes that there are no provisions in the NGR regarding the process in which the service provider notifies the regulator of a proposed reference tariff variation nor the process by which the regulator allows or disallows the variation. GGT proposes to retain consistency with the previous process by incorporating as much of it into the proposed revised access arrangement.

1632. Prior to varying the reference tariff, GGT proposes to:

- provide written notice to the Authority setting out proposed variations to the reference tariff, including evidence that the proposed variations have been calculated in accordance with the tariff variation mechanism (including the formulas); and
- provide the written notice to the Authority at least 25 business days before the date that the relevant tariff is scheduled to be varied.[665]

1633. GGT proposes to vary the reference tariff in accordance with the written notice on the relevant variation date unless one or both of the following occurs:

- the Authority considers that it needs additional information from GGT to adequately assess the proposed tariff variation and extends the period for assessment beyond the relevant variation date in order to consider additional information; and/or
- the Authority disallows the proposed variation to the reference tariff in accordance with section 4.5.1(d) of the proposed revised access arrangement.[666]

1634. Should either of the above occur, GGT proposes that the reference tariffs will be varied on a date and in a form as determined by the Authority in accordance with the tariff variation mechanism.[667]

1635. GGT proposes that the Authority must publish its reasons for seeking an adjustment to a proposed variation at the time that it publishes its decision in relation to an adjustment to a proposed variation. Additionally, GGT proposes that the decision must set a revised date for the proposed tariff variation (as adjusted), and this date must not be later than 20 business days after the relevant tariff variation was originally intended to take place.[668]

Cost Pass-Through Variation of Reference Tariff

1636. GGT notes that the cost pass-through variation mechanism of the proposed revised access arrangement is similar to the adjustment for changes in imposts, as per the current access arrangement under the Code. GGT states that the purpose of the

[665] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section 4.5.1(b), p. 18.

[666] Section 4.5.1(d) of GGT's proposed revised access arrangement states: The Regulator may, by notice to Service Provider before a proposed variation to the Reference Tariff is scheduled to take effect, disallow the proposed variation if it considers that proposed variation does not comply with the approved Scheduled Reference Tariff Variation Mechanism. If the regulator disallows a proposed variation, it may specify a variation that is consistent with the Scheduled Reference Tariff Variation Mechanism.

[667] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section 4.5.1(c), p. 18.

[668] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section 4.5.1(e), p. 18.

mechanism is to ensure that costs from material unforeseen or uncontrollable events affecting provision of the reference service be recovered through the reference tariff.

1637. GGT proposes that the unforeseen or uncontrollable events be limited to the following classes in the access arrangement:

- an insurance cap event
- an insurer credit risk event
- a natural disaster event
- a regulatory change event
- a service standard event
- a tax change event; and
- a terrorism event.[669]

1638. GGT states that the occurrence of any of the above events would be beyond its control and be likely to result in GGT incurring costs in the provision of the reference service for which it is not compensated, either through the unvaried reference tariff or any other mechanism in the proposed revised access arrangement.

1639. GGT proposes that the tariffs should be varied subject to the cost of providing the reference service across the remaining years of the access arrangement period exceeding a materiality threshold of 0.5 per cent of total revenue of the covered pipeline in the year in which the event occurs.

Notice Period for a Cost Pass-Through Variation of a Reference Tariff

1640. GGT notes that, under the Code, the regulator had oversight of the cost pass-through variations via a notice and approval process. GGT states that it has incorporated into its proposed revised access arrangement much of the process that was previously provided in the Code.

1641. GGT's proposed clauses for the notice period are largely similar to the notice period discussed in paragraphs 1632 to 1635.

1642. GGT proposes under section 4.5.2(e) of the proposed revised access arrangement that it may submit one or more cost pass-through event notices each year. Each notice may incorporate a number of claims relating to cost pass-through events. GGT proposes that the minimum notice period for each cost pass-through event notice be 25 business days prior to the date on which the proposed variations are to take effect.[670]

1643. GGT proposes to vary the reference tariff in accordance with the cost pass-through event notice on the next scheduled reference tariff variation date identified in the notice, unless one or both of the following occurs:

- the Authority considers that it needs additional information from GGT to adequately assess the cost pass-through event notice, and extends the period

[669] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section 4.5.2, pp. 19-22.

[670] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section 4.5.2(e), p. 22.

for assessment beyond the date that the cost pass-through notice is intended to take effect in order to consider additional information; and

- the Authority disallows the proposed variation to the reference tariff in accordance with section 4.5.2(h) of the proposed revised access arrangement.[671]

1644. Should either of the above occur, GGT proposes that the reference tariffs will be varied on a date and in a form as determined by the Authority in accordance with the tariff variation mechanism.[672]

1645. Similar to section 4.5.1(e) for the scheduled reference tariff variation mechanism, GGT proposes that the Authority must publish its reasons for disallowing or seeking an adjustment to a proposed variation at the time that it publishes its decision in relation to an adjustment to a proposed variation. Additionally, GGT proposes that, where relevant, the Authority must also set a revised date for the proposed tariff variation (as adjusted) to take effect and this date must not be later than 20 business days after the proposed variation was originally intended to take effect.[673]

Submissions

1646. The Authority has not received any submissions in relation to GGT's proposed reference tariff variation mechanism.

Considerations of the Authority

1647. As per rule 92(2) of the NGR, the Authority has ensured that the approved tariff variation mechanism for the GGP equalises the net present value of tariff revenue and total revenue allocated to reference services.

1648. Pursuant to rule 97(3) of the NGR, the Authority must have regard to the following matters when deciding whether a tariff variation mechanism is appropriate to a particular access arrangement:

- the need for efficient tariff structures;
- the possible effects of the tariff variation mechanism on the administrative costs of the Authority, GGT, and users or potential users;
- the regulatory arrangements applicable to the relevant reference services before the commencement of the proposed tariff variation mechanism;
- the desirability of consistency between regulatory arrangements for similar services (both within and beyond Western Australia); and
- any other relevant factor.

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[671] Section 4.5.1(h) of GGT's proposed revised access arrangement states:

The Regulator may, by notice to Service Provider before a proposed variation to the Reference Tariff is scheduled to take effect, disallow the proposed variation if it considers that proposed variation does not comply with the Cost Pass-through Reference Tariff Variation Mechanism. If the regulator disallows a proposed variation, it may specify a variation that is consistent with the Cost Pass-through Tariff Variation Mechanism.

[672] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section 4.5.2(f), p. 22.

[673] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section 4.5.2(h), p. 22.

1649. The tariff variation mechanism must have the effect of giving the Authority adequate oversight or powers of approval over variation of the reference tariff.[674] Accordingly, this is a factor that the Authority must have regard to in determining whether GGT's proposed tariff variation mechanism is appropriate.

Tariff Variation Mechanism

1650. The Authority has assessed GGT's proposed haulage tariff variation mechanism for the reference tariff, having regard to the matters set out in rules 97(3) and 97(4) of the NGR.

1651. The Authority notes that the tariff variation mechanism proposed by GGT for the forthcoming access arrangement period largely follows a similar structure to that of the current mechanism approved under the Code, with a quarterly tariff variation and annual tariff variation.[675]

1652. For the quarterly tariff variation, the Authority is of the opinion that no substantial change has been made by GGT to the formula and as such finds no reason to reject the proposed formula contained in section A1 of Schedule A to the proposed revised access arrangement.[676] The Authority notes that GGT has set the variable, X, being GGT's forecast annual percentage inflation rate used in its proposal, at 2.5 per cent. However, as discussed in the Rate of Return chapter of this Draft Decision, the Authority does not accept GGT's proposed forecast inflation rate of 2.5 per cent, accordingly, the Authority requires that X be set at the Authority's Draft Decision approved forecast inflation rate of 1.90 per cent.[677] For reasons set out in the discussion below, the Authority has renamed variable X to Z. The Authority requires GGT to rename variable X to Z. The Authority's changes to section A1 of Schedule A to the proposed revised access arrangement are as follows:

> **Quarterly Scheduled Variation of Reference Tariffs**
>
> The Reference Tariff Components (as described in section 4.1 of the Access Arrangement) are adjusted for inflation on a Quarterly basis in accordance with the formula below.
>
> $$C_t = C_{t-1} \times \frac{1}{(1+K)} \times \frac{CPI_{t-2}}{CPI_{t-3}}$$
>
> where
>
> C_t is the relevant charge in the Quarter t in which the adjustment occurs.
>
> C_{t-1} is the charge for the Quarter commencing three months prior to the commencement of Quarter t. For the Quarter commencing 1 September 2016, C_{t-1} is the relevant charge shown above for 1 July 2016.

[674] Rule 97(4) of the NGR.

[675] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section A1 Schedule A, p. 37; Goldfields Gas Transmission Pty Ltd, *Proposed Revisions to Access Arrangement as Amended by the Western Australian Electricity Review Board– Appendix 3*, 30 March 2012, clause 9.8, p. 23.

[676] The Authority notes that the mathematical derivation of variable, K, has been changed by GGT. However, the Authority does not consider that this has a numerical impact on the calculation of the varied reference tariff as it is a simplification of the formula used to derive K.

[677] The estimate is indicative to the extent that it is based on an averaging period ending 2 April 2015. That averaging period and the estimate of inflation will be revised for the Final Decision.

K is $(1+Z)^{0.25}-1$

Z is 0.019 (1.90% being the forecast annual percentage inflation rate used in the Draft Decision).

CPI_{t-2} is the CPI All Groups, Weighted Average of Eight Capital Cities for the Quarter commencing six months prior to the commencement of Quarter t.

CPI_{t-3} is the CPI for the Quarter commencing nine months prior to the commencement of Quarter t.

1653. For the annual tariff variation, the Authority notes that GGT has adopted the current formula under the Code with some modifications such that it can put into effect the annual update of the debt risk premium. As stated in the Rate of Return chapter of this Draft Decision, the Authority has adopted a trailing average for the debt risk premium. As such, the Authority requires GGT to replace the Rate of Return portion of section A2 of Schedule A to the proposed revised access arrangement with the following text.

Annual update of trailing average debt risk premium

The annual update of the trailing average debt risk premium component of the rate of return in each year starting from 1 June 2016 of the Access Arrangement Period is to be calculated by applying the following formula:

$$TA\ DRP_0 = \frac{\sum_{t=0}^{-9} DRP_t}{10}$$

Where

$TA\ DRP_0$ is the equally weighted trailing average of the DRP to apply in the following year as the annual update of the estimate used in the current year; and

DRP_t is the DRP estimated for each of the 10 regulatory years t = *0, -1, -2…. , -9*, which are either:

the forward looking DRP estimators for the calendar year 2017, 2018 or 2019, estimated during the 40 trading days averaging period, using the method of automatic formulas set out in Appendix 8 of the Draft Decision; or

the published DRP_t estimates, derived from the Reserve Bank of Australia 10 year BBB credit spread to swap interpolated daily data (up to period [end date of the month just prior to averaging period date]) and from the Authority's [averaging period date] estimate of the DRP, as follows, as set out in Appendix 8 of this Draft Decision:

calendar year 2007: DRP_{2007}: 1.241 per cent;

calendar year 2008: DRP_{2008}: 3.489 per cent;

calendar year 2009: DRP_{2009}: 4.624 per cent;

calendar year 2010: DRP_{2010}: 2.127 per cent;

calendar year 2011: DRP_{2011}: 2.371 per cent;

calendar year 2012: DRP_{2012}: 3.172 per cent;

calendar year 2013: DRP_{2013}: 3.068 per cent;

calendar year 2014: DRP_{2014}: 2.250 per cent;

calendar year 2015: DRP_{2015}: 1.953 per cent;

calendar year 2016: DRP_{2016}: [to be estimated and included in the Final Decision].

The first annual update will apply for the tariff variation for the 2017 calendar year. As noted, all annual updates of the debt risk premium should be determined consistent with the automatic formulas summarised in [Schedule [ ]] of the Access Arrangement and set out in Appendix 8 of the Draft Decision.[678] The resulting automatic annual adjustment to the rate of return, based on the outputs of the updating of the tariff model for the revised debt risk premium for the regulatory year, should be incorporated in the relevant Annual Tariff Variation.

The Authority in this Draft Decision requires that GGT nominate, as soon as practicable after release of the Draft Decision, the averaging period for 2016 and for each annual update applying in 2017, 2018 and 2019. The averaging periods for each annual update must be a nominated 40 trading days (based on eastern states holidays) in the window 1 June to 31 October in the year prior to the relevant tariff variation. The nominated 40 trading day averaging period for each year of the four years do not need to be identical periods, only that they occur in the period 1 June to 31 October in each relevant year, and are nominated prior.

1654. As a result, the Authority is required to amend the annual tariff variation proposed by GGT. The Authority in revising this tariff variation has considered rule 97(3) of the NGR and has inserted a new factor into the annual tariff variation formula X-Factor to replace TREV. The Authority considers that the X-Factor should be calculated in the Authority's reference tariff model and has made provision such that it will be calculated automatically. This change to the annual tariff variation formula will ensure that efficient tariffs are maintained as the updated rate of return will be applied to total revenue, and the model will ensure that the present value of total revenue and tariff revenue are equalised over the third access arrangement period. The Authority's approach is also consistent with the approach adopted for the Mid-West and South-West Gas Distribution Systems (GDS) Access Arrangement. To avoid confusion with the X-Factor due to replacing TREV with the X-Factor, the Authority has renamed variable X in GGT's proposed tariff variation mechanism to Z.

1655. For the reasons stated in paragraph 1654, the Authority has amended the annual tariff variation formulas in section A2 of Schedule A to the proposed revised access arrangement as shown below. Similar to the quarterly tariff variation, as the Authority does not accept GGT's proposed forecast inflation rate, the Authority requires that Z be set at the Authority's Draft Decision forecast inflation rate of 1.90 per cent. As discussed in paragraph 1621, the Authority has amended the tariff variation formulas for a start date of 1 July 2016. In addition to the Annual update of trailing average debt risk premium changes in paragraph 1653, the Authority requires GGT to replace section A2 of Schedule A to the proposed revised access arrangement with the following text.

Annual Scheduled Variation of Reference Tariffs

The Service Provider has adopted a 'tariff basket price cap' approach as the manner in which Reference Tariff Components (as described in section 4.1 of the Access Arrangement) may vary within this Access Arrangement Period.

The Service Provider has also adopted a 'trailing average' approach to estimate the Debt Risk Premium used to determine the Reference Tariff. The trailing average approach is a method of the type referred to in Rule 87(9)(b). The change in Total Revenue which results from use of a method of the type referred to in Rule 87(9)(b) must be effected through the automatic application of a formula. That formula, which

[678] The Authority expects that the proposed revised access arrangement will include a schedule which summarises the automatic formulas for updating the debt risk premium and the techniques to estimate the forward looking debt risk premium.

was specified in the decision on this Access Arrangement for this Access Arrangement Period, is set out below.

The formula effects a change in Total Revenue in each year of the Access Arrangement Period. The change in Total Revenue requires an annual adjustment to the Reference Tariff. That adjustment is to be made using the formulae in this Annual Scheduled Variation of Reference Tariffs (A2).

The Service Provider may in its discretion vary any Reference Tariff Component annually (each annual period being a Variation Year) subject to the limit on the varied Reference Tariff Components and the limit on movement of the weighted average tariff basket described below.

Any annually varied Reference Tariff Component will be effective 1 January of each Year, and the annual variation in this way will be in lieu of the CPI adjustment specified in A1 above.

Limit on varied Reference Tariff Components and the Tariff Basket for Access Arrangement Period (years) 2017, 2018 and 2019

Each Reference Tariff Component may be varied by the Service Provider provided the varied Reference Tariff Component satisfies the following conditions:

$$p_t^i \le p_{t-1}^i \times \left(1 + X\_Factor_t^i\right) \times \frac{\left(1+Y^i\right)}{(1+Z)} \times \frac{CPI_{Sep(t-1)}}{CPI_{Sep(t-2)}}$$

and the tariff basket:

$$\sum_{i=1}^{m}\left(p_t^i \times q_{t-2}^i\right) \le \frac{1}{(1+Z)} \times \frac{SepCPI_{t-1}}{SepCPI_{t-2}} \times \sum_{i=1}^{m}((1+X\_Factor_t^i) \times p_{t-1}^i \times q_{t-2}^i)$$

where:

p_t^i	is the value of Reference Tariff Component i as varied for Year t;
p_{t-1}^i	is the value of Reference Tariff Component i in Year t – 1;
p_{2016}^1	is \$0.083066 x $\left(1+X\_Factor_{2016}^1\right)$ per GJ MDQ at 1 July 2016 for Toll charge reference tariff;
p_{2016}^2	is \$0.000446 x $\left(1+X\_Factor_{2016}^2\right)$ per GJ MDQ km at 1 July 2016 for Reservation charge reference tariff;
p_{2016}^3	is \$0.000163 x $\left(1+X\_Factor_{2016}^3\right)$ per GJ km at 1 July 2016 for Throughput charge reference tariff;
q_{t-2}^i	is the quantity of service (GJ, GJ km MDQ, or GJ km throughput) provided at Reference Tariff Component i in Year t – 2;
$CPI_{Sep(t-1)}$	is the September Quarter CPI for Year (t – 1) ;
$CPI_{Sep(t-2)}$	is the September Quarter CPI for Year (t – 2);
$X\_Factor_t^i$	is the change from 1 January Year (t-1) to 1 January Year (t) in tariff for Reference Tariff Component i as varied for Year t of 2017, 2018 and 2019 resulting from the annual update of the Debt Risk Premium and from any change in Regulatory Costs and calculated using the approved Tariff Model

$X\_Factor^{i}_{2016}$	is the change in tariff for Reference Tariff Component i from 1 July 2016 to 1 January 2017 as calculated by the approved Tariff Model
Z	is 0.019 (1.90% being the forecast annual percentage inflation rate used in the [Draft] Decision)
Y^{i}	is not greater than 0.02 (2%) for each of the Tariff Component i
t	is the Variation Year and t <= 2017 to 2019
i	is the Tariff Component with:
	i = 1 for Toll charge;
	i = 2 for Reservation charge; and
	i = 3 for Throughput charge

1656. In addition to the change from TREV to X-Factor and the re-labelling of the variable X to Z, the Authority has amended the component (1-X) with 1/(1+Z) to ensure that the mathematical calculation of inflation is correct.

1657. The Authority notes that GGT's proposed annual tariff variation formula contains an adjustment for the difference between the actual and forecast regulatory costs each year, which was also previously in the tariff adjustment formula under the Code.[679] Whilst the Authority notes that it has previously approved the inclusion of an annual adjustment for the difference between actual and forecast regulatory costs, the Authority is of the opinion that its inclusion is contrary to the revenue and pricing principles.[680] In particular the Authority does not consider that this would provide GGT with the right incentive to incur efficient expenditure on regulatory costs.

1658. The Authority considers that by removing the adjustment of forecast regulatory costs for actual regulatory costs, this will ensure that GGT forecasts its future regulatory costs reasonably, and ensure that regulatory expenditure is incurred prudently during the forthcoming access arrangement period. Additionally, the Authority considers that GGT is best placed to forecast its annual regulatory expenditure obligations, and as such should not require an adjustment from forecast to actual regulatory costs if it submits a reasonable estimate.

Notice Period for a Reference Tariff Variation

1659. The Authority notes that under section 4.5.1(b)(ii) of GGT's proposed revised access arrangement, it proposes to set a minimum notice period of 25 business days between the time it submits the written notice and the time it proposes the reference tariff be varied. The Authority does not consider that 25 business days is sufficient to assess GGT's proposed tariff variations, especially given the introduction of the annual update of the debt risk premium in the annual reference tariff variation. Given the potential complexities that may arise as a result of this additional factor, the Authority considers that a minimum notice period of 40 business days to provide the written notice should be set in the proposed revised access arrangement. The Authority requires that GGT amend section 4.5.1(b)(ii) to set a minimum notice period of 40 business days prior to the scheduled variation date.

[679] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section A2 Schedule A, pp. 38-39; Goldfields Gas Transmission Pty Ltd, *Proposed Revisions to Access Arrangement as Amended by the Western Australian Electricity Review Board*, 30 March 2012, Schedule 1, pp. 18-19.

[680] National Gas Access (WA) Act 2009. Section 24(2)-(7).

1660. The Authority is of the opinion that section 4.5.1(c) has been drafted to allow GGT to vary its reference tariff unless the Authority responds to GGT in the manner specified in sections 4.5.1(c)(i) and 4.5.1(c)(ii). The Authority considers that this drafting would constitute an automatic approval of the GGT's proposed reference tariff variation should the Authority not respond by the scheduled variation date. The Authority does not consider that this drafting is appropriate as it unduly places responsibility on the Authority to respond before the scheduled variation date. The Authority notes that valid circumstances could arise whereby a delayed response from the Authority would lead to an automatic approval of the reference tariff variation, without the Authority expressly approving it via a written response.

1661. Furthermore, the Authority does not consider that this clause is entirely consistent with rule 97(4) of the NGR, which requires that the reference tariff variation mechanism provide the Authority with adequate oversight or powers of approval over variation of the reference tariff. The Authority considers that an automatic approval of the reference tariff variation as a result of a delayed response would not be consistent with this rule. Accordingly, the Authority rejects the proposed wording of section 4.5.1(c) of the proposed revised access arrangement. The Authority requires that GGT replace section 4.5.1(c) of the proposed revised access arrangement as follows:

> 4.5.1 Scheduled Reference Tariff Variation Mechanism
>
> …
>
> (c) The Regulator will use its reasonable endeavours to give notice to the Service Provider before a proposed variation to the Reference Tariff is scheduled to take effect, advising whether the Regulator approves or does not approve the proposed tariff variation and the reasons for its decision, in accordance with the approved Reference Tariff Variation Mechanism.

1662. As a result of amending section 4.5.1(c), the Authority has introduced an additional clause, section 4.5.1(d), into the proposed revised access arrangement which sets out when the reference tariff will be varied should there be a delay in the assessment of GGT's written notice. The Authority requires that GGT introduce the following additional section 4.5.1(d) into its proposed revised access arrangement:

> 4.5.1 Scheduled Reference Tariff Variation Mechanism
>
> …
>
> (d) If the Regulator approves the proposed tariff variation, it will take effect on the date specified in the proposed Scheduled Reference Tariff Variation Notice, or if the date or dates specified in the proposed Scheduled Reference Tariff Variation notice have passed, the proposed tariff variation will take effect on the date or dates specified in the Regulator's notice to the Service Provider under section 4.5.1(c).

1663. Further to the addition of section 4.5.1(d), the Authority requires that GGT move section 4.5.1(c)(i) and reintroduce it as a standalone clause, section 4.5.1(e) per below:

> 4.5.1 Scheduled Reference Tariff Variation Mechanism
>
> …
>
> (e) If the Regulator considers that it needs additional information from the Service Provider to adequately assess the proposed tariff variation, it may extend the period for assessment beyond the relevant Scheduled Reference Tariff Variation Date in order to consider the additional information.

1664. Similar to the Authority's concerns regarding adequate oversight with respect to section 4.5.1(c), the Authority notes that section 4.5.1(d) would only allow the Authority to disallow a proposed variation if it provides notice to GGT before the scheduled reference variation date. Whilst the Authority considers that it is necessary to provide notice to GGT, it is of the opinion that there would be valid circumstances whereby it is unable to provide notice as soon as intended. Accordingly, the Authority does not consider it appropriate to include a time constraint in this clause.

1665. With respect to the second portion of section 4.5.1(d), the Authority considers that the onus should be on GGT to resubmit a variation to tariffs that is in accordance with the tariff variation mechanism should the Authority disallow it in the first instance. The Authority requires that GGT replace the sections in its proposed revised access arrangements as follows:

> 4.5.1 Scheduled Reference Tariff Variation Mechanism
>
> …
>
> (f) The Regulator may, by notice to the Service Provider, disallow the proposed variation if it considers that the proposed variation does not comply with the approved Scheduled Reference Tariff Variation Mechanism. If the Regulator does not approve the Service Provider's proposed tariff variation, it will not take effect.
>
> (g) If the Regulator does not approve the Service Provider's proposed tariff variation, the Service Provider may submit a revised Scheduled Reference Tariff Variation Notice.

1666. The Authority notes that, as a result of its amendments and inclusions to section 4.5.1, GGT's original section 4.5.1(e) in its proposed revised access arrangement has been deleted. The Authority considers that its amendments and inclusions to section 4.5.1 rendered the original text obsolete as the Authority is committed to providing written notice to GGT stating its decision and its reasons for making the decision. As the Authority considers that the onus should be on GGT to resubmit a compliant tariff variation, the portion of the clause regarding adjustments to the proposed variation and new effective timing of the variation no longer needs to be included.

1667. The Authority does not consider it necessary to replace sections 4.5.1(a) and 4.5.1(b) of the proposed revised access arrangement. The Authority approves these two clauses.

Cost Pass-Through Variation of Reference Tariff

1668. The Authority notes that GGT has introduced seven cost pass-through events as part of its cost pass-through tariff variation mechanism as a result of the regulatory change from the Code to the NGR.[681] Previously under the Code, section 5.4 of the access arrangement included an adjustment for imposts. The Authority notes that impost was a defined term in Appendix 1 of the access arrangement.

1669. The Authority considers that section 4.5.2(b)(ii) of the proposed revised access arrangement does not provide it with adequate oversight over the approval of the variation of the reference tariff, as per rule 97(4) of the NGR, if GGT submits a cost pass-through event notice, without documentary evidence to substantiate the financial impact. The Authority considers that by using the terms "reasonable

[681] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, section 4.5.2, pp. 19-22.

endeavours" and "if available", GGT would be able to submit cost pass-through events without substantiating its financial impact. This would inevitably place the Authority in a position in which it would have to make an assessment of the cost pass-through events without sufficient evidence. The Authority is of the opinion that this information asymmetry is inconsistent with rule 97(4) of the NGR. The Authority requires that GGT replace the clause as follows:

> 4.5.2 Cost Pass-through Reference Tariff Variation Mechanism
>
> …
>
> (b) Before the Service Provider varies the Reference Tariff as provided for in section 4.5.2(a), the Service Provider must:
>
> …
>
> (ii) provide the Regulator with documentary evidence which substantiates the financial impact set out in the Cost-Pass-through Event Notice and its compliance with the NGR.

1670. The Authority notes that the cost pass-through events proposed by GGT are similar to the ones approved by the AER for the Roma to Brisbane Pipeline (**RBP**). The Authority appreciates that GGT is proposing to maintain consistency with other APA operated pipelines, but considers that it is necessary to assess the appropriateness of each cost pass-through event in the context of GGT's overall access arrangement proposal as well.

1671. The Authority considers that the insurance cap event, insurer credit risk event, natural disaster event and terrorism event are insurance related event types. The Authority notes in the Operating Expenditure chapter of this Draft Decision, it has approved an amount of $1.375 million as forecast APA commercial expenditure for insurance. The Authority considers that GGT's proposal should have included reasonable amounts for its insurance expenditure related to its insurance policy it has obtained and the premiums associated with it. The Authority notes that GGT states the following as the purpose of the cost pass-through mechanism is:

> "to ensure that costs resulting from material unforeseen or uncontrollable events affecting provision of the reference service can be recovered through the reference tariff".[682]

1672. Accordingly, the Authority considers it necessary to assess GGT's insurance policies and self-insurance documentation to determine the level of coverage that GGT has sought and the type of events that are covered. The Authority notes that no insurance policies were provided as part of GGT's initial proposal on 15 August 2014.

1673. The Authority requested that GGT provide copies of its insurance policies and internal self-insurance documentation which detailed the types of events that GGT is covered for. In response to the information request, GGT provided the Authority with a copy of its insurance estimate as a stand-alone business from Marsh Pty Limited.[683] The Authority notes that this two page estimate provides a non-binding indication of the insurance premiums that GGT would pay. The estimate does not detail any useful information other than an indicative price that GGT would have to pay. In the absence of a proper and full insurance policy or documentation on self-insurance, the Authority is unable to properly assess the validity and

[682] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 193.

[683] Goldfields Gas Transmission Pty Ltd, *Email Response to ERA17 and ERA18*, 16 October 2015.

appropriateness of GGT's proposed cost pass-through events. The Authority notes that the policies are required so that the Authority can determine whether there is an overlap between the coverage that the insurance policy provides and the cost pass-through events GGT are proposing to include in its proposed revised access arrangement, or whether there is a shortfall between the two.

1674. With respect to the terrorism event, whilst the Authority notes that the text in the proposed revised access arrangement does not mention insurance per se, the Authority considers that it is necessary to review GGT's insurance policies to determine whether it is covered and whether a prudent service provider would seek coverage for this type of event proposed by GGT.

1675. For these reasons, the Authority rejects the inclusion of the insurance cap event, insurer credit risk event, natural disaster event and terrorism event. The Authority requires that GGT amend section 4.5.2(c) of the proposed revised access arrangement to remove all references to the insurance cap event, insurer credit risk event, natural disaster event and terrorism event. Should GGT wish to resubmit these cost pass-through events for consideration in the Final Decision, the Authority requires that GGT submit all relevant insurance policies and self-insurance documentation as part of its response to the Draft Decision. Additionally, the Authority requires that GGT detail the exact insured events that are included in its APA commercial operating expenditure for insurance. The Authority would then expect that these events would not be included as a cost pass-through.

1676. The Authority does not object to the inclusion of cost pass-through events for changes in law or tax change events. The Authority notes that it has previously included such a clause in its revised access arrangement for the GDS, being a cost pass-through event for a "change in law or tax change". The Authority considers that GGT's proposed service standard event is essentially similar to an event for a change in law as it is an event that arises as result of a legislative or administrative act. However, to ensure regulatory consistency between decisions and for ease of application for GGT and the Authority, the Authority requires that:

- the service standard event be renamed to a change in law event;
- the change in law event be combined with the tax change event.

1677. The Authority does not require any change to the wording of these cost pass-through events.

1678. The Authority rejects the inclusion of GGT's proposed regulatory change event. The Authority does not consider that the wording or purpose of the proposed clause is consistent with the rule 97(1)(c) of the NGR. The Authority considers that a catch all "no other category" event is inconsistent with the requirements of rule 97(1)(c), which requires a variation of a reference tariff as a result of a cost pass-through event, to be for a defined event. The Authority considers that the cost pass through event should be defined and as such, requires GGT to remove this event from the proposed revised access arrangement.

1679. The Authority notes that GGT has included a materiality clause as part of its cost pass-through tariff variation mechanism. While the Authority does not object to a materiality threshold being included into the mechanism, it does consider 0.5 per cent to be too low due to the administrative costs of assessing these cost pass-through events. The Authority considers that a higher threshold should be introduced. The Authority notes that the RBP access arrangement, which GGT states it has based its cost pass-through events on, has a materiality threshold of

1 per cent as opposed to the 0.5 per cent proposed by GGT for the GGP.[684] Additionally, the Authority does not consider that GGT has provided valid reasoning as to why it believes that a 0.5 per cent materiality threshold is appropriate.

1680. The Authority requires that GGT amend section 4.5.2(d) to reflect an increased materiality threshold of 1 per cent. The Authority requires that GGT amend the wording of section 4.5.2(d) as per paragraph 1681. The Authority has amended the wording of section 4.5.2(d) to state forecast tariff revenue as opposed to total revenue and removed the words "over the remaining years of the access arrangement period".

1681. As a result of the amendments detailed in paragraphs 1669 to 1680, the Authority has renumbered section 4.5.2 of the proposed revised access arrangement. The Authority requires GGT to replace sections 4.5.2(b) to 4.5.2(d) as follows:

> 4.5.2 Cost pass-through Reference Tariff Variation Mechanism
>
> (a) If one or more Cost Pass-through Events occur or are expected to occur during the Access Arrangement Period the Service Provider has discretion to vary the Reference Tariff for the Firm Service to recover the financial impact of the Cost Pass-through Event/s, to the extent that financial impact of these events is not already accounted for in the Reference Tariff.
>
> (b) Before the Service Provider varies the Reference Tariff as provided for in section 4.5.2(a), the Service Provider must:
>
> (i) provide a written notice (a Cost Pass-through Event Notice) to the Regulator specifying the type of defined Cost Pass-through Event to which the Notice applies, the impact or expected impact of the Cost Pass-through Event, the proposed variations to the Reference Tariff, and an effective date for the changes; and
>
> (ii) provide the Regulator with documentary evidence which substantiates the financial impact set out in the Cost Pass-through Event Notice and its compliance with the NGR.
>
> (c) The following are Cost Pass-through Events for the purposes of section 4.5.2(a):
>
> (i) a change in law or tax change event.
>
> where
>
> **Change in law or tax change event**—means:
>
> A legislative or administrative act or decision that:
>
> (ii) has the effect of:
>
> (A) varying, during the course of the Access Arrangement Period, the manner in which Service Provider is required to provide the Firm Service; or
>
> (B) imposing, removing or varying, during the course of an Access Arrangement Period, minimum service standards applicable to the Firm Service; or
>
> (C) altering, during the course of an Access Arrangement Period, the nature or scope of the Firm Service, provided by Service Provider; and

[684] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 194.

APT Petroleum Pipelines Pty Ltd, *Access Arrangement Effective 1 September 2012 – 30 June 2017*, August 2012, clause 4.5.3, p. 18.

(iii) materially increases or materially decreases the costs to Service Provider of providing the Firm Service.

A tax change event occurs if any of the following arises during the course of the Access Arrangement Period:

(iv) a change in a relevant Tax, in the application or official interpretation of a relevant Tax, in the rate of a relevant Tax, or in the way a relevant Tax is calculated; or

(v) the removal of a relevant Tax; or

(vi) the imposition of a relevant Tax; and

in consequence, the costs to Service Provider of providing the Firm Service are materially increased or decreased.

(d) A Cost Pass-through Event is considered material where the cumulative costs of the event exceed 1.0% of the forecast Tariff Revenue for the Covered Pipeline in the years in which costs are incurred.

Notice Period for a Cost Pass-Through Variation of a Reference Tariff

1682. The Authority notes that the notice period clauses of GGT's proposed cost pass-through reference tariff variation mechanism are largely similar to the clauses it has proposed for the scheduled reference tariff variation mechanism. The Authority considers that, as GGT has drafted the notice period clauses in a similar manner across both variation mechanisms, it is necessary to align its amendments from the scheduled tariff variation mechanism to those of the cost pass-through tariff variation mechanisms. The Authority notes that by aligning both notice period clauses, it will provide more clarity and ease of operating for both GGT and the Authority.

1683. However, the Authority has made an additional change to section 4.5.2(e) as the Authority does not consider it administratively efficient to be making multiple adjustments to the reference tariff during the year, other than that for CPI changes. The Authority considers that it is necessary to restrict the submission of cost pass-through tariff variation written notices only to when the annual scheduled reference tariff variation written notices are submitted. This approach is also consistent with the notice period for a cost pass-through in the recently approved access arrangement for the GDS. Additionally, as the Authority will be making the adjustments for the cost pass-throughs tariff variations through the reference tariff model, this can only happen with the annual tariff variation as the quarterly reference tariff variations are not varied directly through the reference tariff model. This is illustrated by the formulas in paragraphs 1655 above.

1684. The Authority has amended sections 4.5.2(e) to 4.5.2(h) and included two additional clauses, similar to those in the scheduled reference tariff variation mechanism. The Authority requires that GGT replace the sections in its proposed revised access arrangement as follows:

4.5.2 Cost Pass-through Reference Tariff Variation Mechanism

…

(e) The Service Provider may submit a Cost Pass-through Event Notice with its annual Scheduled Reference Tariff Variation. Each notice may incorporate a number of claims relating to Cost Pass-through Events. The minimum notice period for a Cost Pass-through Event Notice is 40 Business Days prior to the date on which the proposed variations to the Reference Tariff are intended to take effect.

(f) The Regulator will use its reasonable endeavours to give notice to the Service Provider before a proposed variation to the Reference Tariff (arising from a Cost Pass-through Event Notice) is scheduled to take effect, advising whether the Regulator approves or does not approve the Cost Pass-through Event/s and the reasons for its decision, in accordance with the approved Reference Tariff Variation Mechanism.

(g) If the Regulator approves the Cost Pass-through Event/s, it will take effect on the next Scheduled Reference Tariff Variation date identified in the Cost Pass-through Event Notice, or if the date or dates specified in the Cost Pass-through Event Notice have passed, the proposed tariff variation will take effect on the date or dates specified in the Regulator's notice to the Service Provider under section 4.5.2(f).

(h) If the Regulator considers that it needs additional information from the Service Provider to adequately assess the Cost Pass-through Event Notice, it may extend the period for assessment beyond the date that the Cost Pass-through Notice is intended to take effect in order to consider additional information;

(i) The Regulator may, by notice to the Service Provider, disallow the proposed variation if it considers that the proposed variation does not comply with the Cost Pass-through Reference Tariff Variation Mechanism. If the Regulator does not approve the Service Provider's Cost Pass-through Event/s it will not take effect.

(j) If the Regulator does not approve the Service Provider's Cost Pass-through Event/s, the Service Provider may resubmit a revised Cost Pass-through Event Notice.

Required Amendment 15

The Authority requires that GGT amend section 4.5 of the proposed revised access arrangement and sections A1 and A2 of Schedule A to the proposed revised access arrangement as set out in paragraphs 1652 to 1684.

Other Access Arrangement Provisions

Requests for Access and Queuing Policy

Regulatory Requirements

1685. Schedule 1, clause 3(16) of the NGR states that a service provider who was, immediately before the date of transition, required to maintain a public register by or under section 5.9 of the Gas Code is taken to have been required by the Authority, on the date of transition, to maintain a public register of spare capacity under rule 111 of the NGR.

1686. Rule 111 of the NGR – Public registers of spare capacity - requires that a scheme pipeline service provider that provides pipeline services by means of a transmission pipeline to which this rule applies, must establish and maintain a register of spare capacity.

(1) This rule applies to:

(a) a *scheme pipeline service provider* that provides pipeline services by means of a transmission pipeline; and

(b) a *scheme pipeline service provider* that:

(i) provides pipeline services by means of a distribution pipeline; and

(ii) is, by determination of the [Authority], a service provider to which this rule applies.

(2) In deciding whether this rule should apply to a distribution service provider, the [Authority] must have regard to whether it is technically feasible and commercially reasonable for the service provider to maintain a register of spare capacity.

(3) A service provider to which this rule applies must establish and maintain a register of spare capacity.

(4) The register of spare capacity must include the following information:

(a) information about the spare capacity that the service provider reasonably believes exists for the haulage of natural gas between defined receipt and delivery points; and

(b) information about spare capacity that the service provider reasonably believes will exist for the haulage of natural gas between defined receipt and delivery points including information about planned developable capacity and expected additions to spare capacity; and

(c) information (which must be as specific as the circumstances reasonably allow) about when the spare capacity is, or will become, available; and

(d) information notified to the service provider by a user about unutilised contracted capacity including:

(i) the quantity and type of the unutilised contracted capacity and when it will be available; and

(ii) proposed terms and conditions (which may include the price) for the sale of the unutilised contracted capacity.

1687. Rule 112 of the NGR – Request for access, provides that a prospective user 'may' request a scheme pipeline service provider to provide a pipeline service for the prospective user.

112 Requests for access

(1) A prospective user may request a *scheme pipeline service provider* to provide a pipeline service for the prospective user.

(2) The request must be made in writing and must:

(a) state the time or times when the pipeline service will be required and the capacity that is to be utilised; and

(b) identify the entry point where the user proposes to introduce natural gas to the pipeline or the exit point where the user proposes to take natural gas from the pipeline or, if the requested service is a haulage service, both entry and exit point; and

(c) state the relevant technical details (including the proposed gas specification) for the connection to the pipeline, and for ensuring safety and reliability of the supply of natural gas to, or from, the pipeline.

(3) The service provider must, within 20 business days after the date of the request, respond to the request:

(a) by informing the prospective user:

(i) whether the service provider can provide the requested pipeline service; and

(ii) if so, the terms and conditions on which the service provider is prepared to provide the requested pipeline service;

(b) by informing the prospective user that the service provider needs to carry out further investigation to determine whether it can provide the requested pipeline service and setting out a proposal for carrying out the further investigation including:

(i) a statement of the nature of the investigation; and

(ii) a plan (including a time schedule) for carrying out and completing the investigation; and

(iii) a statement of the reasonable costs of the investigation the prospective user would be required to meet.

(4) If the service provider informs the prospective user that it cannot provide the requested pipeline service, the service provider must:

(a) provide the prospective user with written reasons explaining why the requested pipeline service cannot be provided; and

(b) if there is some prospect that it will become possible to provide the requested service at some time in the future – give details (which must be as specific as the circumstances reasonably allow) of when capacity to provide the requested service is likely to become available and, if possible, nominate a specific date.

(5) If the service provider responds to the request by proposing further investigation, the following provisions apply:

(a) if the parties have not agreed on the service provider's proposal or some negotiated modification of it within 20 business days after the date of the response – the service provider is taken to have rejected the prospective user's request; and

(b) if the parties agree on the service provider's proposal or on some negotiated modification of it within 20 business days after the date of the response – the service provider must carry out the investigation in accordance with the agreement and, on the conclusion of the investigation, inform the prospective user whether it can, or cannot, provide the requested pipeline service and comply with other relevant requirements of this rule.

1688. Rule 103 of the NGR – Queuing requirements – provides that an access arrangement must contain queuing requirements if it is for a transmission pipeline.

103 Queuing requirements

(1) An access arrangement must contain queuing requirements if:

(a) the access arrangement is for a transmission pipeline; or

(b) the access arrangement is for a distribution pipeline and the [Authority] notifies the service provider that the access arrangement must contain queuing requirements.

(2) If the [Authority] gives a notification under subrule (1), the access arrangement must contain queuing requirements as from the commencement of the first *access arrangement period* to commence after the date of the notification (but this requirement lapses if the [Authority], by notice to the service provider, withdraws the notification).

(3) Queuing requirements must establish a process or mechanism (or both) for establishing an order of priority between prospective users of spare or developable capacity (or both) in which all prospective users (whether associates of, or unrelated to, the service provider) are treated on a fair and equal basis.

(4) Queuing requirements might (for example) provide that the order of priority is to be determined:

(a) on a first-come-first-served basis; or

(b) on the basis of a publicly notified auction in which all prospective users of the relevant spare capacity or developable capacity are able to participate.

(5) Queuing requirements must be sufficiently detailed to enable prospective users:

(a) to understand the basis on which an order of priority between them has been, or will be, determined; and

(b) if an order of priority has been determined – to determine the prospective user's position in the queue.

GGT's Proposed Changes

1689. GGT has proposed a number of revisions to its application and queuing policy for the third access arrangement period[685]. The major areas of proposed change are:

- changes to the management of its spare capacity register;
- changes to its application process;
- changes to its queuing mechanism for existing spare capacity;
- changes to its queuing mechanism for developable capacity; and
- changes to its requirement to develop capacity where a viable application for it to do so has been made.

Registration of interest

1690. GGT submits that the revisions it has proposed to its application and queuing procedures have been made in order to ensure compliance with rule 112 of the NGR. GGT also makes the case that the current application and queuing processes are too complex, and have previously resulted in uncertainty for prospective users.[686]

1691. The changes proposed by GGT to its application process include removing its Enquiry Form and Order Form (previously Appendix 2.1), introducing a Registration of Interest form, and incorporating the application process into its proposed queuing mechanism. GGT considers that this will lead to a more straightforward process for prospective users wishing to seek access to the covered pipeline.

1692. GGT has proposed to include section 5.1.2, which addresses how it will respond to registrations of interest for spare or developable capacity from prospective users. GGT proposes that within 20 days of receiving a registration of interest, it will:

- confirm with the prospective user that it has received the registration of interest and advise whether there is any available spare capacity (and, if not, why and when capacity may become available);
- advise the prospective user if investigations into developable capacity are required and, if so, provide a proposal for the investigations;

[685] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 24.

[686] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 15.

- require prospective users to accept proposals for investigations in writing, if they wish to do so;
- provide the prospective user with details of other registrations of interest (while maintaining the confidentiality of other interested parties); and
- keep registrations of interest under review in order to determine whether there is likely to be sufficient demand for services that might be provided by means of developable capacity.

Spare capacity - less than 2TJ

1693. When spare capacity that is, or is likely to become available is less than 2TJ per day, GGT proposes that it may elect not to run an open season and auction for that capacity and will instead make that spare capacity available by placing it on the Spare Capacity Register. Capacity that has been placed on the Spare Capacity Register will continue to operate on a first come first served basis as per the current access arrangement.[687]

Spare Capacity – open season

1694. GGT proposes not to place any spare capacity greater than 2TJ per day on the Spare Capacity Register but to instead notify users who have expressed an interest in accessing the GGP with information about the available spare capacity and information about the bids for that spare capacity placed by other companies wishing to access the GGP (while maintaining the confidentiality of other interested parties).

1695. GGT proposes that, where spare capacity is or is likely to become available, it will:

- notify prospective users who have submitted expressions of interest for pipeline capacity;
- publish a notice that there is spare capacity to become available in a local and a national newspaper; and
- advise of a deadline of 30 days by which time subsequent expressions of interest must be made.

1696. Where all expressions of interest for services to be provided by spare capacity can be met with the available spare capacity, GGT will enter into negotiations with all prospective users that lodge expressions of interest, for the provision of services using the available spare capacity.

Spare capacity – Auction

1697. In the event that GGT determines there is sufficient demand to proceed with an auction for the spare capacity (and that the spare capacity is not sufficient to meet the expressions of interest for services), GGT has proposed to replace the first-come-first served queuing policy in the current access arrangement with a public auction process.

1698. GGT considers that the adoption of a public auction will better meet the NGO as it will promote the efficient use of natural gas services by ensuring that existing

[687] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 25.

capacity is allocated to those users who value it most, and should, therefore, allocate capacity in a way that is in the long term interests of consumers with respect to price, reliability and security of supply.[688] GGT submits that its current queuing policy prevents it from allowing higher value projects to have a higher priority than lower value projects when the GGP does not have sufficient spare capacity to accommodate both.

1699. GGT submits that the auction will incorporate several stages, with non-binding bids followed by binding bids. The key features of the auction are:

- GGT will accept expressions of interest in existing capacity;
- GGT will confirm the expression of interest, inform the prospective user of any available spare capacity and provide details of other registrations for capacity received from other prospective users;
- GGT will notify all prospective users, that an auction of existing capacity is planned and advertise in local and national newspapers;
- all prospective users will be asked to submit a first-price sealed bid, which specifies the prospective user's requirements for capacity, delivery point location/s, duration of contract, and tariffs;
- bids may be for the reference service at the reference tariff, or for a negotiated service for which the user proposes a negotiated tariff;
- GGT may set a reserve price for the auction. For the provision of the firm service the reserve price will not exceed the reference tariff;
- prospective users will be required to meet prudential requirements;
- bids are to be irrevocable, and submitted in the form of an executable contract;
- prospective users may consult with GGT on the acceptability of potential alternative terms and conditions prior to submitting a bid; and
- once the period allowed for the auction has expired, GGT will rank the bids on a Net Present Value (**NPV**) basis, with bids which have a higher NPV ranked ahead of bids with a lower NPV.

1700. GGT also indicated that:

- If the aggregate of all complying bids for spare capacity in the auction does not exceed the spare capacity each complying bid will be deemed to be an irrevocable request capable of immediate acceptance.
- If the aggregate of all complying bids received on or before the auction cannot be satisfied by the spare capacity then GGT will allocate the spare capacity on the basis of its assessment of the NPV of the respective applications, from highest to lowest.

Developable Capacity

1701. GGT proposes an open season approach for developable capacity as efficient investment in pipeline capacity is facilitated by a process that aggregates similar capacity requirements into an efficient project. GGT proposes to conduct a public process to aggregate all possible interest in developable capacity, and then, if there is sufficient demand for similar projects, commence negotiations with interested

[688] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 18.

parties with the aim of developing the most efficient investment in additional capacity. GGT considers that this process is more likely to facilitate timely decisions on investment, and realise economies of scale than a first come, first served approach.

1702. The key features of the proposed requirements for developable capacity are:[689]

- GGT will accept registrations of interest for developable capacity at any time; a registration of interest will not imply any priority of access to developable capacity;
- where registrations of interest or other factors indicate there is sufficient demand for developable capacity, GGT will, where the circumstances allow, advertise in local and national newspapers the potential for expansion of the pipeline in order to ensure that all potential users of an expansion have been identified;
- following receipt of the expressions of interest, GGT will undertake investigations where there appears to be sufficient interest in similar types of services which can potentially be met with similar types of investment; and
- once the investigations are completed, and assuming that GGT has identified a capacity development project for which there is sufficient interest, the developable capacity will be offered to prospective users by direct negotiations with those prospective users.

1703. GGT proposes that, regardless of the outcome of a negotiation for developable capacity, it is not bound to undertake the relevant development.

Compliance Reports

1704. GGT proposes to provide to the regulator an independently audited report within 60 days of the completion of an auction for spare capacity, outlining the process and subsequent allocation of capacity. GGT proposes that the function of this report will be to determine GGT's compliance with proposed sections 5.2.2, 5.3.3 and 5.2.5.

1705. Where GGT has engaged in consultation with prospective users for developable capacity, GGT proposes to provide the regulator with an independently audited report that outlines the number of prospective users who expressed interest in developable capacity, any negotiations for developable capacity entered into and any negotiations that have resulted in investment in developable capacity.

Submissions

1706. Santos notes its concern that the process proposed by GGT relating to developable capacity in section 5.3.3 of the proposed revised access arrangement does not oblige GGT to undertake a development if it chooses not to. It further notes that if a pipeline expansion is technically feasible and economically viable, there should not be an opportunity to prevent it from proceeding. Santos believes that GGT's proposed revision is inconsistent with the NGO and will diminish the effectiveness of the Authority.

1707. Santos noted in its submission that currently it does not appear that a third party can enforce a right to gain access to the pipeline through access arrangement terms

[689] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 19.

and conditions if they are required to expand the pipeline capacity or fund construction of a new lateral or delivery station.

1708. Santos notes that, in order to meet the NGO, the Authority should consider whether an access arrangement should contain clearer provisions to regulate pipeline expansion for third party access.

1709. BHPB submits that under the current and proposed revised access arrangement, GGT is only required to expand the GGP where a user commits to sufficient negotiated services for GGT to recover all its costs in undertaking such an expansion. BHPB notes that a negotiated service is, by definition not a reference service and accordingly is not subject to a regulated tariff.

1710. BHPB considers that requiring expansions to be funded by negotiated services is unnecessary, and that GGT should not be obliged to expand unless it is able to recover its costs of providing such an expansion. However, where GGT is able to recover these costs by providing sufficient reference services, users should be given the opportunity to obtain such references services.

Considerations of the Authority

Spare Capacity

1711. The Authority considers that GGT's proposed revisions to the maintenance of its public spare capacity register do not comply with the NGR or the NGO.

1712. GGT's proposal to include only spare capacity of up to 2TJ in the spare capacity register is contrary to the NGR (Schedule 1, Part 1 (3)(16) and rule 111), which requires that all spare capacity belonging to the covered pipeline be included in the spare capacity register.

1713. The Authority requires GGT to remove the provision that only spare capacity less than 2 TJ will be listed in the spare capacity register for the GGT, and to reinstate the provision that all spare capacity belonging to the covered pipeline will be included in the spare capacity register.

1714. The Authority agrees with GGT's concerns regarding the first-come-first-served queuing policy and its possible impediments to the efficient capacity utilisation of the GGP.

1715. The Authority considers that GGT's proposal for a queuing policy for existing spare capacity based on the capacity requirements, demand, volumes, commencement and end dates, and receipt and delivery points proposed by prospective users has a number of merits. GGT's concerns regarding the efficiency of pipeline utilisation in the face of potentially competing requests for access will be addressed if its proposed amendments are implemented. The implementation of the auction method in cases where there is insufficient capacity to meet the needs of all prospective users will, as submitted by GGT, also ensure that the pipeline is utilised by users who place the highest value on its use.

1716. However, the Authority considers that the information thus far provided by GGT regarding the way that it intends to calculate the NPV for each application in order to assign ranks for the purpose of providing capacity to bidders is insufficient to allow prospective users to determine where their position in the queue might be.

1717. The Authority approves GGT's proposal to amend its access and queuing methodology as outlined in its access arrangement revision proposal for the third access arrangement period. However, the Authority requires GGT to explain how it intends to calculate the NPV in more detail in its access arrangement.

Developable capacity

1718. GGT has proposed an open season approach for the allocation of developable capacity as opposed to the first-come-first-served approach in the second access arrangement.

1719. The Authority notes that GGT's proposed approach has a number of differences from the current queuing approach. For example:

- under proposed section 5.3.1(c) of GGT's revised access arrangement the proportion of costs of investigations to be borne by prospective users is to be based on their "MDQ" (something a prospective user is unlikely to have), instead of their "requested capacity" (as is currently the case under section 7.2(c) of the current access arrangement). "MDQ" is relevantly defined (in schedule C to GGT's revised access arrangement) as the maximum quantity of gas that the service provider "is from time to time obliged" to receive at the receipt point or deliver at a delivery point for the user on any gas day. However, as at the time of any investigation into developable capacity, the service provider will not yet have any obligation to receive or deliver any of that capacity for a prospective user. So, it is not clear how section 5.3.1(c) will work in practice (other than where a "prospective user" is already a user, in which case its existing MDQ is unlikely to bear any meaningful relationship to the capacity that the user and other prospective users are requesting). GGT has not provided any adequate justification for this proposed change (which may be a drafting error). The Authority therefore requires that section 5.3.1(c) be amended so that the sharing of costs for the investigation between prospective users is based on their proportionate shares of requested capacity, not "MDQ";
- removal of the requirement in section 7.2(e) of the current access arrangement that meeting the cost of investigations for capacity can play a part in where prospective users sit in the queue;
- removal of the requirement in section 7.2(e) of the current access arrangement that costs of investigations that are passed to prospective users must be incurred reasonably;
- removal of the provision in section 7.2(h) of the current access arrangement that a prospective user who has paid for investigations may assign its application for service and the investigation information to another party interested in the relevant portion of the developable capacity. Section 7.2(h) of the current access arrangement would seem to provide prospective users with greater flexibility to utilise time and costs sunk in an investigation which might otherwise be lost and, as such, would seem to promote more efficient use of the pipeline. GGT has not explained how its proposed removal of this provision would promote the NGO. The Authority is of the view that GGT has not provided adequate justification for its proposed removal of section 7.2(h) of the existing access arrangement. Section 7.2(h) of the existing access arrangement should therefore be reinstated;
- removal of the requirement in section 7.2(i) of the current access arrangement that GGT must provide a prospective user who has paid the cost of an investigation with an itemisation of the costs related to the investigation for

developable capacity as soon as reasonably practicable; The Authority is of the view that GGT has not provided adequate justification for its proposed removal of section 7.2(i) of the existing access arrangement. Section 7.2(i) of the existing access arrangement should therefore be reinstated; and

- there are changes to the way that GGT will go about offering developable capacity to prospective users.

1720. The Authority notes that the removal of the requirement in section 7.2(e) of the current access arrangement that prospective users who decline to meet the cost of investigations will be given a lower priority in the queue may mean that users who do not pay for investigations may be given a higher priority in the queue for developable capacity on the basis of higher negotiated tariffs, differentiating capacity requirements, length of their proposed contract, or other factors. The Authority considers that the removal of this provision is therefore not in the best interests of consumers, as those users paying the costs of investigations may in essence be funding access investigations for other consumers while receiving no net benefit themselves.

1721. GGT has not explained how its proposed removal of this provision would promote the NGO. The Authority is of the view that GGT has not provided adequate justification for its proposed removal of section 7.2(e) of the existing access arrangement. The Authority requires GGT to reinstate the provision in section 7.2(e) of the current access arrangement, which requires GGT to give a higher priority to users who have contributed to the cost of investigations than it does to those who have not contributed to their cost.

1722. The Authority notes that GGT has sought to introduce a greater degree of discretion for itself than exists under section 7.3 of the existing access arrangement, as regards whether developable capacity that can be provided will actually be made available. For example:

- In section 5.3.2(a), it is left to GGT to a determine (without any safeguards imposed to ensure it makes that determination fairly and equitably) whether developable capacity "may be made available" and whether GGT "may enter into negotiations"; and
- In section 5.3.3, GGT reserves to itself the right not to develop capacity.

1723. The Authority does not agree that GGT should be allowed this discretion. The Authority notes that rule 112(5)(b) of the NGR effectively provides that if GGT has carried out a further investigation into developable capacity, then its obligation is to inform prospective users whether it "can or cannot" provide the requested pipeline service. That is a question of ability, not discretion. Similarly rules 112 (3)(a)(i) and 112(d) of the NGR are couched in terms of whether the service provider "can" or "cannot" provide the requested pipeline service. So, it is clear from the wording of rule 112 of the NGR that if GGT is able to provide the requested pipeline service, then it should do so. An exception to this "ability" rule might be where some other overriding provision of the NGR, NGL or another law prevents or limits the service provider providing the requested pipeline service. However, it is clear that the NGR does not give GGT any general discretion to refuse to provide a developable capacity pipeline service where it can provide that pipeline service.

1724. Further, the Authority considers that it would be inequitable and contrary to the NGO if prospective users might be required to go through the time and expense of an investigation into developable capacity only to be told that, despite the developable capacity being available, they cannot have it because the service provider doesn't

want to make it available. If the service provider were to be permitted such a discretion, the Authority would expect rule 112 of the NGR to require the service provider to state its intention at the outset so that prospective users do not incur wasted time and expense.

1725. The Authority considers that allowing prospective users to pay the costs of investigations and then not allowing viable capacity expansions (even with the assistance of capital contributions from users) is not in the best interests of consumers and is inconsistent with the NGO. The Authority agrees with Santos that capacity development should not be hindered where it is economically, technically and financially viable.[690]

1726. The Authority therefore requires GGT to:

- amend proposed section 5.3.2(a) to remove GGT's subjective discretion, so that it must be objectively assessed whether any Developable Capacity "can" be provided, and, if it can be provided, then the service provider must enter into negotiations with prospective users in relation to it. In this regard, if there are certain circumstances known in advance where it is generally accepted that a service provider "cannot" provide developable capacity, then those circumstances should be listed in section 5.3.2(a) so that unnecessary waste of time and expense can be avoided[691] ; and
- delete proposed section 5.3.3.

1727. The Authority regards the removal of the provision in section 7.2(e) of the current access arrangement, which provides that investigation costs borne by users are those that are incurred on a reasonable basis by GGT, as potentially detrimental to prospective users and is inconsistent with rule 112(3)(b)(iii) of the NGR and with the NGO. GGT has not provided any adequate justification for this proposed change. The Authority therefore requires GGT to reinstate this provision.

Compliance Reports

1728. The Authority requires GGT to delete proposed section 5.4, Compliance Reports. It is, of course, prudent for GGT to keep audited records to evidence its compliance with its policies and procedures should the need arise, and the Authority reserves the right to request production of those records and other information should it consider it necessary to do so. However, the Authority does not currently consider it necessary or efficient for it to receive or review such records on an ongoing basis and accordingly proposed section 5.4 is not necessary and should be deleted.

[690] Santos (BOL) Pty Ltd, *Public Submission by Santos in Response to the Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement and Access Arrangement Information*, 15 August 2014, dated 10 November 2014 at p 2.

[691] Such a list would benefit both parties by clarifying the reasoning behind decisions made by GGT with respect to requests for developable capacity, and enable access seekers to better tailor their requests to maximise the chance of progressing their application.

Required Amendment 16

Section 5.2

Proposed section 5.2.1 should be amended to reflect that all spare capacity will be included in the spare capacity register

Proposed section 5.2.5 should be amended to provide a detailed description of how GGT intends to calculate the NPV of bids from prospective users

Section 5.3

Proposed section 5.3.1(c) should be amended so that the sharing of costs for the investigation between prospective users is based on their proportionate shares of requested capacity, not MDQ.

Section 7.2(h) of the existing access arrangement (prospective user who has paid for investigations may assign its application for service and the investigation information to another party interested in the relevant portion of the developable capacity) should be reinstated.

Section 7.2(i) of the existing access arrangement which states that prospective users who have contributed to the cost of an investigation for developable capacity must be provided with an itemisation of the costs incurred in the investigation should be reinstated.

Section 7.2(e) of the current access arrangement, which requires GGT to give a higher priority to users who have contributed to the cost of investigations than it does to those who have not contributed to their cost should be reinstated.

The final sentence of current section 7.2(e) relating to the requirement for the user to only bear costs of investigations that are reasonably incurred should be reinstated into section 5.3.1 (after section 5.3.1 (d)).

Proposed section 5.3.2(a) should be amended to remove GGT's discretion, so that it must be objectively assessed if any Developable Capacity "can" be provided, and if it can be provided then the Service Provider "must" enter into negotiations with prospective users for it. In this regard, if there are certain circumstances known in advance where it is generally accepted that a service provider "cannot" provide developable capacity, then those circumstances should be listed in section 5.3.2(a).

Proposed section 5.3.3 should be removed. Section 5.3.3 states that GGT is not bound to undertake development.

Section 5.4

Proposed section 5.4 should be removed. Section 5.4 states that GGT will provide compliance reports to the regulator.

Extensions and Expansions Policy

Regulatory Requirements

1729. Section 18 of the NGL(WA) states:

> 18. Certain extensions to, or expansion of the capacity of, pipelines to be taken to be part of a covered pipeline
>
> For the purposes of this Law—
>
> (a) an extension to, or expansion of the capacity of, a covered pipeline must be taken to be part of the covered pipeline; and
>
> (b) the pipeline as extended or expanded must be taken to be a covered pipeline,
>
> if, by operation of the extension and expansion requirements under an applicable access arrangement, the applicable access arrangement will apply to pipeline services provided by means of the covered pipeline as extended or expanded.

1730. Under rule 48(1)(g) of the NGR, a full access arrangement proposal must set out extension and expansion requirements.

1731. Extension and expansion requirements are defined under section 2 of the NGL(WA).

> Extension and expansion requirements means –
>
> (a) the requirements contained in an access arrangement that, in accordance with the Rules, specify—
>
> (i) the circumstances when an extension to, or expansion of the capacity of, a covered pipeline is to be treated as forming part of the covered pipeline; and
>
> (ii) whether the pipeline services provided or to be provided by means of, or in connection with, spare capacity arising out of an extension to, or expansion of the capacity of, a covered pipeline will be subject to the applicable access arrangement applying to the pipeline services to which that arrangement applies; and
>
> (iii) whether an extension to, or expansion of the capacity of, a covered pipeline will affect a reference tariff, and if so, the effect on the reference tariff; and

1732. Specific provisions relating to extension and expansion requirements are set out in rule 104 of the NGR:

> 104 Extension and expansion requirements
>
> (1) Extension and expansion requirements may state whether the applicable access arrangement will apply to incremental services to be provided as a result of a particular extension to, or expansion of the capacity of, the pipeline or may allow for later resolution of that question on a basis stated in the requirements.
>
> (2) Extension and expansion requirements included in a full access arrangement must, if they provide that an applicable access arrangement is to apply to incremental services, deal with the effect of the extension or expansion on tariffs.
>
> (3) The extension and expansion requirements cannot require the service provider to provide funds for work involved in making an extension or expansion unless the service provider agrees.

1733. 'Incremental services' are defined under rule 3 of the NGR as "pipeline services provided by means of an extension to, or expansion of the capacity of, the pipeline".

1734. Under rule 100 of the NGR, the extension and expansion policy must also be consistent with the NGO.

GGT's Proposed Changes

1735. GGT is proposing to maintain its current approach of seeking consent for elections in relation to extensions and expansions. GGT has proposed what it indicates are minor amendments to the wording of the section of its access arrangement relating to extensions and expansions:

- The opening paragraph of section 10.1 in the current access arrangement specifies that GGT would not incur capital to expand the "Capacity of the Covered Pipeline". GGT has removed the words "covered pipeline" from the opening paragraph so that section 7.1 of its proposed revised access arrangement would read as follows:

  "Other than as required under the National Gas Rules, Service Provider will not incur capital to expand the Capacity unless a User."

- Proposed section 7.3(b) (section 10.3(b) in the current access arrangement) has been updated from stating that users making use of expanded capacity who have not made a capital contribution towards that capacity *will* be liable to pay for surcharges as allowed for in section 8 of the code to say that they *may* be liable to pay a surcharge under rule 83 of the NGR.

1736. GGT submits that:

- it has proposed revisions of its extensions and expansions policy to align it with requirements and terminology of rule 104 of the NGR;
- in proposing these revisions, GGT is not seeking to change the intent of the extensions and expansions policy, which was the subject of a decision by the Western Australian Electricity Review Board (**ERB**) in 2012 (Applications Nos. 1 and 2 of 2010, Supplementary Decision, 30 March 2012)[692]; and
- the changes are limited to terminology and approach under the NGR which differ to the former Code, with no change to operation of provisions.[693]

Submissions

1737. Santos submits that, in order to meet the NGO, the Authority should consider whether an access arrangement should contain clearer provisions to regulate pipeline expansion for third party access.[694] BHPB considers that the principles of the gas access regime, especially the NGO, can be seriously undermined by an extensions and expansions policy which is not sufficiently robust and transparent.[695]

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[692] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, at para 2.5 on p. 14.

[693] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information, Attachment 1, Log of Changes to GGP Access Arrangement*, 15 August 2014, p. 12.

[694] Santos (BOL) Pty Ltd, *Public Submission by Santos in Response to the Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement and Access Arrangement information*, 15 August, 2014, dated 10 November 2014, p. 2.

[695] BHP Billiton, *In response to Goldfields Gas Transmission Pty Limited's Proposed revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 11.

1738. Santos notes in its submission that currently it does not appear that a third party can enforce a right to gain access to the pipeline through access arrangement terms and conditions if they are required to expand the pipeline capacity or to fund construction of a new lateral or delivery station. Santos submits that the terms and conditions associated with the expansion gas transportation agreement should be those contained in the access arrangement. If a party should require something other than those terms and conditions, a negotiated service would then be appropriate however it should not be the default position for all new shippers.

1739. BHPB submits that in Western Australia the owners of significant pipeline infrastructure such as the GGP enjoy a position of considerable market power. BHPB considers that the expansions and extensions policies of the GGP have ensured that past expansions were not covered and could therefore not be contracted on regulated terms. Even though the Authority's consent for an election is required, the GGT is not required to expand the GGP unless users commit to a negotiated service (see section 10.2(c)). In GGT's proposed revised access arrangement, GGT is proposing to maintain the current approach of seeking consent for elections in relation to expansions and extensions including requiring expansions to be underpinned by negotiated services.[696] BHPB considers that GGT should not be obliged to expand unless it is able to recover its costs of providing such an expansion. However, where GGT is able to recover these costs by providing sufficient reference services, users should be given the opportunity to obtain such reference services. BHPB submits that all extensions and expansions to the GGT pipeline be automatically covered unless GGT can satisfy the ERA that this is inconsistent with the NGO. BHPB submits that this would bring the proposed revised access arrangement into line with the DBP and would put the onus on GGT to make timely elections in respect to coverage.

1740. BHPB notes that currently and still within the proposed revised access arrangement, GGT is required to elect 'at some point' in time whether or not a proposed extension or expansion should be treated as part of the covered pipeline. BHPB submits that the current process does not give sufficient protection to users or allow the Authority sufficient time to properly consider the implications of a proposed election and that this was shown in the latest decision on the GGP when a decision was made after capacity had been contracted with users.

1741. BHPB submits that the proposed revised access arrangement should provide a robust mechanism for dealing with extensions/expansions. BHPB submits that users applying for coverage through the National Competition Council (**NCC**) is not sufficient protection for users, is inefficient duplication and is a burden on users.[697] BHPB states that an alternative method to ensure the appropriate treatment of expansions would be to include a requirement that until the Authority has consented to any election, GGT should be prevented from entering into agreements with users with respect to the additional capacity. This would prevent GGT from being able to extract monopoly rents from users.

1742. BHPB submits that, in relation to the notification of uncovered capacity GGT should be required to notify the ERA and any current or prospective users of the GGP prior to any portion of its existing uncovered capacity ceasing to be contracted. The

[696] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, pp. 11-12.

[697] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 13.

timing of this notification should be such that all interested parties are afforded adequate time to consider the appropriate treatment of any available GGP capacity. This would encourage the efficient use of pipeline infrastructure and contribute to the achievement of the NGO.

1743. BHPB submits that GGT should be required to adopt an open and transparent approach to planning extensions and expansions. Introducing a more transparent system in relation to the planning of extensions and expansions in its proposed revised access arrangement would contribute to the achievement of the NGO.

Considerations of the Authority

1744. GGT is proposing to maintain its current approach of seeking consent for elections in relation to extensions and expansions. GGT's proposed sections 7.1 and 7.3(b) amend the wording of existing sections 10.1 and 10.3(b) (respectively).

1745. The Authority has received public submissions from Santos and BHPB. Both submissions highlighted as a major area of concern the treatment of extensions and expansions of the GGP.

GGT incurring costs

1746. Under proposed section 7.1 GGT states that other than as required under the NGR, the service provider will not incur capital to expand the pipeline capacity unless a user can demonstrate:

- the existence of reserves and demand for the economic life of the expansion;
- that it has the financial capability to pay the costs; and
- commits to a negotiated transportation agreement sufficient to ensure the payment of all costs.

1747. BHPB considers that GGT should not be obliged to expand unless it is able to recover its costs of providing such an expansion. However, where GGT is able to recover these costs by providing sufficient reference services, users should be given the opportunity to obtain such reference services.

1748. Santos submits that, should a party require something other than the reference service terms and conditions, a negotiated service would then be appropriate however it should not be the default position for all new shippers.

1749. Furthermore, Santos notes in its submission that currently it does not appear that a third party can enforce a right to gain access to the pipeline through access arrangement terms and conditions if they are required to expand the pipeline capacity or to fund construction of a new lateral or delivery station. Santos submits that the terms and conditions associated with the expansion gas transportation agreement should be those contained in the access arrangement.

1750. The Authority accepts GGT's submission that its proposed section 7.1 makes a number of amendments to the wording of existing section 10.1 to better reflect the terminology and approach under the NGR (which differs to the Code), but otherwise do not change the operation of the provisions.

1751. However, having regard to the submissions of interested parties, the Authority considers that GGT's proposal to only incur capital to expand the capacity if a user commits to a negotiated transportation agreement is not consistent with the NGO.

The requirement for users to enter into 'negotiated transportation agreements' has the effect that the service provider does not have to expand the GGP unless a user contracts for a non-regulated service. This effectively denies users the option of obtaining a regulated tariff and is not consistent with the NGO. The Authority therefore requires GGT to remove proposed section 7.1(c).

Application of access arrangement

1752. Under proposed section 7.2(a), GGT proposes that it must, with the regulator's consent, elect at some point in time whether or not a proposed extension to, or expansion of the capacity of the pipeline should be treated as part of the covered pipeline. Section 7.2(b) states that in the event that the regulator refuses consent to service provider's election, the regulator must make an express determination.

1753. BHPB submits that the Authority should ensure that all extensions and expansions to the GGP pipeline are automatically covered unless GGT can satisfy the ERA that coverage is inconsistent with the NGO. This change would put the onus on GGT to make timely elections in respect of coverage and encourage an efficient and timely process which would contribute to the achievement of the NGO. Further, BHPB has put forward an alternative view that until the ERA has consented to any election on expansions, GGT should be prevented from entering into agreements with users in respect of the additional capacity. This would also bring the draft access arrangement into line with the DBNGP access arrangement.

1754. The Authority notes that GGT has not provided any supporting information for how its proposed extension and expansion policy is consistent with the NGO. The Authority also notes that under the extension and expansion requirements of GGT's proposed revised access arrangement, GGT has the discretion to elect whether an extension or expansion is covered and the onus is on the Authority to determine why the extension or expansion should or should not be covered in accordance with the NGO.

1755. The Authority acknowledges that GGT's proposed policy was the subject of a decision by the ERB in 2012, under the Code.[698] The ERB ruled that each expansion needed to be considered by the Authority on a case by case basis, 'at the time the extension or expansion is proposed'.

1756. As stated in paragraph 2 GGT's proposed revisions to its current access arrangement are now assessed in accordance with the NGR and NGL(WA). Therefore, the Authority has assessed GGT's proposed policy in accordance with rules 48 and 104 of the NGR, the NGL(WA) and the NGO.

1757. The Authority is concerned that GGT's proposal outlined in paragraph 1753 may result in GGT making an election that takes into account only its own commercial interests, which may result in an outcome contrary to the NGO. This reason is consistent with the decision of the ERB on GGT's current access arrangement.[699]

1758. The Authority has considered this matter previously for the DBNGP access arrangement, which was subject to a decision by the Australian Competition

[698] Western Australian Electricity Review Board, *Applications Nos. 1 and 2 of 2010, Supplementary Decision*, 30 March 2012.

[699] Western Australian Electricity Review Board 22 Nov 2011, *Decision on Application No. 1 of 2010 and Application No. 2 of 2010*, paragraph 107.

Tribunal (**ACT**).[700] The Authority required DBNGP to amend its policy for expansions and the ACT upheld the Authority's decision. The Authority's decision was as follows:

> The Authority considers that it would more appropriate for the extension and expansion requirements to provide that the access arrangement will apply to incremental services to be provided as a result of any expansion in capacity of the DBNGP, except in instances where DBP can demonstrate to the Authority's reasonable satisfaction that application of the access arrangement to such services is inconsistent with the National Gas Objective. If DBP were to take the view at any time that an expansion of capacity should not form part of the covered pipeline, it is open to DBP to seek revocation of coverage of the relevant part of the DBNGP under the coverage provisions of the NGL(WA).

1759. The Authority acknowledges BHPB's submission that prospective users of the GGT should be given the opportunity to obtain reference services and that GGT's expansions and extensions policies have ensured that past expansions were not covered and, therefore could not be contracted on regulated terms.

1760. The Authority considers that incremental services that are provided as a result of any extension or expansion in capacity of the GGP should be automatically covered, except in instances where GGT can demonstrate to the Authority's reasonable satisfaction that application of the access arrangement to such services is inconsistent with the NGO. The Authority considers that this approach is consistent with the NGO. The Authority considers that where the default position is for deemed coverage there is greater certainty that regulated services will apply and consequently less opportunity for GGT to channel prospective users into contracting for a negotiated rather than a regulated service which could expose them to the extraction of unregulated (monopoly) tariffs and undermine the NGO.

1761. The Authority considers that if GGT were to take the view at any time that an expansion of capacity should not form part of the covered pipeline then it is open to GGT to seek revocation of coverage of the relevant part of the GGP under the coverage provisions of the NGL(WA).

1762. The Authority also notes that GGT's proposal allows GGT to elect at some point in time whether or not a proposed extension to, or expansion of the capacity of the pipeline should be treated as part of the covered pipeline.

1763. BHPB submits that GGT's proposal to elect "at some point in time" is not timely enough.[701] At paragraph 6.2, BHPB shows how GGT has used the "at some point in time" wording in section 7.2(a) to "game" the timing for when GGT can elect that an extension or expansion is not to be covered (so that prospective users face uncertainty and are channelled into contracting for a negotiated rather than a regulated service, thereby exposing them to unregulated tariffs and potentially undermining the NGO).

1764. BHPB submits that the current process does not give sufficient protection to users or enable the Authority adequate time to consider the implications of a proposed

[700] Australian Competition Tribunal, *Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14*, Decision, 26 July 2012.

[701] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, para 6.2 on p 12.

election and that this was shown in the latest decision on the GGP when a decision was made after capacity had been contracted with users. In particular:

- it has resulted in ERA decisions on coverage being made after extension/expansion capacity has been contracted with users not having the opportunity of a clear and efficient contracting path (a negotiated versus a regulated service) and therefore not being able to mitigate against the extraction of monopoly rents. This is inefficient and undermines the rationale for having coverage elections in the first place; and
- it does not allow the ERA sufficient time to properly consider whether a decision to consent to a proposed election contributes to the achievement of the NGO, which ultimately means that the ERA's election is of limited benefit to users.

1765. The Authority agrees with BHPB's submission that GGT's proposal to elect "at some point in time" is not timely enough. On 30 May 2014, the Authority made a determination to approve GGT's application to not cover an expansion on the GGP that added 43.3TJ/d capacity to the GGP. The Authority noted in its determination that GGT applied to the Authority for approval just as the expansion capacity was nearing its commissioning date. The Authority considered that this was contrary to the requirements of the GGP access arrangement. The Authority considered that GGT should have applied earlier, when the expansion was first being considered, prior to final investment decision. The Authority then could have engaged with GGT to ensure that its coverage determination occurred in a timely way, and related to an expansion of optimal size, given the prospective demand.

1766. The Authority considers that having regard to the reasons highlighted in its determination on 30 May 2014 and the submissions by BHPB, GGT's proposal to elect "at some point in time" is not consistent with the NGO. However, the Authority considers that this issue will be removed when the access arrangement is amended such that such that the default position is that the extended or expanded pipeline capacity is automatically to be treated as covered unless the service provider makes an election to have it not covered and the Authority consents

1767. The Authority considers that GGT's proposed "extension and expansion requirements" (formerly "policy") are not compliant with relevant requirements of the NGL and NGR.

Pipeline Extensions/Expansions and Tariffs

1768. GGT's proposed section 7.3 sets out the effect of pipeline extensions and expansions on tariffs when funded by different parties. GGT has updated section 7.3(b) to replace "will be liable to pay for surcharges" to "may be liable to pay a surcharge" under Rule 83 of the NGR.

1769. GGT did not provide any explanation for this proposed amendment, but claims in its supporting information that its proposed amendment does not change the operation of the provision.[702]

1770. No public submissions were received that referred specifically to this proposed amendment.

[702] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information, Attachment 1, Log of Changes to GGP Access Arrangement*, 15 August 2014, p. 12.

1771. The Authority notes that, under proposed section 7.3, whether or not a user is actually required to pay a surcharge will be determined "as provided under rule 83 of the National Gas Rules". Rule 83 requires GGT to obtain the Authority's approval for a surcharge (r 83(2)) and effectively allows GGT a discretion whether or not to recover a surcharge in that it has discretion whether or not to apply for that approval (r 83(1)). So GGT's proposed amendment to replace "will be liable to pay for surcharges" with "may be liable to pay a surcharge" would appear to be simply reflecting the reality that a surcharge will only arise if GGT seeks and obtains the ERA's approval for it (neither of which are certainties).

1772. The Authority accepts GGT's proposed amendments to the wording of section 7.3(b).

Required Amendment 17

GGT is required to remove section 7.1(c) that requires a user to commit to a negotiated transportation agreement before GGT will incur capital to expand the capacity.

Section 7.2 should be amended so that the access arrangement will apply to incremental services to be provided as a result of any extension or expansion in capacity of the GGP, except in instances where GGT can demonstrate to the Authority's reasonable satisfaction that application of the access arrangement to such services is inconsistent with the NGO.

Capacity Trading Requirements

Regulatory Requirements

1773. Rule 105 of the NGR provides for capacity trading requirements.

> 105 Capacity trading requirements
>
> (1) Capacity trading requirements must provide for transfer of capacity:
>
> (a) if the service provider is registered as a participant in a particular gas market – in accordance with rules or Procedures governing the relevant gas market; or
>
> (b) if the service provider is not so registered, or the relevant rules or Procedures do not deal with capacity trading – in accordance with this rule.
>
> (2) A user may, without the service provider's consent, transfer, by way of subcontract, all or any of the user's contracted capacity to another (the **third party**) with the following consequences:
>
> (a) the transferor's rights against, and obligations to, the service provider are (subject to paragraph (b)) unaffected by the transfer; but
>
> (b) the transferor must immediately give notice to the service provider of:
>
> (i) the subcontract and its likely duration; and
>
> (ii) the identity of the third party; and
>
> (iii) the amount of the contracted capacity transferred.

(3) A user may, with the service provider's consent, transfer all or any of the user's contracted capacity to another (the **third party**) with the following consequences:

(a) the transferor's rights against, and obligations to, the service provider are terminated or modified in accordance with the capacity trading requirements; and

(b) a contract arises between the service provider and the third party on terms and conditions determined by or in accordance with the capacity trading requirements.

(4) The service provider must not withhold its consent under subrule (3) unless it has reasonable grounds, based on technical or commercial considerations, for doing so.

(5) An adjustment of rights and liabilities under subrule (3) does not affect rights or liabilities that had accrued under, or in relation to, the contract before the transfer took effect.

(6) The capacity trading requirements may specify in advance conditions under which consent will or will not be given, and conditions to be complied with if consent is given.

GGT's Proposed Changes

1774. GGT has renamed its "Trading Policy" as "Capacity Trading" and replaced provisions in section 9 of its current access arrangement with new provisions in section 6 of its proposed revised access arrangement. GGT has deleted the "Capacity management policy" in section 11 of its current access arrangement as GGT claims it is no longer required by the NGR.

1775. GGT has proposed substantial changes to the section on capacity trading to comply with rule 105 of the NGR and other APA Group access arrangements[703] GGT did not provide the Authority with any access arrangement supporting information in relation to this issue but did submit a log of changes to the GGP Access Arrangement.[704]

1776. Proposed section 6.1 ("governing provisions") provides that where parties are registered as participants in a particular gas market, transfers will be undertaken in accordance with the rules of the relevant market. Where parties are not so registered, transfers will be undertaken in accordance with rule 105 of the NGR and sections 6.2 and 6.3 of GGT's proposed revised access arrangement.

1777. Proposed section 6.2 ("assignment of contracted capacity by subcontract") allows the user to assign by way of subcontract, all or any of the user's contracted capacity to another person without prior consent of service provider in accordance with the terms of the transportation agreement. GGT claims this proposed amendment is consistent with rule 105(2) of the NGR.

1778. Proposed section 6.3 ("other assignments") allows the user to assign, other than by way of subcontract, its Receipt Point MDQ or Delivery Point MDQ (or both) with GGT's prior written consent, which must not be unreasonably withheld but may be withheld on reasonable commercial and technical grounds, provided that:

[703] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, Attachment 1, Log of changes, 15 August 2014.

[704] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information, Attachment 1, Log of Changes to GGP Access Arrangement*, 15 August 2014, pp. 11-12.

- the user pays GGT's reasonable costs and expenses in respect of the application for consent and any assignment;
- GGT and the assignee execute a transportation agreement "acceptable to" GGT in relation to the Receipt Point MDQ or Delivery Point MDQ in a form and substance similar to the user's transportation agreement;
- where the assignment relates to an existing Firm Service Transportation Agreement, GGT and the assignee must execute a replacement Firm Service Transportation Agreement, unless GGT otherwise agrees;
- the Receipt Point MDQ or Delivery Point MDQ to be assigned relates to the user's Receipt Point and Delivery Points under the user's Transportation Agreement or, if different Receipt Points or Delivery Points are proposed, the assignee meets GGT's reasonable requirements;
- the assignee agrees with any other user using the relevant Receipt Point and Delivery Points to sharing of the use of facilities and any conditions and charges, at no additional cost to GGT;
- the assignee confirms in writing that it has made all necessary arrangements with producers of Gas for the assignee, purchasers of Gas from the assignee and any other party relating to that service, including all Gas purchase, Gas sale, operating and multi-party Receipt Point and Delivery Point arrangements;
- if the assignment of part or all of the Receipt Point MDQ or Delivery Point MDQ to the assignee requires additional facilities at the Receipt Point or Delivery Point, the user or the assignee (or both) agree to pay GGT for the cost of construction on terms and conditions reasonably determined by GGT; and
- the user agrees to comply with any other reasonable commercial or technical conditions of GGT.

Submissions

1779. The Authority did not receive any submissions relating to the proposed capacity trading requirements in the revised access arrangement.

Considerations of the Authority

1780. As per rule 105 of the NGR, GGT's proposed capacity trading requirements allow a user to transfer all or any of the user's contracted capacity to a third party. GGT proposes that for "relevant parties" that are not registered to a particular gas market, transfers of contracted capacity should be in line with rule 105 of the NGR and proposed sections 6.2 and 6.3 of its access arrangement. GGT has used the term "relevant parties" in proposed section 6.1 in place of the term "service provider" which is used in rule 105(1) and does not appear to have provided any definition for "relevant parties" or made any attempt to explain why this change has been made. The Authority therefore requires that GGT either provide adequate justification for its use of "relevant parties", together with an adequate definition of the term, or revert to using "service provider" as used in rule 105(1).

1781. Proposed section 6.2 allows the user to assign, by way of subcontract, all or any of the user's contracted capacity to another person without prior consent of service provider "in accordance with the terms of the Transportation Agreement". "Transportation Agreement" is defined in schedule C as "any contract entered into between the Service Provider and a User for Services for that User" so it is not necessarily a contract based on the terms and conditions attached in schedule D.

It is therefore not clear what terms apply to the "Transportation Agreement" and whether it contains any terms that are consistent with rule 105(2) of the NGR. The Authority considers that GGT has not adequately outlined the requirements for users assigning capacity to third parties by way of subcontract in accordance with rule 105 of the NGR. The Authority requires GGT to specify the consequences of assignment by way of subcontract as set out in paragraphs (a) and (b) in rule 105(2) of the NGR in proposed section 6.2 of its access arrangement. The Authority also requires GGT to delete the word "prior" from proposed section 6.2, as its inclusion might wrongly imply that "subsequent" consent is required, which would not be consistent with rule 105(2) of the NGR (which does not require consent of any kind). The Authority also notes that the word "prior" is not used in the comparable provision in new clause 108 of GGT's proposed terms and conditions (schedule D).

1782. Proposed section 6.3 deals with the assignment of rights in relation to capacity by the user to a third party, with GGT's prior written consent, by methods other than by subcontract. Proposed section 6.3 must therefore be consistent with rules 105(3), 105(4), 105(5) and 105(6) of the NGR.

1783. The Authority is of the view that, for consistency with rule 105(3), proposed section 6.3 should set out the "consequences" of assignment set out in paragraphs (a) and (b) of rule 105(3). Proposed section 6.3 does not currently address this requirement. The Authority therefore requires that proposed section 6.3 should be amended to set out the "consequences" of assignment as set out in paragraphs (a) and (b) of rule 105(3).

1784. Rule 105(4) of the NGR requires that GGT must not withhold its consent under rule 105(3) unless it has "reasonable grounds, based on technical or commercial considerations, for doing so". GGT has provided in the opening paragraph of proposed section 6.3 that its consent "must not be unreasonably withheld" and then in the penultimate paragraph of proposed section 6.3 it has stated that it "may withhold its consent to an assignment under this section 6.3 on reasonable commercial and technical grounds". GGT has also proposed a definition of "reasonable commercial" (but not "technical") in proposed section 6.5 which, because of the use of the word "include" (rather than "means") is a non-exhaustive definition. Although they are similar to the requirements in rule 105(4), the Authority is of the view that these various provisions do not strictly comply with rule 105(4). This is because:

- the wording in the penultimate paragraph of proposed section 6.3 (i.e. "*may withhold its consent to an assignment under this section 6.3 on reasonable commercial and technical grounds*") is permissive (i.e. "may withhold") rather than restrictive, as used in rule 105(4) (i.e. "must not withhold), so that it does not expressly prevent the possibility of GGT withholding its consent for grounds that are not reasonable commercial and technical grounds; and
- the wording in the penultimate paragraph of proposed section 6.3 refers to "*reasonable commercial and technical grounds*", whereas the requirement in rule 105(4) is that GGT must have "*reasonable grounds, based on technical or commercial considerations*". As a result, the drafting of proposed section 6.3:
  - is slightly ambiguous as it does not clearly require that the "technical grounds" must also be "reasonable" (although this would be required anyway by the overriding "must not be unreasonably withheld" requirement in the opening paragraph of proposed section 6.3); and
  - requires GGT to have grounds that are both commercial "and" technical, whereas the requirement in rule 105(4) is that the rounds be based on

considerations that are either commercial "or" technical. The Authority has no objection to GGT imposing a more restrictive requirement on itself than is required by rule 105(4) of the NGR.

1785. On balance, the Authority is of the view that the above concerns could be addressed by amending the penultimate paragraph of proposed section 6.3, to track more closely the wording of rule 105(4), so that it states:

> "Service Provider must not withhold its consent to an assignment under this section 6.3 unless it has reasonable grounds, based on technical or commercial considerations, for doing so."

1786. Rule 105(5) of the NGR provides that an adjustment of rights and liabilities under rule 105(3) does not affect rights or liabilities that had accrued under, or in relation to, the contract before the transfer took effect. The Authority considers that GGT has substantially addressed consistency with this requirement by the inclusion of the final paragraph of proposed section 6.3.

1787. Rule 105(6) of the NGR allows GGT to "specify in advance conditions under which consent will or will not be given, and conditions to be complied with if consent is given". The Authority is of the view that:

- the word "specify" in rule 105(6) means that GGT must explain or describe the relevant condition clearly and exactly;
- any such condition that GGT seeks to impose must also satisfy the reasonableness test in rule 105(4) of the NGR, otherwise the condition could undermine rule 105(4); and
- any such condition that GGT seeks to impose must also satisfy the NGO, otherwise the condition could undermine rule 100 of the NGR; and
- any restriction on, or requirement for, assignment, such as those listed in paragraphs (a) to (g) of proposed sections 6.3, could be considered to be in the nature of "conditions under which consent will or will not be given" and/or "conditions to be complied with if consent is given", and so must satisfy the above requirements.

1788. Proposed section 6.3 includes a number of such conditions. Under section 6.3 an assignment (and therefore any consent to it) is expressed to be "subject to any Pre-existing Contractual Rights affecting the transfer or assignment by Service Provider or any other party of rights in relation to Capacity, including under the GGP State Agreement and the GGTJV Agreement". The Authority considers that while substantially the same words already appear in section 9.1 of the existing access arrangement, GGT has not explained why they have been included in the proposed revised access arrangement. The Authority considers that GGT should provide an explanation as to precisely what the term "subject to any Pre-existing Contractual Rights" is supposed to mean in this context.

1789. GGT's consent must be "prior written consent". The Authority notes that rule 105 of the NGR does not require the service provider's consent to a transfer to be "prior" or "written" and while both those things may evidence a prudent approach, by requiring them as conditions for consent, this could prevent a shipper having the flexibility to obtain consent in some unwritten form (e.g. verbal, implied or deemed consent) and/or after the event. GGT has not provided any explanation for this requirement. No submissions were received in relation to it. The Authority has decided to reject GGT's proposal that consent must be in writing. However, the

Authority will consider this proposal if GGT can justify why “prior written consent” is necessary, meets the NGO and is consistent with efficient operation of a pipeline.

1790. The user must pay GGT's "reasonable costs and expenses (including legal costs, internal costs and other costs as reasonably determined) in respect of application for consent (whether or not the assignment proceeds to completion) and any assignment" (see proposed section 6.3(a)). The Authority considers that it is reasonable and consistent with the NGO for GGT to recover these costs direct from the user. Also, the Authority considers that it is reasonable to expect the individual user to pay GGT's costs irrespective of whether or not consent to the transfer is given. However, GGT will only be allowed reimbursement of costs etc. that it has "reasonably and properly incurred".

1791. GGT and the assignee must execute a Transportation Agreement acceptable to GGT in relation to the Receipt Point MDQ or Delivery Point MDQ in a form and substance similar to the user’s Transportation Agreement (see proposed section 6.3(b)) and, where the assignment relates to an existing Firm Service Transportation Agreement, GGT and the assignee must execute a replacement Firm Service Transportation Agreement, unless otherwise agreed by GGT (see proposed section 6.3(b)(i)). The Authority requires that GGT amend proposed sections 6.3(b) and 6.3(b)(i) to require that, in exercising its rights and discretions under the provision, GGT must do so "acting reasonably, based on reasonable commercial or reasonable technical considerations".

1792. The Receipt Point MDQ or Delivery Point MDQ to be assigned must relate to the user’s Receipt Point and Delivery Points under the user’s Transportation Agreement or, if different Receipt Points or Delivery Points are proposed, the assignee must meet GGT’s "reasonable requirements" (see proposed section 6.3(c)). The Authority considers that the "reasonable requirements" referred to in proposed section 6.3(c) are not sufficiently "specified" (as required by rule 105(6)) so that it can be determined if they satisfy the (more stringent) reasonableness test in rule 105(4) and the NGO. The Authority therefore requires GGT to clarify what these "reasonable requirements" would be.

1793. The assignee must agree with any other user using the relevant Receipt Point and Delivery Points to sharing of the use of facilities and any conditions and charges, at no additional cost to GGT (see proposed section 6.3(d)).

1794. The assignee must confirm in writing that it has made all necessary arrangements with producers of Gas for the assignee, purchasers of Gas from the assignee and any other party relating to that service, including all Gas purchase, Gas sale, operating and multi-party Receipt Point and Delivery Point arrangements (see proposed section 6.3(e)).

1795. If the assignment of part or all of the Receipt Point MDQ or Delivery Point MDQ to the assignee requires additional facilities at the Receipt Point or Delivery Point, the user or the assignee (or both) must agree to pay GGT for the cost of construction on terms and conditions reasonably determined by GGT (see proposed section 6.3(f)). The Authority requires that proposed section 6.3(f) be amended to require that, in exercising its rights and discretions under the provision, GGT must do so "acting reasonably, based on reasonable commercial or reasonable technical considerations".

1796. The user must agree to comply with "any other reasonable commercial or technical conditions" of GGT (see proposed section 6.3(g)). The Authority considers that the

"reasonable commercial or technical conditions" referred to in proposed section 6.3(g) are not sufficiently "specified" (as required by rule 105(6)) so that it can be determined if they satisfy the NGO. Also, the words used do not exactly match, and may therefore not be consistent with, the (more stringent) reasonableness test in rule 105(4) (see the Authority's comments on compliance with rule 105(4) at paragraph 1784 above. The Authority therefore requires GGT to clarify what these "reasonable commercial or technical conditions" would be.

1797. The Authority considers that GGT's references to MDQ in relation to tradeable capacity throughout proposed section 6.3 may cause confusion to prospective users and are not consistent with the NGR. The Authority notes that rule 105(3) of the NGR refers to a user's "contracted capacity" and that the capacity trading requirements that (by virtue of rule 48 of the NGR) must be included in GGT's access arrangement are not confined to dealing with reference services. The Authority also notes that, by contrast, proposed section 6.2 already references a user's contracted capacity (rather than MDQ), which the Authority considers is consistent with rules 48 and 105(2) of the NGR. The Authority therefore questions why GGT does not also reference user's contracted capacity (rather than MDQ) in proposed section 6.3. The Authority therefore requires GGT to clarify that section 6.3 refers to all or any of a user's contracted capacity that might be traded, and not just capacity that has a nominated throughput associated with it.

Required Amendment 18

Section 6.1

The Authority requires that either GGT provides adequate justification for its use of "relevant parties" in proposed section 6.1, and includes in its revised access arrangement an adequate definition of "relevant parties" for use in proposed section 6.1, or proposed section 6.1 should be amended so that "service provider" is used instead of "relevant parties".

Section 6.2

Proposed section 6.2 should be amended to specify the consequences of assignment as set out in rule 105(2) of the NGR and to delete the word "prior".

Section 6.3

Proposed section 6.3 should be amended to specify the consequences of assignment as set out in paragraphs (a) and (b) of rule 105(3).

The penultimate paragraph of proposed section 6.3 should be amended to read as follows:

"Service Provider must not withhold its consent to an assignment under this section 6.3 unless it has reasonable grounds, based on technical or commercial considerations, for doing so."

The conditions in proposed section 6.3 should be amended to include:

> An explanation as to precisely what the term "subject to any Pre-existing Contractual Rights" is supposed to mean in this context.

Justification why “prior written consent” is necessary, meets the NGO and is consistent with efficient operation of a pipeline.

Proposed section 6.3(a) should be amended so GGT will only be allowed reimbursement of costs that it has "reasonably and properly incurred".

Proposed sections 6.3(b) and 6.3(b)(i) should be amended to require that, in exercising its rights and discretions under the provision, GGT must do so "acting reasonably, based on reasonable commercial or reasonable technical considerations".

Proposed section 6.3(c) should be amended so it is clear what the "reasonable requirements" would be if different Receipt Points or Delivery Points are proposed.

Proposed section 6.3(f) should be amended to require that, if the assignment requires additional facilities then GGT in exercising its rights and discretions under the provision, must do so "acting reasonably, based on reasonable commercial or reasonable technical considerations".

Proposed section 6.3(g) should be amended to clarify what are the "reasonable commercial or technical conditions" referred to in it.

The Authority requires GGT to clarify that proposed section 6.3 refers to all or any of a user's contracted capacity that might be traded, and not just capacity that has a nominated throughput associated with it.

Changing Delivery and Receipt Points

Regulatory Requirements

1798. Rule 106 of the NGR provides for changing receipt and delivery points.

> 106. Change of receipt or delivery point by user
>
> (1) An access arrangement must provide for the change of a *receipt or delivery point* in accordance with the following principles:
>
> (a) a user may, with the service provider’s consent, change the *user’s receipt or delivery point*;
>
> (b) the service provider must not withhold its consent unless it has reasonable grounds, based on technical or commercial considerations, for doing so.
>
> (2) The access arrangement may specify in advance conditions under which consent will or will not be given, and conditions to be complied with if consent is given.

GGT’s Proposed Changes

1799. GGT has included a new section under capacity trading titled “Changing delivery and receipt points” in section 6.4 of its proposed revised access arrangement, in order to address the requirements of rule 106 of the NGR. Section 6.4 contains the proposed conditions under which GGT is prepared to allow users to substitute receipt and delivery points. These include:

- the proposal that the user must provide GGT a minimum of 45 days’ notice in writing of their request to substitute all or part of their receipt or delivery point

MDQ for a receipt or delivery point MDQ at an alternative receipt or delivery point; [705]

- the proposal that GGT will respond within 30 days of receiving the Notice of a request for the substitution of receipt and delivery points from a user; and
- the caveat that GGT may withhold its consent on "Reasonable technical or commercial grounds". GGT proposes that it may also make its consent subject to additional conditions on technical or commercial grounds.[706]

1800. GGT has proposed the addition of new section 6.5 to address its intended meaning of the term 'reasonable commercial', which is used throughout section 6 of its proposed revised access arrangement.

1801. In section 6.5, GGT has proposed that the terms "reasonable commercial grounds" and "reasonable commercial conditions" will mean that any changes to the services proposed by a user will not result in a reduction of services provided or revenue received by GGT, or result in additional capital or non-capital costs to GGT than applied before the assignment or change, as the case may be. [707]

Submissions

1802. The Authority did not receive any submissions that related to GGT's proposed provisions for the changing of receipt points and delivery points.

Considerations of the Authority

1803. The Authority considers that, while the terms of GGT's proposed section 6.4 are largely acceptable, it would be beneficial to users and prospective users if the requirements contained in the first paragraph of this section were stated with more clarity. The Authority therefore requires GGT to amend the first paragraph of proposed section 6.4 to make clear the requirements for the substitution of receipt and delivery points.

1804. In the absence of any public submissions that address GGT's proposed provisions for changing delivery or receipt points, the Authority is satisfied with the timeframes proposed by GGT with respect to the proposed notice period and response periods.

1805. However, the Authority also notes that GGT has not specified in its proposed section 6.4 whether the proposed notice and response periods consist of calendar days, or gas days. The Authority therefore requires GGT to amend section 6.4 to clarify if the notice period and response period requirements are for calendar days or for gas days.

1806. The Authority observes that GGT has not included provisions for the medium through which it will convey its decision to the user with respect to their request to substitute delivery or receipt points. The Authority therefore requires GGT to amend the third paragraph of section 6.4 to indicate that it will respond to the user in writing within its proposed timeframe of 30 days.

1807. The Authority is concerned that GGT's proposed caveat stating that it may impose additional conditions on the substitution of delivery or receipt points on "technical or

[705] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 32.

[706] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 32.

[707] Goldfields Gas Transmission Pty Ltd, *Proposed Revised Access Arrangement*, 15 August 2014, p. 33.

commercial grounds" may not contain the same level of protection for users as GGT's proposed definition of "reasonable commercial grounds".

1808. Rule 106(1)(b) of the NGR requires that GGT must not withhold its consent under rule 106(1)(a) unless it has "reasonable grounds, based on technical or commercial considerations, for doing so". GGT has provided in the second paragraph of proposed section 6.4 that it "may withhold its consent to all or part of the above request on reasonable commercial or technical grounds or make its consent subject to conditions which are on reasonable commercial or technical grounds". The Authority is of the view that the above wording in the second paragraph of proposed section 6.4 is not consistent with the requirements in rule 106(1)(b). That is because:

- "may withhold its consent " is permissive rather than restrictive, as used in rule 106(1)(b) (i.e. "must not withhold), so that it does not expressly prevent the possibility of GGT withholding its consent for grounds that are not reasonable commercial or technical grounds; and
- the wording in the second paragraph of proposed section 6.4 refers to "reasonable commercial or technical grounds", whereas the requirement in rule 106(1)(b) is that GGT must have "reasonable grounds, based on technical or commercial considerations". As a result, the drafting of proposed section 6.4 is slightly ambiguous as it does not clearly require that the "technical grounds" must also be "reasonable".

1809. The Authority is of the view that the above concerns could be addressed by amending the second paragraph of proposed section 6.4 to read as follows (for consistency with rule 106(1)(b) of the NGR):

> "Service Provider must not withhold its consent to all or part of the above request or make its consent subject to conditions, unless it has reasonable grounds, based on technical or commercial considerations, for doing so."

1810. The Authority also requires GGT to more clearly articulate its intended meaning of "technical grounds", which is used throughout its proposed access arrangement in the same way that it has done for the term "reasonable commercial grounds".

1811. The Authority has also decided that GGT should include a set of circumstances under which GGT may impose additional conditions on users who wish to substitute receipt or delivery points, and include information about what these additional conditions might be.

1812. GGT has included proposed section 6.5 to address the meaning of the term 'reasonable commercial grounds', which is used throughout section 6 of its proposed revised access arrangement.

1813. The Authority notes that the NGR contains no requirement for such a definition as it has been proposed in GGT's proposed revised access arrangement. While the Authority accepts that there may be some benefit to both the service provider and to any prospective and existing users for this term to be defined in the access arrangement, the Authority is concerned that the examples provided in the proposed definition are one-sided and may have the effect of preventing an objective assessment of reasonableness taking into account all of the relevant circumstances. Further, the Authority notes that GGT's proposed definition is inclusive only and so lacks certainty.

1814. The Authority therefore rejects GGT's proposed definition for the term "reasonable commercial grounds" for the purposes of this access arrangement on the basis that it is not consistent with the NGO.

Required Amendment 19

Proposed section 6.4, paragraph 1 should be amended to improve the clarity of GGT's requirements for the substitution of receipt and delivery points.

Proposed section 6.4 should also be amended to clearly state it's the notification timeline requirements for GGT and users are on the basis of calendar days or gas days.

Proposed section 6.4 should be amended to state that GGT will respond to the users request to change delivery or receipt points in writing.

Paragraph 2 of section 6.4 should be amended to clarify that GGT's commercial and technical requirements with respect to a user's request to change delivery or receipt points will be reasonable.

Proposed section 6.4 should be amended to include circumstances under which GGT may choose to impose additional conditions on the changing of delivery or receipt points.

Proposed section 6.4 should be amended to include the additional conditions that may be imposed on users who wish to change delivery or receipt points.

Proposed section 6.5 should be deleted. Section 6.5 defines the meaning of "reasonable commercial".

Trigger Events

Regulatory Requirements

1815. The NGR provides for the inclusion of a trigger event for accelerating the review submission date.

> 51 Acceleration of review submission date
>
> (1) The *review submission date* fixed in an access arrangement advances to an earlier date if:
>
> (a) the access arrangement provides for acceleration of the *review submission date* on the occurrence of a trigger event; and
>
> (b) the trigger event occurs; and
>
> (c) the *review submission date* determined, in accordance with the access arrangement, by reference to the trigger event, is earlier than the fixed date.
>
> (2) A trigger event may consist of any significant circumstance or conjunction of circumstances.
>
> **Examples:**
>
> 1. A re-direction of the flow of natural gas through the pipeline.
>
> 2. A competing source of natural gas becomes available to customers served by the pipeline.

3. A significant extension, expansion or interconnection occurs.

(3) The [Authority] may insist on the inclusion in an access arrangement of trigger events and may specify the nature of the trigger events to be included.

GGT's Proposed Changes

1816. GGT's proposed revised access arrangement does not include any trigger events. GGT considers that the circumstances which would have triggered an access arrangement revision in accordance with section 3.4 of its current access arrangement have now passed. GGT submits that the early revision of an access arrangements is:[708]

- inconsistent with the scheme of incentive regulation provided for by the NGL(WA) and the NGR;
- inconsistent with the provision of effective incentives for efficient investment in a pipeline, as provided for in section 24(3) of the NGL(WA); and
- inconsistent with the NGO in terms of efficient investments for the long term interests of consumers in section 23 of the NGL(WA).

Submissions

1817. The Authority did not receive any submissions that related to the inclusion of trigger events in the proposed revised access arrangement.

Considerations of the Authority

1818. A trigger review mechanism in an access arrangement allows for a requirement to be included in the access arrangement for a service provider to submit revisions to its access arrangement before the scheduled review date due to the occurrence of a specified event.

1819. Under the NGR, the Authority may insist on the inclusion of trigger events in the access arrangement and may specify the nature of the trigger events.

1820. GGT considers that the circumstance under which it might lodge an application for alteration to its pipeline licence PL24 with the Minister for Mines, Western Australia, on the basis of the construction and installation of expansion facilities which result in increased capacity of the covered pipeline as measured at the pipeline's inlet points beyond 120 TJ, have passed.

1821. The Authority disagrees with GGT that the requirement for the inclusion of trigger events in the GGP access arrangement is against the principles of the NGO, the NGL(WA) or the NGR. The Authority considers that the inclusion of trigger events in an access arrangement provides protection for the long term interests of the consumers of natural gas, and under certain circumstances, may offer protection for the interests of pipeline owners themselves.

1822. However, the Authority has scrutinised GGT's forecast capital and operating expenditure, and forecast demand, and is satisfied on the basis of GGT's forecast that it is unlikely that the events contained within GGT's current provisions for triggering of revisions to its access arrangement will occur. The Authority therefore

[708] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 14.

does not require GGT to have any trigger events in its proposed revised access arrangement.

Terms and Conditions Applying to Firm Services

Regulatory requirements

1823. Rule 48(d)(ii) of the NGR requires an access arrangement proposal to detail the terms and conditions for each reference service.

1824. In accordance with rule 100 of the NGR, the Authority must be satisfied that any proposed amendments to reference service terms and conditions are consistent with the NGO.

GGT's Proposed Revisions

1825. GGT has modified the GGP access arrangement to align with the current form and structure of APA Group access arrangements. Some of the items that were previously included in the general terms and conditions have been transferred into the main body of the access arrangement.

1826. GGT has informed the Authority that it has undertaken a comprehensive revision of the terms and conditions applying to the provision of the reference service (firm gas transportation service) for the following reasons:

(a) to align terms and conditions with APA Group's national operations;

(b) to comply with the NGR (previous access arrangement was under the Code); and

(c) to remove obsolete terms and conditions.

Submissions

1827. The Authority received submissions in relation to GGT's proposed amendment of the terms and conditions from BHPB and Santos.[709] [710] In these submissions, BHPB and Santos both challenged the need for the wholesale changes proposed by GGT.

1828. BHPB submitted that GGT's amendments "represent a significant deterioration in the rights of both new and existing users from the current access arrangement. BHPB considers that GGT has not provided any compelling rationale for the changes and absent clearly articulated reasons the previous terms and conditions should remain. BHPB state that the proposed amendments will increase inefficiency, raise costs and would be contrary to the achievement of the NGO." BHPB specifically commented on the following amendments to the terms and conditions:

- Minimum term
- Title to Gas

[709] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014.

[710] Santos (BOL) Pty Ltd, *Public Submission by Santos in Response to the Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement and Access Arrangement information*, 15 August, 2014.

- Dispute resolution process

1829. Santos submitted that such wholesale change "creates an unnecessary burden on all stakeholders" and that "Certainty is critical. Change should only be necessary where a clear error has occurred or where conditions have altered to the extent that a change is absolutely necessary. GGT has not adequately demonstrated the need for change".

Considerations of the Authority

1830. The Authority has reviewed GGT's proposed revised terms and conditions. To satisfy itself that the reference service terms and conditions are consistent with the NGR and NGO. The Authority has given consideration to matters including:

(a) the effect of each of the reference service terms and conditions contained in GGT's Proposed Revisions;

(b) any reasons given by GGT for its proposed variations to the existing terms and conditions;

(c) submissions on the proposed reference service terms and conditions;

(d) the factors set out in the NGR, to the extent that they are applicable; and

(e) the existing GGP access arrangement.

1831. The Authority's considerations and required amendments for GGT's proposed revised terms and conditions are set out in Appendix 9. Appendix 9, Part 1 deals with the provisions in GGT's proposed revised terms and conditions while Part 2 deals with additional provisions, which the Authority requires GGT to insert or move back to the terms and conditions.

Compliance with the NGR and NGL

GGT's Proposed Revisions

1832. GGT claims that the GGP Access Arrangement has been revised to be consistent with the requirements of the NGL(WA) and the NGR. The changes made are largely associated with the adoption of new terms used in the NGL(WA) and the NGR.

Submissions

1833. BHPB submits that GGT's proposed amendments will increase inefficiency, raise costs and would be contrary the achievement of the NGO. Santos submits that change should only be necessary where a clear error has occurred or where conditions have altered to the extent that a change is absolutely necessary.

Considerations of the Authority

1834. The Authority has considered GGT's assertion that many of its amendments are required to comply with the NGR.

1835. However, for the reasons set out in detail in Appendix 9, the Authority does not agree that the amendments proposed by GGT to the current terms and conditions are required in order for the terms and conditions to comply with the NGR.

1836. As noted above, the Authority is required to assess GGT's proposed amendments to the terms and conditions for reference services, for consistency with the NGO.

1837. In many instances, the Authority was of the view that the current terms and conditions offer fairer or more reasonable terms and conditions for users and prospective users than under GGT's proposed revisions.

1838. Accordingly, in the instances identified in detail in Appendix 9, the Authority prefers the existing terms and conditions over GGT's proposed amendments for the reason that they are more likely to promote the long term interests of consumers of gas than GGT's proposed amendments and are, therefore, more likely to achieve the NGO.

1839. Taking into account the submissions made by BHPB and Santos, and save for the proposed amendments expressly approved in Appendix 9, the Authority does not approve changes proposed by GGT to the terms and conditions for the reference service which GGT says have been proposed to comply with the NGR.

Required Amendment 20

Amend the proposed revised terms and conditions for the reference service and the access arrangement so that all terms and conditions for the reference service comply with the NGR and achieve the NGO.

Changes consequent on this required amendment are itemised in Appendix 9.

GGT's proposed relocation of terms and conditions to the access arrangement or otherwise

GGT's Proposed Revisions

1840. GGT's proposed terms and conditions are set out in Schedule D to the GGP access arrangement.

1841. GGT's proposed Schedule D includes some, but not all, of the terms and conditions that would be required for a transportation agreement. The rest of the terms required for a transportation agreement have either been included elsewhere in the proposed revised access arrangement (e.g. see sections 2, 3 and 4 of the proposed revised access arrangement) or have not been included at all (e.g. boilerplate). As a result, the proposed revised access arrangement does not include a single document containing all of the terms and conditions for the reference service in a form that is readily capable of acceptance by a prospective user without the need for negotiation or modification.

Submissions

1842. The Authority did not receive any public submissions which commented on this aspect of GGT's proposed revised terms and conditions.

Considerations of the Authority

1843. The Authority considers that it is important that the terms and conditions for a reference service that are included in the access arrangement are presented in such a way that they can be readily accepted by a prospective user "as is" (without

requiring any further changes) if a prospective user wishes to take the reference service. If terms and conditions for a reference service are not presented in such a way, then a prospective user may be forced to negotiate changes to them, in which case the service may not be a reference service and will have unregulated pricing. Where a prospective user has to negotiate any changes, it may also be disadvantaged by a lack of bargaining power against the monopoly pipeline operator. The added time and costs for the prospective user of having to negotiate changes may eventually flow through to gas consumers. This, in turn, may mean the access arrangement is contrary to the requirement in rule 100 of the NGR that the provisions of an access arrangement must be consistent with the NGO.

1844. In *Application by DBNGP (WA) Transmission Pty Ltd (No 3) [2012] ACompT 14*, at [540], the ACT found that the terms and conditions on which a reference service is to be offered are inseparable from the nature of the service. Further, the Authority is of the view that for the reference service to be meaningful in practice (and for the access arrangement to comply with rule 100 of the NGR) it must be offered to users in a readily acceptable agreement. The Authority is of the view that this means the template transportation agreement should be attached to the access arrangement in either a single contractual document template incorporating the terms and conditions or a combination of a template order form or other form of agreement together with the terms and conditions. Whichever method is used, a single document or combined documents should contain all of the terms necessary for a transportation agreement without the need for negotiation, and must be included with the access arrangement.

1845. While this entire agreement approach may result in a degree of duplication where some provisions in the terms and conditions also have to be included in the access arrangement in order to comply with rule 48 of the NGR, the Authority is of the view that it is more important that prospective users have available to them in a single document all of the terms and conditions for the reference service, presented in a transparent way and capable of being readily accepted as a contract without the need for negotiation.

1846. The Authority does not approve changes proposed by GGT to the terms and conditions for the reference service that have the effect of preventing those terms and conditions being in a single document or bundle of documents annexed to the access arrangement, containing all of the terms and conditions for the reference service, presented in a transparent way and capable of being readily accepted as a contract without the need for negotiation (other than to insert contract specific details such as particulars for the user, its required quantities, start date and delivery point(s)).

1847. As noted above, while this entire agreement approach may result in a degree of duplication in order to comply with rule 48 of the NGR, it is not preferred. The Authority considers that overlap or duplication generally increases the risk of inconsistency and potential conflict between provisions, and makes the task of interpretation more difficult. The Authority considers that where possible duplication of provisions in the access arrangement and terms and conditions must be avoided.

Required Amendment 21

Amend the proposed revised terms and conditions for the reference service and the access arrangement so that all terms and condition for the reference service are contained in a single document or bundle of documents annexed to the access

arrangement. The changes identified in Required Amendment 2 should be reflected in the relevant terms and conditions that GGT is required to reinstate in the terms and conditions for the firm services.

Changes consequent on this required amendment are itemised in Appendix 9.

GGT's proposed alignment of terms and conditions with APA Group's national operations

GGT's Proposed Revisions

1848. GGT has sought to modify the terms and conditions for the reference service substantially to align them with those approved by the AER for the Roma to Brisbane Pipeline access arrangement. GGT claims the RBP access arrangement terms and conditions (**RBP AA T&Cs**) are, largely, APA Group's standard terms and conditions.

1849. GGT claims that efficiency benefits are potentially available to both GGT and prospective users from having terms and conditions which are consistent across gas transportation agreements. These claimed benefits are in the form of:

(a) better service provider and user understanding of the contractual arrangements for pipeline service provision;

(b) lower costs of the legal drafting of gas transportation agreements, and for legal advice obtained in respect of those agreements; and

(c) facilitation of pipeline capacity trading as a result of consistency across gas transportation agreements.

1850. Furthermore, GGT claims some pipeline users have national businesses, contract for service on multiple APA Group pipelines in different States and Territories, and benefit from consistency in contracting arrangements across those pipelines (where that consistency is possible and appropriate given the specific circumstances of each pipeline). The benefits are, again, the lower legal costs of contracting for pipeline services, and the lower administrative and legal costs of ongoing contract administration.

Submissions

1851. The Authority received submissions in relation to GGT's proposed amendment of the terms and conditions from BHPB and Santos.[711] [712] In these submissions, BHPB and Santos both challenge the need for the wholesale changes proposed by GGT.

[711] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014.

[712] Santos (BOL) Pty Ltd, *Public Submission by Santos in Response to the Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement and Access Arrangement information*, 15 August, 2014.

1852. BHPB submit that GGT's amendments "represent a significant deterioration in the rights of both new and existing users from the current access arrangement". BHPB considers that GGT has not provided any compelling rationale for the changes and absent clearly articulated reasons the previous terms and conditions should remain. BHPB states that the proposed amendments will "increase inefficiency, raise costs and would be contrary to the achievement of the NGO."[713]

1853. Santos submitted that such wholesale change "creates an unnecessary burden on all stakeholders" and that "Certainty is critical. Change should only be necessary where a clear error has occurred or where conditions have altered to the extent that a change is absolutely necessary. GGT has not adequately demonstrated the need for change".[714]

Considerations of the Authority

1854. The Authority notes that both BHPB and Santos are pipeline users with national businesses and yet, contrary to GGT's justifications in paragraph 1850 for its proposed changes, do not appear to favour the national consistency sought by GGT or perceive any efficiency benefits for them in the changes GGT has proposed to achieve that national consistency.

1855. Further, the Authority does not believe that GGT has, in its proposals or submissions, made out a convincing case in terms of the NGR that there is a need to change the terms and conditions to align them with APA Group's national operations.

1856. Taking into account the submissions made by BHPB and Santos, the Authority does not approve changes proposed by GGT to the terms and conditions for the reference service which are proposed for the purpose of making the terms and conditions consistent with the RBP access arrangement terms and conditions unless those changes:

(a) are necessary to comply with the NGR or any other law,

(b) offer fairer or more reasonable terms and conditions for prospective users than under the existing access arrangement,

(c) correct errors, or

(d) remove provisions that are obsolete.

1857. GGT has not provided convincing explanations or evidence to show that any of its proposed changes are justified on any of the above grounds.

[713] BHP Billiton, *Public Submission by BHP Billiton In Response to the Goldfields Gas Transmission Pty Limited's Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement*, 27 November 2014, p. 15.

[714] Santos (BOL) Pty Ltd, *Public Submission by Santos in Response to the Proposed Revisions to the Goldfields Gas Pipeline Access Arrangement and Access Arrangement information*, 15 August, 2014, p. 1.

Required Amendment 22

Amend the proposed revised terms and conditions for the reference service to modify all changes proposed by GGT for the purpose of aligning the terms and conditions to the RBP access arrangement.

Changes consequent on this required amendment are itemised in Appendix 9.

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Appendix 1 Summary of Recommendations (or) Required Amendments

Required Amendment 1
The proposed revised access arrangement should be amended to:

Include a website address that links directly to the description of the GGP.

Remove the provision to submit revisions to the access arrangement four years from the commencement date of this access arrangement.

Required Amendment 2
MDQ and MHQ

Amend proposed section 2.2.2(a) to clarify precisely how the user is to "establish" a Firm MDQ and Firm MHQ for each contract year.

Amend proposed section 2.2.2(b) of the revised access arrangement to clarify precisely how a user with multiple delivery points is to "establish" an MDQ and MHQ for each delivery point.

Amend proposed section 2.2.2(c) of the revised access arrangement to reinstate the existing MHQ formula from the definition of MHQ in Appendix 1 to the existing access arrangement.

Amend proposed section 2.2.2(d)(i) of the revised access arrangement so as to contain the same exclusion for System Use Gas and User's Linepack as regards receipt of gas (not deliveries) as exists in proposed section 2.2.2(d)(ii)).

Amend proposed section 2.2.2(d)(iii) so as to exclude System Use Gas and User's Linepack contributions from the receipt point MHQ restriction.

Adjustments to MDQ for Gross Heating Value

Delete section 2.2.3 of GGT's revised access arrangement and reverse all changes to the Gas Specification in Appendix 2 of the proposed revised terms and conditions.

Overrun

Amend section 2.2.4(e) to clarify that a user may, but need not, Nominate its Authorised Overrun with its monthly Nomination for the Firm Service (at least 3 Days before the Month start) but must Nominate its Authorised Overrun by no later than the Nomination Deadline of 4.00pm on the day before the relevant gas day.

Delete the indemnities for unauthorised overrun in section 2.2.4(k) and section 4.2.2(f) of GGT's revised access arrangement.

Reinstate clause 7.3(d) of the existing terms and conditions in place of proposed section 2.2.4(l).

Minimum Term

The Authority requires that GGT amend section 2.2.5 of GGT's revised access arrangement so the minimum term of the firm service will be 12 months rather than 5 years.

Title to Gas

Delete proposed clauses 57 and 66 of GGT's proposed terms and conditions and reinstate clauses 14.3 and 14.4 of the current terms and conditions.

Amend section 2.2.8 of GGT's revised access arrangement accordingly to clarify that title to gas does pass to GGT at the receipt point and will pass from GGT to User at a delivery point.

Gas specification and commingling

Amend sections 2.2.7(a),(b) and (c) of GGT's revised access arrangement to align the content with the Authority's required amendments for clause 43 in GGT's proposed terms and conditions set out in Part 1 of Appendix 9. In addition, the following should be added as a new paragraph at the end of section 2.2.7 of GGT's revised access arrangement:

Toll and Capacity Reservation Tariff

Amend proposed section 2.2.11 to clarify the drafting and remove any doubt that all, not just "any" Conditions must be satisfied. For example, this could be done by amending "any Conditions" to read "all and any Conditions."

Negotiated Services

Reinstate section 4.2(c) of the current access arrangement.

Required Amendment 3
The Authority requires that GGT amend the proposed revised access arrangement values for total revenue (nominal) to reflect the values in Table 4.

Required Amendment 4
GGT must provide an operating expenditure cost per Km KPI in units of $/Km of pipeline to facilitate benchmarking with comparable firms.

GGT must provide operational expenditure linked KPIs that relate to pipeline integrity, availability and reliability as shown in its asset management plan.

Required Amendment 5
The Authority requires GGT to amend its forecast operating expenditure to the amounts in Table 14 to account for the Authority's required reductions under rules 91 and 74 of the NGR.

Required Amendment 6
The opening capital base for 1 January 2015 in the proposed revised access arrangement must be amended to reflect the values in Table 26 of this Draft Decision.

Required Amendment 7
The value of capital expenditure for 2015 to 2019 access arrangement period must be amended to reflect the values shown in Table 36 of this Draft Decision.

Required Amendment 8
The projected capital base in the proposed revised access arrangement must be amended to reflect the values in Table 39 of this Draft Decision

Required Amendment 9
The Authority requires that the rate of return be consistent with the estimates set out in Table 65 of the Draft Decision. The *indicative* nominal post tax rate of return for 2015 is 6.32 per cent (this estimate will be revised for the Final Decision).

The Authority requires an annual adjustment to be applied to the debt risk premium to be incorporated in each subsequent tariff update during the third access arrangement period. The first annual update will apply for the tariff variation for the 2017 calendar year, and should be determined based on the automatic formula set out in Appendix 8 of the Draft Decision. The resulting annual adjustment to the rate of return should be incorporated in the Annual Tariff Variation.

The Authority requires that GGT nominate, as soon as practicable, the averaging period for each annual update applying in 2017, 2018 and 2019. The averaging periods for each year must be a nominated 40 trading days in the window 1 June to 31 October in the year prior to the relevant tariff variation, which will allow estimation of the updated DRP for inclusion in the relevant annual tariff variation. The nominated 40 trading day averaging period for each of the four years do not need to be identical periods, only that they occur

in the period 1 June to 31 October in each relevant year, and are nominated prior. The nominated averaging periods will remain confidential.

For each annual update for 2017, 2018 and 2019, the Authority will estimate the updated rate of return following the relevant annual averaging period and then notify GGT of the outcomes as soon as practicable. Following that notice, GGT is required to respond on any issues as soon as practicable, in order to allow the updated estimate to be finalised prior to submission by GGT of its proposed annual tariff variation within the required timeframe.

Required Amendment 10
GGT is required to adopt a gamma of 0.4.

Required Amendment 11
The Authority requires GGT to update the calculation of depreciation and the forecast capital base for the third access arrangement period as follows:

- Apply straight-line depreciation with the Current Cost Accounting approach to the regulatory asset base from 1 January 2015.
- Remove over-depreciation adjustment from the regulatory asset base and total revenue.
- Calculate the opening capital base for the GGP for the third access arrangement period by escalating it at the rate of inflation as measured by the CPI All Groups, Weighted Average of Eight Capital Cities.

Required Amendment 12
The Authority requires GGT to update the calculation of the estimated cost of corporate income tax (net of imputation credits) as per Table 72.

The Authority requires that GGT:

- Base its taxable income calculation on the smoothed tariff revenue rather than on the building block revenue
- Update the rolled forward TAB to ensure that it includes commissioned assets only.
- Update its cost of debt financing to $61.055 million, operating expenditure to $112.204 and the value of gamma to 0.4.

Required Amendment 13
The total revenue to be allocated for the calculation of reference tariffs for the third access arrangement period must be amended to reflect Table 99 of this Draft Decision.

Required Amendment 14
The Authority requires that GGT amend its Reference Tariffs and Charges section of the proposed revised access arrangement in accordance with paragraphs 1603 to1618

The Authority requires that GGT update its calculation of the reference tariff for the third access arrangement period, as per Table 103 of this Draft Decision.

Required Amendment 15
The Authority requires that GGT amend section 4.5 of the proposed revised access arrangement and sections A1 and A2 of Schedule A to the proposed revised access arrangement as set out in paragraphs 1652 to 1684.

Required Amendment 16
Section 5.2

Proposed section 5.2.1 should be amended to reflect that all spare capacity will be included in the spare capacity register

Proposed section 5.2.5 should be amended to provide a detailed description of how GGT intends to calculate the NPV of bids from prospective users

Section 5.3

Proposed section 5.3.1(c) should be amended so that the sharing of costs for the investigation between prospective users is based on their proportionate shares of requested capacity, not MDQ.

Section 7.2(h) of the existing access arrangement (prospective user who has paid for investigations may assign its application for service and the investigation information to another party interested in the relevant portion of the developable capacity) should be reinstated.

Section 7.2(i) of the existing access arrangement which states that prospective users who have contributed to the cost of an investigation for developable capacity must be provided with an itemisation of the costs incurred in the investigation should be reinstated.

Section 7.2(e) of the current access arrangement, which requires GGT to give a higher priority to users who have contributed to the cost of investigations than it does to those who have not contributed to their cost should be reinstated.

The final sentence of current section 7.2(e) relating to the requirement for the user to only bear costs of investigations that are reasonably incurred should be reinstated into section 5.3.1 (after section 5.3.1 (d)).

Proposed section 5.3.2(a) should be amended to remove GGT's discretion, so that it must be objectively assessed if any Developable Capacity "can" be provided, and if it can be provided then the Service Provider "must" enter into negotiations with prospective users for it. In this regard, if there are certain circumstances known in advance where it is generally accepted that a service provider "cannot" provide developable capacity, then those circumstances should be listed in section 5.3.2(a).

Proposed section 5.3.3 should be removed. Section 5.3.3 states that GGT is not bound to undertake development.

Section 5.4

Proposed section 5.4 should be removed. Section 5.4 states that GGT will provide compliance reports to the regulator.

Required Amendment 17

GGT is required to remove section 7.1(c) that requires a user to commit to a negotiated transportation agreement before GGT will incur capital to expand the capacity.

Section 7.2 should be amended so that the access arrangement will apply to incremental services to be provided as a result of any extension or expansion in capacity of the GGP, except in instances where GGT can demonstrate to the Authority's reasonable satisfaction that application of the access arrangement to such services is inconsistent with the NGO.

Required Amendment 18

Section 6.1

The Authority requires that either GGT provides adequate justification for its use of "relevant parties" in proposed section 6.1, and includes in its revised access arrangement an adequate definition of "relevant parties" for use in proposed section 6.1, or proposed section 6.1 should be amended so that "service provider" is used instead of "relevant parties".

Section 6.2

Proposed section 6.2 should be amended to specify the consequences of assignment as set out in rule 105(2) of the NGR and to delete the word "prior".

Section 6.3

Proposed section 6.3 should be amended to specify the consequences of assignment as set out in paragraphs (a) and (b) of rule 105(3).

The penultimate paragraph of proposed section 6.3 should be amended to read as follows:

"Service Provider must not withhold its consent to an assignment under this section 6.3 unless it has reasonable grounds, based on technical or commercial considerations, for doing so."

The conditions in proposed section 6.3 should be amended to include:

The Authority requires GGT to clarify that proposed section 6.3 refers to all or any of a user's contracted capacity that might be traded, and not just capacity that has a nominated throughput associated with it.

Required Amendment 19
Proposed section 6.4, paragraph 1 should be amended to improve the clarity of GGT's requirements for the substitution of receipt and delivery points.

Proposed section 6.4 should also be amended to clearly state it's the notification timeline requirements for GGT and users are on the basis of calendar days or gas days.

Proposed section 6.4 should be amended to state that GGT will respond to the users request to change delivery or receipt points in writing.

Paragraph 2 of section 6.4 should be amended to clarify that GGT's commercial and technical requirements with respect to a user's request to change delivery or receipt points will be reasonable.

Proposed section 6.4 should be amended to include circumstances under which GGT may choose to impose additional conditions on the changing of delivery or receipt points.

Proposed section 6.4 should be amended to include the additional conditions that may be imposed on users who wish to change delivery or receipt points.

Proposed section 6.5 should be deleted. Section 6.5 defines the meaning of "reasonable commercial".

Required Amendment 20
Amend the proposed revised terms and conditions for the reference service and the access arrangement so that all terms and conditions for the reference service comply with the NGR and achieve the NGO.

Changes consequent on this required amendment are itemised in Appendix 9.

Required Amendment 21
Amend the proposed revised terms and conditions for the reference service and the access arrangement so that all terms and condition for the reference service are contained in a single document or bundle of documents annexed to the access arrangement. The changes identified in Required Amendment 2 should be reflected in the relevant terms and conditions that GGT is required to reinstate in the terms and conditions for the firm services.

Changes consequent on this required amendment are itemised in Appendix 9.

Required Amendment 22
Amend the proposed revised terms and conditions for the reference service to modify all changes proposed by GGT for the purpose of aligning the terms and conditions to the RBP access arrangement.

Changes consequent on this required amendment are itemised in Appendix 9.

Appendix 2 Abbreviations

Abbreviation	For
AA1	First Access Arrangement Period (1 January 2000 to 31 December 2009)
AA2	Second Access Arrangement Period (20 August 2010 to 31 December 2014)
AA3	Third Access Arrangement Period (1 January 2015 to 31 December 2019)
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACT	Australian Competition Tribunal
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
AMP	Asset Management Plan
APIA	Australian Pipeline Industry Association
API	Bloomberg Application Programming Interface
ATCO	ATCO Gas Australia Pty Ltd
ATCO GDS Final Decision	Amended Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems
ATO	Australian Taxation Office
AUD	Australian Dollar
Authority	Economic Regulation Authority
BBSW	Bank Bill Swap Rate
BBSY	Bank Bill Bid Rate
BDH	Bloomberg Data History
BDP	Bloomberg Data Point
BHM	Brailsford, Handley and Maheswaran
BHPB	BHP Billiton Limited
BVAL	Bloomberg Valuation Service
CAGR	Compound Annual Growth Rate
CAM	Cost Allocation Methodology
CAPM	Capital Asset Pricing Model
CCA	Current Cost Accounting

CDA	Cost Directly Attributable
CnDA	Costs not Directly Attributable
CEG	Competition Economists Group
CGS	Commonwealth Government Securities
Code	National Third Party Access Code for National Pipeline Systems
Commerce Commission	New Zealand Regulator
CPI	Consumer Price Index
CV	Coefficient of Variation
DAC	Depreciated Actual Cost
DBNGP	Dampier to Bunbury Natural Gas Pipeline
DBP	Dampier to Bunbury Pipeline
DDO	Dividend Drop Off
DFL	Degree of Financial Leverage
DGM	Dividend Growth Model
DMP	Department of Mines and Petroleum
DOL	Degree of Operating Leverage
DORC	Depreciated Optimised Replacement Cost
DRP	Debt Risk Premium
DTL	Degree of Total Leverage
EAMS	Enterprise Asset Management System
EBIT	Earnings Before Interest & Tax
EEP	Extension and Expansion Policies
EMCa	Energy Market Consulting associates
ERB	Western Australian Electricity Review Board
ERP	Equity Risk Premium
FSA	Formal Safety Assessments
FTE	Full Time Equivalent
FVC	Fair Value Curves
GBP	British Pound
GDS	Mid-West and South-West Gas Distribution Systems
GFC	Global Financial Crisis
GGT	Goldfields Gas Transmission Pty Ltd
GGTJV	Goldfields Gas Transmission Joint Venture

GHV	Gross Heating Value
GJ	Gigajoule
GSL	Gas Supply (Gas Quality Specifications) Act 2009 and Gas Supply (Gas Quality Specifications) Regulations 201
GST	Goods and Services Tax
HCA	Historical Cost Accounting
HHV	Higher Heating Value
HoustonKemp	HoustonKemp Economists
IDMT	Integrity Data Management Tool
Incenta	Incenta Economic Consulting
IPART	Independent Pricing and Regulatory Tribunal
IRS	Interest Rate Swap
ITAA97	Income Tax Assessment Act 1997
KPI	Key Performance Indicators
LAD	Least Absolute Deviation
MCE	Ministerial Council of Energy
MDQ	Maximum Daily Quantity
MHQ	Maximum Hourly Quantity
MM	Modigliani-Miller
MRP	Market Risk Premium
NCC	National Competition Council
NEM	National Electricity Market
NEO	National Electricity Objective
NERA	NERA Economic Consulting
NFC	Non-Financial Corporate
NGL	National Gas Law
NGL(WA)	National Gas Access (WA) Act 2009
NGO	National Gas Objective
NGR	National Gas Rules
NPV	Net Present Value
NSP	Network Service Provider
NSS	Nelson-Siegel Svennson
OLS	Ordinary Least Squares
PIA	Pipeline Impact Agreement
PTRM	Post Tax Revenue Model

QCA	Queensland Competition Authority
RAB	Regulatory Asset Base
RBA	Reserve Bank of Australia
RBP	Roma to Brisbane Pipeline
RBP AA T&Cs	RBP Access Arrangement Terms and Conditions
RPP	Revenue and Pricing Principles
RPP2	Revenue Pricing Principles 2
RPP3	Revenue Pricing Principles 3
RPP4	Revenue Pricing Principles 4
RPP5	Revenue Pricing Principles 5
RPP6	Revenue Pricing Principles 6
RPP7	Revenue Pricing Principles 7
Santos	Santos (BOL) Pty Ltd
SCADA	Supervisory Control and Data Acquisition
SFG	SFG Consulting
SIB	Stay In Business
SL CAPM	Sharpe-Lintner Capital Asset Pricing Model
SQO	Supplementary Quantity Option
SS	Spread of Swap
TAB	Tax Asset Base
USD	United States Dollar
VIX	Volatility Index
WACC	Weighted Average Cost of Capital
WST	Western Standard Time

Appendix 3 SFG's Proposed Approach to Estimating the Return on Equity for GGT

1. GGT's consultant, SFG prepared a report on return on equity for the Goldfields Gas Pipeline in 2014. SFG's approach is to determine a direct estimate of the return on equity for the benchmark entity, rather than developing an indirect estimate, based on the return on equity of the selected comparators in the benchmark sample.

2. Specifically, SFG considers that its direct estimate overcomes shortcomings in the Authority's benchmark sample approach to estimating beta.

3. SFG notes that the only information used by the Authority to determine the return on equity for the benchmark entity, relative to an estimate of the return on equity for the average firm in the market, is a beta estimate which is based on a sample of five Australian listed stocks. In addition, beta estimates computed using ordinary least squares (OLS) regression, least absolute deviation (LAD) regression, MM regression, and Theil-Sen regression.[715]

4. SFG argues that running four different weighted regressions on the same dataset does not substantially improve the reliability of the return on equity estimated using beta and the Sharpe-Lintner CAPM.[716]

5. SFG conducts its analysis of return on equity by estimating the expected return outcomes for the benchmark entity in different market situations, drawing on insights from what it says is standard finance theory.[717]

6. The way SFG approaches the issue is to ask the question, "What is the expected outcome to equity holders in a gas pipeline investment under different market conditions?" SFG considers that the answers to this question lead directly to an estimate of the required return to equity holders, given assumptions about the risk-free rate, yield on debt, market risk premium and equity market volatility.[718]

7. SFG admits that this is the first time that the approach has been used in making an estimate of the return on equity for a regulated energy network in Australia. However, SFG argues that this does not mean that the approach is in any way out of line with conventional finance theory. Instead, SFG argues the approach is entirely consistent with the standard approach for pricing any asset with payoffs that depend upon outcomes for any other asset.[719]

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[715] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 2.

[716] SFG Consulting. *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, 2014, p. 2.

[717] SFG Consulting. *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 3.

[718] SFG Consulting. *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 3.

[719] SFG Consulting. *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 3.

8. SFG argues that its analysis is not restricted by an assumption that the Sharpe-Lintner CAPM is the model via which assets are priced.[720]

SFG's estimation approach

9. In SFG's analysis, the following assumptions are made.

10. *First*, the risk-free rate is estimated at 3.87 per cent per year. This is the average annualised yield to maturity on the estimated yield on 10 year government bonds published by the Reserve Bank of Australia (RBA) for the 40 trading days ending on 10 June 2014.[721]

11. *Second,* the expected market return (r_m) is estimated at 10.54 per cent per year, which represents a premium of 6.67 per cent above the risk-free rate of interest. Imputation credits are not considered. The expected market return is a weighted average of outcomes from four estimation approaches: (i) analysis of historical average excess returns (20 per cent weight) implies r_m = 10.38 per cent, based upon a 6.51 per cent premium to the risk-free rate; (ii) analysis of historical average real returns adjusted for current inflation expectations, also termed the Wright approach (20 per cent weight), implies r_m = 11.58 per cent, based upon historical average real returns of 8.86 per cent and inflation expectations of 2.50 per cent; (iii) dividend discount model analysis (50% weight) implies r_m = 10.32 per cent.; and (iv) assumptions used in independent expert reports (10 per cent weight) imply r_m = 9.87 per cent based upon a 6.00 per cent market risk premium.[722]

12. *Third*, the cost of debt is estimated at 6.23 per cent per year, which represents a premium of 2.36 per cent to the risk-free rate. The cost of debt was estimated with reference to the estimated yield on 10 year BBB rated non-financial corporate debt provided by the RBA for the end of May 2014 (6.08 per cent effective annual rate), plus a premium of 0.15 per cent for debt raising and hedging costs.[723]

13. *Fourth,* benchmark leverage is 60 per cent and the benchmark credit rating is BBB.[724]

14. *Fifth*, the standard deviation of market returns is estimated at either 16.64 per cent per year or 14.89 per cent per year.[725] The first estimate of 16.64 per cent is the standard deviation of annual returns on the Australian share market over 130 years

[720] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 3.

[721] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 6.

[722] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 6.

[723] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 7.

[724] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 7.

[725] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 7.

from 1883 to 2013, based on Authority's updated data of Brailsford, Handley and Maheswaran.[726]

15. As a first illustration of its approach, SFG considers a five year period in which there are two possible market outcomes. The market outcome in which the market performs better than expected is labelled the 'good' outcome. In the good market outcome the market return exceeds the expected market return of 10.54 per cent per year. This is also a situation in which the Australian economy and the global economy perform well, so above-average commodity prices and volumes for the mining customers of the gas pipeline can be expected. The other 'bad' market outcome represents a poor share market return, in which the market performs worse than expected. The market return is less than the expected market return of 10.54 per cent per year. The Australian economy and the global economy perform relatively poorly, so below-average commodity prices and volumes for the mining customers of the gas pipeline can be expected.[727]

16. Later, SFG considers greater than two possible market outcomes over five years, by allowing monthly returns to give positive or negative outcomes over a five year period. This generates a binomial tree with 61 possible market outcomes at the end of five years. However, the method and results are similar, although SFG considers the values more precise.[728] For that reason, the two outcome approach is summarised in detail in what follows. The results for the 61 possible market outcomes are then summarised briefly.

17. The following steps are followed in SFG's approach to directly estimate the return on equity for GGP using the two outcome approach.[729]

18. *First*, the market return in the good and bad outcomes, and the probabilities of those two outcomes are estimated. SFG notes that the returns and probabilities of good and bad market outcomes need to be consistent with the market volatility (16.64 per cent per year), the average market return (10.54 per cent per year) and the risk-free rate (3.87 per cent per year).

19. *Second*, the payoffs to debt holders and equity holders in the good market outcome, the bad market outcome without default, and the bad market outcome including default are estimated.

20. *Third*, the average return to equity holders across all three scenarios, and the average return to equity holders across the *no default* scenarios is estimated. SFG considers that the latter average return, across the no default scenarios, is consistent with the scenario approach used to set regulated prices in practice.

SFG's results for the two outcome case

[726] The second estimate of 14.89 per cent is an adjusted figure used by SFG in its monthly analysis – see paragraph 59 (Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 2.

[727] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline, Report for Goldfields Gas Transmission*, 22 July 2014, p. 8.

[728] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 30.

[729] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 9.

21. The outcomes of the three steps for the two outcome case (good and bad) are summarised as below.

Step 1. Market outcomes and probabilities

22. SFG considers that a useful way to construct two outcomes for the market is to think about the market return in the good outcome being one standard deviation above expectations. SFG's calculations indicate that, over five years, the resulting expected market return with the good outcome would be 65.03 per cent[730] and the standard deviation of market returns is 37.20 per cent.[731] This means that the market return in the good scenario is 102.23 per cent over five years.

23. SFG then constructs a binomial tree, with the resulting 'up factor' *U* being 2.0223. The 'down factor *D* is 1/*U* = 0.4945. Therefore, the market return in the bad scenario is -50.55 per cent.

24. SFG considers that if the expected market return is 65.03 per cent, and the returns in the good and bad markets are 102.23 per cent, and 50.55 per cent, respectively, then the probabilities of the two states can be solved for. Based on these estimates, the probabilities for the two market outcomes are estimated by SFG at 75.65 per cent and 24.35 per cent. This means that there is a 75.65 per cent chance of the good market outcome and a 24.35 per cent chance of the bad market outcome.[732]

25. SFG considers that "risk-neutral probabilities" are needed in order to estimate the return on equity capital[733] and that risk-neutral probabilities are just real world probabilities that lead to the same value for the underlying asset, when discounting is done at the risk-free rate.

26. With the assumed risk free rate of 3.87 per cent per year, the cumulated risk free rate return over the 5 years period is 20.90 per cent.[734] The risk neutral probability of achieving this outcome with the expected return in a good market and in a bad market is estimated by solving the following equation (1).

$$p^{rn} = \frac{1 + \text{risk free return} - D}{U - D} \quad (1)$$

Where:

- p^{rn} is the risk neutral probability of the good market outcome;
- D is the 'down' probability (0.4945); and

[730] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 9.

[731] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 9.

[732] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 10.

[733] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 10.

[734] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 11.

- U is the 'up' probability (2.0223).

27. With that equation, a 46.77 per cent risk-neutral probability of the good market outcome, and a 53.23 per cent risk-neutral probability of the bad market outcome are estimated.[735] SFG also notes that the real-world probabilities have not changed (still a 24.35 per cent chance of the bad market outcome) and that the use of the term "risk-neutral" does not mean the standard view that investors prefer less risk to more risk for the same expected return (risk aversion) is changed. SFG considers that the use of risk-neutral probabilities is a computational device that allows it to correctly value the equity in the gas pipeline and arrive at an estimate of the return on equity.

Step 2. Payoffs to debt and equity holders in different market outcomes

28. In this step, the possible payoffs to debt and equity holders in different market outcomes are considered.

29. With regard to debt, its holders expect to receive the yield to maturity, which as noted above, is estimated to be 6.23 per cent. Over five years, the expected cumulative promised yield for debt holders is 35.28 per cent.

30. As presented in Step 1, a 46.77 per cent risk-neutral probability of the good market outcome and a 53.23 per cent risk-neutral probability of the bad market outcome are estimated. On average, these probabilities would allow debt holders to earn the risk-free rate of interest (20.90 per cent over 5 years or 3.27 per cent per year as a risk free rate). As default does not occur in the good market, there is a 46.77 per cent chance that debt holders receive the promised yield of 35.28 per cent.[736]

31. SFG then calculates the average payoff in a bad market by assuming a recovery rate consistent with historical recovery rates reported by Moody's for Baa rated debt of 43.00 per cent.

32. SFG's use this to calculate that the average return for every $1.00 of debt investment is 8.27 per cent over five years (1.2 per cent per year) when the market outcome is bad.[737]

33. Following further mathematic manipulation, SFG presents that in the event of a bad market, this outcome implies that there is a 35.03 per cent chance of default. Together with the probability of a bad market of 24.35 per cent, the overall chance of default is (0.3503 x 0.2435=) 8.53 per cent.[738]

34. SFG concludes that this default rate of 8.53 per cent is high for Baa (or BBB) rated debt, compared to historical average default rates which are about 1.97 per cent over a five year period on average. SFG notes that the range of default rates for

[735] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 12.

[736] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 13.

[737] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 13.

[738] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 13.

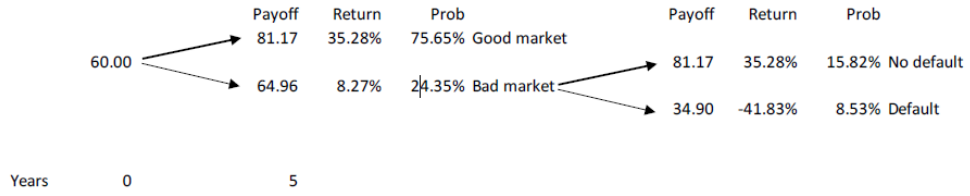
Baa rated debt over five years is 0.00 per cent to 5.85 per cent for the cohort of bonds formed in 1975 and 1992.[739]

35. However, SFG also notes that the default rates on Ba rated corporate debt are much higher, with an average default rate over five years of 9.73 per cent and a range of 0.00 per cent to 23.28 per cent.

36. As such, SFG concludes that the default rate of 8.53 per cent from SFG's calculations used in computations lies between the average default rates on Baa rated debt and Ba rated debt reported by Moody's.

37. SFG then uses the foregoing to estimate the expected return on debt, as opposed to the yield to maturity of 28.70 per over five years, or 5.18 per cent per annum, which is the probability weighted sum of the returns:[740]

> We can now extend the binomial tree to show the payoffs to debt holders in three possible situations – a good market (75.65% probability, payoff = $81.17 on a $60.00 investment, return = 35.28%), a bad market but no default (15.82% probability, payoff = $81.17, return = 35.28%) and a bad market with default (8.53% probability, payoff = $34.90, return = –41.83%). This is illustrated in the figure below.
>
> Figure 4. Payoffs to debt holders



> This information can be used to estimate the expected return on debt, as opposed to the yield to maturity. On average, debt holders earn a return of 28.70% over five years, or 5.18% per year. The average return is 0.7565 × 35.28% + 0.1582 × 35.28% + 0.0853 × –41.83% = 26.69% + 5.58% – 3.57% = 28.70%.
>
> This means that the yield to maturity on debt is comprised of a risk-free component (3.87% per year), an expected risk premium (1.31% per year) and a default premium (1.05% per year). To earn the expected return of 5.18% per year, debt is priced at a yield to maturity of 6.23% per year, because there is some chance of default but no chance the debt holders receive additional payoffs from the asset.

Step 3. Returns to equity holders

38. SFG submits that, across all three scenarios, the average expected return to equity holders is 53.66 per cent over five years, that is, 8.97 per cent per year.

39. This is estimated by first estimating the total return to the asset under all three scenarios. The payoff to equity holders under each scenario is then the difference between the expected return on the asset and the expected return on debt in each scenario. These expected returns on equity are then probability weighted and summed to give the overall expected return on equity.

40. The annualised average return to equity holders of 8.97 per cent per year can be compared to the risk-free rate of 3.87 per cent per year, the average return to debt

[739] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 13.

[740] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 14.

holders of 5.18 per cent per year, and the average market return of 10.54 per cent per year.

41. SFG also submits that the analysis presented above did not rely upon the Sharpe-Lintner CAPM as the underlying asset pricing model. The analysis did rely upon the concept of systematic risk, but it was not restricted by a particular equation. However, if the Sharpe-Lintner CAPM was to be used as the underlying asset pricing model for the return on equity, the average return is consistent with an equity beta of 0.77.[741]

42. SFG considers that, on average, in the absence of default, the equity return over five years is 67.99 per cent, that is, 10.93 per cent per year. On an annualised basis, the expected return to equity holders in the absence of default is a premium of 7.06 per cent to the risk-free rate, compared to the market risk premium of 6.67 per cent. If the Sharpe-Lintner CAPM was adopted as the asset pricing equation for setting regulated prices in this no default scenario, the expected return to equity is consistent with an equity beta of 1.06.[742] Importantly, SFG considers this latter value is the relevant consideration under the post-tax revenue model, as it does not account for investor expectations in the presence of default.

43. In contrast, with default, the average return to equity is 8.97 per cent, which is equivalent to a Sharpe Lintner CAPM beta of 0.77. SFG compares the two outcomes (default and no default), suggesting:[743]

> If the model used to estimate regulated prices accounted for average outcomes (which includes the expected return to debt holders of 5.18%), the fair return to equity holders in that model would be 8.97% (and an equivalent Sharpe-Lintner CAPM beta of 0.77). The equity return input to the model would be lower in this latter model, but the estimated revenue stream would be the same for both models.
>
> In the first model (in which prices are set according to a no default scenario) there is a higher return on equity but this return is offset by the higher payments to debt holders. In the second model (in which prices are set according to the average outcome) there is a lower return on equity but there are also lower payments for debt holders because the model only incorporates their average return. There would need to be a computation of what price and revenue stream is appropriate in the no default or business as usual situation.

Sensitivity analysis for the two outcome case

44. SFG conducts sensitivity analysis to re-run its calculations with different inputs as a means to test its conclusions on the appropriate beta, absent default.

45. SFG's sensitivity analysis is conducted in two ways. *First*, the sensitivity of the results to changes in individual input assumptions, holding all other assumptions constant, is conducted. *Second*, sensitivities of different outcomes when more than one input assumption changes at the same time are conducted.[744] Each of these

[741] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 18.

[742] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 18.

[743] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 18.

[744] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 18.

two approaches in relation to SFG's sensitivity analysis is discussed in detail further below.

46. SFG examines the resulting sensitivity of the return to equity holders and the 'implied beta' which results in the without default scenario (which, as noted above, SFG considers approximates the scenario accounted for in a post-tax revenue model used to set prices of regulated assets).

The first approach

47. In relation to the first approach to the sensitivity analysis, SFG is of the view that the results from its sensitivity analysis are broadly consistent with the conclusions the Authority reached in 2010, when it determined that an equity beta estimate of 0.8 to 1.0 was appropriate. SFG submits that the base case equity beta equivalent is 1.06 and the range of equity beta estimates from the sensitivity analysis is from 0.81 to 1.32.[745]

48. SFG considers:[746]

> In the discussion reported by the Authority in 2010, the Authority stated that the equity beta could be calculated from asset beta estimates from suitable comparators, or the equity beta could be determined on the basis of a first principles analysis which accounts for the characteristics of the GGP and the associated level of risk. The basis for the Authority's 2010 decision (beta of 0.8 to 1.0) included consideration of take or pay contracts, inelastic demand for revenue, and the GGP's small customer base. The same characteristics apply today to the GGP
>
> In the Authority Guidelines released at the end of 2013, the Authority determined that an appropriate range for equity beta is from 0.5 to 0.7. This range is formed entirely with respect to regression-based estimates of beta with respect to six Australian-listed firms. As mentioned previously, the Authority has conducted more regression-based analysis of risk using four different weighting schemes. But running a larger number of regression types on the same underlying data does not necessarily lead to the beta estimates from that data being more and more reliable. The Authority's selection of 0.7 in the Guidelines as its best estimate of beta reflected the concern that regression-based beta estimates could lead to a return on equity that had a downward bias.
>
> The analysis presented above, and the analysis which follows, demonstrates that a beta estimate within the range of 0.5 to 0.7 is unlikely to reflect the risks faced by equity holders, as implied by all the other inputs into the cost of capital estimate. The analysis shows that if investors price government bonds at yields below 4% per year and corporate bonds at yields above 6% per year they will also price stocks at returns close to 11% per year for an investment with 60% leverage. This would allow equity investors in the pipeline, on average, to earn returns of close to 9%.

The second approach

49. In relation to the second approach to the sensitivity analysis, SFG uses first, a set of assumptions drawn from the 2005 Authority determination for the GGP, namely: (i) a risk-free rate of 5.45 per cent per year; (ii) a yield to maturity on debt of 6.43 per cent to 6.68 per cent per year (based upon a debt margin of 0.980 per cent to 1.225 per cent per year), a market return of 10.45 per cent to 12.45 per cent per

[745] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 20.

[746] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 21.

year (based upon a market risk premium of 5.00 per cent to 7.00 per cent per year) and an equity beta within the range of 0.80 to 1.33.[747]

50. In SFG's analysis, the risk-free rate, the yield to maturity on debt and the market return are inputs, and the return on equity and implied equity beta are outputs.[748]

51. SFG analyses four combinations from the extreme ends of these ranges.[749] SFG's analysis indicates the return on equity falls within the range of 9.52 per cent to 10.60 per cent per year, which implies a range of equity beta of 0.68 and 0.90.[750] SFG concludes:[751]

> The implication of this analysis is that the Authority's 2005 joint set of assumptions... are, for the most part, internally consistent. The upper part of the equity beta range is high, compared to the other assumptions, which support an implied equity beta within the range of 0.68 to 0.90. The variation in the equity beta estimate is largely due to the range for the MRP. The key outcome from the analysis is a return on equity range of 9.52% to 10.60% per year, which is a premium to the risk-free rate of 4.07% to 5.15% per year and a premium to the cost of debt of 3.09% to 3.93% per year.

52. Similarly, SFG uses a second set of assumptions drawn from the 2010 Authority determination for the GGP: (i) a risk-free rate of 5.79 per cent per year, a yield to maturity on debt of 8.75 per cent per year (based upon a debt margin of 2.96 per cent); (iii) a market return of 10.79 per cent to 12.79 per cent per year (based upon a market risk premium of 5.00 per cent to 7.00 per cent per year) and an equity beta within the range of 0.80 to 1.00.[752]

53. SFG concludes from this analysis, again using the upper and lower bounds of the market return, that a range for the return on equity is 13.13 per cent to 13.77 per cent. This represents an equity risk premium above the risk-free rate of 7.34 per cent to 7.98 per cent and a premium of 4.38 per cent to 5.02 per cent compared to the yield on debt.[753] The implied equity beta for the no default scenario is 1.14 to 1.47, whereas for the default scenario is 0.81 to 0.91. SFG considers that the high no default implied beta of 1.47 suggests that a 5 per cent lower bound of the range for the MRP was too low. In particular, SFG states that:[754]

> These outcomes [for the return on equity and on debt in 2005 as compared to 2010] are not consistent with the assumption that the market risk premium has remained constant from 2005 to 2010. The implication of maintaining the same, constant market risk premium is that the market return on equity has only increased by the increase in the risk-free rate of 0.34%. It is counterintuitive to think that the yield on corporate debt

[747] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 21.

[748] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 21.

[749] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 21.

[750] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 22.

[751] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 22.

[752] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 23.

[753] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 23.

[754] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 23.

> would increase by more than 2% while the average stock in the market offered higher returns of less than 0.5%. In addition, the increased yield on corporate debt suggests that the average return on corporate debt increased by 1.33% to 1.37%, and the average return on equity in a gas pipeline increased by 1.74% to 1.83%. This is consistent with there being an increase in the expected return to equity in the average firm.

54. As the third set of assumptions adopted in its sensitivity analysis, SFG used inputs estimates from the 2013 Guidelines released by the Authority: (i) a risk-free rate of 3.44 per cent per year; (ii) a yield to maturity on debt of 5.62 per cent per year (based upon a debt margin of 2.18 per cent per year); (iii) a market return of 8.44 per cent to 10.94 per cent per year (based upon a market risk premium of 5.00 per cent to 7.50 per cent per year) and an equity beta within the range of 0.50 to 0.70.[755]

55. SFG observes:[756]

> The Guidelines do not refer specifically to the GGP and the Authority is not bound by the Guidelines in making a determination. But the manner in which the Guidelines have been written suggests that parameter inputs will be constrained to the boundaries of the ranges relied upon in the Guidelines. This means that the position of the Authority in 2005 and 2010 was that the minimum equity beta of a benchmark gas pipeline was 0.80, but that in 2013 the maximum equity beta of a benchmark gas pipeline is 0.70. This is a substantial change in position, and as mentioned earlier, is based entirely upon regression analysis of six Australian-listed firms. If there was any weight applied to firms listed in the U.S., or any weight applied to the Fama-French model, or any weight applied to the dividend discount model, the upper bound of the Authority range for the equivalent Sharpe-Lintner CAPM equity beta would lie above 0.70.

56. Based on its analysis, SFG submits that a range for the return on equity is from 9.69 per cent to 10.34 per cent per year. This represents an equity risk premium above the risk-free rate of 6.25 per cent to 6.90 per cent per year and a premium of 4.07 per cent to 4.72 per cent per year compared to the yield on debt.[757] The estimated equity beta is within a range of 0.99 to 1.25 (absent default). The equity beta associated with the average (default included) return to equity holders is 0.73 to 0.82. SFG notes that the movement in the implied returns to debt and equity between 2010 and 2013 is 'normal':[758]

> …in comparison to the results from using the 2010 determination inputs, there is a decrease in the yield on debt of 3.13% per year[759], and a decrease in the return on equity of 3.42% to 3.44% per year.[760] As with the movement in cost of capital estimates over 2005 to 2010, these changes are consistent with a normal situation in which the cost of capital for all risky assets moves in the same direction, and the riskiest assets experience larger declines in risk premiums than the safest assets.

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[755] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, pp. 26-7.

[756] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 24.

[757] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, page 24.

[758] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 24.

[759] [SFG footnote] That is, in the 2013 Guidelines the yield on debt was estimated by the Authority at 5.62%, compared to 8.75% in the 2010 determination, which represents a decrease in the yield on debt of 3.13%.

[760] [SFG footnote] Using the 2010 determination parameter inputs, the cost of equity had a lower bound of 13.13% and an upper bound of 13.77%. Using the parameter inputs in the 2013 Guidelines, the lower bound cost of equity decreased by 3.44% to 9.69%, and the upper bound cost of equity decreased by 3.42% to 10.34%

57. That said, SFG considers that given that:[761]

> …the estimated equity beta is within a range of 0.99 to 1.25, with the lower bound associated with the market risk premium of 7.00% per year and the upper bound associated with the market risk premium of 5.00% per year. Again, we are not suggesting that the Authority adopt an equity beta estimate as high as 1.25 for the GGP. Rather, this outcome suggests that at government bond yields as low as 3.44%, the MRP is at the upper end of the Authority's range of 5.00% to 7.00% per year.

Overall conclusion

58. SFG argued that the sensitivity analysis demonstrates three implications from the framework adopted in its study.[762] *First*, there is a set of internally consistent parameter estimates relating to yields on government bonds, yields on corporate bonds, market returns, leverage and the return on equity. *Second*, the distinction between expected returns across all possible outcomes, and expected returns in the absence of default. *Third*, the approach adopted by the Authority in estimating the return on equity will understate the average return for equity holders.

The 61 outcomes case

59. SFG also considers a 'stage 2' scenario in which more than two possible market outcomes are possible over five years. This is achieved by allowing *monthly* returns to give positive or negative outcomes, over a five year period. This generates a binomial tree with 61 possible market outcomes at the end of five years. The method and results are similar to the two outcome scenario, although SFG considers the values more precise.[763]

60. SFG summarises the stage 2 results as suggesting that the equivalent Sharpe Lintner CAPM beta should be 1.10 (in the absence of accounting for the probability of default):

> …equity investors in the gas pipeline would, on average, earn a return that is 1.29% less than an investment in the equity market, which corresponds to an equity beta of 0.78. But for this expectation to hold, prices would need to be set such that the allowed return on equity is 0.61% above the expected market return. That is, on average across the 2005, 2010 and 2013 input sets, the expected return to equity holders in the absence of default is 11.51% per year, compared to the average market return assumption of 10.89%. This corresponds to an equity beta of 1.10.

61. GGT adopts this stage 2 value for beta of 1.10 for use in its proposed estimate of the return on equity.[764]

Key conclusions from SFG's study

[761] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 25.

[762] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 23.

[763] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 30.

[764] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, p. 106.

62. On the basis of its report, SFG provides the following conclusions in relation to the estimate of the return on equity for GGP.

63. *First*, SFG considers that 'a limitation of return on equity estimation in regulation is the inconsistent approaches of estimating the return on equity and the cost of debt. The return on equity is typically estimated using risk estimates from analysis of historical returns on listed stocks.'[765] SFG argues that there is no other technique or dataset relied upon to estimate the risk to equity holders, despite considerable evidence that the return on equity estimate generated by this approach has almost no documented association with realised returns. In addition, SFG is of the view that the market risk premium estimate is also estimated largely with respect to historical stock returns.[766] SFG argues that the return on equity estimate relies almost entirely on analysis of historical stock returns and the cost of debt estimate relies entirely on analysis of current debt prices.

64. *Second*, SFG argues that this inconsistency in approaches adopted means that the estimates of the return on equity and the cost of debt can move in different directions over time, and that the spread between the return on equity estimate and the cost of debt is not constrained in any quantitative manner. SFG notes the Authority's view that it would not make sense for the return on equity to be less than the cost of debt. However, SFG argues that apart from constraining the return on equity estimate at a lower bound, movement in debt yields are not used to estimate the return on equity.[767]

65. *Third*, SFG argues that its approach to estimating the return on equity provides a direct link between the return on equity, the cost of debt, the risk-free rate, the market return and leverage. The return on equity estimates are formed with respect to conventional finance theory on options pricing taught in undergraduate and master's finance courses.[768]

66. *Fourth*, SFG notes that the expected returns to equity holders across all potential scenarios, and the expected return to equity holders in the absence of default, is explicitly considered. SFG argues that it is important to understand this distinction because a standard post-tax revenue model used to set prices for regulated assets is not an expected returns and expected cash flow model. SFG is of the view that it is a model that relies upon a no default scenario. Depending upon the model compiled it could be considered the most likely scenario, or the average no default scenario, but it is certainly not a model that accounts for the average case.[769]

67. *Fifth,* SFG concludes that its analysis shows that the return on equity to be incorporated into a no default post-tax revenue model is close to the estimated market return. SFG's specific return on equity estimate is 11.24 per cent per year compared to its market return assumption of 10.54 per cent per year. SFG

[765] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 58.

[766] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 58.

[767] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 58.

[768] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 60.

[769] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 60.

considers that the assets of the benchmark gas pipeline have low risk but this is offset by the high financial risk of taking on 60 per cent leverage.[770]

68. *Sixth,* SFG concludes that its quantitative analysis demonstrates that the high financial risk approximately offsets the benchmark pipeline's low asset risk. SFG argues that the results are consistent with cost of capital estimates resulting from analysis of a larger sample of U.S.-listed firms, or the application of the Fama-French model to Australian-listed firms, or the application of the dividend discount model to Australian-listed firms. SFG is of the view that the only quantitative analysis inconsistent with its analysis is the beta estimates from a regression of stock returns on market returns for a sample of six firms.[771]

Considerations of the Authority

69. The Authority has engaged Professor Lally from Capital Financial Consultants Ltd to provide expert advice in relation to SFG's proposed approach to determine the return on equity for GGT.

70. The Authority has also considered the approach adopted by SFG to estimate a return on equity for GGT. The Authority considers that the fundamental issue to consider is that whether SFG's proposed approach to estimating the return on equity for GGT follows a standard finance theory. In addition, the Authority's considerations of SFG's proposed approach include the following issues: (i) the link between a return on debt and a return on equity; and (ii) the sensitivity analysis of SFG's proposed approach. Each of these is discussed in turn below.

Does SFG's approach follow a standard finance theory?

71. The Authority notes that SFG appears to rely on option pricing model(s) to derive its proposed approach to estimating the return on equity for GGT. Key rationales for SFG's approach to be developed are that: (i) the GGP has a higher systematic risk compared to typical pipeline businesses in Australia; and (ii) estimates of equity beta in Australia are wrong and/or not relevant (in relation to choice of comparators included in the benchmark sample and the econometric techniques adopted).

72. In relation to option pricing models, the Authority considers that these option pricing models can be considered as the tools/approaches in which the theoretical price of the options (financial derivative) can be estimated for the purpose of risk management and/or speculation. Option pricing models value an asset (i.e. the option on a stock – the derivative asset) by reference to an underlying asset (a stock) which determines the payoff on the derivative asset.

73. Two models are well known in academic literature: (i) the binomial option pricing model – a computational procedure (not a formula); and (ii) the Black-Scholes-Merton option pricing model – a mathematical model.

74. The Authority notes that while the binomial option deals with discrete time, the BSM model deals with continuous time. The Authority also notes that an examination of

[770] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 60.

[771] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 60.

how the binomial model will behave as the number of time periods is increased indicates that it converges to a specific value.

75. In the following sections, the Authority's considerations are in relation to an understanding whether or not SFG's proposed model can be linked with any option pricing model.

SFG's proposed approach and Black Scholes Merton option pricing model

76. The Authority notes SFG's argument that its proposed approach to estimating the return on equity for GGT follows standard finance theory. SFG considers that:[772]

> The approach adopted in the current paper is no more complex than the Authority's existing approach. The cost of equity in the current paper is estimated as a direct result of a series of input assumptions and the application of standard finance theory.

and that:[773]

> We emphasise that this approach is entirely consistent with the framework used to price any asset on the basis of outcomes for another asset, such as pricing call options on the basis of outcomes for stock prices, as used in the Black-Scholes-Merton option pricing model. All we do in this instance is apply a general theory of asset pricing to the specific instance of an equity investment in a gas pipeline. The underlying asset is the asset value of the pipeline (just like a stock is the underlying asset in pricing a call option) and equity value is determined as a function of changes in the value of the underlying asset and the fixed claim of debt holders.

77. The Authority is not convinced that SFG's argument is robust. Together with the Authority's own analyses, which will be further discussed below, the Authority notes that Lally is not convinced with SFG's claim either.

78. Lally considers that option pricing analysis seeks to value an asset (the derivative asset) by reference to an underlying asset that determines the payoff on the derivative asset. Lally notes the seminal paper by Black and Scholes (1973) which deals with European call and put options over shares, in which the underlying asset is the share. Lally also notes that the principles have been applied to other financial assets including futures contracts (Black, 1976), foreign exchange (Grabbe, 1983), bonds (Black et al, 1990), and even the value of a project involving natural resource extraction (Brennan and Schwartz, 1985). Lally notes that Additional literature extends this framework to projects in general, with the underlying asset being the present value of the project benefits without the choices (McDonald and Siegel, 1986; Dixit and Pindyck, 1994; Trigeorgis, 1996). Lally is of the view that:[774]

> in all of these cases, the underlying asset determines the payoff on the option coupled with the rational exercise of a choice by the owner of the option. By contrast, in SFG's analysis in which the underlying asset is the market portfolio and the other asset is the firm, the value of the market portfolio does not determine the payoff on the firm; it is merely correlated with the payoff on the firm and even includes the value of the firm itself. So, the outcomes on the market portfolio merely provide expected payoffs on the firm, around which there is considerable uncertainty. Furthermore, this linkage between the value of the two assets does not require the rational exercise of any choice by the firm. Accordingly, SFG's analysis is not option pricing analysis.

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[772] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 60.

[773] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 60.

[774] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 9.

> SFG (2014, para 42) claims that the underlying asset in their analysis is the firm value and the derivative asset is the value of equity but this is not the case; SFG invoke a binomial distribution for the returns on the market portfolio and therefore this portfolio is necessarily the underlying asset (as recognised by SFG in their para 14). SFG use the payoff on the firm to determine that on the equity of the firm, and the equity is a call option on the firm, but this is only secondary in their analysis. SFG (2014, para 42) also claim that their approach is an application of the methodology of Black and Scholes (1973) and Merton (1973). However, these papers deal with continuous time rather than binomial situations, they deal with the valuation of financial options (calls and puts) rather than companies, the underlying asset is a share price rather than the market portfolio, the underlying asset determines the value of the calls and puts at their maturity date rather than being merely correlated, and it does so in conjunction with the rational exercise of a choice by the owner of the option. So, **SFG's analysis is not an application of Black and Scholes (1973) or Merton (1973)**. SFG do not refer to any other papers in the option pricing literature. [emphasis added]

79. On balance, based on the above analyses, the Authority is of the view that SFG's proposed approach to estimating the return on equity for GGT does not follow the popular Black Scholes Merton option pricing model.

SFG's proposed model and the binomial option pricing model

80. The Authority agrees that the design of the SFG's proposed model appears to be similar with the binomial option pricing model. This is because the approach involved with expected market payoffs.

81. At a fundamental level, the Authority notes that the binomial framework is an extremely useful tool allowing derivatives professionals to estimate the fair market value of complex financial instruments.[775] However, the Authority is not convinced that SFG's approach is equivalent in purpose to the binomial approach. The binomial approach is used to determine the theoretical fair price of a financial instrument (that is, an option over the stock at some future date). An option provides a holder the right (but not an obligation) to buy (call option) or sell (put option) the financial assets (such as foreign currency), and is often used for hedging purposes. In stark contrast, SFG's objective is to estimate a return on equity on the firm's assets which include debt and equity.

82. The Authority notes that the binomial option pricing framework can be equally applied in debt and equity, which, in combination, determine the asset value of the firm. For example, the binomial option pricing framework is often used to value executive stock options both by management and the firm.[776]

83. In addition, the Authority notes the view presented by Chance and Brooks, well known experts on derivatives and risk management, that:[777]

> Debt securities often contain embedded options, making it more difficult to appraise their current market value. Examples of embedded options include the option to call the debt (callable bonds) and the option to convert the debt to equity (convertible bonds). The call feature essentially amounts to determining whether a bond is worth more to keep it alive, thereby paying the contracted interest rate, or to call it at the

[775] Chance, D. M. and Brooks, R. *An Introduction to Derivatives and Risk Management,* 9th edition, SOUTH-WESTERN CENGAGE Learning, 2013, p. 127.

[776] Chance, D. M. and Brooks, R. (2013), *An Introduction to Derivatives and Risk Management,* 9th edition, SOUTH-WESTERN CENGAGE Learning, p. 127.

[777] Chance, D. M. and Brooks, R. *An Introduction to Derivatives and Risk Management,* 9th edition, SOUTH-WESTERN CENGAGE Learning, p. 127.

> contracted call price, thereby paying it off. The conversion feature is one in which the value of the bond, if continued, is worth more or less than the value of the equity into which it would be converted. Both of these decisions are similar to exercising an option early. The binomial framework, through its ability to handle early exercise, provides a practical mechanism for determining the value of a call or conversion feature and assessing whether to exercise either of those options.

84. Chance and Brooks then conclude that:[778]

> The binomial model is a very useful tool to have when faced with **an option-related problem** [emphasis added]

85. The Authority is not convinced that SFG's proposed approach is an option-related problem or framework. The Authority notes SFG's argument that its proposed approach is used to estimate the equity value and cost of equity for a gas pipeline as a function of the outcomes for the market. SFG argues that the finance theory is exactly the same as that used to price an option as a function of the outcomes for an underlying asset (for example, pricing a call option as a function of a stock price, or pricing equity as a function of asset value). However, while the stock price (the market price) moves randomly frequently, the asset value of a regulated business does not. As such, the Authority does not agree with SFG's view that its proposed approach is an option-related problem.

86. On balance, based on the above analyses, the Authority is of the view that SFG's proposed approach to estimating the return on equity for GGT does not follow the popular binomial option pricing model.

The convergence-of-the-estimates characteristic of the model/approach

87. With regard to the binomial options pricing model, the Authority notes that this model is the basic model in option pricing in comparison with the other more well-known option pricing model, the Black-Scholes-Merton option pricing model – which the Authority considers is a more complex but realistic model for option pricing. The Authority notes that the binomial model will behave differently when the number of time periods increase. Specifically, estimates of the price for options under various numbers of time periods in the binomial model appear to converge to a specific value – which is the estimate of the price for options using the Black-Scholes-Merton option pricing model.

88. The binomial model is one of two types of so-called 'discrete time' models. In such models, the life of the option is divided into a specific number of finite units of time. For example, if an option has a life of 100 days and 100 binomial time steps are used, then each time step will represent a one day duration. As a one day duration elapses, the stock price jumps from one level of either of the next two levels (i.e. either one level in which the stock price increases with a certain probability or another level in which the stock decreases).

89. The real world is characterised by the continuous passage of time. Stock prices generally move only in very small increments, which in this context are called an uptick (being up the smallest possible increment) or a downtick (being down the smallest possible decrement). The Authority notes that such properties are captured much better with continuous time models, with the Black-Scholes-Merton model being the most popular example in option pricing.

[778] Chance, D. M. and Brooks, R. *An Introduction to Derivatives and Risk Management,* 9th edition, SOUTH-WESTERN CENGAGE Learning, 2013, p. 127.

90. The Authority notes that the Black-Scholes-Merton call option pricing formula, which won the Nobel Prize for its authors, can be used to produce the theoretical call price in terms of the stock price, exercise price, risk free rate, time to expiration, and volatility of the stock return. For example, with an asset price of $125.94, the exercise price of $125, time to expiration of 0.0959 (year) (or 35 days to expiration), volatility of the stock of 83 per cent, and the continuously compounded risk free rate of 4.46 per cent, the estimated theoretical European Call price is $13.5526 using the Black-Scholes-Merton formula.

91. Using the above inputs, Chance and Brooks demonstrated that the call price of the option using the binomial model will produce estimates which converge to this value of $13.5526 when the number of time period is increased. For example, they demonstrate that the price of the call option is $13.5523 when the 100 steps are used in the binomial option.[779]

92. The Authority considers that this example simply illustrates that the estimates from the binomial model will converge to the specific value, which is produced from the Black-Scholes-Merton call option pricing formula, when the number of time period increases.

93. In SFG's second analysis, the market payoffs and probabilities associated with market movements every month over five years are presented. The binomial tree is thus extended to 60 months, which leads to 61 potential payoffs at the end of five years. SFG concluded that:

> The binomial tree illustrates how most of the potential market outcomes are concentrated around the average market return of 10.54 per cent. For example, there is a 10.21 per cent chance of a market return equal to 10.54 per cent per year (payoff of $1.65 for every $1.00 invested).

94. SFG then presents the potential market outcomes which can then be summarised with reference to groups classified as *Good, Most,* and *Bad* market outcomes as below:[780]

> Good market outcomes, comprising the top 8.50 per cent of potential market outcomes, have an average return of 25.54 per cent per year. This comprises the top 21 nodes in the binomial tree. It spans market returns of +22.91 per cent per year to +82.42 per cent per year.
>
> Most market outcomes, comprising the middle 84.81 per cent of potential market returns, have an average return of 9.52 per cent per year. This comprises the next 11 nodes of the binomial tree. It spans market returns of +19.76 per cent per year to –1.98 per cent per year.
>
> Bad market outcomes, comprising the bottom 6.69 per cent of potential market outcomes, have an average return of –6.09 per cent per year. This comprises the bottom 31 nodes of the binomial tree. It spans market returns of –3.93 per cent per year to –45.18 per cent per year.

95. The Authority is unclear with SFG's assumption in relation to its classification of the market outcomes and any basis for this classification. In addition, if the purpose of this exercise is to extend a number of time repeats (from 6 into 61), then the

[779] Chance, D. M. and Brooks, R., *An Introduction to Derivatives and Risk Management,* 9th edition, SOUTH-WESTERN CENGAGE Learning, 2013, p. 146.

[780] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 34.

Authority is of the view that the classification of "Bad" market and "Good" market, as SFG had adopted in its analysis, should be maintained.

96. More fundamentally, the Authority notes that under the 6-scenario case (the simple case), the average real world return and the average real world return if no default are 8.97 per cent and 10.93 per cent per year as presented by SFG's calculations. When the extended analysis of 61 scenarios case is conducted, SFG concluded the typical market in the absence of default, the return to equity holders is 11.69 per cent per year, an increase of approximately 1 per cent.

97. On the basis of the above considerations, the Authority is of the view that a return on equity estimated using SFG's proposed approach may increase as long as the number of time repeats (scenarios) increases. As such, the Authority is convinced that the estimates of the return on equity produced from the SFG's proposed approach may not converge.

98. In this regard, the Authority is not convinced that the essence of SFG's proposed approach is linked in any way with the binomial model in option pricing. The Authority considers that SFG's proposed approach in estimating the return on equity for GGT fails to produce a similar behaviour (i.e. a "specific value" is obtained when the number of time periods increases).

99. In addition, the Authority notes Lally's advice in relation to this important characteristics of option pricing:[781]

> SFG's specification of the "good" and "bad" market states is incapable of reproducing the empirical estimate of the market standard deviation, and therefore cannot converge to any continuous time model, including that of Black and Scholes (geometric Brownian motion for share returns).

The SFG's proposed approach and a "state pricing" approach

100. The Authority notes Lally's view that SFG's proposed approach is in substance a "state pricing" approach, deriving from Arrow (1964) and Debreu (1959), with application to capital budgeting/firm valuation by Banz and Miller (1978) and Breeden and Litzenberger (1978). Lally considers that:[782]

> In this framework, one specifies expected outcomes for a firm or project conditional upon particular states of the market, and then values these conditionally expected payoffs using state prices (which differ from SFG's risk-neutral probabilities only by the risk-free rate). This state pricing framework can be applied to situations in which the asset payoff is determined by an underlying asset, and therefore option pricing could be viewed as a special case of state pricing when the underlying asset determines the payoff on the asset of interest rather than being merely correlated with it. Since the special case does not hold here, SFG's analysis is therefore state pricing rather than option pricing.

101. However, Lally is of the view that variations in outcomes around the expected payoffs on the firm for a given market state (good or bad) are treated as unpriced

[781] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 25.

[782] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 9.

risk. However this state pricing approach to firm or project valuation is not "standard finance theory".[783]

102. Lally also notes that:[784]

> Using SFG's (2014, para 276) own test for "standard finance theory" to be that "taught in undergraduate and master's finance courses", I have examined a collection of widely-used books in such courses: Grinblatt and Titman (2002), Brealey et al (2011), Damodaran (2011), Berk and DeMarzo (2014), Welch (2009), Ross et al (2013), and Copeland et al (2005). Of these books, only Copeland et al (2005, pp. 97-100) mentions the state pricing approach to firm or project valuation (briefly) and expresses doubts about its feasibility. SFG's addition of default and no default cases to each market outcome places them even further away from standard finance theory. Furthermore, SFG's paper does not contain even a single relevant reference to the (limited) academic literature in support of such an approach. SFG have used state pricing, which is not standard finance theory, and confused it with option pricing, which is standard finance theoryOn balance, based on Lally's advice. The Authority is of the view that SFG's proposed approach to estimating the return on equity for GGT is also not a "state pricing" approach.

SFG's proposed approach lacks credibility

103. The Authority notes that the return on equity produced from SFG's proposed approach relies on the assumed values of the risk free rate, yield on debt, market risk premium, equity market volatility, as well as a range of other assumptions. As an illustration, in its report, SFG concludes that, given current information, and based upon the proposed options pricing framework, the best estimate of the return on equity for a benchmark gas pipeline (with similar risk to the GGP) is 11.24 per cent. This estimate draws on the following assumptions: (i) a risk-free rate of 3.87 per cent; (ii) a yield to maturity on debt of 6.23 per cent; (iii) an expected return on the market of 10.54 per cent; and (iv) an equity market volatility of 16.64 per cent and various other assumptions.

104. Based on its estimate, SFG considers that it is appropriate to conclude that equity beta for GGT should be 1.10.

105. The Authority notes that most of SFG's assumptions are relevant for the Australian equity market wide, such as the assumed estimates of the risk free rate; the MRP; the equity market volatility. The Authority considers that, among the long list of assumptions adopted in SFG's analysis, there are only two assumed estimates which can be considered relevant to GGT, in particular, or for Australian regulated utilities, in general: (i) the BBB credit rating (which then produces the assumed estimate of the cost of debt of 6.23 per cent); and (ii) the benchmark gearing of 60 per cent for debt and 40 per cent for equity.

106. The Authority notes that Australian economic regulators have consistently adopted the benchmark gearing of 60 per cent and a benchmark credit rating of BBB for Australian regulated utilities.

107. The Authority is of the view that SFG's results essentially indicate that all other Australian regulated utilities including ATCO Gas Australia, DBNGP, Western Power and others should be given the equity beta of 1.10 – which is higher than the

[783] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 10.

[784] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 10.

market level. This means that a level of systematic risk faced by these regulated utilities is higher than the level faced by the entire Australian equity market.

108. This implication is not consistent with SFG, and with other consultants, in its advice relating to equity beta for the DBNGP and various regulated businesses in the East of Australia who have also used SFG as an expert in estimating the equity beta for their businesses.

109. To a larger extent, the Authority notes that SFG's proposed approach essentially produces a return on equity for any Australian company regardless of its industry of 11.24 per cent (which implies the equity beta of 1.10) as long as these companies have the benchmark gearing of 60 per cent and the benchmark credit rating of BBB.

Overall conclusion

110. In conclusion, based on the above analyses and considerations, the Authority is of the view that SFG's proposed approach to directly estimate the return on equity is not driven by economic principles. The Authority considers that SFG's proposed approach to estimating the return on equity for GGT does not follow any standard finance theory. As such, the Authority considers that while SFG's proposed approach may contribute to research endeavours, the application of this approach to estimate a return on equity is problematic.

Fundamental issues with SFG's proposed approach

111. In this section, the Authority's considerations will focus on fundamental issues arising from SFG's proposed approach, putting aside that SFG's proposed approach is not well established, and that the approach is unconventional and the estimates from the approach are not robust and nonsensical.

112. The Authority notes that, in a report prepared for the Authority, Lally has clearly indicated that various fundamental issues are found in the SFG's analysis in relation to the estimate of the return on equity for GGT. Each of these fundamental issues, as discussed in Lally's report, is summarised below.[785]

113. *First*, Lally considers that all of the returns data used by SFG is discrete time data. However, SFG's formula for converting the standard deviation for annual returns (SD1) into that for a period of T years (five years and one month in this case) is only valid if these standard deviations are over returns expressed in continuously compounded terms.

114. *Second*, Lally is of the view that, in using a binomial process, there are choices in the specification of the up and down factors (U and D), as noted by Jarrow and Turnbull (1996, section 4.4). However, SFG's approach does not correspond to any of those specifications. Lally considers that in effect, SFG avoids any error in the mean at the potential expense of error in the standard deviation. Lally notes SFG's claims that the returns and probabilities in its binomial framework need to be consistent with their empirical estimates of both the expected market return and standard deviation. However, Lally considers that SFG has failed to do so in respect of the standard deviation.

[785] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, pp. 8-17.

115. *Third*, Lally notes SFG's view that the debt risk premium (being a difference of a return on debt (6.23 per cent) and a risk free rate (3.67 per cent)) is due entirely to the possibility of default. However, Lally is of the view that there is a considerable body of literature on the impact of the inferior liquidity of corporate bonds relative to the risk-free asset (government bonds). As a consequence, Lally notes that:[786]

> Unsurprisingly in view of their failure to account for illiquidity, SFG (2014, page 13) obtain an estimate of the default probability from their analysis that is significantly more (over four times) than that of the average default rate in Moody's data for Baa bonds (8.53% in the analysis above and 9.65% in their multi-period extension, versus 1.97% in the Moody's data). Remarkably, SFG (2014, paras 62-63) seem to recognise that there is a problem here but brush it off, presumably because they did not appreciate that the discrepancy could be explained by an illiquidity premium. Equally remarkably, SFG (2014, para 77) critique the standard regulatory approach as potentially leading to inconsistencies between the observed cost of debt and the estimated cost of equity, but have committed **a more egregious mistake themselves**. [emphasis added]

116. *Fourth*, Lally also notes that, even within SFG's multi-period analysis, all payoffs are assumed to occur in five years and therefore firms retain all cash flows from operations over the course of five years (rather than paying dividends) and debtholders do not receive any interest for five years. Lally is of the view that this is well outside the bounds of standard financial analysis and that it is also far removed from the reality of business operations and is likely to have affected SFG's estimate of the cost of equity.

117. *Fifth*, Lally considers that a fundamental test that any approach to setting regulatory revenues or prices must face is the NPV = 0 principle. However, Lally notes that SFG never considers this issue in its analysis. Lally's analysis also provides evidence to conclude that SFG's proposed approach would likely violate the NPV=0 test.

118. Lally is of the view that:[787]

> In summary, SFG's theoretical analysis significantly diverges from standard finance theory in using state prices with the market portfolio as the 'underlying' asset to the value of a firm, and also in assuming payoffs from regulated assets only at five-yearly frequencies. In addition, their analysis is wrong in applying a formula to discrete time returns that can only be applied to continuously compounded returns, in their specification of the market payoff in the "good" state, and in failing to take account of an illiquidity premium in corporate bond yields. Finally, their use of a cost of equity that is conditional upon no default occurring is likely to produce output prices that are too high relative to the NPV = 0 test. These features can be corrected, apart from the highly unconventional use of state prices with the market portfolio as the 'underlying' asset, and the failure to satisfy the NPV = 0 test. The latter failing is decisive.

119. *Sixth*, the Authority also notes that Lally's response to SFG's sensitivity analysis in respect of: (i) the market standard deviations; (ii) the recovery rate; (iii) the range in the firm's payoff from the best to worst market states sans default; and (iv) the probability of default on GGP's bonds. Lally's conclusion indicates that SFG's approach is very sensitive to estimates of several unobservable parameters.[788]

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[786] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 13.

[787] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 17.

[788] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 20.

120. Lally considers that:[789]

> These sensitivities must be compared with those from the CAPM, whose estimate for the cost of equity is sensitive to only estimates for the MRP and the equity beta. **Prima facie, with twice as many parameters to estimate, SFG's approach seems much more sensitive to errors**. Furthermore, there is a considerable body of empirical literature on estimating the CAPM parameters, and therefore considerable evidence about the extent of possible errors from its use (in the form of standard errors on the estimates of the MRP and beta). By contrast, there is much less evidence on the extent of estimation error in most of the parameters used in SFG's approach, most particularly the recovery rate in default, the expected default rate on existing bonds, and the range in the firm's payoff in the best to worst market states sans default. So, **SFG's approach would seem to be more sensitive to estimation error and there is considerably less evidence about possible estimation errors**. [emphasis added]

Overall conclusion

121. On balance, the Authority agrees with Lally's advice that SFG's proposed approach to estimating the return on equity for GGT is fundamentally flawed and as a result, this approach should not be adopted. The Authority notes that SFG's proposed approach does not follow any standard finance theory. The approach is not well established and untested. In addition, as evidenced in Lally's report, there are fundamental issues attached to the SFG's proposed approach, setting aside its failure on theoretical grounds.

The link between return on equity and cost of debt

122. The Authority notes that one of SFG's key conclusions is that there is an inconsistency between the approaches used to estimate the return on equity and the return on debt. SFG argues that this inconsistency means that the estimates of the return on equity and the cost of debt can move in different directions over time, and that the spread between the return on equity estimate and the cost of debt is not constrained in any quantitative manner. SFG notes the Authority's view that it would not make sense for the return on equity to be less than the cost of debt. However, SFG argues that apart from constraining the return on equity estimate at a lower bound, movement in debt yields are not used to estimate the return on equity.[790]

123. SFG argued that its proposed approach provides a direct link between the return on equity; the cost of debt; the risk-free rate; the market return and leverage. Specifically, the estimated return on equity under SFG's proposed approach is estimated based on the assumed values of: (i) the cost of debt; (ii) the risk-free rate; (iii) the market return; and (iv) the leverage. The Authority also notes that SFG adopt various other assumptions, but not limited to: (i) the standard deviation of the market return; (ii) the debt recovery ratio; and (iii) the link in relation to the payoff in a *good* market and a *bad* market.

124. However, the Authority considers that it is unreasonable to draw such strong conclusions with regard to the existence of a systematic link between the equity market and the debt market.

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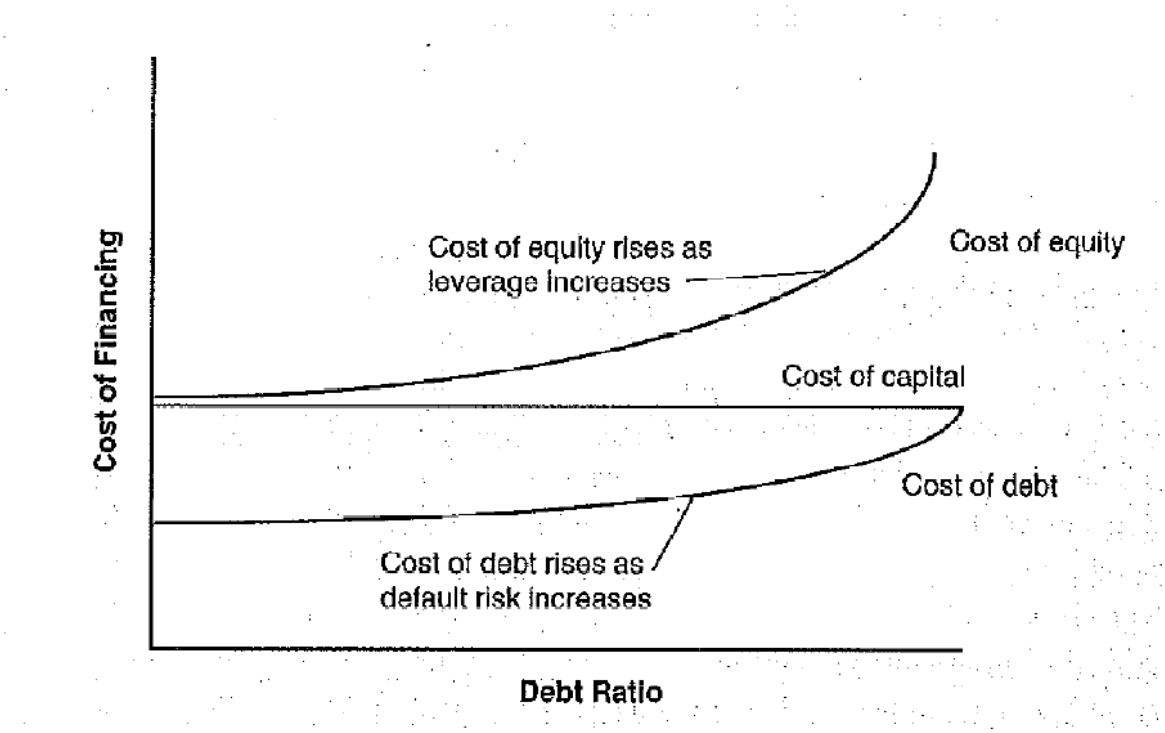
[789] Lally, M. *Review of SFG's approach to estimating the cost of equity,* Capital Financial Consultants Ltd, 2015, p. 20.

[790] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 58.

125. In the context of Australian economic regulation, Professor Grundy from the University of Melbourne sought to derive the relationship between the debt risk premium (**DRP**) and the equity risk premium (ERP) in 2010.[791]

126. In his analysis, Professor Grundy adopted the figure from the Damodaran's (2009) textbook, reproduced at Figure 33 below, which illustrates the cost of debt initially increasing very little as the debt ratio grows from a very low level. However, when a firm becomes increasingly debt-financed, the cost of debt rises rapidly to become equal to the firm's cost of capital, as the debtholders' claim on the firm comes increasingly closer to the right to 100 per cent of the firm's cash-flows.

Figure 33 Cost of Capital in the Miller-Modigliani World



127. Professor Grundy argued that the convexity of the relationship between the two implies that a lower bound for the DRP can be derived from the ERP for a given firm. With the gearing level of 60 per cent, Professor Grundy concluded that:[792]

> If the firm has 60 per cent debt financing and the asset pricing model does not imply an Equity Risk Premium at least 2.66 the observed Debt Risk Premium, then the asset pricing model is underestimating the true return on equity for the firm.

128. In a report prepared for the AER, Professor Davis, also from the University of Melbourne, argued that Professor Grundy's argument was based on the view that finance theory does provide some consistency checks on the relative cost of debt and equity. Professor Davis notes that this argument is derived from the Modigliani-Miller (**MM**) irrelevance theorem, whereby the value of the firm is unaffected by leverage. He noted that the result from Professor Grundy's analysis is based on a number of assumptions, including zero corporate taxes and no financial distress costs. Professor Davis was of the view that the assumption of zero taxes is clearly

[791] Grundy, B. 2010, *The Calculation of the Cost of Capital*, *A Report for Envestra*, 30 September 2010.

[792] Grundy, B, *The Calculation of the Cost of Capital*, *A Report for Envestra*, 30 September 2010, p. 18.

inconsistent with reality – unless it is assumed that franking credits are fully valued ($\gamma = 1$) such that corporate taxes are washed out.[793]

129. In addition, Professor Davis argued that:[794]

> More importantly, this argument does not, of itself, provide any substantive information about the relationship between the debt premium and the return on equity. The reason is straightforward. The MM relationship, when expressed in terms of rates of return on debt and equity, applies to the expected rates of return. The debt premium, and cost of debt commonly used in a WACC calculation, relate to a contractual (promised) rate of return on debt – which will generally exceed the expected return because of default risk.

130. Associate Professor Handley, also from the University of Melbourne, has also considered the validity of the Grundy's analysis. In his report to the AER, Professor Handley was of the view that there are three key steps in Grundy's analysis, viz:

- *First*, Grundy claims – based on the shape in Figure 33 – that the cost of debt of a firm is an increasing, convex, bounded function of the (market) debt-to-value ratio of the firm.[795] However, Handley notes a different interpretation to that of Grundy, which was presented in Merton (1974), showing the return on equity is an increasing, concave, unbounded function of the (market) *debt-to-equity* ratio of the firm and the cost of debt is an increasing, S-shaped, bounded function of the (market) debt-to-equity ratio of the firm, which is reproduced in Figure 34 below. In this figure, the top line is the return on equity, the bottom line is the cost of debt and the middle line is the firm's cost of capital which is constant in accordance with Modigliani and Miller's proposition II.

  - Handley concluded that:

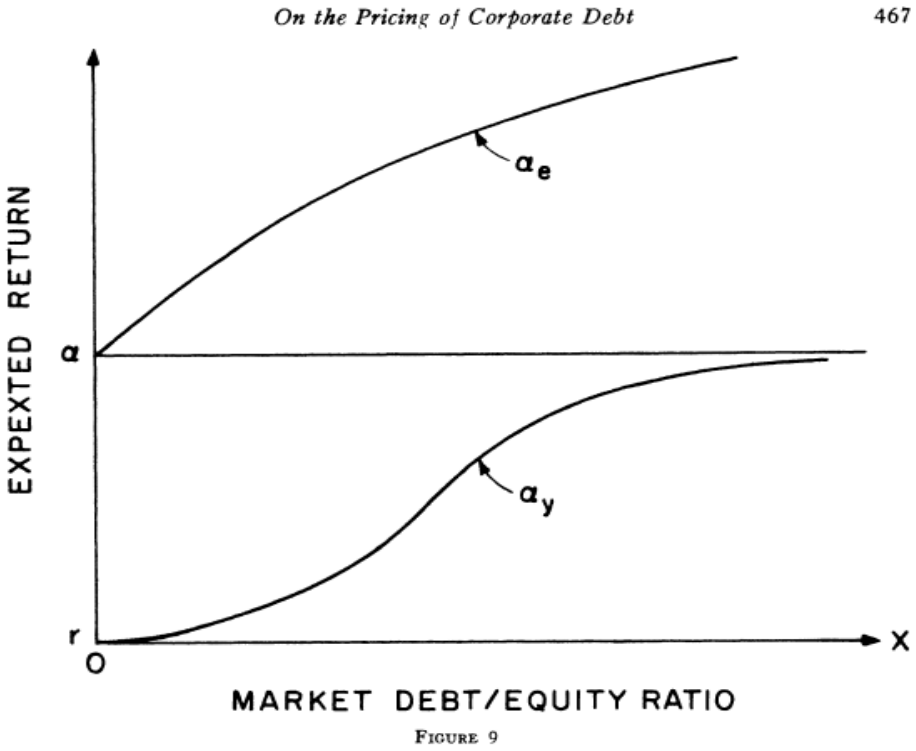
    > The above [Figure 33] from Damodaran (2001) suggests that the cost of debt is a convex function of leverage, when measured by the (market) **debt-to-value** ratio of the firm whereas the previous figure from Merton (1974) [reproduced as Figure 34 below] suggests that the cost debt is neither a convex nor a concave function of leverage, when measured by the (market) **debt-to-equity** ratio of the firm. It is not clear from where Damodaran (2001) has sourced this diagram and so I have not been able to confirm the convexity of the relationship, but I note that a similar diagram appears in Copeland, Weston and Shastri (1995).

[793] Grundy, B, *The Calculation of the Cost of Capital*, *A Report for Envestra*, 30 September 2010, p. 19.

[794] Grundy, B, 2010, *The Calculation of the Cost of Capital*, *A Report for Envestra*, 30 September 2010, p. 19.

[795] Handley, J, *Peer Review of Draft Report by Davis on the Cost of Equity*, *A Report for The Australian Energy Regulator*, 18 January 2011, p. 7.

Figure 34 Merton (1974)'s link between Cost of Debt and Cost of Capital



- *Second,* Professor Handley considered that, taking the convexity as given, the second step is Grundy's observation that the above diagram leads to an implied relationship between the equity risk premium ERP and the debt risk premium DRP of the firm. In particular, the equity risk premium of the firm (at a 60 per cent leverage) must be at least 2.66 times the debt risk premium of the firm (at a 60 per cent leverage).
- *Third,* Professor Handley then stated that, taking the observed cost of debt and so the estimated debt risk premium as given, the third step is Grundy's conclusion that if the relevant asset pricing model (in this case, the Sharpe Lintner CAPM) does not result in an estimate of the equity risk premium at least 2.66 times the estimated debt risk premium in accordance with equation (2), then the asset pricing model is underestimating the true return on equity for the firm.

131. However, importantly, Professor Handley considered that:[796]

> Stiglitz (1969), Rubinstein (1973), Merton (1974) and Galai and Masulis (1976) have all shown that (under certain assumptions) the Modigliani-Miller theorem holds in the presence of risky debt. An implicit assumption common to all four papers, is that both the equity and debt securities in the firm are priced according to the same relevant asset pricing framework – i.e. a general equilibrium state preference framework in the case of Stiglitz (1969), a mean-variance framework in the case of Rubinstein (1973), an option pricing framework in the case of Merton (1974) or a combined CAPM/option pricing framework in the case of Galai and Masulis (1976). In other words, the validity of the Modigliani-Miller theorem in the presence of risky debt is based on **the implicit assumption that equity and debt are priced in the (same) integrated market rather than being priced in (separate) segmented markets**. [emphasis added]

[796] J. Handley, *Peer Review of Draft Report by Davis on the Cost of Equity, A Report for The Australian Energy Regulator*, 18 January 2011, p. 8.

and that:[797]

> In this case, not only is it possible to derive a lower bound on the firm's equity risk premium relative to its debt risk premium but rather one can derive an exact relationship between the firm's cost of debt and its return on equity and accordingly an exact relationship between the firm's equity risk premium and its debt risk premium. This is precisely what is implied by the diagrams of Damodaran (2001) and Merton (1974) above.

132. Professor Handley then argued that there are joint hypothesis considerations in comparing the observed cost of debt to the estimated return on equity. He argued that if:[798]

> …the equity risk premium is less than 2.66 times the debt risk premium then this could imply either: (i) that the equity and debt are priced in an integrated market and the equity risk premium is too low; or (ii) that the equity and debt are priced in an integrated market and the debt risk premium is too high; or (iii) that the equity and debt are priced in segmented markets and so **the Modigliani-Miller theorem cannot be used to infer that the equity is mispriced relative to the debt**. [emphasis added]

133. Handley's observations suggest that comparisons between the expected return on equity and the expected return on debt in the WACC are not straightforward. They depend crucially on whether debt and equity are priced in an integrated market. To the extent that markets are segmented, then the law of one price does not hold, and the MM theorem will break down. That is, it would not be irrelevant whether a firm held debt or equity, if one was significantly cheaper than the other, given constant levels of risk of default.

Overall conclusion

134. The Authority considers that there is a link between the cost of debt and the return on equity. However, the Authority is of the view that the only sure link that one can infer is that the return on debt should generally be lower than the return on equity because debtholders are considered less risky in comparison with equity holders for the same asset (firm).

135. In particular, the Authority considers that efforts to establish a quantitative link between the return on equity and cost of debt – while enticing – are fraught with uncertainties and therefore are not robust. Both Davis and Handley have pointed to significant issues which confound such efforts.

136. The exercise by SFG is no different in seeking to quantify the link between debt and equity. As such, the Authority does not accept it.

The Authority's sensitivity analysis of the SFG's proposed approach

137. The Authority is also of the view that the SFG's proposed approach has demonstrated significant drawbacks in its estimates of the return on equity, given the reliance on the assumed values of the inputs. As one of these inputs change, the estimated return on equity will change in an unexpected direction and magnitude. Some of the most significant drawbacks are discussed in turn below.

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[797] Handley, J, *Peer Review of Draft Report by Davis on the Cost of Equity*, *A Report for The Australian Energy Regulator*, 18 January 2011, p. 9.

[798] Handley, J, *Peer Review of Draft Report by Davis on the Cost of Equity*, *A Report for The Australian Energy Regulator*, 18 January 2011, p. 9.

The assumed inputs adopted in the SFG's proposed approach

The risk free rate of return

138. In its analysis, SFG adopted the risk free rate of 3.87 per cent per year.

139. As at June 2015, the prevailing risk free rate of 2.90 per cent, a reduction of 1 per cent in comparison with SFG's assumed estimate. The reduction of a risk free rate will certainly lead to a change in both return on debt and return on equity.

The expected market return on equity

140. The Authority notes that an expected market return of 10.54 per cent per year was used in SFG's estimate. This estimate is derived as a weighted average of the four different approaches of estimating the market return: (i) historical average excess returns (20 per cent weight); (ii) Wright's approach (20 per cent weight); (iii) SFG's DGM (50 per cent weight); and (iv) Expert reports (10 per cent weight).

141. The Authority is of the view that the estimate of 10.54 per cent for the expected market return is unstable. This view is based on the following considerations that: (i) the weighting is arbitrary and (ii) the estimate of the market return from each approach adopted by SFG is disputed.

142. *First,* there is no justification for the weighting mechanism adopted in SFG's analysis. The Authority considers that there is no theoretical and practical support for this choice in relation to the weighting. It is clear that different weighting will certainly lead to a different outcome of the expected return on the equity market.

143. *Second,* the estimates of the market return from each approach is far from in consensus. In particular, SFG used its own estimate of the market return using the DGM. The Authority is of the view that estimates of the market return using the DGM can only be used from a wide range of studies and with great caution to derive the estimates.

144. In addition, as an illustration, in this SFG analysis, the Authority notes that the expected market return of 10.38 per cent and 11.58 per cent were adopted in the historical average excess return approach and Wright's approach. The Authority notes that these two estimates are mainly drawn from the historical excess return. However, the Authority is of the view that the difference of 1.20 per cent between the two estimates appears unreasonable because these two estimates are generally estimated from the same data sources.

145. On balance, based on SFG's analysis, as long as the expected market return on equity is different from 10.54 per cent, it is unclear where the return on equity for GGT will land.

The cost of debt

146. The cost of debt adopted in SFG's analysis was 6.23 per cent. SFG noted that the cost of debt was estimated with reference to the estimated yield on 10 year BBB rated non-financial corporate debt provided by the RBA for the end of May 2014 (6.08 per cent effective annual rate), plus a premium of 0.15 per cent for debt raising and hedging costs.

147. The Authority notes that, as at May 2015, the 10 year cost of debt of 4.94 per cent which is equivalent of 5.00 per cent effective annual rate.

148. The Authority notes the difference of more than one per cent in relation to the cost of debt between SFG's assumed value and the prevailing estimate in the market at the moment. As such, the Authority is not convinced that the estimated return on equity under this proposed approach is still relevant when the cost of debt is now 5 per cent.

Overall conclusion

149. The Authority notes that the estimated return on equity of 12.24 per cent for GGT derived from SFG's proposed approach is based on a set of input assumptions. The Authority is of the view that the choice of these assumed input estimates is unjustified and that the change of each of these assumed inputs will change the final estimate of the return on equity for GGT.

An update of a risk free rate and a cost of debt and other input assumptions

150. As previously indicated, the Authority considers that estimates of the return on equity using SFG's proposed approach heavily depend on the input assumptions. As long as one of the input assumptions changes, the estimates produced from SFG's proposed approach will change significantly.

151. The Authority notes that a number of assumptions are subject to variation given fluctuations in financial markets. The Authority therefore conducted a sensitivity analysis – based on SFG's framework - which updates these assumptions. The Authority the first substitutes two estimates: (i) the risk free rate of return of 1.96 per cent; and (ii) the cost of debt of 5.16 per cent, from the Final Decision on ATCO Gas Australia. [799] In addition, the Authority has also conducted the sensitivity analysis based on the Authority's market return on equity of 10.83 per cent from the ATCO Final Decision and SFG's second assumed standard deviation of the market return of 14.89 per cent (adopted by SFG in its 61 outcomes case, instead of 16.64 per cent adopted in SFG's two outcome analysis).

[799] Economic Regulatory Authority, *Final Decision on Final Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution Systems*, as amended 10 September 2015.

Table 105 Sensitivity analysis with Risk free rate, Cost of Debt, Market return and Standard deviation of the market return

		SFG's scenario	Authority's updated input assumptions			
			Risk-free rate	Cost of debt	Average market return of 10.83 per cent	Standard deviation of 14.89 per cent
Risk free rate (%)		3.87	1.96	3.87	3.87	3.87
Cost of debt (%)		6.23	6.23	5.16	6.23	6.23
Payoff to Debt holder in a Good market ($)		81.17	81.17	77.16	81.17	81.17
Payoff to Debt holder in a Bad market ($)	***No default***	81.17	81.17	77.16	81.17	81.17
	Default	34.90	34.90	33.18	34.90	34.90
Payoff on the asset in a Good market ($)		153.68	159.61	145.05	153.88	153.32
Payoff on the asset in a Bad market ($)	***No default***	122.94	127.69	116.04	123.10	122.65
	Default	34.90	34.90	33.18	34.90	34.90
Payoff to Equity holder in a Good market ($)		72.51	78.45	67.89	72.71	72.15
Payoff to Equity holder in a Bad market	***No default***	41.78	46.52	38.88	41.93	41.48
	Default	0	0	0	0	0
Equivalent range of equity beta		**0.77 – 1.06**	**0.94 – 1.31**	**0.63 – 0.79**	**0.75 – 1.03**	**0.79 – 1.06**

Source Economic Regulation Authority analysis

152. The Authority notes that, with the change in only one input assumption, the range of equity beta varies significantly. For example, when the risk free rate of 1.96 per cent is adopted, equity beta falls within a range of 0.94 to 1.31.

153. In addition, as another illustration, SFG assumed in the simple binomial model that, in a *bad* market, the asset payoff is 80 per cent of the payoff that would occur in the *good* market.[800] In contrast, in the 61 period binomial model, SFG assumed three scenarios:

- good market outcomes occur 8.5 per cent of the time and give an asset payoff of 115 per cent of the typical average return (absent default);
- bad market outcomes occur 6.7 per cent of the time and give an asset payoff of 85 per cent of the typical average return (absent default);

[800] SFG Consulting, *Cost of equity for the Goldfields Gas Pipeline*, *Report for Goldfields Gas Transmission*, 22 July 2014, p. 19.

- across most market outcomes (the middle 84.8 per cent) the asset payoff compared to the typical case ranges between 85.00 per cent and 115.00 per cent;
  - the asset payoff varies depending upon the probability of each outcome, compared to the typical case;
  - the probability of a different market outcome is first estimated, then compared to the typical (most probable) case by measuring the ratio of the probabilities of occurrence, and then this ratio 'distance' is applied to the gap between either 85.00 per cent and 100.00 per cent, or 115.00 per cent and 100.00 per cent (depending which side of the typical case the market outcome is).

154. The Authority considers that these assumptions, as with other assumptions adopted in SFG's analysis, have not been justified by SFG. There is no theory to support for these choices. SFG did not provide any reference to support its choice on this assumption. However, the Authority notes that the choice of this assumption affects significantly the range of equity beta produced from SFG's proposed approach. For example. When another assumed percentage of 90 per cent is adopted, equity beta will fall within a wide range of 0.56 and 0.83. However, when the ratio of 70 per cent is adopted, the range for equity beta produced from SFG's proposed approach is 0.98 – 1.27.

155. For example, SFG's considered that:[801]

> This means that, in the event of a 10.00% volume decline and no change in prices, equity holders are 4.22% worse off than in the base case after five years. That is, an equity investment of $40.00 was projected to be worth $68.12 at the end of five years with the reinvestment of dividends. The volume decline means that the equity investment is worth $65.25 at the end of five years with the reinvestment of dividends. Hence, equity returns are 95.78% of what was projected in the base case.
>
> If [GGT's] volume falls 10.00% below projections and prices are unchanged the internal rate of return on assets would be 7.35% per year (42.54% over five years). So a $100.00 investment in the asset was projected to be worth $148.52 with the reinvestment of cash flows. The volume reduction leads to an asset worth just $142.54, so asset returns are 95.97% of the base case projection.
>
> The key point is that asset and equity returns have some sensitivity to volume fluctuations, even if capacity charges are fully paid, and the impact of volume fluctuations on asset and equity returns can be measured. Further, volume differences from the baseline estimate are only likely to result from economic events. The volume demands on the GGP are ultimately determined only by the demands of operating mining companies and towns that serve operating mining companies. So the variation in asset and equity returns will be due to variation in global economic demand.

156. SFG then uses a post-tax revenue model to suggest that the good market/bad market assumptions in the two outcome binomial model case will lead to returns that are ±3 to 9 per cent different to the typical case:

> Recall that in the analysis presented in Sub-section 2.3 we considered asset returns over five years that were 85.00% to 115.00% of asset returns in the typical case over five years. The upper bound corresponded to a good market outcome and the lower bound corresponded to a bad market outcome. We can use information in the post-tax revenue model to determine the feasibility of this range.
>
> With just consideration of volume fluctuations we can determine the maximum asset return on the GGP, compared to the base case. This occurs in the situation in which

[801] Goldfields Gas Transmission Pty Ltd, *Access Arrangement Revision Proposal: Supporting Information*, 15 August 2014, Attachment 7, p. 52.

volume is 100.00% of capacity, prices are unchanged and there are zero defaults. In this event the internal rate of return on the asset over five years is 9.97% per year, equivalent to 60.81% over five years. This represents a total asset return that is 8.27% above the base case return of 48.52% over five years.[123]

This maximum asset return is unlikely to be achieved because it is based upon the assumption that prices are locked in for 50 years. In reality, prices are reset at the beginning of each contract and contracts last for less than 50 years. For regulated assets, each regulatory period is analogous to a contract in which the regulator states the terms that it considers to be fair.

Suppose all prices outside of the first five year regulatory period were re-set by the regulator such that the present value of cash flows is equal to the asset base at the end of five years. The new assumption adopted by the regulator is that throughput of 100.00% of capacity is projected for the last 45 years. This leads to reductions in the throughput charge.

In this situation, the increase in volume assumption results in an internal rate of return on the asset of 8.74% per year, equivalent to 52.03% over five years. This represents a total asset return that is 2.36% above the base case return of 48.52% over five years.

So we know that the upside to asset returns, based entirely on volume being above projections, is within the range of 2.36% to 8.27% over five years. Either extreme is unlikely to occur, but this represents a full spectrum of possibilities. With respect to the upper end, it is not the case that prices are locked in for 50 years. So with volume increases we would expect some price falls. At the lower end, it is also not the case that volume increases will be entirely offset by price reductions after the five year period. It is highly unlikely that just because volumes were at 100.00% of capacity in one period that prices will be re-set with observed volume as the future projection.

This upside range of 2.36% to 8.27% relative to base case asset returns is based entirely on volume changes and full capacity payments. There is no reason to think that this upside potential would occur for any reason other than strong economic conditions.

The impact on returns in a low volume case are approximately symmetric to those for the high volume case. If there was a volume shortfall equal to the difference between capacity and volume, and no change in prices, the internal rate of return on the asset would be 6.41% per year, equivalent to 36.44% over five years. This represents a total asset return that is 8.13% lower than in the base case.[125] In the event of price re-sets, in which volume is projected to be at the same low level for the remaining 45 years, the internal rate of return on the assets would be 7.65% per year, equivalent to 44.58% over five years. This represents a return over five years that is 2.65% lower than in the base case.

In summary, the potential upside and downside to asset returns from volume fluctuations, provided all capacity charges are paid, lies within the range of ±3% to ±9%, compared to a base case projection. This means that, in a good market, the potential upside in asset returns from better than projected volume lies somewhere from 3% to 9%; and, in a bad market, the potential downside in asset returns from worse than projected volume lies somewhere from 3% to 9%.

157. On balance, based on these analyses, the Authority is convinced that equity beta produced from SFG's proposed approach relies significantly on the assumed inputs utilised in the analysis. When one of many inputs changes, the final estimate of the return on equity for GGT will change significantly. As such, the Authority is of the view the estimates are not robust and they cannot be used to estimate the return on equity/equity beta for GGT.

Draft Decision

158. In conclusion, the Authority is of the view that SFG's proposed approach to estimating the return on equity for GGT is fundamentally flawed and as a result, this approach should not be adopted. The Authority notes that SFG's proposed approach does not follow any standard finance theory. The approach is not well established and is untested. In addition, as evidenced in Lally's report and the Authority's sensitivity analyses, there are fundamental issues attached to the SFG's proposed approach, setting aside its failure on theoretical grounds.

159. As a result, based on the above considerations together with Lally's expert advice on the issue, the Authority is of the view that the SFG's proposed approach is not appropriate for the purpose of estimating the return on equity for GGT.

Appendix 4 Review of models for estimating the return on equity

1. Following a review of GGT's proposal, the Authority remains of the view that its reasons for adopting the Sharpe Lintner CAPM, with the parameters informed by outcomes from the DGM and the Black CAPM, are sound for the purpose of estimating the return on equity. The Authority considers that the resulting application of the Sharpe Lintner CAPM met the requirements of the NGR and the allowed rate of return objective.[802]

The Sharpe Lintner CAPM

2. This section considers the ability of estimates of the return on equity derived from the Sharpe Lintner CAPM to meet the requirements of the NGL and NGR. Each of the three inputs to the Sharpe Lintner CAPM – the estimates of the risk free rate, equity beta, and the MRP – are considered in the following sections.

3. The Authority notes that there is no new information presented by GGT in its proposal with regard to the approach using the Sharpe Lintner CAPM. The Authority considers that all of information submitted by GGT had been previously considered in the Rate of Return Guidelines. However, for completeness, key criticisms in relation to the adoption of the Sharpe Lintner CAPM are considered in turn below.

Empirical evidence of the Sharpe Lintner CAPM

4. As discussed in detail in its Rate of Return Guidelines and ATCO's Final Decision, the Authority is of the view that the Sharpe Lintner CAPM was developed from theory, the results are robust and the model is widely adopted by practitioners and academics for determining the return on equity.

5. The Authority also addresses criticisms in relation to the poor empirical performance of the Sharpe Lintner CAPM. The Authority remains of the view that these criticisms remain contentious, with no clear agreement among the experts (for example, with regard to the estimate of beta, exemplified in the consideration of the Black CAPM above). However, the Authority notes that an adoption of equity beta from an upper bound of the estimated range of equity beta from empirical studies represents an upward revision of the return on equity estimated from the Sharpe Lintner CAPM.

6. The Authority notes that, in their report prepared for the AER in October 2014, Professors McKenzie and Partington concluded that:[803]

> With regard to the CAPM, its efficacy comes from the test of time. This model has been around for in excess of half a century and has become the standard workhorse model of modern finance both in theory and practice. The CAPMs place as the foundation model is justifiable in terms of its simple theoretical underpinnings and relative ease of application. The competing alternatives, which build upon the CAPM, serve to add a level of complexity to the analysis.

[802] Economic Regulation Authority, *Draft Decision on Proposed Revisions to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 14 October 2014, p. 160.

[803] McKenzie, M. and Partington, G. *"A Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 9.

7. The Authority notes that other criticisms of the Sharpe Lintner CAPM include those relating to the risk factors proposed by Fama and French. Fama and French, and some others, have argued that beta alone cannot explain the cross section of average returns of the stocks. However, the Authority notes that the cross section of stocks' average returns is only one dimension of interest when modelling the risk-return relationship.

8. In addition, as discussed in McKenzie and Partington's report, the evidence against the CAPM may not be as robust as previously thought.[804]

   - *First*, Ray, Savin and Tiwari (2009) conclude that the statistical evidence for rejecting the CAPM is weaker than previously thought when more appropriate statistical tests are used.
   - *Second*, more importantly, Da, Guo and Jagannathan (2012) argue that the empirical evidence against the CAPM based on stock returns does not invalidate its use for estimating the cost of capital for projects in making capital budgeting decisions. Their findings support the continued use of the CAPM irrespective of one's interpretation of the empirical literature on asset pricing.

Ability to reflect changes in market conditions

9. The Authority is not satisfied that a return on equity estimated by the Sharpe Lintner CAPM is unable to reflect changes in market conditions. The Authority notes that estimates of risk free rate, equity beta and the MRP consider relevant data available at the time the decision is made. As such, any changes in market conditions should be reflected in the data which are used in the estimates.

10. For example, estimates of the risk free rate use recently observed yields on the Commonwealth Government bonds over the period of 20 trading days prior to the decision. Similarly, estimates of equity beta generally use a sample of stock and market returns over the most recent period of five years.

11. Estimates of the MRP also account for prevailing conditions.

Achieving rates of return that would be consistent with the outcomes of efficient, effectively competitive markets

12. The Authority is satisfied that an equity rate of return derived from the Sharpe Lintner CAPM is consistent with the outcomes of efficient, effectively competitive markets. As noted above, the model is widely accepted, has stood the test of time, and as a result continues to be the standard asset pricing model of modern finance, in theory and practice.

13. The Authority's process for determining the return on equity cross checks the outputs of the model against available evidence from the market (see Step 4 below). On the basis of that analysis, the Authority is satisfied that the rate of return on equity determined using the Sharpe Lintner is consistent with prevailing market outcomes and for the benchmark efficient entity.

[804] McKenzie, M. and Partington, G. *"A Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 9.

The Authority's decision on the Sharpe Lintner CAPM

14. The Authority does recognise that recent market conditions since the Global Financial Crisis have raised important issues with regard to the application of the Sharpe Lintner CAPM. The Authority considers that its revised approach to estimating the Sharpe Lintner CAPM – as set out in the Rate of Return Guidelines and implemented for this Draft Decision – allows for much greater flexibility in the estimates of the return on equity, thereby improving the overall estimates of that return. That approach, among other things, involves establishing a range for the forward looking MRP and then determining a point estimate at the time of each decision, based on the prevailing conditions in the market.

15. The Authority notes that its decision in relation to a continuous use of the Sharpe Lintner CAPM to estimating the return on equity for GGT is fully supported by the most recent report prepared by Professors Partington and Satchell:[805]

> "Our first observation is that the CAPM is ubiquitous in relation to the estimation of the cost of equity. The same cannot be said for the alternative models proposed by the regulated businesses. Whilst much of the criticism of the CAPM has some validity, the good points of the CAPM need repeating, it is parsimonious, it is widely used and understood, and, importantly, it is an equilibrium model. Equilibrium theories for the Fama and French models are much less well-founded and the model itself is in the process of revision by Fama and French. The zero-beta CAPM is an equilibrium model, but we have made the case, that was not refuted by the submission of the regulated businesses, that there are troublesome problems in estimating the zero beta return".

16. Partington and Satchell also concluded that:[806]

> The CAPM has not performed well in terms of empirical attempts to fit the model to realised returns, but the CAPM has passed an important test. That test is the test of time. While academics are still debating the merits of the different asset pricing models, how they should be tested and what the appropriate test statistics are, the users of models have made up their mind about which model to use when estimating the cost of capital. The CAPM has had several decades of widespread practical use in estimating the cost of capital. None of the other models have passed the same test.

Black CAPM

Assumptions under the Black CAPM

17. The Authority notes that the assumptions underlying the Black CAPM are the same as those of the Sharpe Lintner CAPM, with one exception. One assumption underpinning the Sharpe Lintner CAPM is that investors are assumed to be able to borrow or lend freely at the risk free rate of a risk free asset. Black (1972) questioned this assumption by arguing that an investor may take unlimited long or short positions in any security, including the risk free security.

18. In his paper, Black (1972) considered two separate scenarios:

- *First*; there is no risk free security and, as such, no borrowing or lending at the risk free rate. However investors may take long or short positions of any size

[805] Partington, G. and Satchell, S. "*Report to the AER: Analysis of Criticism of 2015 Determinations", a report prepared for the Australian Energy Regulator*, October 2015, p. 17.

[806] Partington, G. and Satchell, S. *"Report to the AER: Analysis of Criticism of 2015 Determinations", a report prepared for the Australian Energy Regulator*, October 2015, p. 21.

in any risky asset. This version of the Black CAPM is also known as the fully restricted version.

- *Second*; investors are assumed to be able to lend but not borrow at the risk free rate, known as the partially restricted version.

19. McKenzie and Partington (2014) considered that in the absence of the riskless asset, there is a role for the zero beta portfolio. The expected return on any asset is a linear function of the beta of the asset. In the second scenario the resulting market equilibrium is more complex, but equilibrium asset returns again depend linearly on the beta of the asset as well.[807]

20. The Black CAPM requires that investors can short sell. SFG (2014) argued that while in reality investors do not have an unlimited ability to sell short, short-selling is a feature of the equity market. It is possible that the more realistic assumptions underlying the Black CAPM provide a better data fit.

21. In the Rate of Return Guidelines, the Authority was of the view that the Black CAPM substituted one assumption of the Sharpe Lintner CAPM with another assumption that was arguably, unrealistic. The Authority notes that this view is consistent with both Black (1972) and Fama French (2004).

> This assumption is not realistic, since restrictions on short selling are at least as stringent as restrictions on borrowing.[808]

and that:

> The assumption that short selling is unrestricted is as unrealistic as unrestricted risk-free borrowing and lending.[809]

22. In their report prepared for the AER in October 2014, Professors McKenzie and Partington concluded that:[810]

> In theory, theory and practice are the same. In practice, however, theory and practice are different. It is important to understand that the conditions under which investors can short sell in the real world are very different to the conditions assumed in the Black model. As SFG point out, investors in the real world do not have an unlimited ability to short sell. The differences go far beyond that however, and short selling is actually a very risky and expensive exercise. In order to short sell, an investor must typically borrow the stock and most stock loan agreements require the investor to post in excess of 100% of the value of the loan in cash or equivalent, they must pay a fee for lending the stock (termed the rebate rate), loans are typically on 24-hour recall, investors face the constant risk of a short squeeze, etc.. For details on the process of stock lending for short selling see Faulkner (2002) and for academic research on the costs and impact of short selling see Henry and McKenzie (2006), McKenzie, (2012), Berkman and McKenzie (2012), McKenzie and Henry (2012) Jain, Jain, McInish and McKenzie (2013).

[807] McKenzie, M. and Partington, G. "*A Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, pp. 21-22.

[808] Black, F., 1972, Capital Market Equilibrium with Restricted Borrowing, *Journal of Business*, 45, pp. 444-454, p. 446.

[809] Fama, E.F. and K.R. French, 2004. The Capital Asset Pricing Model: Theory and Evidence, *Journal of Economic Perspectives*, Vol. 18, pp. 25-46, p. 30.

[810] McKenzie, M. and Partington, G. *"A Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 22.

23. In conclusion, the Authority is of the view that it is incorrect to suggest that the Black model is based on more realistic assumptions than the Sharpe Lintner CAPM. The Authority considers that the Black model simply replaces one of the underlying assumptions of the Sharpe Lintner CAPM with another, and the validity of this new assumption has not been substantiated in either theory or practice. This view is supported by McKenzie & Partington and also by Handley.[811]

Estimates of the return on zero beta portfolio under the Black CAPM

24. Network service providers and their consultants have argued that empirical results obtained from the Black CAPM are better at explaining historical stock returns for low beta assets than those obtained by the Sharpe Lintner CAPM. This is generally known as a "low beta bias". This bias has led to the argument that the Black CAPM is better for estimating the return on equity than the Sharpe Lintner CAPM.

25. However in a report prepared for the AER in October 2014, Professors McKenzie and Partington disagreed with that view:[812]

> To be clear on this point, empirical results for the Black and S-L CAPM are not directly comparable as they each involve very different investment strategies. In the S-L CAPM, the investor may hold the risk free asset. In the Black CAPM however, the investor may hold the zero beta portfolio, which consists of long and short positions. It is entirely reasonable to expect that these two strategies will have different payoffs, given their different risks and costs.
>
> The fact that the S-L CAPM produces a relationship between beta and average return that is too flat (as exemplified in Figures 2, 5 and 6 in SFG, 2014e), cannot be interpreted as evidence in support of the Black CAPM, or indeed as evidence against the S-L CAPM. It does remain an outstanding issue as to why these empirical predictions differ to the theoretical predictions of the CAPM. As noted earlier, Ray, Savin and Tiwari (2009) shows that the statistical evidence for rejecting the CAPM is weaker than previously thought when more appropriate statistical tests are used.

26. Handley (2014) has also concluded that:[813]

> The difficulty here lay in knowing how to interpret this empirical evidence. It is important to be clear that the results of Black, Jensen and Scholes (1972) and the updated results in Fama and French (2004) are said to be consistent with rather than being a direct test of the Black-CAPM. In other words, the Black-CAPM and the low beta bias are not equivalent concepts.

and that:

> In particular there are a number of competing (but not necessarily mutually exclusive) explanations for the low beta bias. It may reflect restrictions on riskless borrowing consistent with the Black CAPM. It may reflect the impact of barriers to international investment consistent with the international CAPM of Black (1974). Black identifies a variety of types of such barriers including the possibility of expropriation of foreign holdings, direct controls on the import or export of capital, reserve requirements on bank deposits and other assets held by foreigners, restrictions on the fraction of a business that can be foreign owned and even the barriers created by the unfamiliarity that residents of one country have with other countries. It may reflect a specification error in the proxy for the market portfolio consistent with the suggestion by Roll (1977).

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811 Handley, J. "*Advice on the Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 10.

812 McKenzie, M. and Partington, G. *"A Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 23.

813 Handley, J. "*Advice on the Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 10.

> It may reflect model misspecification consistent with the value and/or size effects of the Fama-French model. It was also initially thought that it may reflect the impact of differential personal taxes consistent with the after-tax CAPM of Brennan (1970) but this idea has since been dismissed by subsequent research. It may reflect price pressure exerted by leverage-constrained investors who tilt their portfolios towards high-beta stocks relative to low-beta stocks in seeking higher expected returns, consistent with Frazzini and Pederson (2014). It may reflect price pressure exerted by investors who seek lottery-like stocks consistent with Bali, Brown, Murray and Tang (2014).

27. The Authority notes that estimated returns on a zero beta portfolio by NERA in 2012 were evaluated by Professors McKenzie and Partington for the AER in 2012, where they concluded that:[814]

> With regard to the robustness of the estimated zero beta return we take this to mean robustness in the sense that there is little or no variation of the estimated parameter in response to sensible alternative approaches to estimation. We conclude that, with respect **to the magnitude of the zero beta return, the estimate is not robust**. The NERA (2012) report, for example, shows estimates ranging from 6.985 percent to 10.309 percent. However, we make a more general and more important point that "the empirical zero beta portfolio" is not unique. Consequently, **there are many different zero beta returns that might be estimated and very large differences in the value of that return could be obtained** [emphasis added].

28. The Authority notes that empirical estimates have been conducted by consultants for network service providers in Australia. Key findings from these studies are summarised as follows:

- CEG (2008) used Australian data from 1964 to 2007 and reported estimates of the zero beta premium that range between 7.21 per cent per annum and 10.31 per cent per annum using various cross-sections of stocks traded on the ASX data formed into 10 portfolios on the basis of past estimates of beta.[815]
- NERA (2013) used Australian data from 1974 to 2012 and reports estimates of the zero beta premium that range between 8.74 per cent per annum and 13.95 per cent per annum using both individual stocks and stocks formed into portfolios on the basis of past estimates of beta.[816]
- SFG (2014) reported an estimate of the zero beta premium of 3.34 per cent per year. This study was based on 20 years of returns information from 1994 and 2013.[817]

29. In their recent report prepared for the AER, Partington and Satchell also concluded that:[818]

> Beaulieu, Dufour and Khalaf have been working on this problem [of estimating zero beta return] for over a decade and have developed improved estimation procedures. Applying these procedures they conclude that the estimate of the zero beta return is

[814] McKenzie, M. and Partington, G. "*Review of NERS report on the Black CAPM", a report prepared for the Australian Energy Regulator*, August 2012.

[815] CEG (September 2008) *Estimation of, and correction for, biases inherent in the Sharpe CAPM formula,* a report prepared for the Energy Networks Association Grid Australia and APIA.

[816] NERA Economic Consulting (June 2013) *Estimates of the Zero-Beta Premium,* a report prepared for the Energy Networks Association, p. 16 and p. 23.

[817] SFG Consulting (2014) *Cost of equity in the Black Capital Asset Pricing Model,* a report prepared for Jemena Gas Networks, ActewAGL, Ergon, Transend, TransGrid, and SA PowerNetworks, p. 27.

[818] Partington, G. and Satchell, S. "*Report to the AER: Analysis of Criticism of 2015 Determinations", a report prepared for the Australian Energy Regulator*, October 2015, p. 19.

> unstable over time. Although these improved procedures are a valuable contribution to the research literature, they involve complex econometrics and are not yet widely accepted. Consequently, we would not currently recommend them for regulatory use.

30. Partington and Satchell noted that:[819]

> Given that an inefficient portfolio is used as the proxy for the market portfolio there is an infinite possible set of zero beta returns and even when you constrain the estimate by using a regression model, what you get is very much determined by what you do. Hence the wide range of estimates previously submitted by regulated business.

and that:[820]

> First, the estimate of the return on the zero beta portfolio is sensitive to the choice of the portfolio used to represent the market and it can be very sensitive to this choice. Second the sensitivity depends on the curvature of the efficient frontier lying between alternative portfolios used to represent the market.
>
> At a theoretical level the choice of portfolio to represent the market leads to a multiplicity of possible values for the zero beta return and what you get in empirical work depends very much on what you do. The very substantial variation in the estimates provided by the regulated businesses, and the theoretical and empirical work showing the unreliable nature of zero beta return estimates, clearly suggests that estimates of zero beta returns are not appropriate for use in determining regulated returns.

31. In conclusion, the Authority is of the view that the estimates of the zero beta premium are not robust and that there are many different zero beta returns which could be estimated. Therefore, the differences in the value of the estimates may vary significantly from study to study as previously presented. The issue of wide estimates of the zero beta premium is closely linked with the argument that the Black CAPM is not widely used by academics and practitioners, as discussed in detail below.

The Black CAPM is not widely used by academics or practitioners

32. The Authority is of the view that the Black CAPM is not widely used by academics as an approach to estimating a return on equity, either in Australia or overseas. Neither is the Authority aware of any regulator in Australia or overseas who has utilised the Black CAPM to provide a direct estimate of the return on equity in its decisions. This view is supported McKenzie & Partington and Handley.

33. In addition, Handley argued that:[821]

> The Black CAPM is not widely adopted in practice – there is one very good reason for this. The theoretical prediction which distinguishes the Black-CAPM from the Sharpe-CAPM is that the (shadow) risk free interest rate – more commonly called the zero beta rate – is unspecified except to say that it must be less than the expected return on the market portfolio. In the partially-restricted version of the model, the zero beta rate must also be above the risk free rate. From a practical point of view, this is not very useful due to the wide range of possible values that the zero beta rate may take on. The Black-CAPM therefore presents the non-trivial task of having to estimate the

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819 Partington, G. and Satchell, S. "*Report to the AER: Analysis of Criticism of 2015 Determinations", a report prepared for the Australian Energy Regulator*, October 2015, p. 20.

820 Partington, G. and Satchell, S. "*Report to the AER: Analysis of Criticism of 2015 Determinations", a report prepared for the Australian Energy Regulator*, October 2015, p. 26.

821 Handley, J. *"Advice on the Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 12.

expected zero beta rate which the theory says could be anywhere in a very wide range as well as having to estimate an expected market risk premium relative to the expected zero beta rate.

The Authority's decision on the Black CAPM

34. The Authority has come to the view that the Black CAPM is relevant for the purpose of estimating a return on equity for regulatory decisions in Australia. All of its underlying assumptions except for one are the same as those underlying the Sharpe Lintner CAPM. The Black model therefore satisfies the criterion of having a theoretical foundation.

35. The concept of zero beta portfolio, however, is not well established. Estimates of the zero beta premium are both unstable and unreliable, particularly in the Australian context. Neither is the Black CAPM widely adopted by academics or practitioners in Australia or overseas for estimating a return on equity directly. None of the estimates of a return on equity that are made using the Black CAPM are sufficiently robust. The Authority considers that it is therefore impractical to utilise the Black CAPM to determine the return on equity directly.

36. However, the Authority will recognise the theoretical insight from the Black CAPM when estimating a return on equity with the Sharpe Lintner CAPM. The Authority will have regard to these outcomes when estimating the equity beta from within the estimated range.

The Dividend Growth Model

37. With regard to the DGM, the Authority in the Rate of Return Guidelines considered applying the DGM for the purpose of estimating the return on equity for the individual infrastructure firm.[822] However, the Authority noted that the results are very sensitive to inputs, and hence to analyst discretion, particularly relating to growth rates. The Authority was not convinced that DGM estimates can be relied upon for individual equities, and hence for estimating the return on equity to the benchmark firm.

38. In this context, the Authority notes that the AER investigated the possibility of using the DGM for estimating the return on equity for individual infrastructure businesses in Australia.[823] The AER found that the DGM estimates could not be relied upon as, among other things, the average estimated return on equity is consistently higher than that of the market over recent periods from 2006, even with real growth of dividends at zero; thus failing a basic 'sanity check'.

39. Having considered these findings, the Authority remains of the view that the DGM cannot be relied upon for estimating the return on equity for the firm.

[822] Economic Regulation Authority, *Appendices to the Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 75.

[823] Australian Energy Regulator, *Explanatory Statement: Rate of Return Guideline*, December 2013, p. 119.

SFG's (2014) study

40. The Authority notes that SFG's (2014) study was not considered in its Rate of Return Guidelines, released in December 2013, as it post-dated that evaluation.[824]

41. The study is now considered with regard to the following key features:

- overall approach to estimating the return on equity for the market using a DGM;
- use of the model for estimating the return for the benchmark efficient entity'; and
- conversion from a 'without-imputation MRP' (or return on equity) to a 'with-imputation MRP' (or return on equity).

Overall approach of estimating a return on equity

42. The Authority notes that estimates of the market cost of equity over time under SFG's approach are conducted using a simultaneous estimation technique, where an estimate of the cost of equity is developed simultaneously with an estimate of long-term growth and returns on investment. SFG is of the view that if the long-term growth assumption is held constant, then all changes in share prices and analyst forecasts are captured in changes to the estimated discount rate.

43. SFG consider that this is unlikely to be true, on the basis that share prices are likely to fluctuate because of changes in expectations for growth in dividends outside of the explicit forecast period of two years, and because of changes in discount rates. SFG conclude that one reason why dividend discount model estimates of the cost of equity are met with distrust is that they fluctuate too much. SFG is of the view that estimates under the DGM approach fluctuate too much because of the fixed growth assumption.[825]

44. SFG argue that the main difference between its estimation technique, and that of the AER's DGM estimates, is that SFG's growth rate estimate is contingent upon the share price, earnings per share forecast, and dividends per share forecast. SFG notes that the AER's long run growth rate estimate is independent of the share price, earnings per share forecast, and dividend per share forecast.[826] In addition, SFG argues that its estimation technique generates cost of equity estimates that are more stable over time than a technique that assumes constant growth.

45. The Authority is of the view that the SFG's proposed approach in estimating a cost of equity is not well established and that the approach (or its deviations from the approach) has not been considered or adopted by any regulator in Australia and overseas. Further, the Authority considers that the approach is not developed on a robust theoretical basis.

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[824] SFG Consulting (2014) *Alternative versions of the dividend discount model and the implied cost of equity,* a report prepared for Jemena Gas Networks, ActewAGL, APA, Ergon, Networks NSW, Transend and TransGrid.

[825] SFG Consulting (2014) *Alternative versions of the dividend discount model and the implied cost of equity,* a report prepared for Jemena Gas Networks, ActewAGL, APA, Ergon, Networks NSW, Transend and TransGrid, p. 46.

[826] SFG Consulting (2014) *Alternative versions of the dividend discount model and the implied cost of equity,* a report prepared for Jemena Gas Networks, ActewAGL, APA, Ergon, Networks NSW, Transend and TransGrid, p. 48.

46. The Authority's view is supported by the opinions of experts, which are summarised below.

47. In a report prepared for the AER in October 2014, Handley (2014) was of the view that:[827]

> The DGM proposed by SFG essentially adopts a brute force approach to estimating the implied cost of equity for the market. It substitutes a large number of combinations of a set of parameter estimates into an assumed valuation model – in this case, a ten-year three-stage DGM – with the objective of simultaneously determining the expected cash flows and discount rate which best fits the data, subject to certain assumed constraints.
>
> The model is interesting but the regulatory environment involving an aggregate regulatory asset base measured in the tens of billions of dollars is not an appropriate setting to trial a new model whose widespread use and acceptance is yet to be established.

48. In addition, Professors McKenzie and Partington were of the view that:[828]

> SFG (2013f) have added another choice to the mix, jointly estimate the cost of equity, the return on equity investment and the dividend growth rate, utilising a relation between the dividend growth rate the return on equity and the reinvestment rate. Clearly this has not yet become the definitive choice. As an additional choice among many, we are unconvinced about the merits of the SFG model. A reasonable requirement, before adopting the SFG model as a preferred choice over well-established models, would be substantial agreement on its superiority in the research literature and/or extensive use in practice.

49. McKenzie and Partington observed that application of this form of DGM could generate virtually any return on equity estimate depending on the specification of the model:

> SFG constrain the choices available by requiring that their estimates meet certain criteria. As we have pointed out before… the result is that assumptions about the long term growth rate are replaced by assumptions about how the massive set of available choices should be filtered. Since the available set of choices is limitless, the exact result we get will also be determined by how coarse a grid we apply in initial selection of the choices that we allow to enter the filtering process.

50. The Authority therefore has strong reservations about SFG's results.

Estimating the return for the benchmark efficient entity

51. SFG estimate the return on equity for network businesses using the DGM for each of the analysts' forecasts. SFG then subtract the risk free rate to obtain the Equity Risk Premium (**ERP**) for each return on equity estimate. SFG then averages the resulting ERPs as a proportion of the MRP estimated from the model (see above).

52. This delivers an average risk premium of 0.94. This may be interpreted as the equity beta estimate in the context of the Sharpe Lintner CAPM.

53. However, this approach:[829]

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827 Handley, J. "*Advice on the Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 15.

828 McKenzie, M. and Partington, G. *"A Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 27.

829 Australian Energy Regulator, *Draft decision: Jemena Gas Networks (NSW) Ltd: Access arrangement 2015–20*, November 2014, Attachment 3: Rate of return, p. 3-229.

- is not an econometrically sound approach to estimating beta;
- relies on a very much smaller dataset than the Authority's beta estimates;
- uses inappropriate weightings in the beta estimation process because SFG give businesses with more analyst coverage greater weight; and
- delivers an equity beta that is implausibly high.

54. For these reasons, the Authority rejects use of the SFG DDM estimates as being a relevant approach to estimating the return on equity for the benchmark efficient entity.

Grossing up returns for Imputation

55. SFG (2014) argues that in approaches that use data to produce ex-imputation estimates of the required return on the market the relationship between the ex-imputation return r_{ex} and the with-imputation return r_{with} is given by the standard Officer (1994) gross-up formula (1).

$$r_{ex} = r_{with}\left[\frac{1-t}{1-t(1-\gamma)}\right] \quad (1)$$

Where t is the corporate tax rate and represents the assumed value of imputation credits γ (gamma).

56. SFG argues that the above formula should be used to convert standard ex-imputation estimates of the MRP provided by survey respondents into regulatory estimates with-imputation.[830]

57. However, the Authority notes that Professor Handley does not agree with SFG's view. In a report prepared for the AER in October 2014, Handley was of the view that:[831]

> The conversion formula (7) is indeed appropriate in the setting that Officer (1994) considers but is in general not correct in non-perpetuity settings.[832] In this case, it is appropriate to use theta to directly gross-up the imputation credits **associated with the dividend component of the return rather than grossing-up the entire return**.[833] For example, in relation to historic estimates of the equity premium (and historic stock returns) this is precisely the approach adopted by Brailsford, Handley and Maheswaran (2012) in their tables 2 and 3.[834] This approach should similarly be used to gross-up an ex-imputation MRP estimate from experts' estimates.

[830] SFG Consulting (2014) *Alternative versions of the dividend discount model and the implied cost of equity,* a report prepared for Jemena Gas Networks, ActewAGL, APA, Ergon, Networks NSW, Transend and TransGrid, p. 73.

[831] Handley, J. "*Advice on the Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 22.

[832] Officer (1994) assumes a perpetuity framework whereby there is a full distribution of free cash flow and franking credits each period and returns are entirely in the form of fully franked dividends i.e. there are no capital gains. This means that γ = θ within the Officer framework.

[833] It is noted that the SFG approach specifies gamma rather than theta in the conversion formula and so indirectly allows for less than full payout of credits based on the assumed distribution ratio *F* but this will not necessarily correspond to the actual payout of credits associated with the return.

[834] See Brailsford T., Handley J. and Maheswaran K, Re-examination of the historical equity risk premium in Australia, *Accounting and Finance*, 48, 2008, pp. 84-85 for details.

58. The Authority notes that Professors McKenzie and Partington hold the same views as Professor Handley on the issue.[835]

59. The Brailsford, Handley and Maheswaran approach utilises the following formula:[836]

> …we estimate the (weighted) average imputation credit yield c_t, for each year t, using the following model [2]:

$$c_t = p_t d_t \frac{T_t}{1-T_t} \quad (2)$$

Where:

- d_t represents the annual dividend yield implied from the Historical Stock Price Index and the Historical Stock Accumulation Index;
- p_t is the (average) proportion franked; and
- T_t is the tax rate at which dividends are franked.

60. Using theta directly – to determine the value of credits distributed with the dividend each period – ensures that the grossed-up cash flow stream is expressed on an after-company-before-personal-tax basis. By definition, the resultant implied cost of equity will also be expressed on an after-company-before-personal-tax basis.[837] The equation set out in paragraph 59 may then be re-written as in equation (3).

$$c_t = F \; x \; d_t \left(\frac{T_t}{1-T_t} \right) x \; \theta \quad (3)$$

where:

- θ is the value of distributed imputation credits consistent with the Authority's estimate of gamma;
- d_t is the dividend yield in year t ;
- F is the proportion of dividends which are franked; and
- T_t is the corporate tax prevailing in that year.

61. On the basis of the above considerations, the Authority has concerns regarding the estimates of a market return on equity by SFG in its 2014 study. The Authority accounts for these concerns when determining the point estimate from within the estimated range.

Authority's decision on the DGM

[835] McKenzie, M. and Partington, G. "*A Return on Equity", a report prepared for the Australian Energy Regulator*, October 2014, p. 37.

[836] Brailsford T., Handley J. and Maheswaran K, Re-examination of the historical equity risk premium in Australia, *Accounting and Finance*, 48, 2008, p. 85.

[837] J. Handley, *Advice on the Return on Equity*, October 2014, p. 23.

62. The Authority remains of the view set out in the Rate of Return Guidelines that the DGM is relevant for the purpose of estimating the market return on equity for its regulatory decisions.

63. However, given the estimates of a market return on equity are unstable and sensitive to analysts' inputs, the Authority maintains its view from its Rate of Return Guidelines that the DGM can only be used to inform the overall return on the market. This is used to inform the estimates of the forward looking MRP.

64. The Authority has reservations about SFG's DGM estimates of the return on the market submitted by GGT in developing its proposed rate of return. The Authority will take those reservations into account in its determination of the point estimate of the MRP.

65. The Authority also rejects the use of SFG's estimates of the return on equity for the benchmark efficient entity.

66. The Authority remains of the view that DGM should not be used to directly estimate the market return on equity of the benchmark efficient entity in regulatory decisions.

Appendix 5 Converting Foreign Currency Yields into Australian Dollar Equivalents

1. The Authority's process for converting foreign currency yields into Australian dollar equivalents is detailed here. This provides for replicability and transparency of the Authority's approach.

2. Bloomberg LP have recently developed functionality that allows for the conversion of foreign currency bond yields into hedged Australian dollar equivalents for historical dates. The solution requires a Bloomberg users' account to be enabled to access the 'Swaps Toolkit (beta)'. Once enabled a user can interface with Bloomberg's Swap Manager through Microsoft Excel. A sample of bonds with their associated fields can then be loaded into Excel where historical yields and spreads for each bond can be converted into hedged Australian dollar equivalents by accessing Bloomberg's swap manager function.

3. The facility can convert the yields on the following instruments:

   - fixed rate instruments which receive a fixed coupon payment;
   - a floating rate instrument for which the coupon payments consist of a spread (quoted margin) over an index such as the bank bill swap rate in Australia or London Interbank Offered Rate (Libor) in foreign markets; or
   - a variable instrument which receives a coupon for that can vary due factors additional to the index.

Asset Swap Spreads

4. The starting point is to acquire the 'mid' asset swap spread for instrument in the sample. This is calculated as the average of the bid and ask asset swap spreads (ASW spreads) returned from Bloomberg's asset swap calculator.

5. The ASW spread is the spread between the instruments yield and the relevant point on the swap curve (index) for the currency of each instrument in question. This is calculated using a 'par/par breakeven asset swap spread' formula which solves for an ASW spread such that the present value of the bonds cash flows on the fixed side of the swap equals the present value of cash flows based on the index plus ASW spread (at each future payment date).

6. The swap has two legs; a floating leg in which the ASW spread plus index is received; and a fixed side which pays the floating leg in exchange for the fixed payment. If the payments made on the fixed side are in a currency other than Australian dollars (due to the instrument being issued in a foreign currency) the currency of the instrument in question is input into the swap calculation making it a 'cross currency' swap so that the floating payments received are converted into Australian dollars. The costs of swapping from this currency to Australian dollars are determined using Bloomberg's default cross currency basis curves.

7. The ASW spread is calculated assuming a quarterly payment frequency and is adjusted to account for differences between the frequencies of payments on the fixed and floating side of the swap.

8. The Australian dollar ASW mid spread is then effectively converted to a yield to maturity using the Bloomberg swap manager.

Bloomberg Swap Manager

9. The swap manager is a facility used for calculating various aspects of a swap such as premiums, notional principal and spreads. For the purposes of converting the mid Australian dollar ASW spread into an effective yield to maturity, the swap is treated as a 'fixed float swap' where a fixed payment (which effectively represents the yield to maturity) is received in exchange for a floating payment (discussed above) made.

10. The main input is the 'mid' Australian dollar ASW spread which is treated as the spread component of the floating payment made. The output is a fixed coupon payment fully hedged in Australian dollars.[838] This fixed coupon payment can effectively be treated as the yield to maturity for two reasons. Firstly, it uses the Australian swap curve as the index to which the calculated hedged Australian dollar spread is added. It therefore reflects Australian interest rates for the date the calculation is made. Secondly, it is calculated on the assumption that the premium on the fixed leg of the swap is zero.[839] In other words it is trading at 'par' per 100 Australian dollars. When the fixed instrument is traded at par the coupon per 100 dollars is effectively equal to the yield to maturity. On the fixed leg the payment frequency is set to semi-annual while on the floating leg the payment frequency is set to quarterly. The reset frequency is also set at quarterly.

11. The priority of pricing sources or 'pricing water fall' used in the conversions to Australian dollar equivalent yields in Excel are shown in Table 106.

Table 106 Pricing Waterfall Set in Bloomberg for AUD Equivalent Yield Conversion

Currency of Issuance	1st Pricing Source	2nd Pricing Source
USD	BVAL	TRAC
EUR	BVAL	BGN
GBP	BVAL	BGN
AUD	BVAL	CBBT

[838] The 'BPRICE' formula in Excel that calls the Swap Manager must have 'Target' set to 'FixedCoupon' while the 'BView' formula must be set to output the fixed coupon.

[839] The 'BPRICE' formula in Excel that calls the Swap Manager must have 'Premium' set to zero.

Appendix 6 International Bond Sample

Table 107 Sample of Bonds with Australia as Country of Risk as at 2 April 2015

Ticker	S&P Credit Rating	Industry	Country of Risk	Coupon Type	Issue Date	Maturity Date	Currency	AUD Amount Issued
EJ1181084 Corp	BBB	Utilities	AU	FIXED	11/04/2012	11/04/2017	AUD	265000000
ED9016905 Corp	BBB-	Utilities	AU	FLOATING	20/04/2005	25/04/2017	AUD	275000000
EJ1389117 Corp	BBB+	Utilities	AU	FIXED	27/04/2012	27/04/2017	AUD	200000000
EI5951831 Corp	BBB+	Utilities	AU	FLOATING	12/01/2007	15/07/2017	AUD	300000000
EI5951997 Corp	BBB+	Utilities	AU	FLOATING	12/01/2007	15/07/2017	AUD	275000000
EJ2797904 Corp	BBB	Consumer Discretionary	AU	FIXED	18/07/2012	18/07/2017	AUD	300000000
EI7021435 Corp	BBB-	Industrials	AU	FIXED	21/07/2010	21/07/2017	USD	165126000
EF0695496 Corp	BBB+	Industrials	AU	FLOATING	10/11/2005	10/11/2017	AUD	300000000
EJ5156389 Corp	BBB+	Consumer Staples	AU	FIXED	24/01/2013	6/02/2018	AUD	100000000
EI6300228 Corp	BBB	Industrials	AU	FIXED	7/04/2011	7/04/2018	USD	716400000
CP5029097 Corp	BBB+	Energy	AU	FIXED	14/04/1998	15/04/2018	USD	231285000
EI6460709 Corp	BBB+	Materials	AU	FIXED	20/04/2011	20/04/2018	EUR	677745000
EF3590199 Corp	BBB-	Utilities	AU	FLOATING	26/04/2006	26/04/2018	AUD	325000000
EI6849026 Corp	BBB	Industrials	AU	FIXED	25/05/2011	6/07/2018	AUD	100000000
EJ3377821 Corp	BBB+	Consumer Staples	AU	FIXED	6/09/2012	6/09/2018	AUD	200000000
EJ8660791 Corp	BBB-	Utilities	AU	FIXED	9/10/2013	9/10/2018	USD	847040000
EI1562293 Corp	BBB-	Industrials	AU	FIXED	15/10/2008	15/10/2018	USD	119400600
EJ8818027 Corp	BBB-	Industrials	AU	FIXED	1/11/2013	1/11/2018	AUD	500000000
EI8834174 Corp	BBB+	Energy	AU	FIXED	23/11/2011	23/11/2018	AUD	150000000
EJ7922069 Corp	BBB	Materials	AU	FIXED	21/08/2013	21/02/2019	AUD	200000000
EH7350695 Corp	BBB+	Energy	AU	FIXED	3/03/2009	1/03/2019	USD	940800000
EK0838251 Corp	BBB+	Utilities	AU	FLOATING	27/02/2014	1/04/2019	AUD	150000000
EI6030205 Corp	BBB	Materials	AU	FIXED	16/03/2011	16/04/2019	EUR	777018000
EI6204404 Corp	BBB	Industrials	AU	FIXED	4/04/2011	9/07/2019	AUD	200000000
EJ3879651 Corp	BBB-	Utilities	AU	FIXED	11/10/2012	11/10/2019	EUR	629735000
EJ4265850 Corp	BBB-	Utilities	AU	FIXED	8/11/2012	11/10/2019	AUD	300000000
EJ4333419 Corp	BBB+	Consumer Staples	AU	FIXED	13/11/2012	13/11/2019	AUD	150000000
EK5876389 Corp	BBB	Consumer Discretionary	AU	FIXED	18/11/2014	18/11/2019	AUD	450000000
EK5989620 Corp	BBB-	Materials	AU	FIXED	19/11/2014	19/11/2019	AUD	125000000
EI0704078 Corp	BBB	Materials	AU	FIXED	10/12/2009	10/12/2019	USD	872880000
EI1592092 Corp	BBB+	Industrials	AU	FIXED	31/12/2004	31/12/2019	USD	139192620
EI1608021 Corp	BBB+	Industrials	AU	FLOATING	31/12/2004	31/12/2019	AUD	72000000
EJ5984160 Corp	BBB+	Utilities	AU	FLOATING	25/03/2013	25/03/2020	AUD	150000000
EI2000491 Corp	BBB+	Materials	AU	FIXED	31/03/2010	1/04/2020	USD	545150000
EK2849330 Corp	BBB-	Industrials	AU	FIXED	30/05/2014	29/05/2020	AUD	100000000
EJ6899243 Corp	BBB+	Consumer Staples	AU	FIXED	4/06/2013	4/06/2020	AUD	205000000
EI7021476 Corp	BBB-	Industrials	AU	FIXED	21/07/2010	21/07/2020	USD	130962000
EI3253362 Corp	BBB	Energy	AU	FIXED	22/07/2010	22/07/2020	AUD	300000000

Ticker	S&P Credit Rating	Industry	Country of Risk	Coupon Type	Issue Date	Maturity Date	Currency	AUD Amount Issued
EJ7588209 Corp	BBB	Industrials	AU	FIXED	23/07/2013	23/07/2020	AUD	150000000
EJ7646361 Corp	BBB	Industrials	AU	FIXED	29/07/2013	29/07/2020	AUD	300000000
EI4098048 Corp	BBB	Industrials	AU	FIXED	23/09/2010	23/09/2020	USD	632280000
EK5107249 Corp	BBB-	Utilities	AU	FIXED	1/10/2014	1/10/2020	AUD	100000000
EJ8616397 Corp	BBB+	Industrials	AU	FIXED	8/10/2013	8/10/2020	EUR	720135000
EJ8798880 Corp	BBB	Industrials	AU	FIXED	21/10/2013	21/10/2020	AUD	350000000
EJ6371623 Corp	BBB-	Utilities	AU	FIXED	23/04/2013	23/10/2020	EUR	950175000
EJ8893137 Corp	BBB+	Industrials	AU	FIXED	28/10/2013	28/10/2020	AUD	525000000
EJ9225768 Corp	BBB+	Consumer Staples	AU	FIXED	25/11/2013	25/11/2020	AUD	100000000
EI5615311 Corp	BBB+	Utilities	AU	FIXED	11/02/2011	11/02/2021	GBP	399350000
EI4214900 Corp	BBB	Industrials	AU	FIXED	7/10/2010	22/02/2021	USD	508900000
EK1048710 Corp	BBB+	Utilities	AU	FIXED	12/03/2014	12/03/2021	AUD	350000000
EK1306886 Corp	BBB	Industrials	AU	FIXED	25/03/2014	25/03/2021	AUD	400000000
EI6641167 Corp	BBB+	Energy	AU	FIXED	10/05/2011	10/05/2021	USD	645960000
EK2622026 Corp	BBB+	Consumer Staples	AU	FIXED	21/05/2014	21/05/2021	AUD	100000000
EK3554137 Corp	BBB	Industrials	AU	FIXED	7/07/2014	7/07/2021	AUD	200000000
EI7486208 Corp	BBB+	Consumer Staples	AU	FIXED	22/07/2011	22/07/2021	AUD	45000000
EK4152378 Corp	BBB+	Consumer Staples	AU	FIXED	12/08/2014	12/08/2021	AUD	100000000
EI6010694 Corp	BBB+	Utilities	AU	FLOATING	15/08/2007	15/08/2021	AUD	300000000
EI8144731 Corp	BBB+	Consumer Staples	AU	FIXED	27/09/2011	27/09/2021	AUD	30000000
EJ8598074 Corp	BBB-	Utilities	AU	FIXED	4/10/2013	4/10/2021	EUR	1149496000
EI8364461 Corp	BBB-	Utilities	AU	FIXED	14/10/2011	14/10/2021	USD	483550000
EK5737813 Corp	BBB	Utilities	AU	FIXED	5/11/2014	5/11/2021	AUD	600000000
EI8703494 Corp	BBB-	Materials	AU	FIXED	15/11/2011	15/11/2021	USD	736875000
EG0640763 Corp	BBB	Industrials	AU	FLOATING	8/12/2006	20/11/2021	AUD	200000000
EK6279310 Corp	BBB	Industrials	AU	FIXED	8/12/2014	8/12/2021	AUD	250000000
EI6011379 Corp	BBB+	Utilities	AU	FLOATING	15/08/2007	17/01/2022	AUD	630000000
EK8055148 Corp	BBB	Energy	AU	FIXED	20/03/2015	22/03/2022	EUR	974344000
EK3157451 Corp	BBB+	Utilities	AU	FIXED	30/06/2014	30/06/2022	EUR	725780000
EJ2714362 Corp	BBB+	Consumer Staples	AU	FIXED	11/07/2012	11/07/2022	AUD	30000000
EJ3784331 Corp	BBB-	Materials	AU	FIXED	1/10/2012	1/10/2022	USD	723900000
EG0219857 Corp	BBB	Industrials	AU	FLOATING	15/12/2006	11/10/2022	AUD	750000000
EJ3906165 Corp	BBB	Energy	AU	FIXED	11/10/2012	11/10/2022	USD	730725000
EJ4317107 Corp	BBB-	Industrials	AU	FIXED	13/11/2012	13/11/2022	USD	479200000
EJ4068577 Corp	BBB	Industrials	AU	FIXED	23/10/2012	22/03/2023	USD	803715000
EJ5962760 Corp	BBB	Materials	AU	FIXED	22/03/2013	22/03/2023	EUR	373101000
EJ6105286 Corp	BBB-	Utilities	AU	FIXED	5/04/2013	5/04/2023	EUR	187699500
EI6307918 Corp	BBB	Industrials	AU	FIXED	7/04/2011	7/04/2023	USD	238800000
EJ3849779 Corp	BBB+	Utilities	AU	FIXED	9/10/2012	9/04/2023	USD	489950000
EJ8324406 Corp	BBB	Industrials	AU	FIXED	19/09/2013	19/09/2023	GBP	509580000
EK1561159 Corp	BBB	Industrials	AU	FIXED	23/04/2014	23/04/2024	EUR	1040963000

Ticker	S&P Credit Rating	Industry	Country of Risk	Coupon Type	Issue Date	Maturity Date	Currency	AUD Amount Issued
EK3156859 Corp	BBB+	Industrials	AU	FIXED	12/06/2014	12/06/2024	EUR	718810000
EK4655081 Corp	BBB+	Industrials	AU	FIXED	16/09/2014	16/09/2024	EUR	855024000
EK4685294 Corp	BBB+	Industrials	AU	FIXED	18/09/2014	18/09/2024	EUR	718685000
EJ4508010 Corp	BBB	Energy	AU	FIXED	26/11/2012	26/11/2024	GBP	536025000
EK6424791 Corp	BBB	Industrials	AU	FLOATING	16/12/2014	16/12/2024	AUD	200000000
EK7758478 Corp	BBB+	Energy	AU	FIXED	5/03/2015	5/03/2025	USD	1285000000
EK8078215 Corp	BBB	Energy	AU	FIXED	23/03/2015	23/03/2025	USD	1395790000
EK8055387 Corp	BBB	Energy	AU	FIXED	20/03/2015	22/03/2027	EUR	904748000
EK8055262 Corp	BBB	Energy	AU	FIXED	20/03/2015	22/03/2030	GBP	1153920000
EK8078397 Corp	BBB	Energy	AU	FIXED	23/03/2015	23/03/2035	USD	380670000
EJ3049461 Corp	BBB-	Energy	AU	FLOATING	4/09/2012	15/09/2037	AUD	550000000
EI8704930 Corp	BBB-	Materials	AU	FIXED	15/11/2011	15/11/2041	USD	491250000
EI4096521 Corp	BBB-	Energy	AU	VARIABLE	22/09/2010	22/09/2070	EUR	1401130000

Source: Bloomberg and ERA Analysis

Appendix 7 Evaluation of capital expenditure weighting the hybrid trailing average estimate of the DRP

1. By weighting the trailing average to account for new capex, it can be made to ensure that the cost of capital for new capex reflects prevailing rates. This efficiency consideration is a key concern of the Authority, given the requirements of the NGL and NGR.

2. This adds significant complexity. However, the Authority considers that QTC and DBP have demonstrated that a spreadsheet calculation relating to weights could be implemented, at least for the Post Tax Revenue Model (**PTRM**) approach.

3. Weights may be based on the following approaches:

   - actual debt issuance data – this approach would require an ex post true up of the rate of return, once actual debt issuance data became available;
   - actual changes in the debt component of the RAB, consistent with the benchmark gearing – again, this approach would require an ex post true up of the rate of return, once actual debt issuance data became available; or
   - weights based on the (forecast ex ante) debt issuance assumptions in the PTRM – this approach has the advantage of not requiring an ex post true up for the rate of return.[840]

4. QTC in a submission to the AER proposed that the weighting method should be based on the forecast new capex approved for use in the PTRM for the forthcoming access arrangement:

   > QTC considers that a weighted average based on the PTRM debt balances is appropriate to ensure that changes in the debt balance are correctly compensated at the prevailing cost of debt. An example of the proposed approach is provided in Appendix B.[841]
   >
   > …This approach is computationally simple and transparent, which should alleviate any concerns around complexity. A simple spreadsheet model can be used to perform the calculations.
   >
   > The return on debt would be calculated as a simple average of the adjusted rates. This approach is consistent with the use of a single set of weights (eg, 10 per cent for each annual observation based on a 10-year debt tenor), but still results in the changes in the PTRM debt balance being compensated at the prevailing cost of debt.
   >
   > Worked example

[840] GGT in its submission on the 4 March 2015 Discussion Paper on estimating the return on debt stated that (Goldfields Gas Transmission, *GGT submission on ERA return on debt discussion paper*, 25 March 2015, p. 5):

> Paragraph 152 of the Discussion Paper advises that the ERA considers that adoption of the weighting implicitly assigned to debt issues in the Australian Energy Regulator's Post Tax Revenue Model (PTRM) would ensure a return on debt which provides appropriate incentives for new capital expenditure.
>
> Use of the PTRM, a model designed initially for use in the electricity sector, is not required under the access regulatory regime of the National Gas Law and the National Gas Rules. However, any properly constructed model for post-tax revenue determination (which is effectively required by rule 87(4)) is likely to incorporate the active debt management policy which is implicit in the PTRM, whereby the gearing is maintained at 60% (the gearing of the benchmark efficient entity).
>
> However, the Authority agrees with GGT when it subsequently states that its post-tax revenue model shares relevant features with the AER's PTRM for the purposes of this discussion.

[841] Queensland Treasury Corporation, *Submission to the Draft Rate of Return Guideline*, 11 October 2013, p. 21.

Consider an example where the PTRM debt balance increases from $100 to $115 over a 1-year period. The service provider is assumed to have been operating under the trailing average approach for at least 10 years, so the underlying interest rates in the trailing average reflect the historical rates over the last 10 years. For the purpose of this example, a series of hypothetical rates have been used to populate the trailing average.

Regardless of how the return on debt is calculated, the final estimate will be applied to the PTRM debt balance to determine the dollar value of the return on debt allowance. As such, the following weights will apply (either explicitly or implicitly) to the interest rates associated with the existing and new debt:

Weight applying to existing debt = $100 ÷ $115 = 0.8696

Weight applying to change in debt = $15 ÷ $115 = 0.1304

Table 4 displays the adjustments to the rates in the trailing average based on QTC's proposed method, which compensates the increase in the debt balance at the prevailing cost of debt (6.25 per cent).[842]

TABLE 4: ADJUSTED RATES USING THE PREVAILING COST OF DEBT AND CHANGE IN THE PTRM DEBT BALANCE

Observation	Rates before new borrowing (%)	Rate adjustments based on change in PTRM debt balance	Rates after new borrowing (%)
-9	8.00	8.00 x 0.8696 + *6.25* x 0.1304	7.77
-8	8.50	8.50 x 0.8696 + *6.25* x 0.1304	8.21
-7	9.00	9.00 x 0.8696 + *6.25* x 0.1304	8.64
-6	8.00	8.00 x 0.8696 + *6.25* x 0.1304	7.77
-5	6.00	6.00 x 0.8696 + *6.25* x 0.1304	6.03
-4	6.00	6.00 x 0.8696 + *6.25* x 0.1304	6.03
-3	7.00	7.00 x 0.8696 + *6.25* x 0.1304	6.90
-2	8.00	8.00 x 0.8696 + *6.25* x 0.1304	7.77
-1	7.00	7.00 x 0.8696 + *6.25* x 0.1304	6.90
Prevailing	6.25	6.25 x 0.8696 + *6.25* x 0.1304	6.25
Return on debt	**7.38**		**7.23**

5. An advantage of the PTRM approach would be that it allows for prevailing rates to apply to new investments. This occurs because the prevailing rate is adjusted through the weighting, at the time of the access arrangement review, to the extent that the forecast capex adds to the outstanding debt in the PTRM. The result is that the prevailing rate becomes the marginal cost of debt for the new forecast capex.

[842] Queensland Treasury Corporation, *Submission to the Draft Rate of Return Guideline*, 11 October 2013, p. 28.

Should capex weights be trued up ex post?

6. The question arises as to whether capex weights, if adopted, would be revised ex post, at the next access arrangement review, based on actual approved capital expenditure.

7. This could create incentives to bring forward or over-invest in the event that interest rates were abnormally high, as it would increase the weighting for that year in the following access arrangement. However, offsetting this effect, high interest rates would discourage additional investment, as projects would be less likely to be profitable at the margin.

8. Overall, the Authority considered that it would be sensible to adjust PTRM weights (if adopted) ex post at the next access arrangement review, to allow for actual PTRM outcomes. Such an approach would be consistent with the treatment of capex in the PTRM more broadly, where actual capex outcomes for the past access arrangement are used for the next access arrangement.

9. DBP in its submission on the Authority's 4 March 2015 Discussion Paper on estimating the return on debt considered that there was some confusion as to exactly what was being proposed with regard to ex post true up for capex weights.[843]

10. Therefore, for the removal of doubt, the Authority reiterates that where such an ex post true up was undertaken at the next access arrangement review, there would be no retrospective adjustment of tariffs and revenue – that would remain based on the forecast capex established at the start of the access arrangement period.

No capex weights for historic trailing average data

11. The Authority considered the application of PTRM capex weights in the forward years. The objective of weighting the trailing average in this way is to ensure that forecast new capex is remunerated by the most timely estimate of the prevailing return on debt.

12. As to the past, DBP submitted:[844]

> The third and final caveat applies to models without a transition period. The ATCO Hybrid Approach provides for a weighting of ten percent per annum on debt from the past ten years. However, this is not in keeping with the efficiency arguments which underpin the PTRM weighting model. If a regulated service provider did not incur any debt in 2009, when debt risk premia were very high, the apportioning ten percent to that year would over-reward the service provider and provide a windfall gain. The weights, therefore, should bear some resemblance to efficient debt actually incurred, just as the case going forward, rather than an arbitrary figure such as ten percent.
>
> Although public data on actual debt incurred by service providers (including debt instruments such as derivatives) are available on sources such as Bloomberg, the Rules require the ERA to consider the benchmark efficient entity, not the actual firm. Thus, it is not sufficient to look at actual debt as it was incurred and assume this is efficient. Instead, regulators ought to look at the reason for incurring the debt; more specifically, expansion of the RAB and other capital spending. If this is deemed to be efficient capital spending, and the efficient way of issuing debt is a ten-year bond (as

[843] Dampier Bunbury Pipeline, *Estimating the Return on Debt: Response to ERA Discussion Paper of 4 March 2015*, 25 March 2015, p. 10.

[844] Dampier Bunbury Pipeline, *Estimating the Return on Debt: Response to ERA Discussion Paper of 4 March 2015*, 25 March 2015, p. 11.

> regulators agree that it is) then the PTRM weighting approach, applied to actual capital spending from the past, should be applied. This is because it captures the cost of debt when efficient spending of capital was actually incurred, and thus reflects the cost of debt which the benchmark efficient entity would have on its books today if it undertook the capital spending when regulators deemed it to be efficient. Thus, if the ERA accepts the ATCO Hybrid Approach, it should not accept a weighting of ten percent per annum, but should implement the PTRM model starting with a RAB in 2005, and capturing actual capital spending since that point in time.

13. The Authority notes these points, but does not accept that past estimates of the DRP should be capex weighted, in the event that weights were adopted.

14. First, investment in the past has already been expended, so incentives for that investment through the introduction of capex weights will not have any influence on the timing of that investment.

15. Second, the Authority considers that there would be considerable uncertainty as to the timing of debt raising in the past by the benchmark efficient entity, as it would not have been seeking to replicate any clear financing strategy for the DRP under the previous on the day regime. It could have opportunistically raised debt finance at those times that it considered best lowered its cost of debt, which may have been removed in timing terms from the actual capital expenditure profile. To ascribe capex weights to the past data then runs the risk of over or under compensating the benchmark efficient entity.

16. The Authority considers that the best estimate of the DRP relating to debt raised at unknown points in the past will be the simple, equally weighted annual averages applicable to those periods.

Implementing capex weights as an overlay to the simple trailing average

17. There are two ways to implement an approach for incorporating the PTRM capex weights. The first is that proposed by the QTC, which is outlined above. The second is the method proposed by DBP. Both approaches produce identical outcomes, but the method of calculation is different.

18. The Authority considered the method proposed by DBP.[845] This method accords with the approach suggested by ATCO's consultant CEG:[846]

> 123. Calculating a weighted trailing average DRP is not complex to model on a forward-looking basis. Suppose that an initial RAB of a regulated business consists of 10 year debt staggered so as to expire evenly across a 10 year period. That is, the starting position is a simple trailing average. However, let the business have a significant net capital expenditure requirement in a given year such that the RAB will grow. This simply means that the weight of that year in future trailing averages should be higher.

[845] Dampier Bunbury Pipeline, *Proposed Revisions DBNGP Access Arrangement: 2016 – 2020 Regulatory Period: Rate of Return: Supporting Submission: 12, Appendix J* (excel file version available on the Authority's website).

[846] ATCO Gas Australia, *Response to the ERA's Draft Decision on required amendments to the Access Arrangement for the Mid-West and South-West Gas Distribution System*, 27 November 2014, Appendix 9.2, p. 39.

124. If the business finances the increase in the RAB with debt that is, on average, 10 year maturity but is itself staggered[847] then a smoothly staggered refinance profile will continue to be maintained in the future.

- the DRP on financing (and refinancing) the pre-existing RAB is simply the trailing average 10 year cost of debt over the last 10 years; and
- the cost of debt on each 'vintage' of change in RAB from the pre-existing level is modelled as a transition from the initial staggered debt raising (of, say, 6 to 14 years maturity) at the time of the change in RAB back to a trailing average 10 year cost of debt (the same as the pre-existing RAB). The transition is straightforward to model - as each tranche of the staggered (initial 6-14 year) debt expires and is replaced with 10 year debt. At which point that tranche of change in RAB can simply be treated the same as the pre-existing RAB.

125. The weighted trailing average cost of debt in any year is then simply the average across the cost of debt for the RAB and subsequent changes in RAB, weighted by the associated RAB amount.

19. Under such an approach, the PTRM capex weighting overlay could apply to each of the forward looking estimators from 2015 (t=0) to 2019 (t=4). Each PTRM capex weight could be consistent with the capex forecast to occur in each regulatory year. So for:

- the DRP to apply in calendar year 2015, the PTRM capex weight to apply to the estimate t=0 would be the forecast capex to occur over the period 1 January 2015 to 31 December 2015, as a proportion of the closing value of the RAB at 31 December 2015;[848]
- for the DRP to apply in calendar year 2016, the PTRM capex weight to apply to the:
  - t=1 estimate would be the forecast capex to occur over the period 1 January 2016 to 31 December 2016, as a proportion of the closing value of the RAB at 31 December 2016; and
  - t=0 estimate would be the forecast capex to occur over the period 1 January 2015 to 31 December 2015, as a proportion of the closing value of the RAB at 31 December 2015.
- for the DRP to apply in calendar year 2017, the PTRM capex weight to the:
  - t=2 estimate would be the forecast capex to occur over the period 1 January 2017 to 31 December 2017, as a proportion of the opening value of the RAB at 31 December 2017.
  - t=1 estimate would be the forecast capex to occur over the period 1 January 2016 to 31 December 2016, as a proportion of the closing value of the RAB at 31 December 2016; and
  - t=0 estimate would be the forecast capex to occur over the period 1 January 2015 to 31 December 2015, as a proportion of the closing value of the RAB at 31 December 2015.
- for the DRP to apply in calendar year 2018, the PTRM capex weight to the:

[847] For example, the business finances the increase in the RAB with debt ranging from 6 to 14 year debt.

[848] In what follows, it is assumed that gearing remains at 60 per cent across all periods. Therefore there is equivalence between the proportion of depreciated new capex in the depreciated RAB, as compared to the same proportions that are funded by debt.

- t=3 estimate would be the forecast capex to occur over the period 1 January 2018 to 31 December 2018, as a proportion of the opening value of the RAB at 31 December 2018.
- t=2 estimate would be the forecast capex to occur over the period 1 January 2017 to 31 December 2017, as a proportion of the opening value of the RAB at 31 December 2017.
- t=1 estimate would be the forecast capex to occur over the period 1 January 2016 to 31 December 2016, as a proportion of the closing value of the RAB at 31 December 2016; and
- t=0 estimate would be the forecast capex to occur over the period 1 January 2015 to 31 December 2015, as a proportion of the closing value of the RAB at 31 December 2015.

- for the DRP to apply in calendar year 2019, the PTRM capex weight to the:
  - t=4 estimate would be the forecast capex to occur over the period 1 January 2019 to 31 December 2019, as a proportion of the opening value of the RAB at 31 December 2019.
  - t=3 estimate would be the forecast capex to occur over the period 1 January 2018 to 31 December 2018, as a proportion of the opening value of the RAB at 31 December 2018.
  - t=2 estimate would be the forecast capex to occur over the period 1 January 2017 to 31 December 2017, as a proportion of the opening value of the RAB at 31 December 2017.
  - t=1 estimate would be the forecast capex to occur over the period 1 January 2016 to 31 December 2016, as a proportion of the closing value of the RAB at 31 December 2016; and
  - t=0 estimate would be the forecast capex to occur over the period 1 January 2015 to 31 December 2015, as a proportion of the closing value of the RAB at 31 December 2015.

Calculating capex weights

20. Capex weights work to adjust the simple (equally weighted) trailing average, so as to account for the relative proportion of new capex in the RAB which is less than 10 years old. That ensures the forecast new capex initially faces the prevailing rate. So for example, if capex comprised the same proportion of the depreciated RAB (opening value) in each year, then the weights would be 10 per cent for each year of the trailing average. However, where the new capex proportions of the RAB vary between years, then the weights in the trailing average will diverge from the equal weighting (see paragraph 4 above for the QTC's summary of the effect of capex weights).

21. An equivalent approach to the QTC method for incorporating weights is to transition new capex progressively from an initial on the day annual estimate to a full trailing average over 10 years (see paragraph 962 for an outline of how transition weights work). This approach, submitted by DBP, is essentially the same transition approach followed by the AER for its full trailing average, but in this instance applied

to new forecast capex.[849] It is equivalent to the QTC's PTRM weights method in outcome, but works slightly differently in the calculation. The calculation is explained in the following hypothetical example.

22. First, the data required to calculate the capex weights for each of the years 2015-16 to 2019-20 in a typical regulatory period are established (Table 108).

23. An asset life of 60 years is assumed, to allow for depreciation of the new capex. The weight of any new capital expenditure depends on its depreciated proportion of the closing asset value of the RAB.

24. Second, the trailing averages of rates that will be weighted by the old and new capex are established (Table 109). For the sake of this simplified example, it is assumed that an illustrative prevailing (t=0) rate of 6.36 per cent applied over the previous 9 years from t=-9 to t=-1. The prevailing rate then changes from 2016-17 on. The values in this table involve the most complex step of the DBP method to establish and describe.

[849] For a spreadsheet example of DBP's method, see Dampier Bunbury Pipeline, *Proposed Revisions DBNGP Access Arrangement: 2016 – 2020 Regulatory Period: Rate of Return: Supporting Submission: 12*, Appendix J (excel file version available on the Authority's website)

Table 108 Data for capex weights example

Row		2015-16	2016-17	2017-18	2018-19	2019-20
1	**Opening PTRM RAB**	$10,041.50	$10,651.70	$11,233.30	$11,748.10	$12,311.50
2	**Closing PTRM RAB**	$10,651.70	$11,233.30	$11,748.10	$12,311.50	$12,867.00
3	**Benchmark gearing**	60%	60%	60%	60%	60%
4	**Opening debt portfolio**	$6,024.90	$6,391.00	$6,740.00	$7,048.90	$7,386.90
5	**Closing debt portfolio**	$6,391.00	$6,740.00	$7,048.90	$7,386.90	$7,720.20
6	**Change in debt portfolio**	$366.10	$349.00	$308.90	$338.00	$333.30
7	**Prevailing rate**	6.36%	7.00%	7.75%	8.00%	8.25%
8	**Pre 2015-16 debt weighting**	94.27%	89.39%	85.47%	81.56%	78.04%
9	**2015-16 new debt weighting**	5.73%	5.43%	5.19%	4.96%	4.74%
10	**2016-17 new debt weighting**	0.00%	5.18%	4.95%	4.72%	4.52%
11	**2017-18 new debt weighting**	0.00%	0.00%	4.38%	4.18%	4.00%
12	**2018-19 new debt weighting**	0.00%	0.00%	0.00%	4.58%	4.38%
13	**2019-20 new debt weighting**	0.00%	0.00%	0.00%	0.00%	4.32%
14	**Total debt weighting**	100.00%	100.00%	100.00%	100.00%	100.00%
15	**Capex weighted average rate**	6.36%	6.45%	6.64%	6.85%	7.08%

Source ERA analysis (December 2015).

Table 109 Transition weighted interest rates for capex weights example

Row	Column	(1) 2006-07 (t=-9)	(2) 2007-08 (t=-8)	(3) 2008-09 (t=-7)	(4) 2009-10 (t=-6)	(5) 2010-11 (t=-5)	(6) 2011-12 (t=-4)	(7) 2012-13 (t=-3)	(8) 2013-14 (t=-2)	(9) 2014-15 (t=-1)	(10) 2015-16 (t=-0)	(11) 2016-17 (t=+1)	(12) 2017-18 (t=+2)	(13) 2018-19 (t=+3)	(14) 2019-20 (t=+4)
1	**Prevailing rate**	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	7.00%	7.75%	8.00%	8.25%
2	**2006-07 (t=-9)**	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
3	**2007-08 (t=-8)**		6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
4	**2008-09 (t=-7)**			6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
5	**2009-10 (t=-6)**				6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
6	**2010-11 (t=-5)**					6.36%	6.36%	6.36%	6.36%	6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
7	**2011-12 (t=-4)**						6.36%	6.36%	6.36%	6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
8	**2012-13 (t=-3)**							6.36%	6.36%	6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
9	**2013-14 (t=-2)**								6.36%	6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
10	**2014-15 (t=-1)**									6.36%	6.36%	6.42%	6.56%	6.73%	6.92%
11	**2015-16 (t=0)**										6.36%	6.42%	6.56%	6.73%	6.92%
12	**2016-17 (t=+1)**											7.00%	7.08%	7.18%	7.30%
13	**2017-18 (t=+2)**												7.75%	7.78%	7.83%
14	**2018-19 (t=+3)**													8.00%	8.03%
15	**2019-20 (t=+4)**														8.25%

Source ERA analysis (December 2015).

25. In Table 109:

- Row 2 gives the 10 year equally weighted rates, comprising the sum of 10 per cent of the rate of each of the 10 prior years in the relevant columns:
  - the equally weighted 10 year sum in 2015-16 is 100 per cent of 6.36 per cent, given that the prior 10 years of rates are all 6.36 per cent;
  - the equally weighted 10 year sum in 2016-17 is 90 per cent of 6.36 per cent and 10 per cent of 7 per cent, giving a weighted sum of 6.42 per cent;
  - the equally weighted 10 year sum in 2017-18 is 80 per cent of 6.36 per cent, 10 per cent of 7 per cent and 10 per cent of 7.75 per cent, giving a weighted sum of 6.56 per cent;
- and so on;
- Row 3 gives the 9 year weighted sum for 2015-16, and the 10 year equally weighted rates thereafter:
  - the 9 year sum in 2015-16 is 100 per cent of 6.36 per cent, given that the prior 9 years of rates are all 6.36 per cent (for all 9 year estimates, 20 per cent weight is applied to the first year term and 10 per cent to each year term thereafter, following the transition method – see paragraph 962 above for a discussion of transition weights);
  - the equally weighted 10 year sum in 2016-17 is 90 per cent of 6.36 per cent and 10 per cent of 7 per cent, giving a weighted sum of 6.42 per cent;
  - the equally weighted 10 year sum in 2017-18 is 80 per cent of 6.36 per cent, 10 per cent of 7 per cent and 10 per cent of 7.75 per cent, giving a weighted sum of 6.56 per cent;
- and so on;
  - Row 4 gives the 8 year weighted sum for 2015-16, the 9 year weighted sum for 2016-17 and the 10 year equally weighted rates thereafter:
  - the 8 year sum in 2015-16 is 100 per cent of 6.36 per cent, given that the prior 8 years of rates are all 6.36 per cent (for all 8 year estimates, 30 per cent weight is applied to the first year term and 10 per cent to each year term thereafter, following the transition method);
  - the 9 year sum in 2016-17 is 90 per cent of 6.36 per cent, 10 per cent of 7 per cent, giving a weighted sum of 6.42 per cent;
  - the equally weighted 10 year sum in 2017-18 is 80 per cent of 6.36 per cent, 10 per cent of 7 per cent and 10 per cent of 7.75 per cent, giving a weighted sum of 6.56 per cent;
  - the equally weighted 10 year sum in 2018-19 is 70 per cent of 6.36 per cent, 10 per cent of 7 per cent, 10 per cent of 7.75 per cent and 10 per cent of 8.00 per cent, giving a weighted sum of 6.73 per cent;
- and so on;
  - Row 5 gives the 7 year weighted sum for 2015-16, the 8 year weighted sum for 2016-17, the 9 year weighted sum for 2017-18 and the 10 year equally weighted rates thereafter:
  - the 7 year sum in 2015-16 is 100 per cent of 6.36 per cent, given that the prior 7 years of rates are all 6.36 per cent (for all 7 year estimates, 40 per cent weight is applied to the first year term and 10 per cent to each of the 6 year terms thereafter, following the transition method);

- the 8 year sum in 2016-17 is 90 per cent of 6.36 per cent, 10 per cent of 7 per cent, giving a weighted sum of 6.42 per cent;
- the equally weighted 10 year sum in 2017-18 is 80 per cent of 6.36 per cent, 10 per cent of 7 per cent and 10 per cent of 7.75 per cent, giving a weighted sum of 6.56 per cent;
- the equally weighted 10 year sum in 2018-19 is 70 per cent of 6.36 per cent, 10 per cent of 7 per cent, 10 per cent of 7.75 per cent and 10 per cent of 8.00 per cent, giving a weighted sum of 6.73 per cent;

- and so on;
- through to;
  - Row 11 gives the 1 year weighted sum for 2015-16, the 2 year weighted sum for 2016-17, the 3 year weighted sum for 2017-18, the 4 year weighted sum for 2018-19, and the 5 year weighted sum for 2019-20:
  - the 1 year sum in 2015-16 is 100 per cent of 6.36 per cent (100 per cent weight is applied to the first year);
  - the 2 year sum in 2016-17 is 90 per cent of 6.36 per cent, 10 per cent of 7 per cent, giving a weighted sum of 6.42 per cent (for a 2 year estimate, 90 per cent weight is applied to the first year term and 10 per cent to the second year term, following the transition method);
  - the 3 year sum in 2017-18 is 80 per cent of 6.36 per cent, 10 per cent of 7 per cent and 10 per cent of 7.75 per cent, giving a weighted sum of 6.56 per cent (80 per cent weight is applied to the first year term and 10 per cent to the second and third year terms, following the transition method);
- and so on;
- through to;
  - Row 15 gives the 1 year weighted sum for 2019-20;
  - the 1 year sum in 2019-20 is 100 per cent of 8.25 per cent (100 per cent weight is applied to the first year term, which is the prevailing rate in this case).

26. Third, the contribution of various vintage (illustrative) depreciated capex in the closing asset value in each year is developed (Table 110).

Table 110 Composition of closing asset values (existing capital and new capital in $ million)

Row	Column	(10) 2015-16 (t=-0)	(11) 2016-17 (t=+1)	(12) 2017-18 (t=+2)	(13) 2018-19 (t=+3)	(14) 2019-20 (t=+4)
1	**2006-07 (t=-9)**	6024.90	6031.00	6042.92	6059.99	6082.69
2	**2007-08 (t=-8)**					
3	**2008-09 (t=-7)**					
4	**2009-10 (t=-6)**					
5	**2010-11 (t=-5)**					
6	**2011-12 (t=-4)**					
7	**2012-13 (t=-3)**					
8	**2013-14 (t=-2)**					
9	**2014-15 (t=-1)**					
10	**2015-16 (t=0)**	366.10	360.00	353.90	347.80	341.69
11	**2016-17 (t=+1)**		349.00	343.18	337.37	331.55
12	**2017-18 (t=+2)**			308.90	303.75	298.60
13	**2018-19 (t=+3)**				338.00	332.37
14	**2019-20 (t=+4)**					333.3
	Total	**6391.00**	**6740.00**	**7048.90**	**7386.90**	**7720.20**

Source ERA analysis (December 2015).

27. Fourth, capex weights are developed that correspond to the column proportions in Table 111.

Table 111 Capex weights to apply to each year for the trailing average

Column		(10)	(11)	(12)	(13)	(14)
		2015-16	2016-17	2017-18	2018-19	2019-20
Row		(t=-0)	(t=+1)	(t=+2)	(t=+3)	(t=+4)
1	**2006-07 (t=-9)**	94.27%	89.39%	85.47%	81.56%	78.04%
2	**2007-08 (t=-8)**					
3	**2008-09 (t=-7)**					
4	**2009-10 (t=-6)**					
5	**2010-11 (t=-5)**					
6	**2011-12 (t=-4)**					
7	**2012-13 (t=-3)**					
8	**2013-14 (t=-2)**					
9	**2014-15 (t=-1)**					
10	**2015-16 (t=0)**	5.73%	5.43%	5.19%	4.96%	4.74%
11	**2016-17 (t=+1)**		5.18%	4.95%	4.72%	4.52%
12	**2017-18 (t=+2)**			4.38%	4.18%	4.00%
13	**2018-19 (t=+3)**				4.58%	4.38%
14	**2019-20 (t=+4)**					4.32%
	Total	**100%**	**100%**	**100%**	**100%**	**100%**

Source ERA analysis (December 2015).

28. Finally, the 'sumproduct' of corresponding columns (10 through to 14) in each of Table 111 and Table 108 are calculated to give the capex weighted trailing average to apply in each year (Table 112).

Table 112 Capex weighted trailing average rate in each year

Column	(10)	(11)	(12)	(13)	(14)
	2015-16	2016-17	2017-18	2018-19	2019-20
	(t=-0)	(t=+1)	(t=+2)	(t=+3)	(t=+4)
Capex weighted trailing average rate	**6.36%**	**6.45%**	**6.64%**	**6.85%**	**7.07%**
Simple weighted trailing average rate	6.36%	6.42%	6.56%	6.73%	6.92%
Prevailing rate	6.36%	7.00%	7.75%	8.00%	8.25%

Source ERA analysis ERA, GGP Tariff Model, December 2015.

29. It may be observed that the capex weighted trailing average is below the prevailing rate in most years, in this illustrative example. This occurs because prevailing rates are rising strongly, while the majority of capex was undertaken in years prior to

2015-16, when interest rates were low. However, the capex weighted trailing average is above the simple (equally weighted) trailing average, reflecting the influence of the capex weights in this example, lifting the influence of the later years when rates are higher.

Appendix 8 Automatic updating formulas for the return on debt

1. This appendix sets out the method and automatic formulas for updating the debt risk premium (**DRP**) for each regulatory year. The annual update will contribute to the revised tariff that is published at each annual tariff variation. Annual tariff variations for GGT will occur on 1 January 2017, 1 January 2018 and 1 January 2019.[850]

2. The Authority has determined that the return on debt will be estimated as the sum of the:
   - risk free rate;
   - spread of the bank bill swap rate over the risk free rate (BBSW spread);
   - DRP; and
   - relevant debt raising and hedging transactions costs.

3. The risk free rate and BBSW spread are estimated with the same term as the regulatory period, that is, 5 years. These two components are estimated once every 5 years at the start of the regulatory period, so do not require annual updating.

4. The DRP is estimated using a 10 year trailing average consisting of a DRP for the current year and a DRP for each of the 9 prior years and so must be updated each year. The DRP for each yearly update is based on:
   - a term to maturity of 10 years;
   - a BBB band credit rating;
   - the Authority's revised bond yield approach; and
   - a corresponding 10 year bank bill swap rate estimation.

5. The revised bond yield approach uses international bonds that have their country of risk identified by Bloomberg as Australia to estimate the cost of debt each year. The DRP represents the risk spread of the cost of debt estimated over the 10 year bank bill swap rate estimation in any given year.

6. The debt raising and hedging transactions costs, like the 5 year risk free rate and swap spread, are estimated only once, at the start of the regulatory period, and so do not require annual updating.

Averaging period

7. The DRP estimates that are to be included the 2017, 2018 and 2019 tariff variations are based on an averaging period of 40 trading days.[851] This averaging period must fall within a window at least two months prior to, but no longer than eight months before the regulatory year. Therefore, the Authority requires that the nominated averaging period occur in the period 1 June to 31 October in each year. For example, the updated DRP for inclusion in the 1 January 2017 tariff variation will be

[850] The tariff variation for 1 January 2016 is not required given that the Final Decision will occur after that date.

[851] With the trading days based on the eastern states' public holidays.

based on an averaging period that falls within the window 1 June 2016 to 31 October 2015.

8. The averaging periods must be nominated in advance. The Authority requires GGT nominate the averaging periods for 2017 to 2019 as soon as practicable following the release of this Draft Decision. The Authority does not require that the nominated 40 business day averaging period for each of the four years be identical periods, only that they occur in the period 1 June to 31 October.

Method for estimating the DRP

The simple equally weighted trailing average

9. The estimate of the DRP for each year will be a simple trailing average.

10. The trailing average estimate of the DRP will weight the most recent 10 years of annual DRP estimates, which have been estimated consistent with debt with a 10 year term in the BBB credit rating band.

11. Annually updating the resulting 10 year trailing average will involve adding in the most recent estimate of the DRP and dropping the estimate from 10 years ago. The weights for a simple hybrid trailing average DRP estimate will be 10 per cent each.

12. The automatic formula for the equally weighted trailing average of the DRP to apply in any regulatory year as shown below:

$$TA\ DRP_0 = \frac{\sum_{t=0}^{-9} DRP_t}{10}$$

Where

$TA\ DRP_0$ is the equally weighted trailing average of the DRP to apply in the following year as the annual update of the estimate used in the current year; and

DRP_t is the DRP estimated for each of the 10 regulatory years t = *0, -1, -2…. , -9*.

13. All years are in the same year convention as year *0*. For example, if year *0* is the regulatory year 2016, *t = -9* is the calendar year 2007 because 2016 is a calendar year in this Access Arrangement. Similarly, if year *0* is the regulatory year 2017, *t = -9* is the calendar year 2008.

14. For example, the DRP trailing average estimate for the calendar 2016 regulatory year will be:

$$\begin{aligned} TA\,DRP_{2016} = {} & 0.1 \times DRP_{2016} + 0.1 \times DRP_{2015} + 0.1 \times DRP_{2014} \\ & + 0.1 \times DRP_{2013} + 0.1 \times DRP_{2012} + 0.1 \times DRP_{2011} \\ & + 0.1 \times DRP_{2010} + 0.1 \times DRP_{2009} + 0.1 \times DRP_{2008} \\ & + 0.1 \times DRP_{2007} \end{aligned}$$

15. In terms of the notation used by the Australian Energy Regulator (but in the Authority's case applying just to the DRP trailing average), the foregoing TA DRP for the 2016 calendar year may be written as follows:[852]

$$\begin{aligned} {}_{2015}kd_{2016} = {} & 0.1 \times {}_{2006}R_{2007} + 0.1 \times {}_{2007}R_{2008} + 0.1 \times {}_{2008}R_{2009} \\ & + 0.1 \times {}_{2009}R_{2010} + 0.1 \times {}_{2010}R_{2011} + 0.1 \times {}_{2011}R_{2012} \\ & + 0.1 \times {}_{2012}R_{2013} + 0.1 \times {}_{2013}R_{2014} + 0.1 \times {}_{2014}R_{2015} \\ & + 0.1 \times {}_{2015}R_{2016} \end{aligned}$$

16. Equivalently, where 't=0' specifies the year 2016 in this case:

$$\begin{aligned} {}_{-1}kd_{0} = {} & 0.1 \times {}_{-10}R_{-9} + 0.1 \times {}_{-9}R_{-8} + 0.1 \times {}_{-8}R_{-7} + 0.1 \times {}_{-7}R_{-6} \\ & + 0.1 \times {}_{-6}R_{-5} + 0.1 \times {}_{-5}R_{-4} + 0.1 \times {}_{-4}R_{-3} \\ & + 0.1 \times {}_{-3}R_{-2} + 0.1 \times {}_{-2}R_{-1} + 0.1 \times {}_{-1}R_{0} \end{aligned}$$

Post-March 2015 Estimates of the DRP for inclusion in the trailing average DRP estimate

17. The estimates of the DRP applying to each calendar year will be estimated using the Authority's revised bond yield approach. Resulting estimates of the DRP will be included in the trailing average.

18. The first estimate is that made for the *indicative* 20 day period ending 2 April 2015, which has been included as the estimate of the DRP for calendar year 2015 included in this Draft Decision. This 2015 estimate will be revised for the Final Decision, to be published in 2015, based on RBA data for the actual credit spreads for 2015. An estimate for 2016 will also be provided as part of the Final Decision.

19. The first annual update estimate that will be made for GGT will fall in the period 1 June to 31 October 2016, (DRP_{2017}), and will be incorporated in the trailing average DRP to apply in 2017 (that is, TA DRP_{2017}).

[852] Australian Energy Regulator, *Draft Decision: Jemena Gas Networks (NSW) 2015-20*, November 2014, Attachment 3, p. 3-288.

20. The following automatic formulas will apply, and will remain unchanged for the duration of the AA3 period, and hence will apply for the estimates made for DRP_{2017}, as well as for the estimates DRP_{2018} and DRP_{2019}.[853]

Techniques to estimate the debt risk premium

21. The Authority's approach to estimating the debt risk premium (DRP) is designed so that a stakeholder can replicate the debt risk premium calculation implemented by the Authority. The process is outlined in sufficient detail such that replicating it should incur minimal research and development costs for stakeholders whilst maintaining transparency and removing discretion in the application. Once the approach has been established in Bloomberg and Excel for the first time the settings and spreadsheet templates do not need to be established again. The estimation process thereafter requires significantly less time and becomes mechanistic. ***The footnotes in this section provide assistance with Bloomberg commands.***

22. The Revised Bond Yield Approach consists of the following six processes.

- Determining the Benchmark Sample
  - Identifying a sample of bonds based on the benchmark sample selection criteria. This will comprise a 'cross section' of bonds.
- Collecting Data
  - Collecting data for those bonds over the averaging period in question, for example 20 trading days). This represents 'time series' data related to each bond.
- Converting Yields to Australian Dollar Equivalents
  - Converting yields for bonds denominated in foreign currencies into Australian dollar (**AUD**) equivalents so that all yields are expressed as an AUD equivalent.
- Averaging Yields over the Averaging Period
  - Calculating an average AUD equivalent bond yield for each bond in the cross section across the averaging period. For example, where a 20 trading day averaging period applies, each bond will have a single 20 day 'average yield' calculated.
- Estimating 'Curves'
  - Estimating three yield curves based on different methodologies and using the average yield for each bond; its remaining term to maturity; and AUD face value.[854]
- Calculating the DRP
  - Calculating the DRP by subtracting the average of the 10 year AUD interest rate swap (**IRS**) rate from the 10 year cost of debt estimate, with the latter

[853] As part of the response to the consultation on the proposed changes to the ATCO Final Decision, the automatic formulas for the annual update in this section were amended. However, the Authority determined not to amend some aspects of the approach used to estimate the 2 April 2015 estimate of the DRP set out in the Final Decision (for example, the constraints on the Nelson-Siegel Svennson curve parameters). Therefore, applying the amended methods set out below will not reproduce the exact DRP estimated as at 2 April 2015 (see paragraphs 924 to 940 in the main body for the 2 April 2015 value of the DRP and the method adopted to estimate it).

[854] The three curves are based on the Gaussian Kernel, the Nelson Siegel and the Nelson Siegel Svennson methodologies. The Gaussian Kernel approach produces a series of point estimates as opposed to a curve. However, each point estimate can be seen as points that compose a curve.

calculated as the average of the three estimated yield curves at the ten year tenor.

Step 1: Determining the benchmark sample

23. The benchmark sample of bonds should be identified as soon as practicable, but 24 hours after the date identified as the final trading day in the averaging period in order to allow the sample from Bloomberg to 'settle' to its final form.

24. The first step in determining the benchmark sample, or cross section of bonds is to identify the appropriate benchmark credit rating. For Gas Access Arrangements, the Standard & Poors' credit rating for the benchmark firm is outlined in the Economic Regulation Authority's Rate of Return Guidelines and is currently the BBB band.[855]

25. The Bloomberg search SRCH <GO> facility is used to conduct a search for bonds with a Standard & Poors' issue level (as opposed to issuer) rating that matches the benchmark firm's credit rating, and other criteria set out in Table 113.[856] This is carried out between 24 and 48 hours after the date that marks the final trading day in the averaging period in order to allow global markets to close. The exception here is where this 24 hour period overlaps a Western Australian non-trading day, in which case this process is carried out on the next Western Australian trading day.[857]

Table 113 Revised Bond Yield Approach Search Criteria – Bloomberg Search Structure

Criteria	ERA's approach
Country of risk	Australia
S&P Rating	BBB+ to BBB-
Currency	Australian Dollar, United States Dollar, Euro Currency and British Pound
Maturity Date	>= 2 years from now
Maturity Type	Bullet or Callable or Putable but not Perpetual
Security Type	Exclude Inflation Linked Note
Sector/Industry Group	Exclude 'Financials' (based on Bloomberg Industry Classification System Level 1 Sector Name)
Was Called	No

26. A screen shot of how this would look in the Bloomberg SRCH<GO> function is presented in Figure 35. The security status defaults to 'active'. It is important to note that in the top left hand corner of this figure the 'Asset Classes' criteria has been enabled to consolidate duplicate bond issues. The consolidation option is accessed by typing 11 in the top left hand corner to the left of <HELP> and then hitting <GO>. Ensure that *only* the 'Corporate' and 'Consolidate Duplicate Bonds' option is checked before clicking 'Update'. The remaining criteria are entered into the Bloomberg SRCH function as shown in Figure 35 by typing the keywords into

[855] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines: Meeting the Requirements of the National Gas Rules*, 16 December 2013, pp. 44-52.

[856] <GO> is the Bloomberg equivalent of hitting the enter key after entering commands in the top left hand corner of the screen to the left of <HELP>. For example, type SRCH and then hit the <GO> key.

[857] Note that the revised bond yield approach is based on Eastern States trading days for consistency with Commonwealth Government Security data used in risk free rate and inflation calculations.

the 'Field' column and hitting <GO> after each of the criteria are entered to add new criteria. The criteria in the Bloomberg search panel can be edited by clicking the pencil icon to the right of each criteria. [858]

Figure 35 Bloomberg 'SRCH' Function Populated with Sample Selection Criteria.

Source: Bloomberg

27. The results of this bond search are exported into Microsoft Excel.[859] The only information that is collected from the search result output into Excel at this stage is the 'Bloomberg ID' or 'ticker' for each bond.[860] Each ticker needs to be appended with " Corp" so that formulas used in the next step can recognise them as a corporate bond. This can be carried out using the structure in Microsoft Excel below.[861]

[858] For the maturity date change the boundary condition to 'years from now' by selecting 'Y'.

[859] Click the 'Results' button and in the resulting screen click 'Actions' and then 'Export to Excel'.

[860] It is important to save a copy of this search for future reference if help is requested from Bloomberg Helpdesk.

[861] It is recommended that formulas presented in these Excel structure tables are copy and pasted from an electronic copy of this document.

Table 114 Appending Bloomberg Bond Tickers for use in Pricing Formulas– Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Pasted value of bond ticker (example)	A2 down	EXXXXXXXX Corp
Bond ticker appended with " Corp"	B2 down	=A2&" Corp"

28. The bond tickers in B2 down should be pasted as values (as opposed to Excel commands) into a separate worksheet for use in subsequent calculations.

Step 2: Collecting Data and Conversion of yields into AUD equivalents

29. Data is collected between 24 and 48 hours after the date that marks the final trading day in the averaging period in order to allow global markets to close. The exception here is if a Western Australian non-trading day falls in this period, in which case this process is carried out on the next Western Australian trading day.[862]

30. Before data for each of the bond identifiers in the sample (established in the previous section) is retrieved, some 'pricing source defaults' need to be set in the Bloomberg terminal, to ensure that data sources are consistent and of similar quality. This determines the source that formula outlined further below use to draw bond pricing from.

31. Table 115 provides the 'pricing source defaults' for bonds issued in the relevant range of currencies.

Table 115 Pricing Waterfall Set in Bloomberg for Retrieving Bond Price Data

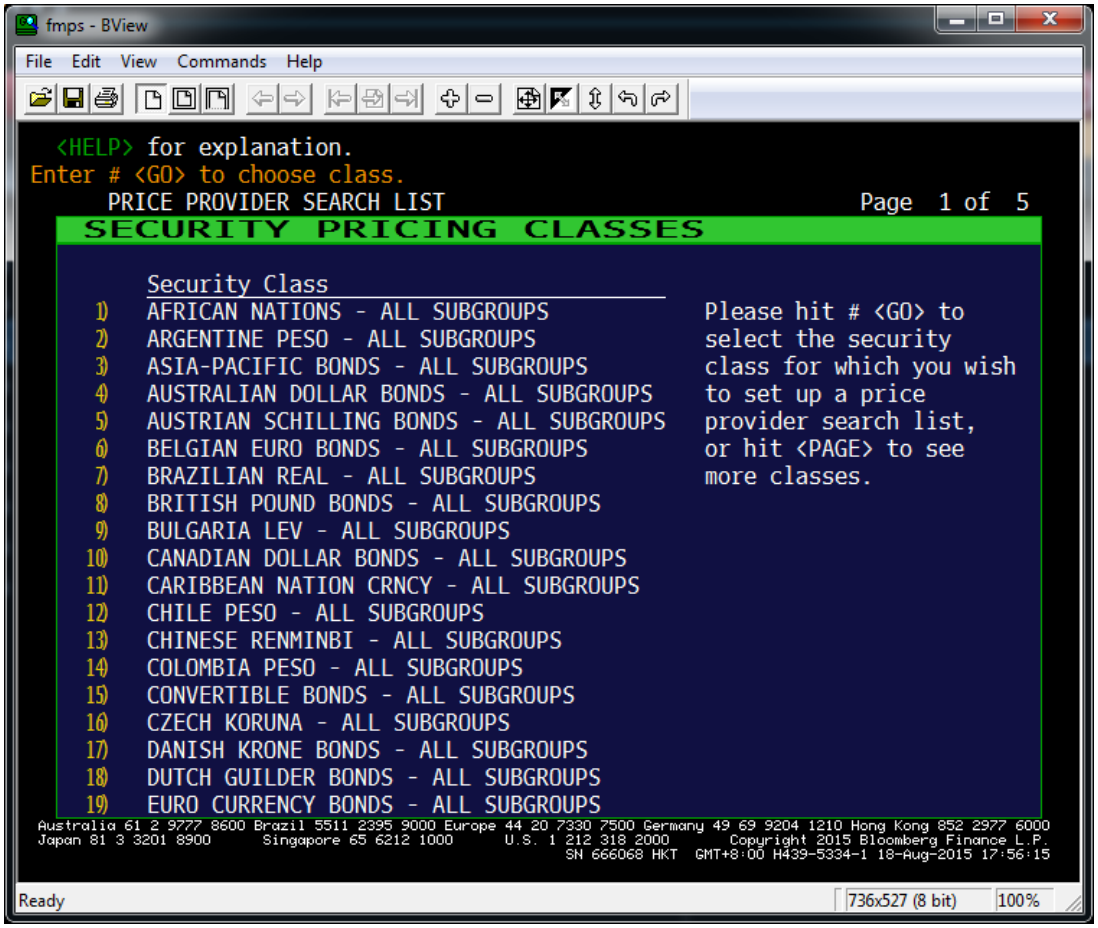
Currency of Issuance	1st Pricing Source	2nd Pricing Source
USD	BVAL	TRAC
EUR	BVAL	BGN
GBP	BVAL	BGN
AUD	BVAL	CBBT

32. To set these as the default sources in the Bloomberg terminal for each currency use FMPS <GO> shown in Figure 36.[863] Scroll down to reveal 'US Denominated Corporate Bonds – All Subgroups'. Select this and in the resulting window select US Denominated Corporate Bonds – All Subgroups' again.

[862] Note that the revised bond yield approach is based on Eastern States trading days for consistency with Commonwealth Government Security data used in risk free rate and inflation calculations. The Authority will maintain a copy of the pricing sources used for each bond in the sample so that third parties can replicate the pricing sources for all bond yield observations retrospectively.

[863] The Authority considers that in practice the BVAL pricing source will find pricing data in the majority of cases. If the first preference contains any observations of historical data FMPS ensures that all observations will rely on this one pricing source for consistency. Events such as US Federal public holidays can result in days within the averaging period where no prices will be returned from the first preference. In these rare cases the bond ticker is manually appended with "@PCS Corp" to hard code the preferred pricing source. For example in Table 116 further below the ticker would be modified to "EXXXXXXXX@BGN Corp" as second preference for Euro denominated bonds. If no pricing is available from the second preference the observation is left blank. The Authority will maintain a copy of the pricing sources used for each bond in the sample so that third parties can replicate the pricing sources for all bond yield observations.

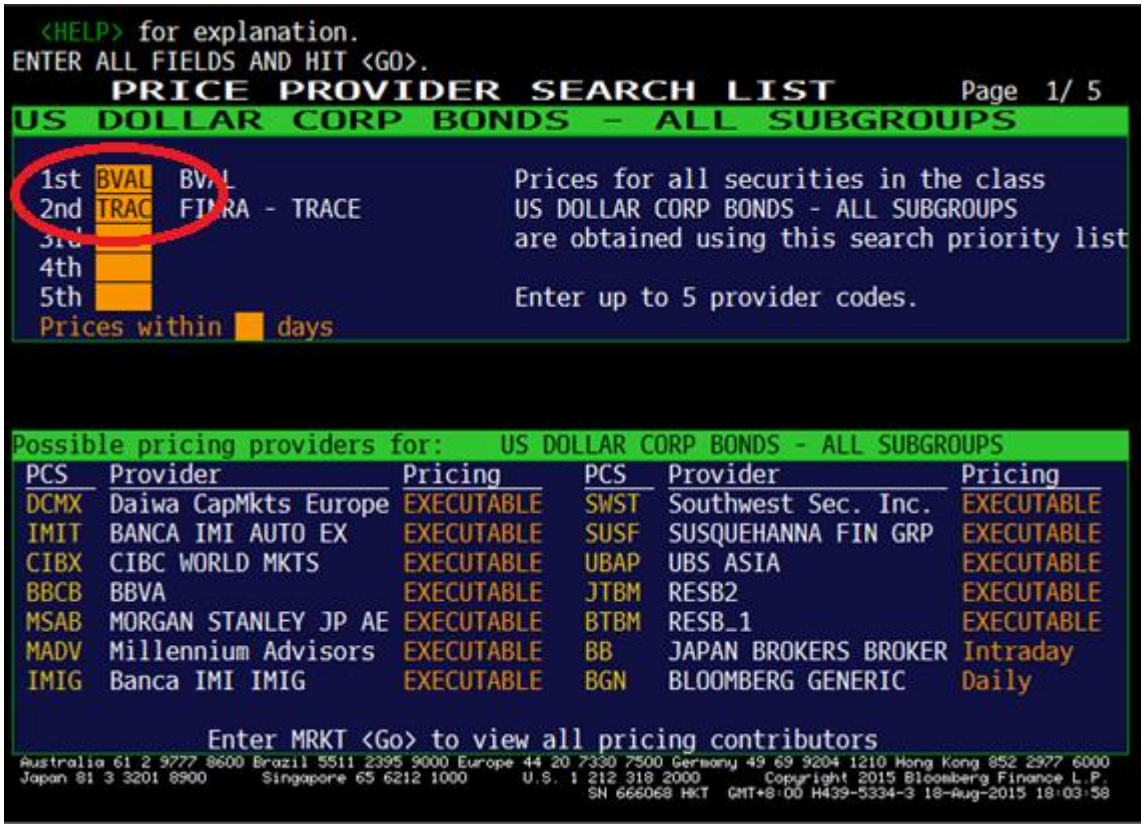
Figure 36 Security Pricing Classes List



Source: Bloomberg

33. Figure 37 shows where the pricing source settings in Table 115 should be entered in the pricing source window using the US dollar denominated bonds as an example. In particular, the first pricing source should be entered to the right of '1st' and the second pricing source to the right of '2nd'. Once this is complete select <GO> followed by 1 <GO> to save.

Figure 37 Pricing Source Window Default Setting - US Dollar Corporate Bond Example



Source: Bloomberg

34. Repeat the steps outlined in paragraphs 32 and 33 for the remaining currencies selecting:

- 'Euro Currency Bonds – All Subgroups' > 'Original EUR Issued Bonds and Other Redenominated Bonds' > 'Euro Currency Bonds – All Subgroups' for Euro denominated bonds;
- 'British Pound Bonds – All Subgroups' > 'British Pound Bonds – All Subgroups' for GBP denominated bonds; and
- 'Australian Dollar Bonds – All Subgroups' > 'Australian Dollar Bonds – All Subgroups' for AUD denominated bonds.

35. Data is collected through a Microsoft Excel spreadsheet that interfaces with Bloomberg through the Bloomberg Application Programming Interface (**API**). The 'tickers' identifying each bond in the sample selection step above are the key input into this spreadsheet. The bond tickers are appended with " Corp" so that they can be read by the "Bloomberg Data Point" (**BDP**) or "Bloomberg Data History" (**BDH**) function in Excel which then retrieves various attributes for each bond in question.[864] Once the pricing source defaults have been set, some key attributes are be exported into Excel:

- Maturity date (MATURITY);
- Currency (CRNCY);

[864] The space before " Corp" is intentional. BDP retrieves current values while BDH is used to retrieve historical data.

- Amount issued (AMT_ISSUED);
- Issue date (ISSUE_DT);
- Bid price for the bond (px bid);
- Ask price for the bond (px ask); and
- Asset swap spread bid (asset swap spd bid);
- Asset swap spread ask (asset swap spd ask);
- Australian dollar exchange rate with each bond's native currencyat date of issue (for example for the US/Australian dollar exchange rate; USDAUD Curncy).

36. The key formulas for exporting the Bloomberg data into Excel are provided in Table 116. All formulas B2 through to E2 should be filled downward in Excel to retrieve the attributes for the entire cross section of bonds.

37. Once these key attributes have been exported, the formulas in Table 117 then convert the mid asset swap spread highlighted in K2 into a hedged Australian dollar equivalent. The formulas in Table 116 and Table 117 should be contained in the same spreadsheet. All formulas P2 through to R2 should be filled downward in Excel to retrieve the converted yields for the cross section of bonds.[865]

38. The Excel worksheet based on the formulas in Table 116 and Table 117 provides a template to calculate the hedged AUD bond yields for the entire cross section of bonds in the benchmark sample on any given trading day. Specifically, once a trading date is entered into cell A1, the hedged AUD bond yield is returned in cells R2 downward.[866] The hedged yields for the entire cross section of bonds are saved as values (rather than excel formulas) for each day in the 20 day averaging period.

[865] The Bloomberg Swaps Toolkit must be enabled so that these formulas can call the swap manager tool in the Bloomberg terminal through Excel. Further information and example templates can be found in the Swaps Toolkit under DAPI <GO> in the Bloomberg terminal.

[866] Note that this process can take a few minutes to populate. It is important to ensure the yields have populated fully and without error each time the date is changed in cell A1. At times this may require restarting Excel.

Table 116 Formula to Retrieve Bond Prices and Attributes– Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Bond Ticker	From A2 down	EXXXXXXXX Corp
Trading day date	A1	mm/dd/yyyy
Currency to convert to	B1	AUD
Payment frequency	C1	Q
Issue date	B2 down	=BDP(A2,"ISSUE_DT")
Maturity date	C2 down	=BDP(A2,"MATURITY")
Currency of bond issue	D2 down	=BDP(A2,"CRNCY")
Amount issued – currency of issuance (bond face value)	E2 down	=BDP(A2,"AMT_ISSUED")
Amount issued – Australian dollars (bond face value)	F2 down	=IF(D2="AUD",E2,E2*BDH(D2&"AUD Curncy","px_last",B2,B2))
Bid Price Label	G1	PX BID
Ask Price Label	H1	PX ASK
Bond bid price[867]	G2 down	=BDH(A2, "px bid", $A$1, $A$1, "QuoteType", "P","fill","P")
Bond ask price	H2 down	=BDH(A2, "px ask", $A$1, $A$1, "QuoteType", "P","fill","P")
Asset swap spread bid[868]	I2 down	=BDP(A2,"asset swap spd bid",$G$1,G2,"ASW_SWAP_CURRENCY",$B$1, "ASW_SWAP_PAY_RESET_FREQ",$C$1,"SETTLE_DT",TEXT($A$1,"YYYYMMDD"),"OAS_CURVE_DT",TEXT($A$1,"YYYYMMDD"))
Asset swap spread ask[869]	J2 down	=BDP(A2,"asset swap spd ask",$H$1,H2,"ASW_SWAP_CURRENCY",$B$1, "ASW_SWAP_PAY_RESET_FREQ",$C$1,"SETTLE_DT",TEXT($A$1,"YYYYMMDD"),"OAS_CURVE_DT",TEXT($A$1,"YYYYMMDD"))
Asset swap spread mid	K2 down	=AVERAGE(I2:J2)
Determination Date	$L$1 down	dd/mm/yyyy

[867] The Authority considers that the “fill” “P” option will not return values after the bond has matured, however will ensure a contiguous series whilst the bond is on issue.

[868] The Authority considers that using the option adjusted spread curve date is an appropriate override in order to explicitly fix this curve date to the trading day date entered through Excel.

Attribute	Cell	Formula or entry
Remaining term to maturity from determination date (dd/mm/yyyy)	L2 down	=YEARFRAC($L$1,C2,)

Source: ERA Research, Bloomberg

Table 117 Formula for Converting to Hedged Australian Dollar Equivalent Yields– Microsoft Excel Template Structure (continued on from Table 116)

Attribute	Cell	Formula or entry
Payment frequency for fixed leg of swap (leg 1)	M1 down	Semiannual
Payment frequency for floating leg of swap (leg 2)	N1 down	Quarterly
Deal type (fixed float)	O1 down	FXFL
Deal Structure ID (called from Bloomberg terminal)[870]	P2 down	=BSTRUCTURE($O$1,"Leg[2].Currency",$B$1,"Leg[1].Currency",$B$1,"Leg[2].Spread",K2,"EffectiveDate",$A$1,"MaturityDate",C2,"Leg[1].PayFrequency",$M$1,"Leg[2].PayFrequency",$N$1,"Leg[2].ResetFrequency",$N$1)
Valuation ID (called from Bloomberg terminal)	Q2 down	=BPRICE(P2,"Target=Leg[1].FixedCoupon","Premium=0","Leg[2].Spread",K2,"ValuationDate",$A$1,"MarketDate",$A$1,"headers=false")
Australian dollar equivalent yield	R2 down	=BView(Q2,"Leg[1].FixedCoupon","headers=false")

Source: ERA Research, Bloomberg

Step 3: Averaging yields over the averaging period

39. The 20 day averaging period is based on eastern states trading days with the last day of the averaging period being on the DRP determination date. A table of AUD equivalent bond yields is established for the cross section of bonds in the sample with observations for every day across the averaging period.[871] To build up this time

[869] The Authority considers that using the option adjusted spread curve date is an appropriate override in order to explicitly fix this curve date to the trading day date entered through Excel.

[870] The Authority considers that setting the effective date to the trading date is appropriate to ensure the tenor of the swap matches the remaining term to maturity of the bond.

[871] This is done by cutting and pasting observations from cell R2 down in Table 117 as values into B2 down in Table 118. To avoid 'overloading' the Excel API only one spreadsheet using the structure in Table 117 should be run on a Bloomberg terminal at a time.

series, the date entered in cell A1 at Table 116 should be changed to each of the trading days in the averaging period. The series of observations for each bond is then assessed to ensure it has a number of observations equal to at least half of the averaging period. Bonds that do not meet this requirement are deleted from the sample. The sample of yields for each bond is then averaged. This results in one averaged observation for each bond.

40. The Excel worksheet for calculating the 20 day average bond yield for each bond in the benchmark samples is provided at Table 118.

Table 118 Averaging Yields over the Averaging Period - Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Trading Day Dates	B1:U1	Each trading day date in the averaging period (20 dates for this Decision)
Bond Ticker	A2 down	EXXXXXXXX Corp
Australian dollar equivalent yields for first trading day	B2 down: U2 down	Bond values from R2 down in Table 117 for the 1st trading day through to the 20th trading day.
Average of 20 day yields	V2 down	=AVERAGE(B2:U2)

Step 4: Apply curve fitting techniques

41. To improve the validity of the yield estimates, three techniques are used to fit curves as part of the automatic formula to estimate the 10 year cost of debt used in the calculation of the annually updated DRP. These are:

- the Gaussian Kernel Methodology;
- the Nelson-Siegel Methodology; and
- the Nelson-Siegel-Svennson Methodology.

42. For ease of replication by third parties only Microsoft Excel is used for processing the data. Each of these techniques is discussed in turn below.[872]

Gaussian Kernel Methodology

43. The Gaussian Kernel Methodology is consistent with the approach used by the Reserve Bank of Australia as published in 'New Measures of Australian Corporate Credit Spreads'.[873]

44. The Excel worksheet that replicates the Gaussian Kernel Methodology is provided in Table 119. Note that the inputs required for each bond in the benchmark sample

[872] Microsoft Excel 2013 (15.0.4745.1000) 32 bit as part of Microsoft Office Professional Plus 2013 is the version currently used for these calculations.

[873] Reserve Bank of Australia, '*New Measures of Australian Corporate Credit Spreads'*, Bulletin, December quarter 2013.

are: remaining term to maturity; bond face value in Australian dollars; and Australian dollar equivalent yield. These are the outputs reported in cells L2 and F2 in and cell R2 in Table 117 respectively.

Table 119 Gaussian Kernel Point Estimation Methodology – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Remaining term to maturity	A1 down	L2 as output in Table 116
Amount issued – Australian dollars (bond face value)	B1 down	F2 as output in Table 116
Australian dollar equivalent yield	C1 down	Values in V2 down in Table 118
Absolute deviation from target tenor	D1 down	=ABS(A1-$K$1)
Squared deviation from target tenor	E1 down	=(A1-$K$1)^2
Gaussian kernel	F1 down	=(EXP(-E1/(2*$K$4)))/$K$8
Joint Weighting	G1 down	=F1*B1
Sum of Joint Weighting	Last cell column G	=SUM(G1:GSecond last row)
Weight	H1 down	=G1/(GLast row)
Weighted yield	I1 down	=C1*H1
Weighted maturity	J1 down	=A1*H1
Sum weighted maturity (effective term to maturity)	Last cell column J	=SUM(J1:JSecond last row)
Target tenor	K1	Input target tenor (eg 10 for 10 years)
Smoothing parameter (sigma)	K2	1.5
Actual sigma	K3	=STDEV(A:A)
Sigma squared	K4	=K2^2
mean	K5	=AVERAGE(A:A)
pi	K6	=PI()

Attribute	Cell	Formula or entry
2 x Square root of pi	K7	=SQRT(2*K6)
2 x Square root of pi x smoothing parameter	K8	=K7*K2
Target tenor yield	K9	=SUM(I:I)

45. As the Gaussian kernel methodology is non-parametric, and thus requires no estimation of curves, the output for any target tenor input into cell K1 is instantly reported in cell K8.

46. The target tenor yields are calculated for 3, 5, 7 and 10 year terms. The associated effective term to maturity in the last cell of column J is also recorded for each tenor. A linear extrapolation out to an effective tenor of 10 years and interpolation to 7 years is performed using the following formula.

$$y_t(t) = y_t\left[et(7)\right] + \left(\frac{y_t\left[et(10)\right] - y_t\left[et(7)\right]}{et(10) - et(7)}\right)\left(t - et(7)\right)$$

Where:

t is the tenor to be interpolated or extrapolated to;

$y_t(t)$ is the semi-annual yield extrapolated out to 10 years;

τ is the input target tenor (for example in cell K1 above);

$y_t\left[\tau\right]$ is target tenor yield output from the Gaussian kernel method; and

$et(\tau)$ is the effective tenor output from the Gaussian kernel method.

47. The Excel Worksheet for calculating the target tenor yields is provided at Table 120.

Table 120 Linear Interpolation and Extrapolation of Gaussian Kernel Estimates – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Tenor	A1:D1	Values 3, 5, 7 and 10.
3 year target tenor yield (semi-annual basis)	A2	From cell K9 in Table 119Table 119.
5 year target tenor yield (semi-annual basis)	B2	From cell K9 in Table 119Table 119.
7 year target tenor yield (semi-annual basis)	C2	From cell K9 in Table 119Table 119.
10 year target tenor yield (semi-annual basis)	D2	From cell K9 in Table 119Table 119.
3 year effective tenor	A3	Last row of column J in Table 119Table 119.
5 year effective tenor	B3	Last row of column J in Table 119Table 119.
7 year effective tenor	C3	Last row of column J in Table 119Table 119.
10 year effective tenor	D3	Last row of column J in Table 119Table 119.
3 year target tenor annualized yield	A4	=((1+A2/200)^2-1)*100
5 year target tenor annualized yield	B4	=((1+B2/200)^2-1)*100
7 year target tenor annualized yield	C4	=((1+C2/200)^2-1)*100
10 year target tenor annualized yield	D4	=((1+D2/200)^2-1)*100
Interpolated 7 year yield (semi-annual basis)	E2	=C2+((D2-C2)/(D3-C3))*(7-C3)
Extrapolated 10 year yield (semi-annual basis)	F2	=C2+((D2-C2)/(D3-C3))*(10-C3)
Interpolated 7 year yield annualized	E4	=((1+E2/200)^2-1)*100
Extrapolated 10 year yield annualized	F4	=((1+F2/200)^2-1)*100

48. The value for F4 in Table 120 is the Gaussian Kernel cost of debt extrapolated to a tenor of 10 years. This value averaged with the 10 year cost of debt estimate from the other two methods is the Authority's final 10 year cost of debt estimate.

The Nelson Siegel method

49. The first step in the Nelson Siegel methodology involves the estimation of the value for the decay factor (λ) that provides the tenor at which the medium-term factor (β_{2t}) reaches its maximum influence. Diebold and Li (2006) propose that 30 months (2.5 years) is commonly used as a medium-term tenor.[874] Setting τ to 2.5 and substituting it into the weighting factor attached to β_{2t} in the Nelson Siegel specification gives:

$$Max\left(\frac{1-e^{-2.5\lambda}}{2.5\lambda}-e^{-2.5\lambda}\right)$$

50. The Excel worksheet and Excel solver settings that are used to determine the value of λ that maximises β_{2t} are provided at Table 121, Figure 38 and Figure 39 respectively. Note that the GRG non-linear solver is used to find the maximum point (or peak) on a non-linear function, hence the selection of 'GRG Nonlinear' and 'Max' in Figure 38.

Table 121 Nelson Siegel Decay Factor Estimation – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
β_{2t} weighting factor	A1	=(((1-EXP(-$A$3*A2))/($A$3*A2))-EXP(-$A$3*A2))
Tenor (maturity) τ	A2	2.5
Decay factor λ (Starting value used)	A3	0.00000000000001 (that is 1E-14)

[874] F. Diebold and C. Li, Forecasting the term structure of government bond yields, *Journal of Econometrics,* vol.130, no.2, 2006, pp. 337-364.

Figure 38 Nelson Siegel Decay Factor Estimation – Microsoft Excel Solver Settings

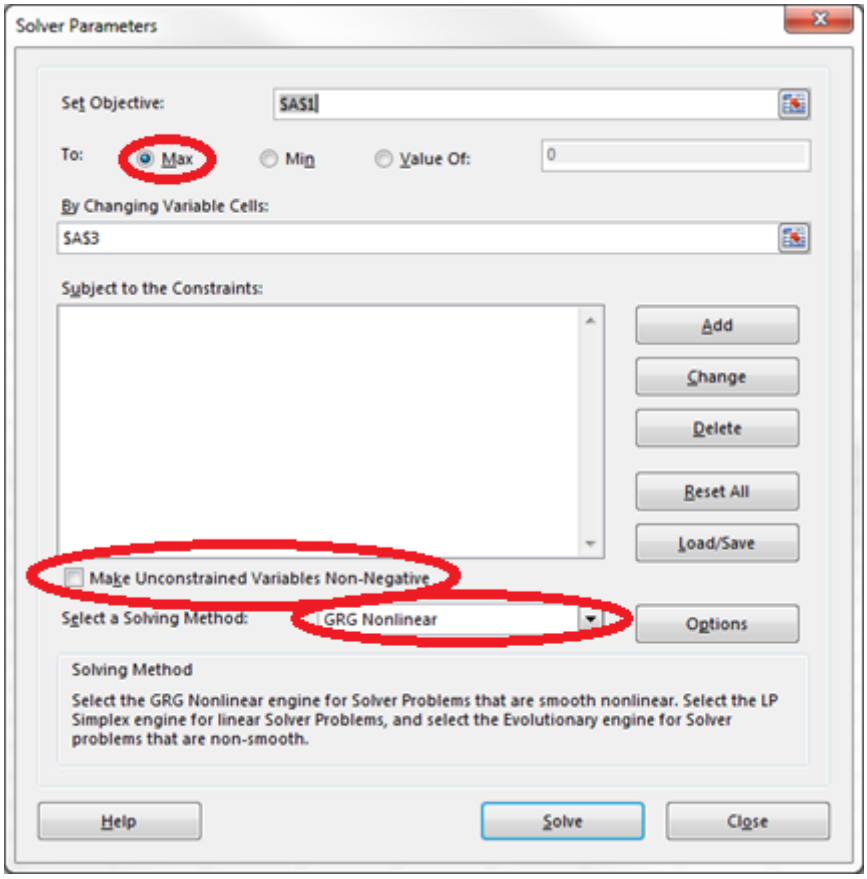
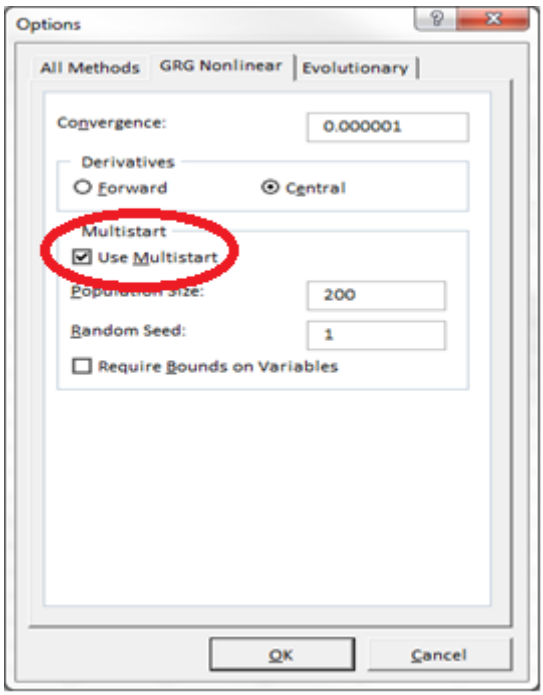


Figure 39 Microsoft Excel GRG Nonlinear Solver Settings



51. The convergence of 0.000001 is considered precise enough such that the solver will stop when the solution in the last iterations change by this amount.[875] To ensure

[875] Diebold and Li (2006) published their decay method to 4 decimal places.

the peak is a global maximum (as opposed to just local) the solver carries out the optimisation from many different random starting points on the function reflected by the selection of the 'Multistart' option in Figure 39. The number of different starting points is based on the 'Population size' field and setting the 'Random seed' to 'one' ensures that the random selection process is always based on the same seed each time the solver is used. The central difference derivative method is selected for the greatest accuracy. In this case the problem is unconstrained and so no bounds are required on variables.

52. This estimation process yields a value for λ of 0.71731 which will be used as a starting value in the final fitting of the NS yield curve.[876]

53. Starting values are still required for $\beta_{0t}, \beta_{1t}, \beta_{2t}$. These are obtained by:

- substituting the decay factor value (λ) as a constant into the terms attached to β_{1t}, $\left(\frac{1-e^{-\lambda\tau}}{\lambda\tau}\right)$ and β_{2t}, $\left(\frac{1-e^{-\lambda\tau}}{\lambda\tau}-e^{-\lambda\tau}\right)$;
- setting these terms as a function of each bond's remaining term to maturity as shown for cell L2 in Table 116, which will provide a β_{1t} weight and β_{2t} weight for every bond in the sample; and
- performing Ordinary Least Squares (**OLS**) regression using the Excel Data Analysis tools' 'Regression' function. The Excel structure for setting out the data to which the OLS regression is applied is shown in Table 122.

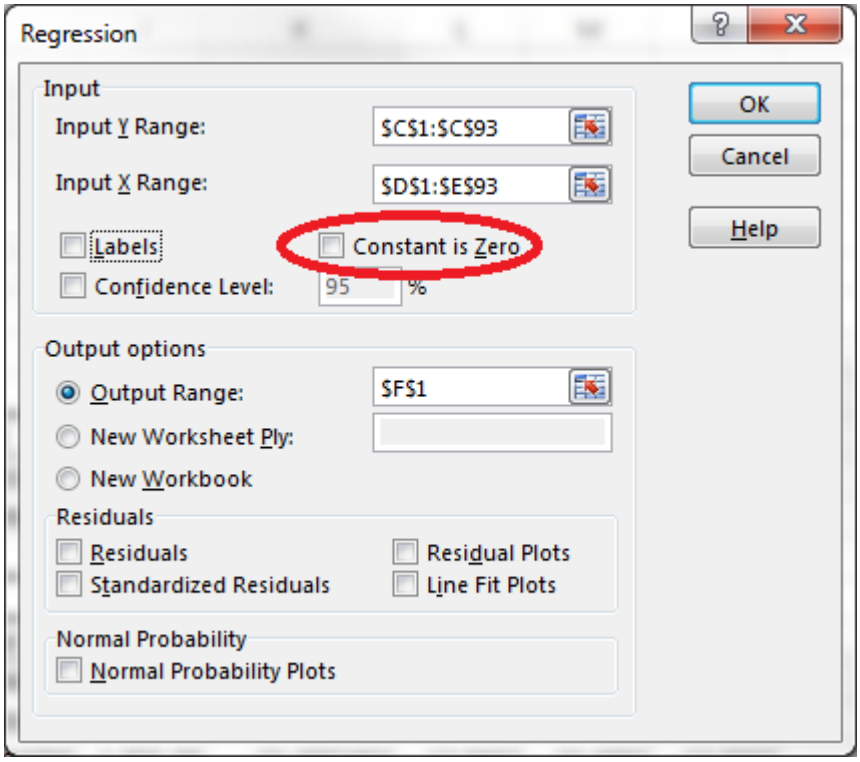
54. The Excel worksheet and regression settings are provided at Table 122 and Figure 40 respectively. The Y input values are the Australian dollar yield equivalents output for each bond as shown in cell R2 in Table 117. The X input values are the entire series of β_{1t} and β_{2t} weights associated with each of the bonds. Note that the 'Constant is zero' box shown in Figure 40 should be left unchecked so that an intercept term is included in the regression which will serve as a starting value for β_{0t}.

[876] This solution is output in cell A3 in Table 121 once the solver has found a solution.

Table 122 Nelson Siegel Starting Value Regression – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Decay factor λ	A1	Link to solution in cell A3 in Table 121.
Maturity (τ)	B1 down	The results of from cell L2 in Table 116
Australian dollar equivalent yield	C1 down	Values in V2 down in Table 118
β_{1t} weight factor	D1 down	=((1-EXP(-$A$1*B1))/($A$1*B1))
β_{2t} weight factor	E1 down	=(((1-EXP(-$A$1*B1))/($A$1*B1))-EXP(-$A$1*B1))

Figure 40 Nelson Siegel Starting Value Regression – Microsoft Excel Regression Settings



55. The intercept, X Variable 1 and X Variable 2 that appear under the coefficients in the Excel regression output table are used respectively as the starting value estimates for β_{0t}, β_{1t} and β_{2t} in the Nelson Siegel curve fitting process while the value in cell A1 in Table 122 is used as the starting value for λ.[877]

56. The Excel worksheet that replicates the Nelson Siegel curve fitting process is provided at Table 123.

[877] This is output into cells G17,G18 and G19 in the example set out above.

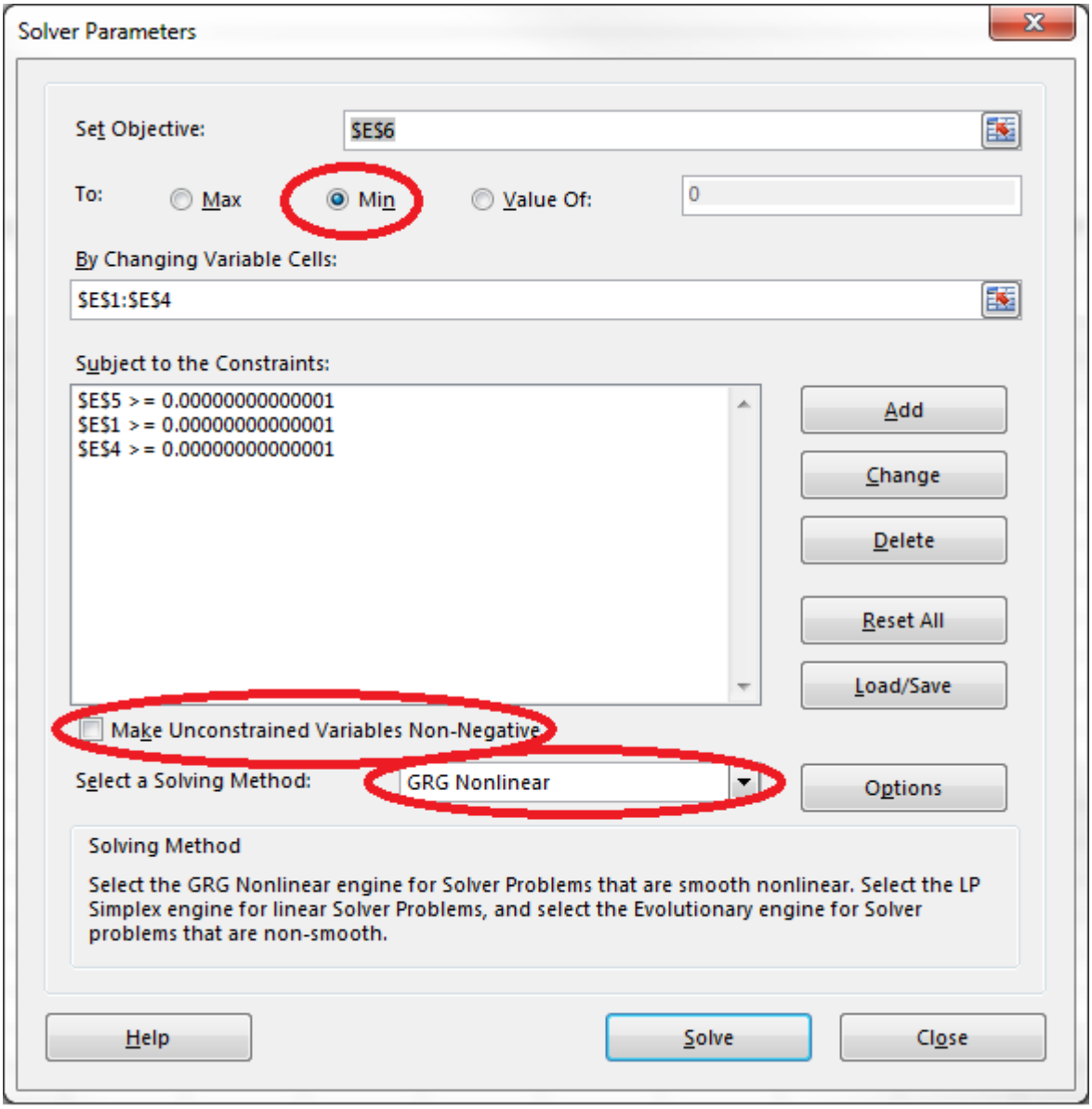
Table 123 Nelson Siegel Curve Fitting Methodology – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Remaining Term to Maturity	A1	Values as calculated by cell L2 in Table 116
Australian dollar equivalent yield	B1	Values in V2 down in Table 118
NS Functional Form	C1 down	=$E$1+$E$2*((1-EXP(-$E$4*A1))/($E$4*A1))+$E$3*(((1-EXP(-$E$4*A1))/($E$4*A1))-EXP(-$E$4*A1))
Squared Residual	D1 down	=(B1-C1)^2
β_{0t}	E1	Starting value for β_{0t} calculated above
β_{1t}	E2	Starting value for β_{1t} calculated above
β_{2t}	E3	Starting value for β_{2t} calculated above
λ	E4	Starting value for λ calculated above[878]
$\beta_{0t} + \beta_{1t}$	E5	= E1+E2
Sum of Squared Residuals	E6	=SUM(D:D)

57. The Excel solver settings (including constraints) that are required to minimize the sum of the squared residuals at cell E6 in Table 123 (by changing the values in the cells E1 through to cell E5) are provided in Figure 41. The associated GRG Nonlinear solver settings are provided at Figure 39.

[878] This cell is linked to the exact solution for the decay factor in order to avoid issues associated with truncating decimal places.

Figure 41 Nelson Siegel Parameter Constraints - Excel Solver Settings



58. The final solutions for $\beta_{0t}, \beta_{1t}, \beta_{2t}$ and λ in cells E1 to E4 in Table 123 must be entered back into the Nelson Siegel functional form to obtain tenor yields for 3, 5, 7 and 10 year terms.

59. The Excel Worksheet that calculates the semi-annual yields at each tenor (that is, as if bond interest payment are made every 6 months) is provided at Table 124. The additional Excel calculations that are required to annualise the output values for A2, B2, C2 and D2 in Table 124 so that it represents an effective annual interest rate at each tenor is provided in Table 125.

Table 124 Nelson Siegel Yield Estimation Methodology – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Tenor	A1:D1	Values 3, 5, 7 and 10.
3 year AUD yield (semi-annual basis)	A2	=$E1+$E2*((1-EXP(-$E4*A1))/($E4*A1))+$E3*(((1-EXP(-$E4*A1))/($E4*A1))-EXP(-$E4*A1))
5 year AUD yield (semi-annual basis)	B2	=$E1+$E2*((1-EXP(-$E4*B1))/($E4*B1))+$E3*(((1-EXP(-$E4*B1))/($E4*B1))-EXP(-$E4*B1))
7 year AUD yield (semi-annual basis)	C2	=$E1+$E2*((1-EXP(-$E4*C1))/($E4*C1))+$E3*(((1-EXP(-$E4*C1))/($E4*C1))-EXP(-$E4*C1))
10 year AUD yield (semi-annual basis)	D2	=$E1+$E2*((1-EXP(-$E4*D1))/($E4*D1))+$E3*(((1-EXP(-$E4*D1))/($E4*D1))-EXP(-$E4*D1))
β_{0t}	E1	Solution for β_{0t} output in cells E1 Table 123.
β_{1t}	E2	Solution for β_{1t} output in cells E2 Table 123.
β_{2t}	E3	Solution for β_{2t} output in cells E3 Table 123
λ	E4	Solution for λ output in cells E4 Table 123

Table 125 Annualising Semi-Annual Bond Yields - Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
3 year AUD yield (annual basis)	A3	=((1+A2/200)^2-1)*100
5 year AUD yield (annual basis)	B3	=((1+B2/200)^2-1)*100
7 year AUD yield (annual basis)	C3	=((1+C2/200)^2-1)*100
10 year AUD yield (annual basis)	D3	=((1+D2/200)^2-1)*100

60. The value for D3 in Table 125 is the Nelson Siegel 10 year cost of debt estimate. This value averaged with the 10 year cost of debt estimate from the other two methods is the Authority's final 10 year cost of debt estimate.

The Nelson-Siegel Svennson Methodology

61. The Nelson-Siegel Svennson Methodology assumes that the term structure of the cost of debt has the parametric form shown below:

$$\hat{y}_t(\tau) = \beta_{0t} + \beta_{1t}\left(\frac{1-e^{-\tau/\lambda_1}}{\tau/\lambda_1}\right) + \beta_{2t}\left(\frac{1-e^{-\tau/\lambda_1}}{\tau/\lambda_1} - e^{-\tau/\lambda_1}\right) + \beta_{3t}\left(\frac{1-e^{-\tau/\lambda_2}}{\tau/\lambda_2} - e^{-\tau/\lambda_2}\right)$$

Where

$y_t(\tau)$ is the yield at time t for maturity τ ; and

$\beta_{0t}, \beta_{1t}, \beta_{2t}, \beta_{3t}, \lambda_1, \lambda_2$ are the parameters of the model to be estimated from the data.

62. The Nelson-Siegel Svennson (**NSS**) methodology uses observed data from the bond market to estimate the parameters $\beta_{0t}, \beta_{1t}, \beta_{2t}, \beta_{3t}, \lambda_1$ and λ_2 by using the observed yields and maturities for bonds. A yield curve is produced by substituting these estimates into the above equation and plotting the resulting *estimated* yield $\hat{y}_t(\tau)$ by varying the maturity τ . $\hat{y}_t(\tau)$ has the interpretation of being the *estimated yield* for a benchmark bond with a maturity of τ for a given credit rating.

63. The NSS methodology uses two decay factors λ_1 and λ_2 . At each annual update the starting values for these parameters are based on the previous years' final estimates. The first annual update will use the values 1.6416 and 4.5834 for λ_1 and λ_2 respectively. The values for these decay factors in the subsequent annual update will use the final values for the decay factors resulting from the process set out below, and so forth for the following years. An exception to this is if the previous years' yield curve estimates are determined to be non-robust as set out in Table 131. In this situation the decay factors λ_1 and λ_2 from the latest set of robust yield curve estimates will be used.

64. Starting values are still required for β_{1t} , β_{2t} and β_{3t} . These are obtained by:

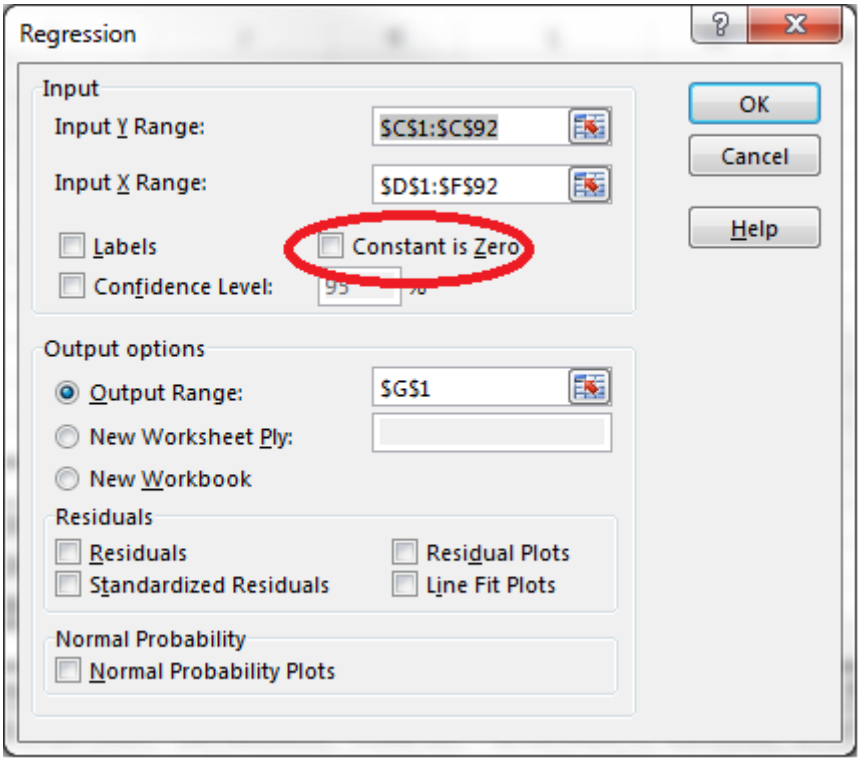
- substituting the decay factors (λ_1 and λ_2) as substitutes as constants into the terms attached to β_{1t} , $\left(\frac{1-e^{-\tau/\lambda_1}}{\tau/\lambda_1}\right)$, $\beta_{2t}\left(\frac{1-e^{-\tau/\lambda_1}}{\tau/\lambda_1} - e^{-\tau/\lambda_1}\right)$ and β_{3t} $\left(\frac{1-e^{-\tau/\lambda_2}}{\tau/\lambda_2} - e^{-\tau/\lambda_2}\right)$;
- setting these terms as a function of each bond's remaining term to maturity as shown for cell L2 in Table 116. This will result in a β_{1t} weight, β_{2t} weight and β_{3t} weight for every bond in the sample.
- performing an Ordinary Least Squares (**OLS**) regression is carried out using the Excel Data Analysis tools' 'Regression' function. The Excel structure for setting out the data to which the OLS regression is applied is shown in Table 126.

Table 126 Nelson Siegel Svennson Starting Value Regression – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Decay factor λ_1	A1	Last years' λ_1 .
Decay factor λ_2	A2	Last years' λ_2 .
Maturity (τ)	B1 down	The results of from cell L2 in Table 116
Australian dollar equivalent yield	C1 down	Values in V2 down in Table 118
β_{1t} weight factor	D1 down	=((1-EXP(-B1/$A$1))/(B1/$A$1))
β_{2t} weight factor	E1 down	=((((1-EXP(-B1/$A$1))/(B1/$A$1)))-(EXP(-B1/$A$1)))
β_{3t} weight factor	F1 down	=((((1-EXP(-B1/$A$2))/(B1/$A$2)))-(EXP(-B1/$A$2)))

65. The Excel worksheet and regression settings are provided at Table 126 and Figure 42 respectively. The Y input values are the Australian dollar yield equivalents output for each bond as shown in cell V2 in Table 118. The X input values are the entire series of β_{1t}, β_{2t} and β_{3t} weight factors associated with each of the bonds. Note that the 'Constant is zero' box shown in Figure 42 should be left unchecked so that an intercept term is included in the regression which will serve as a starting value for β_{0t}.

Figure 42 Nelson Siegel Svennson Starting Value Regression – Microsoft Excel Regression Settings



66. The intercept, X Variable 1, X Variable 2 and X Variable 3 that appear under the coefficients in the Excel regression output Table are used respectively as the starting value estimates for $\beta_{0t}, \beta_{1t}, \beta_{2t}$ and β_{3t} in the Nelson-Siegel Svennson curve fitting process while the values in cell A1 and A2 in Table 126 are used as the starting values for λ_1 and λ_2.[879]

67. The Excel worksheet that replicates the Nelson-Siegel Svennson curve fitting process is provided at Table 127.

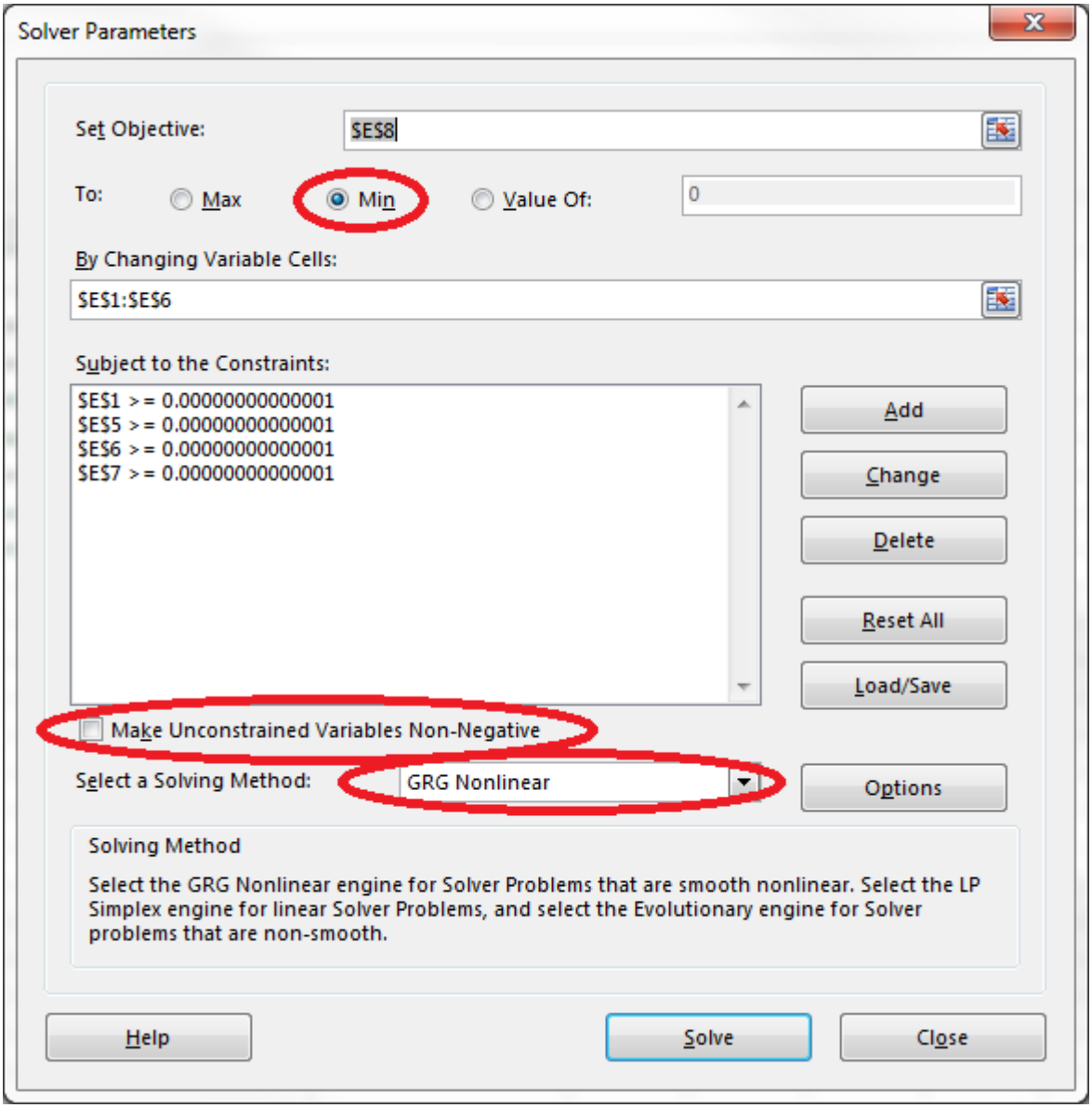
[879] This is output into cells H17, H18, H19 and H20 in the example set out above.

Table 127 Nelson Siegel Svennson Yield Curve Estimation Methodology – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Remaining Term to Maturity	A1	Values as calculated by cell L2 in Table 116
Australian dollar equivalent yield	B1	Values in V2 down in Table 118
NSS Functional Form	C1	=$E$1+$E$2*((1-EXP(-A1/$E$5))/(A1/$E$5))+$E$3*((((1-EXP(-A1/$E$5))/(A1/$E$5)))-(EXP(-A1/$E$5)))+$E$4*((((1-EXP(-A1/$E$6))/(A1/$E$6)))-(EXP(-A1/$E$6)))
Squared Residual	D1	=(B1-C1)^2
β_{0t}	E1	Starting value for β_{0t} calculated above
β_{1t}	E2	Starting value for β_{1t} calculated above
β_{2t}	E3	Starting value for β_{2t} calculated above
β_{3t}	E4	Starting value for β_{3t} calculated above
λ_1	E5	Last years' λ_1 .
λ_2	E6	Last years' λ_2 .
$\beta_{0t} + \beta_{1t}$	E7	= E1+E2
Sum of Squared Residuals	E8	=SUM(D:D)

68. The Excel solver settings (including constraints) that are required to minimize the sum of the squared residuals at cell E8 in Table 127 (by changing the values in the cells E1 through to cell E6) are provided in Figure 43. The associated GRG Nonlinear Solver Settings are provided at Figure 39.

Figure 43 Nelson Siegel Svennson Parameter Constraints – Microsoft Excel Solver Settings



69. The final solutions for $\beta_{0t}, \beta_{1t}, \beta_{2t}, \beta_{3t}, \lambda_1$ and λ_2 output in cells E1 to E6 in Table 127 must be entered back into the Nelson-Siegel Svennson functional form to obtain tenor yields for 3, 5, 7 and 10 year terms.

70. The Excel worksheet that calculates semi-annual yields at each tenor (that is, as if bond interest payment are made every 6 months) is provided at Table 128. The additional Excel Calculations that are required to annualise the output values for A2, B2, C2 and D2 in Table 128, so that outputs represent an effective annual interest rate at each tenor, are provided at Table 129.

Table 128 Nelson Siegel Svennson Yield Estimation Methodology – Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Tenor	A1:D1	Values 3, 5, 7 and 10.
3 year AUD yield (semi-annual basis)	A2	=$E1+$E2*((1-EXP(-A1/$E5))/(A1/$E5))+$E3*((((1-EXP(-A1/$E5))/(A1/$E5)))-(EXP(-A1/$E5)))+$E4*((((1-EXP(-A1/$E6))/(A1/$E6)))-(EXP(-A1/$E6)))
5 year AUD yield (semi-annual basis)	B2	=$E1+$E2*((1-EXP(-B1/$E5))/(B1/$E5))+$E3*((((1-EXP(-B1/$E5))/(B1/$E5)))-(EXP(-B1/$E5)))+$E4*((((1-EXP(-B1/$E6))/(B1/$E6)))-(EXP(-B1/$E6)))
7 year AUD yield (semi-annual basis)	C2	=$E1+$E2*((1-EXP(-C1/$E5))/(C1/$E5))+$E3*((((1-EXP(-C1/$E5))/(C1/$E5)))-(EXP(-C1/$E5)))+$E4*((((1-EXP(-C1/$E6))/(C1/$E6)))-(EXP(-C1/$E6)))
10 year AUD yield (semi-annual basis)	D2	=$E1+$E2*((1-EXP(-D1/$E5))/(D1/$E5))+$E3*((((1-EXP(-D1/$E5))/(D1/$E5)))-(EXP(-D1/$E5)))+$E4*((((1-EXP(-D1/$E6))/(D1/$E6)))-(EXP(-D1/$E6)))
β_{0t}	E1	Solution for β_{0t} output in cells E1 Table 127
β_{1t}	E2	Solution for β_{1t} output in cells E2 Table 127
β_{2t}	E3	Solution for β_{2t} output in cells E3 Table 127
β_{3t}	E4	Solution for β_{3t} output in cells E4 Table 127
λ_1	E5	Solution for λ_1 output in cells E5 Table 127
λ_2	E6	Solution for λ_2 output in cells E6 Table 127

Table 129 Annualising Semi-Annual Bond Yields - Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
3 year AUD yield (annual basis)	A3	=((1+A2/200)^2-1)*100
5 year AUD yield (annual basis)	B3	=((1+B2/200)^2-1)*100
7 year AUD yield (annual basis)	C3	=((1+C2/200)^2-1)*100
10 year AUD yield (annual basis)	D3	=((1+D2/200)^2-1)*100

71. The value at D3 in Table 129 is the NSS 10 year cost of debt estimate. This value averaged with the 10 year cost of debt estimate from the other two methods is the Authority's final 10 year cost of debt estimate.

Step 5: Estimate the regulatory debt risk premium

72. The annualized 10 year cost of debt estimate from each of the three methodologies provided above is averaged to arrive at the Authority's final estimate of the 10 year cost of debt. Specifically, this is the simple average of cell F4 in Table 120, D3 in Table 125 and D3 in Table 129. The DRP is then calculated as the spread between the 10 year cost of debt and the average value of the AUD 10 year IRS rate averaged over the same averaging period used for the observed AUD equivalent bond yields above. The average value of the AUD 10 year IRS rate is obtained by downloading AUD 10 year IRS rate data from Bloomberg for each of the trading days in the averaging period; calculating the average of these observations; and then annualising assuming semi-annual payments. The Excel worksheet that calculates the Authority's final estimate of the 10 year cost of debt is provided at Table 130.

Table 130 Debt Risk Premium Calculation - Microsoft Excel Template Structure

Attribute	Cell	Formula or entry
Trading day date	A1 down	dd/mm/yyyy
AUD 10 year IRS rate	B1 down	=BDH("ADSWAP10 Curncy","PX_LAST",A1,A1)
Average (20 day averaging period example)	B21	=AVERAGE(B1:B20)
Annualized average AUD 10 year IRS rate	B22	=((1+B21/100/2)^2-1)*100
10 year final cost of debt estimate	B23	=AVERAGE(Table 6!F4,Table 11!D3,Table 15!D3)[880]
10 year DRP	B24	=B23-B22

73. The value at cell B24 in Table 130 is the Authority's final 10 year DRP estimate that is used in calculating the return on debt.

[880] This formula assumes that the Excel worksheets have been named after the tables outlined above. For example, Table 6 Linear Interpolation and Extrapolation of Gaussian Kernel Estimates – Microsoft Excel Template Structure is a worksheet in Excel labelled "Table 6". Table 6!F4 makes reference to cell F4 in Table 6.

Contingency approaches to data related issues

74. In the event that there are unexpected problems with the data or results of applying the automatic formulas, the Authority will adopt the following actions outlined in Table 131.

Table 131 Contingency approaches to data related issues

Event	Changes to Approach
A) No bonds in the sample – resulting fro the application of the bond yield approach criteria in Table 1 – have a remaining term to maturity equal to or greater than 10 years (from the last da of the nominated averaging period).	A linear extrapolation will be carried out using the formula outlined below this table. The yield inputs into that formula be the averages of all three methods (Gaussian kernel, NS and NSS) at: • a 7 year tenor (where this means "effective tenor" wh applied to the Gaussian kernel); and • at the effective tenor (where this means "effective ten when applied to the Gaussian kernel) that is equal to the effective tenor that results from adopting a target tenor of 1(years in the Gaussian kernel method. The effective tenor is the weighted average tenor of the sample using the Gaussian kernel weights associated with target tenor.
B) The number of bonds in the sample result in non-robust parametric curve estimates.	Non-robust is defined as the standard deviation between ea of the three yield estimates using each method (Gaussian kernel, NS and NSS reported on a semi-annual basis) beinç equal to or greater than 105 basis points using the '=stdev' formula in Microsoft Excel.[881] Under this circumstance the averaging period will be extenc back into the past by 20 trading day increments at a time, back from the earliest day in the averaging period. The averaging period will continue to be extended this way until the standard deviation between the three estimates falls un 105 basis points.
C) Bloomberg bond data becomes inaccessible.	The Reserve Bank of Australia (**RBA**) 'Aggregate Measures Australian Corporate Bond Spreads and Yields' bond yield data for the BBB band credit rating will take the place of the Authority's estimates and will be extrapolated to 10 years using the equation outlined below this table.

75. The linear extrapolation referred to in the third row of Table 131 above is as follows:

$$y_t(10) = y_t[7] + \left(\frac{y_t[et(10)] - y_t[7]}{et(10) - 7} \right)(10 - 7)$$

Where:

[881] The Authority has added further clarification on this contingency to ensure the yield estimates from the three different methods are used as inputs in the standard deviation formula.

$y_t[et(10)]$ is the average of all three methods estimated cost of debt (as per event A in Table 131) or the RBA's data (as per event C in Table 131).

$et(10)$ is the effective tenor resulting from the 10 year target reported by the Authority's Gaussian kernel approach (as per event A in Table 131) or that corresponding to the effective tenor corresponding the RBA's 10 year estimate (as per event C in Table 131).

$y_t[7]$ is the average of all three methods estimated cost of debt at a 7 year tenor (as per event A in Table 131) or the RBA's data at the target tenor of 7 years (as per event C in Table 131).[882]

Estimates prior to DRP_{2015}

76. The Reserve Bank of Australia's (**RBA**) data provides an available source of historic credit spreads for 10 year non-financial corporate bonds. The Authority has determined to adopt the RBA credit spread estimates for the historic DRP estimates – up to 31 March 2015 – for incorporation in the trailing average for this Draft Decision.[883] For the Final Decision, the RBA credit spread estimates up to the beginning of GGT's nominated averaging period will be used.

77. The RBA monthly estimates for the 10 year BBB spread (the series 'Non-financial corporate BBB-rated bonds – Spread to swap – 10 year') for the period June 2005 to March 2015 will be used for estimating the past DRP, prior to the Authority's 2 April 2015 estimate.

78. The monthly RBA estimates are interpolated to daily estimates, and a simple average of each year of daily observations is then made.

79. In this case, the DRP_t is estimated as shown below:

$$DRP_t = \frac{\sum_{D=1}^{Days\ in\ year} DRP_D}{Days\ in\ year}$$

Where

DRP_D is the DRP for day D in regulatory year t.

80. So for example:

- the average of daily DRPs for the period 1 January 2006 to 31 December 2006 provides the estimated annual DRP for 2006, which gives the first term DRP_{2006} in the trailing average DRP estimate for 2015, $TA\ DRP_{2015}$;

[882] Event A requires the procedure outlined in paragraph 46 to interpolate the cost of debt at the 7 year tenor for the Authority's Gaussian kernel approach. This is not required for the NS and NSS curve 7 year estimates.

[883] Reserve Bank of Australia, *Aggregate Measures of Australian Corporate Bond Spreads and Yields - F3*, www.rba.gov.au/statistics/tables/index.html#interest-rates, updated monthly.

- it may be noted here that given the automatic formula for the trailing average, the term DRP_{2006} in the trailing average DRP estimate for 2015 would drop out of the trailing average estimate for 2016, $TA\ DRP_{2016}$, and be automatically replaced by the term DRP_{2016};
- the final term DRP_{2015} in the trailing average DRP estimate for 2015, $TA\ DRP_{2015}$, is given by the daily interpolated RBA estimates for the period 1 January 2015 to 30 March 2015, with daily estimates for the final period of the financial year for 1 April 2015 to 31 December 2015 given by the Authority's 2 April 2015 estimate of the DRP, which is 1.982 per cent. The resulting year of daily estimates is averaged to give the DRP estimate for 2015 for inclusion in the trailing average estimate to apply for calendar year 2015. This is shown in detail in the next section.

Composition of DRP estimators for the AA3 regulatory period

81. As noted above, the annual update of the trailing average debt risk premium component of the rate of return in each year of the Access Arrangement Period is to be calculated by applying the following automatic formula:

$$TA\ DRP_0 = \frac{\sum_{t=0}^{-9} DRP_t}{10}$$

Where

$TA\ DRP_0$ $TA\ DRP_0$ is the equally weighted trailing average of the DRP to apply in the following year as the annual update of the estimate used in the current year; and

DRP_t is the DRP estimated for each of the 10 regulatory years t = 0, -1, -2…. , -9.

2015 calendar year

82. For the 2015 calendar year estimate (which apply from 1 January 2015 to 31 December 2015, before being superseded by the 1 January 2016 update), the following estimates will be included in the trailing average:

- t=-9: January to December 2006: DRP_{2006}: simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-8: January to December 2007: DRP_{2007}: simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-7: January to December 2008: DRP_{2008}: simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-6: January to December 2009: DRP_{2009}: simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-5: January to December 2010: DRP_{2010}: simple average of (interpolated daily) RBA DRP estimates for the period;

- t=-4: January to December 2011: DRP_{2011}: simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-3: January to December 2012: DRP_{2012}: simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-2: January to December 2013: DRP_{2013}: simple average of (interpolated daily) RBA DRP estimates for the period;
- t=-1: January to December 2014: DRP_{2014}: simple average of (interpolated daily) RBA DRP estimates for the period;
- t=0: January to December 2015: DRP_{2015}: weighted average comprising 25% (interpolated daily) RBA DRP estimates for the period January to March 2015 and 75% the Authority's current (t=0) DRP estimate (interpolated daily to the prior RBA 31 March 2015 estimate).

83. As noted above, the Authority's 2 March 2015 estimate contributes to the t=0 estimate in the 2015 DRP hybrid trailing average, for that period that falls after March 2015 (prior to that date, RBA actual data is available).

84. The DRP_t estimates, consistent with the above, contributing to the calendar 2015 trailing average DRP estimate TA DRP_{2015} for this Draft Decision, which is 2.502 per cent, are published here as follows:

calendar year 2006: DRP_{2006}: 0.724 per cent;

calendar year 2007: DRP_{2007}: 1.241 per cent;

calendar year 2008: DRP_{2008}: 3.489 per cent;

calendar year 2009: DRP_{2009}: 4.624 per cent;

calendar year 2010: DRP_{2010}: 2.127 per cent;

calendar year 2011: DRP_{2011}: 2.371 per cent;

calendar year 2012: DRP_{2012}: 3.172 per cent;

calendar year 2013: DRP_{2013}: 3.068 per cent;

calendar year 2014: DRP_{2014}: 2.250 per cent;

calendar year 2015: DRP_{2015}: 1.953 per cent.

Appendix 9 Authority's required amendments and recommendations to GGT's Terms and Conditions applying to the Firm Service

Part 1 – Provisions the Authority requires to be amended

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
Obligation to provide the Firm Service			
1-3	Varies current clause 1.1 (General Terms and Conditions). Minor changes to terminology/definitions to be consistent with the terminology in NGR and other APA Group access arrangements, including changing references from "GGT" to "Service Provider" and "Service Agreement" to "Transportation Agreement".	While the wording of proposed clause 3 is taken from the wording of current clause 4.1, the provision is now circuitous since GGT has also amended the definition of the "Firm Service" so that it is now defined as the "Reference Service…". It does not appear to serve any useful purpose or add anything to the document.	*Delete proposed clause 3.*
4	Varies current clause 2 (Agreement to Provide and to Accept Service). Concept of Order Form is no longer used. The Order Form and associated processes are	Proposed clause 4 is poorly worded. E.g. it refers to "Users" generally, where it should refer to the particular User who has entered into the Transportation Agreement.	*Amend proposed clause 4 as follows:* *"Where User has entered into a Transportation Agreement with Service Provider to provide the Firm Service, Service Provider will provide the Firm Service to*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	cumbersome and make commercial dealings difficult for Service Provider and User. Proposed clause 4 is taken from the AER approved Roma Brisbane Pipeline (RBP) AA T&Cs.		*User~~s~~ ~~with whom it has a Transportation Agreement to provide the Firm Service~~, in accordance with these Terms and Conditions."*
Prudential requirements			
5	Current clause 9.13 (bond/deposit) deleted and replaced with proposed clause 5. Proposed clause 5 covers prudential requirements for User. This clause is based on the RBP AA T&Cs clause and better reflects the commercial realities of these arrangements and what financial surety is provided. The concept of performance bond is also not used anymore in practice, hence its deletion.	While Proposed clause 5 may be "based on the RBP AA T&Cs clause", it also has some differences. The words "*issued by a bank which has an office in Australia and has a credit rating of at least A by S&P or A2 by Moody's and is for an undrawn amount equal to a minimum of 6 months of Charges payable and User must maintain it for 6 months after termination of the Transportation Agreement*" do not appear in the RBP AA. GGT has not explained why these additional words were included. While they may have been included in an attempt to give more certainty as to the type of guarantee required, in doing so they also introduce some uncertainties of their own. E.g. How will "*a minimum of 6 months of Charges payable"* be calculated given that some of the Charges are variable based on throughput, and others may not necessarily arise (overrun, imbalance, daily variation). How will the amount of the bank guarantee be fixed for these charges? Also, in replacing current clause 9.13 of the current AA (which requires a "bond, deposit or other security") with proposed clause 5 (which requires a "parent company guarantee, bank guarantee or similar security") GGT	*Amend T&Cs to require GGT to act reasonably when determining both the type of security and its amount and to reinstate User safeguards along the lines of current clauses 9.13(a)(1), (2), (3) & (4) (matters GGT must have regard to when determining type and amount of security) and 9.13(c) (interest on security deposits).*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		has also, removed some important safeguards for Users, namely: while current clause 9.13(a) requires GGT to act reasonably when determining *both* the type of security *and* its amount, under proposed clause 5 GGT is only required to act reasonably when determining the type of guarantee, not its amount; and the list of matters GGT must have regard to when assessing the type and amount of security has been removed (see former clauses 9.13(a)(1), (2), (3) and (4), now deleted); and the requirement in current clause 9.13(c) (now deleted) for GGT to pay interest on any security deposit has been removed.	
Nominations			
6-10	Includes clause included in RBP AA T&Cs enabling Users to revise their nominations and requires User to vary their nomination if required by any direction or requirement of a Governmental Authority. Relocates current clause 5.2 (daily nominations) to proposed clause 6 with minor amendments. Nomination time revised down from 7 to 3 days which benefits User. The	The reduction in the notice period for nominations from 7 to 3 days appears acceptable as it benefits the User. However, it is unclear if the replacement of nomination forms with use of the APA Grid tool (Information Interface) has a net benefit for Users. Is the APA Grid tool compatible with Users' existing systems or must they outlay added expense in order to use it (e.g. hardware, software and/or staff training)? In the absence of user submissions, the Authority accepts the proposed change. The proposed Nomination Deadline of 4.00pm on the day before the relevant gas day under proposed clause 7 appears to allow Users 2 more hours in which to nominate than the current 18 hour deadline under current clause 5.5.	*Amend proposed clause 7 to read as follows:* *"7. The User may revise its Nomination:* *a. for ~~the Firm Service~~ a Delivery Point for a Day; or* *b. for the Receipt Point for a Day ~~in order to correct an Imbalance~~, by giving Service Provider an updated Nomination for that Day prior to the Nomination Deadline."* *Amend proposed clause 10 to read as follows:*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	concept of the Nomination Form has also been deleted as Users make nominations through the APA Grid tool (Information Interface).	However, the User's right to revise its Nomination for the Receipt Point (proposed clause 7(b)) is now limited to cases where it does so "*in order to correct an Imbalance*". There was no such limitation in the current clause 5.5 and GGT has given no justification for it (other than that it applies in the RBP AA). It is not clear from the proposed clause 10 if the User must only comply with directions given by GGT *in order to facilitate compliance with any direction or requirement of a Governmental Authority*, or whether the User must comply with all *reasonable directions of* GGT. Proposed clause 10 should be amended to clarify that the new obligation for Users added by GGT is limited to cases of compliance with the requirement of a Governmental Authority. There is a drafting discrepancy between the proposed clause 6 and clause 7, in that "Firm Service" is referred to with a different name. This creates uncertainty and accordingly, the Authority requires an amendment to proposed clause 7.	"*The User must promptly comply with all reasonable directions of Service Provider, (including by making or varying Nominations), given in order to facilitate compliance with any lawful direction or requirement of a Governmental Authority.*"
Scheduling			
11-14	GGT has introduced scheduling provisions to avoid "ambiguity in respect of daily operation of pipeline" (see AA Supporting Information at page 13). GGT claims it has adopted the scheduling provisions of the RBP AA.	**Proposed clause 11:** The scheduling is to occur following receipt of User's nomination. It should also be expressly subject to any *revised* nomination made under new clause 7. Drafting of proposed clause 11 also needs to expressly link the scheduling to each Gas Day to which the Nomination relates. The reference in proposed clause 11(b) to gas "confirmed" for supply does not make clear who provides that confirmation (and how or when).	*Amend proposed clause 11 to read as follows:* *"Following the receipt of the User's Nomination (including any revision of the User's Nomination in accordance with clause [7]), Service Provider must (subject to any adjustments Service Provider (acting reasonably) deems necessary to maintain the operational integrity of the Pipeline in accordance with Good Engineering and*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		Proposed clause 12(b): refers to "Users *with* Transportation Agreements for Negotiated Services" but change "with" to "under" (as per terminology used in new cl 12(a)). Otherwise, if a single User has both negotiated and non-negotiated services, use of "with" creates a possibility that their nominations under *both* agreements could be counted at the second stage in clause 12(b) (which makes no sense). **Proposed clause 13:** Does not expressly state when and how Service Provider will inform User of any scheduling or re-scheduling. **Proposed clause 14:** Should allow a User a *reasonable period* in which to respond to GGT's request for a schedule of User's nomination priorities. At the moment the clause expects an instant response from User or else User loses its right to choose its priorities.	*Operating Practice or to comply with any laws and subject to certain other exceptions specified in these Terms and Conditions), in respect of each Day to which the Nomination relates, Schedule for acceptance at the Receipt Point and Delivery Points the lesser of:* *in respect of the Receipt Point,* a. *the quantity of Gas Nominated by the User at the Receipt Point for that Day; and* b. *the aggregate quantity of Gas confirmed for supply on account of the User at the Receipt Points for that Day by Interconnect Parties at the Receipt Point; and* *in respect of a Delivery Points,* c. *the quantity of Gas Nominated by the User for delivery at the Delivery Points for that Day; and* d. *the quantity of Gas confirmed for acceptance on account of the User at the Delivery Points for that Day by the Interconnect Parties at the Delivery Points."* *Amend proposed clause 12(b) to change "Users with Transportation Agreements for Negotiated Services" to "Users under Transportation Agreements for Negotiated Services".* *Amend proposed clause 13 to expressly state when and how Service Provider will*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
			inform User of any scheduling or re-scheduling (e.g. "as soon as reasonably practicable, but in any event within [ ] hours of it being made"). *Amend proposed clause 14 to allow a User a reasonable period in which to respond to GGT's request for a schedule of User's nomination priorities.*
Curtailment			
15-16	Based on RBP AA T&Cs	Clauses 15 & 16 provide GGT with rights to interrupt or curtail the firm service that are in addition to the rights to interrupt or reduce the firm service that GGT has under current clause 8 of the current AA2 T&Cs (which GGT has also sought to include in its revised T&Cs at proposed clauses 30-36 (Operation of the Pipeline). This would allow GGT significant ability to interrupt/curtail that goes beyond what is permitted in the current AA2 T&Cs and, given GGT has also incorporated its rights from the current AA2 T&Cs, the Authority queries why GGT also needs proposed clauses 15 and 16? Proposed clause 15 should be confined to setting out the order of precedence for curtailments that GGT must (not "may") follow when they occur, not (as currently drafted) potentially providing an expansion of GGT's exclusion of liability for interruptions and curtailments.	*Amend proposed clause 15 to make it an obligation of GGT (change "may" to "must") and to expressly state that nothing in the clause is to be taken as excluding, restricting or modifying GGT's liability in respect of any curtailment of or interruption to the receipt, transportation or delivery of gas.* *Delete proposed clause 16 and replace with an indemnity from GGT to User for losses etc. suffered where GGT interrupts or reduces the firm service:* *except in accordance with proposed clauses 31, 32, 33 and 34 - but not where interruptions or reductions are for:* • *unplanned maintenance or other unplanned activities,* • *"emergencies" caused by circumstances that were within GGT's reasonable prevention or control, or*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		Similarly, proposed clause 16 should be deleted so as to prevent it widening GGT's existing exclusions of liability for interruptions and curtailments. The Authority also notes a number of issues with GGT's existing rights and exclusions of liability in relation to interruptions and curtailments (i.e. current clause 8 which GGT has sought to include (in part) in proposed clauses 30-36 (Operation of the Pipeline). These issues are highlighted by proposed clause 16 and do not seem consistent with the efficient operation of a pipeline in accordance with Good Engineering and Operating Practice (**GEOP**) and the NGO. For example, given that GGT already has the protection of the force majeure provisions in the agreement (i.e. essentially providing relief from liability where a matter is beyond GGT's reasonable control), the Authority is of the view that GGT does not require further relief for "unplanned" maintenance (as sought by GGT under proposed clause 16(a) and as also contemplated under current clause 8.3(b)(2)). If unplanned maintenance arises from something beyond GGT's reasonable control, it can seek relief under force majeure (and does not need a special liability exclusion). If, however, unplanned maintenance arises from something that is not beyond GGT's reasonable control, then there is no good reason why GGT should have any special liability exclusion for it. Similarly, while it is reasonable and consistent with GEOP that GGT be permitted to interrupt/curtail the firm service in emergencies and for planned	• *planned maintenance or other planned activities exceeding a set number of consecutive days or a set number of days (whether or not consecutive) in any rolling period of 30 days; or* *except in accordance with proposed clauses 98-101 (force majeure).*

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		maintenance, the Authority is of the view that some reasonable limits need to be set, such as: • GGT should not escape liability for the interruption/curtailment if and to the extent the "emergency" could have been prevented by GGT taking reasonable precautionary measures (i.e. if the emergency was, in effect, within GGT's reasonable prevention or control). Otherwise, for example, the "emergency" excuse could be used even if GGT was to blame for causing the emergency, which could give rise to poorer pipeline safety and reliability, which in turn would not be consistent with the NGO. • the duration of the interruption/curtailment for planned maintenance does not exceed a set number of consecutive days or a set number of days (whether or not consecutive) in any rolling period of 30 days. This would provide an incentive for GGT to keep its planned maintenance to within reasonable limits. • GGT must otherwise have complied with the requirements in new clauses 32 and 34.	
Imbalances			
17-21	Based on RBP AA T&Cs.	**Proposed clause 17:** requires Users to balance their receipts and deliveries of gas, but in order to do this they will presumably need to have relevant information available to them, some of which they will need to get	*Amend proposed clause 17 as follows:* *"The User must use reasonable endeavors to ensure that receipts of Gas at the Receipt Point and deliveries of Gas at Delivery Points are equal, adjusted for any Authorised*

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		from GGT. GGT has not included any express obligations to itself provide this information. Current clause 5.4(b) (which GGT has removed from its proposed T&Cs for AA3), required GGT to give Users notice of their imbalances and allow them to exchange those imbalances with other Users. The Authority considers that this offered Users: • information they could use to reduce their imbalances; and • a way of avoiding imbalance charges by exchanging imbalances with other Users. Current clause 7.1(c) (which GGT has also removed from its proposed T&Cs for AA3), contains an important protection for Users. Current clause 7.1(c) provides: "*GGT acting as a reasonable and prudent pipeline operator will to the extent reasonably practicable provide Users with specific information on a timely basis sufficient for the User to assess potential liability for Quantity Variation Charges and take action to avoid those charges*" If provisions such as those in current clauses 5.4(b) and 7.1(c) are not included in the proposed T&Cs then this could potentially adversely affect Users. **Proposed clause 18:** requires Users to correct their gas imbalances adjusting nominations and coordinating their receipts and deliveries. It should also mention their ability to do this by exchanging imbalances with other users (as was previously expressly permitted by old clauses 5.4(c) and 7.2(f). If	*Imbalances. Service Provider acting as a reasonable and prudent pipeline operator will, to the extent reasonably practicable, provide User [(which may be via the Information Interface)] with specific information on a timely basis sufficient for the User to assess potential liability for Imbalance Charges and Overrun Charges and take action to avoid those charges. Without limiting the foregoing, Service Provider will notify each User [(which may be via the Information Interface)] of its outstanding Imbalance before 11:00 am on each Day."* *Amend proposed clause 18 to reinstate provisions such as those in current clauses 5.4(c) and 7.2(f) and include references to the Information Interface (if that is the means by which GGT proposes providing Users with the necessary information). For example, amend proposed cl 18 as follows:* *"The User must promptly take steps to correct Unauthorised Imbalances or potential Unauthorised Imbalances by adjusting Nominations and coordinating receipts and deliveries with Service Provider or by exchanging all or part of their Imbalances with other Users including by assigning by way of subcontract in accordance with clause [108] [(which may be via the Information Interface)], in which case Service Provider must adjust each such User's Imbalance and*

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		provisions such as those in current clauses 5.4 and 7.2(f) are not included in the proposed T&Cs then this could potentially adversely affect Users. **Proposed clause 19:** gives GGT rights to correct an imbalance by reducing the User's receipts and/or deliveries of gas and/or buying or selling "the User's Gas". The trigger for GGT to be able to exercise these rights is if GGT believes on reasonable grounds that an unauthorized imbalance may impair gas scheduled under any transportation agreement, whereas previously (under current clause 7.2(i) which GGT has removed) the trigger is if the User is liable for 7 or more consecutive days of imbalance charges – which is arguably a more transparent and clear threshold for Users. Further, GGT is now seeking to allow itself the ability to exercise its correction rights to the extent necessary to enable it to transport gas scheduled under any transportation agreement (not just the User's transportation agreement), whereas currently (under current clause 7.2(i)) GGT's correction rights are limited to what is necessary to reset the User's imbalance to zero. This would seem to potentially transfer excessive operational risk from GGT to the User. If GGT's rights are extended in this way, the Authority is of the view that Users will be disadvantaged. **Proposed clause 20:** requires the User to indemnify GGT for all costs and expenses reasonably incurred by GGT in buying or selling gas or re-scheduling to correct an imbalance under proposed clause 19. The	*relevant charges to reflect the exchange [(and show the adjustment via the Information Interface)]* " *Amend proposed clause 19 to:* • *reinstate provisions from current clause 7.2(i) – so that the trigger for GGT to be able to exercise its correction rights should be changed back to 7 consecutive days of imbalance charges and the extent of GGT's correction rights is limited to resetting the outstanding imbalance to zero;* • *delete reference to "the User's" gas, where it is used in relation to GGT buying or selling "the User's" Gas (as the gas in the pipeline will not belong to the User, as title will have passed to GGT at the receipt point); and* • *include a longer cure period than 4 hours for Users to correct an imbalance.* *Amend proposed clause 20 to include additional limits on the indemnity:* • *to prevent double recovery by GGT (e.g. to the extent it is compensated for its costs via the imbalance charge, by inclusion in the regulated tariff or otherwise, it*

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		indemnity is expressly not to be limited by the exclusion of liability in clause 93 (consequential loss etc.). It would allow GGT to recover all of its costs and expenses reasonably incurred, including not only the actual gas price paid where it buys gas, but also potentially the amount of any loss made where it sells gas or has to re-schedule to correct an imbalance. There is no requirement for GGT to act reasonably to mitigate its loss. By comparison, under current clause 7.2(j)(1) (which GGT has removed), the User is to be charged for gas *bought* by GGT to re-set an imbalance to zero at "twice the prevailing Used Gas price" – where Used Gas is charged "at cost" (item 2 of Fourth Schedule to existing T&Cs). This "twice actual gas price" aspect made the existing process appear potentially "penal" in nature (and therefore potentially unenforceable by GGT at law) unless the "twice actual gas price" aspect could be justified as necessary to compensate for GGT's other costs (i.e. other than the gas price) associated with buying gas (and provided that GGT was not already compensated for those "other costs" via the "accumulated imbalance charge" mechanism or by allowance made for cost recovery in the regulated tariff). In any case, GGT's proposed new indemnity for actual costs (by replacing the "twice actual gas price" mechanism) would appear to address these concerns where GGT is buying gas, provided that additional limits are set on the indemnity: • to prevent double recovery by GGT (e.g. to the extent it is compensated for its costs via the imbalance charge, by inclusion in the regulated tariff or otherwise, it should not be	*should not be allowed to recover for them via the indemnity);* • *to require GGT to use at least reasonable endeavours to ensure that the price paid for the gas is reasonable (as was required under item 2 of the Fourth Schedule to the existing T&Cs) – and GGT must be able to demonstrate (with documentary evidence) to the User's reasonable satisfaction that this has been done;* • *to require that, if the buyer/seller is in any way related to GGT, then, in addition to GGT acting reasonably, GGT must be able to show (with documentary evidence) to the User's reasonable satisfaction that the price is a fair and reasonable market price as if the parties were acting at arm's length; and* • *to reduce the amount GGT can recover under the indemnity to the extent the loss was caused or contributed to by negligence, breach of contract or other default on the part of GGT or anyone acting for or on behalf of GGT (or a related body corporate of GGT) or by a force majeure event. The liability limitations for consequential loss etc. and*

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		allowed to recover for them via the indemnity); • to require GGT to use at least reasonable endeavours to ensure that the price paid for the gas is reasonable (as was required under item 2 of the Fourth Schedule to the existing T&Cs); • if the buyer/seller is in any way related to GGT, then, in addition to GGT acting reasonably, there should also be a requirement for the price to be a fair and reasonable market price as if the parties were acting at arm's length; and • to reduce the amount GGT can recover under the indemnity to the extent the loss was caused or contributed to by negligence, breach of contract or other default on the part of GGT or anyone acting for or on behalf of GGT (or a related body corporate of GGT) or by a force majeure event. The liability limitations for consequential loss etc. and liability cap (proposed clauses 93 and 94) should also apply to the indemnity – (refer to the Authority's recommendations on those clauses). **Current clause 7.2(h)** required a settle-up for any accumulated imbalance remaining at the end of the agreement term. GGT has not included such a provision. This omission could be detrimental to Users if they have an excess of gas "trapped" in the pipeline	*liability cap (new clauses 93 and 94) should also apply to the indemnity, including by deleting new cl 93(c)(i).* *Amend imbalance charging mechanism (including rates) to ensure users are no worse off than under existing AA. This includes reinstating current clauses 9.6(b), 9.6(d) and 9.6(e)) and imbalance allowance thresholds and charging rates such that users are no worse off.* *Reinstate "settle-up" provision for outstanding imbalance at end of agreement term as per current clause 7.2(h) and/or provide some other reasonable means (e.g. post term run-off) for Users to recover any excess imbalance in their favour outstanding at end of term.*

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		at the end of the term and are not permitted a reasonable run-off period to recover that gas. **Imbalance charges:** GGT has deleted current clause 9.6(b). Under current clause 9.6(b), GGT was only entitled to impose imbalance (and overrun) charges where it reasonably considered that the imbalance or overrun caused GGT or any User loss or damage or exposed the GGP to significant risk that threatens the integrity of the GGP. The Authority is of the view that GGT has not provided sufficient justification for the removal of these restrictions. GGT has proposed a new formula for calculating imbalance charges without any good justification for doing so. The existing "Accumulated Imbalance Charge" payable by User is based on a $2.85 per GJ tariff (indexed for CPI) for imbalances outside an allowance of whichever is the greater of 1TJ or 8% of MDQ (old cl 7.2(d)). GGT proposes to replace this with the "Imbalance Charge" in proposed section 4.2.3 of the third AA (which is based on a rate of 250% of Toll Charge + Capacity Reservation Charge + Throughput Tariff charged on excess imbalances outside an imbalance allowance of 5% of all delivery point MDQs). It would appear GGT's proposed new Imbalance Charge is worse for Users as it appears to be chargeable at a lower threshold (5%) and to be charged at a higher rate (assuming 250% of Toll Charge + Capacity Reservation Charge + Throughput Tariff will be higher than $2.85 per GJ where significant gas transportation distances are involved).	

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		Also, it is not clear why GGT is splitting imbalance provisions between the AA and T&Cs. GGT has also removed the "settle-up" provision for outstanding imbalances at end of agreement term (current clause 7.2(h)), so User may forfeit value of any excess gas (positive imbalance) left in pipeline at end of agreement. Proposed clause 19 would only allow Users 4 hours in which to correct an imbalance before consequences kick in (e.g. forced sale/purchase of gas by GGT at User's expense).	
Adjustments to Rates and Charges/ **Additional Payments**			
22	Current clause 9.1 "Deleted and replaced with proposed clause 22. Proposed clause 22 is consistent with the RBP AA T&Cs and provides for the Reference Tariff under the Transportation Agreement to be varied in accordance with the Reference Tariff Variation Mechanism."	Current clause 9.1 set out the User's obligation to pay Transportation Tariff and Charges. If it is deleted there is no clear statement in the T&Cs of a User's obligation to pay these charges. While GGT may be seeking to rely on proposed clause 4.1 of the revised AA (which sets out the "amount payable by User for the Firm Service") that is not sufficient. The AA T&Cs should contain all the terms for the transportation agreement other than contract specific variables such as names, locations, quantities and commencement dates which should be in the form of agreement. Proposed clause 22 is not itself a charging clause (and so, in its scope, does not "replace" current clause 9.1 as GGT claims), but merely refers to how a reference tariff may be varied. Proposed clause 22 is acceptable	*Reinstate current clause 9.1 into the T&Cs.* *Amend proposed clause 22 by deleting the words "set out in section 4.5 of the Access Arrangement"*

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		but the drafting could be improved by removing the unnecessary words "set out in section 4.5 of the Access Arrangement" as they are already included in the definition of "Reference Tariff Variation Mechanism" in Schedule C and so do not need to be repeated.	
23	Current cl 9.12 "Relocated to clause 23 – no change to content. Structural change only to accord with structure of RBP AA T&Cs".	While GGT claim they have simply relocated current clause 9.12 to proposed clause 23 with "no change to content", that is not entirely true. Current clause 9.12 provided: "*Subject to clauses 9.3 and 9.6, where the flow of Gas is restricted in accordance with clauses 8 and 17, all tariffs and charges will continue to apply*." Proposed clause 23 provides: "*Where the flow of Gas is restricted in accordance with these Terms and Conditions, all tariffs and charges will continue to apply*". As can be seen, GGT has omitted the "subject to clauses 9.3 and 9.6" wording at the beginning of old clause 9.12. Current clause 9.3 (Basis of Charges) was relocated by GGT to section 4.4 of the main body of the AA, but when making that relocation GGT omitted to include two important exceptions that were in current clause 9.3 that excuse Users from having to pay the Toll Charge and Capacity Reservation Charge where User is unable to deliver or accept gas because of an FM	*Reinstate current clauses 9.3 and 9.6(d) in full into the T&Cs (including the exceptions they contain). At the same time, the current cl 9.3 exceptions should be re-instated in the version of old clause 9.3 that was relocated to section 4.4 of the main body of the AA.* *Reinstate current clause 9.12 in full (including "subject to" wording and specific clause references).*

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		claimed by GGT or where GGT has interrupted or reduced services otherwise than for a properly notified emergency interruption. Current clause 9.6 (Quantity Variation Charges), which has also not been included by GGT in its revised T&Cs, also included an important exception where Users were excused from imbalance and variance charges during a period of interruption or reduction of services for which GGT was directly responsible (current clause 9.6(d)). The exceptions in current clauses 9.3 and 9.6 are valuable to Users and should be reinstated, and consequently, proposed clause 23 must also be made expressly subject to these exceptions (once they are reinstated). Also, current clause 9.12, limited GGT's rights under the clause to only those situations where gas flow is restricted in accordance with clause 8 [interruption of service] and clause 17 [force majeure], whereas, GGT's proposed new clause 23 does not have that limitation to specific clauses, but extends to potentially *any* of the T&Cs (creating far greater uncertainty for Users and the need to examine each and every term of the T&Cs to see if it allows a restriction in gas flow over and above what is permitted by old clauses 8 and 17).	
System Use Gas and Line Pack			
24-29	Proposed section 2.2.9 "Operational obligations – System	**System Use Gas (SUG) – Proposed clauses 24-26:** Proposed clause 24 provides: "*User must supply, at no cost to Service Provider and at times and in the manner*	*Delete proposed clauses 24-29 unless safeguards are included to cover the following concerns:*

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	Use Gas and User's Linepack" Set out User operational obligations in respect of system use gas and linepack. Further details are in Schedule D – T&Cs, which will be reflected in the firm service transportation agreement.	*notified by Service Provider, the quantity of System Use Gas required by Service Provider at that time to operate the Pipeline, as determined by Service Provider (acting reasonably but at its discretion).*" This is a new obligation for Users. Under the current AA T&Cs, User did not have to supply SUG, but paid a charge ("Used Gas Charge") to GGT in respect of the quantity of SUG ("Used Gas") allocated by GGT in respect of User. The Authority has the following concerns with the new SUG provisions: • There is no safeguard to provide Users with reasonable warning where they are required to supply this gas. • There is no safeguard to ensure that the allocation methodology between Users is fair and reasonable. • There are no safeguards to prevent GGT using SUG and User's line pack as substitutes for its efficient operation of the pipeline. • There are no safeguards to prevent GGT from having too much discretion. User's Linepack – proposed clauses 27-29: This is a new obligation for Users. Under the current AA T&Cs, the User did not have to supply any line pack gas. GGT still supplies some "Base Line Pack" (proposed clause 27), but the User must supply Line Pack in addition to the Base Line Pack on its first day using the service and thereafter "when advised by Service Provider from time to time" (proposed clause 28). The Authority has	• *a reasonable minimum notice period from GGT where Users are being required to supply this gas.* • *allocation methodology between Users must be demonstrably fair, reasonable and equitable.* • *there must be adequate safeguards to prevent GGT using SUG and User's line pack as substitutes for its efficient operation of the pipeline or to reduce its own operational and maintenance costs (or those of any related body corporate) and/or "game" the regulate tariffs.* • *GGT must not have too much discretion.* • *there should be greater use of objective standards such as Good Engineering and Operating Practice and the standard of a reasonable and prudent pipeline operator.* • *there must be adequate provisions for timely return or adequate compensation in lieu of, User's line pack at end of contract term.* • *there must be adequate safeguards to protect Users from loss of the value of their line pack*

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		the following concerns with the new User's line pack provisions: • What minimum notice period from GGT is reasonable where Users are being required to supply this gas? • Is the allocation methodology between Users fair and reasonable? • Query whether there are adequate provisions for timely return of or compensation in lieu for User's line pack at end of contract term? Where Users do not recover their line pack gas in kind, how will the price at which GGT compensates them for it be determined to ensure it is fair and reasonable? • Will GGT provide users with "prudential security" to cover the risk that GGT does not return/compensate users for their line pack contributions (e.g. insolvency credit risk)? • Again, there are no safeguards in the new clause to prevent GGT "gaming" User's line pack contributions to reduce its own operational and maintenance costs.	*contributions in the event of GGT's insolvency.* *System Use Gas and User's Linepack also need to be expressly excluded from the determination of whether the Service Provider has received more than the "Firm MDQ" on any gas day (i.e. proposed section 2.2.2(d)(i) of the revised AA, needs to contain the same exclusion for System Use Gas and User's Linepack as regards receipt of gas as exists in proposed section 2.2.2(d)(ii)).* *System Use Gas and User's Linepack gas quantities also need to be expressly included in the calculation of "Authorised Overrun" for gas receipt (but excluded from the calculation of the Authorised Overrun Charge) so that Users do not end up paying Overrun Charges (proposed section 4.2.2 of revised AA) or having their MDQ forcibly increased (proposed section 2.2.4(l) of revised AA) because of their System Use Gas and User's Linepack gas contributions.*
Operation of Pipeline			
30	Relocates current clause 8.1 to proposed clause 30 – no change to content. Structural change only to	GGT is correct that current clause 8.1 has been relocated to new clause 30 with no change to content. However, the current clause 8.1 provision does not exist in the RBP AA T&Cs. So GGT's claim that this is	*Proposed relocation is acceptable to the extent it does not change content of existing AA provisions.*

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	accord with structure of RBP AA T&Cs.	a "Structural change only to accord with structure of RBP AA T&Cs" is incorrect.	*Amend proposed clause 30 to make GGT's rights under the clause also subject to GGT's obligations under the Transportation Agreement (not just its obligations at law).*
31-34	Relocates current clauses 8.2, 8.3 & 8.4 to proposed clauses 31, 32 & 33 (respectively) – no change to content. Structural change only to accord with structure of RBP AA T&Cs.	GGT is correct that current clauses 8.2, 8.3 & 8.4 have been relocated to proposed clauses 31, 32 & 33 (respectively) with no change to content, except that only current clause 8.4(a) was relocated to proposed clause 33; current cl 8.4(b) has actually been relocated to proposed clause 34 (not mentioned by GGT). However, while this may "accord with structure of RBP AA T&Cs", the *content* of the similar provisions in the RBP AA T&Cs (see RBP AA T&Cs clauses 35 & 36) is less generous to the Service Provider in some respects than current clauses 8.2, 8.3 and 8.4 of the existing AA. For example, in RBP AA T&Cs clause 36, the Service Provider's right to curtail the firm service without liability in order to carry out pipeline works is subject to the curtailment being not predominantly caused by the Service Provider's negligence, breach of contract or failure to comply with GEOP, whereas no such proviso applies in current clauses 8.2, 8.3 or 8.4. GGT appears to be applying its argument for consistency with APA's national template on a subjectively selective basis. Also, GGT has imported proposed clause 16 from clause 16 of the RBP AA T&Cs which grants GGT extensive rights to interrupt or curtail in circumstances that go beyond force majeure and the provisions in proposed clauses 31, 32 & 33. The Authority is of the view that this is unnecessary given GGT's rights under	*Proposed relocation is acceptable to the extent it does not change content of existing AA provisions but, consistent with GGT's "national template", add a limitation on its right to curtail/interrupt firm service to conduct pipeline works where GGT has been negligent, in breach of contract or failed to comply with Good Engineering and Operating Practice (i.e. see clause 36 of the RBP AA T&Cs).* *Consistent with the Authority's recommendations at proposed clauses 15-16 above (i.e. to delete proposed clause 16 and replace it with an indemnity from GGT to the User for losses etc. suffered where GGT interrupts or reduces the firm service except in certain permitted circumstances) and at new clause 23 above (to reinstate the payment exceptions in current clauses 9.3 and 9.6(d)), amend proposed clauses 31 and 33 to clarify that where the words "without penalty or cost" are used in those clauses, that is to be subject to an exception for any penalty, cost or other amount payable or foregone by GGT as a result of any provision in the transportation agreement that requires GGT to indemnify the User, or excuses the User from paying any charge or other amount, where there is an interruption or reduction in service (such as, for example,

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		the force majeure provisions and proposed clauses 31, 32 & 33. **Proposed clauses 31 and 33** will also need to be amended to make them consistent with the Authority's recommendations at proposed clauses 15-16 above (i.e. to delete proposed clause 16 and replace it with an indemnity from GGT to the User) and at proposed clause 23 above (to reinstate current clauses 9.3 and 9.6(d) in full into the T&Cs including the exceptions they contain). **Proposed clause 33** uses "risk of injury or damage" as an excuse for GGT to interrupt or reduce the service without penalty or cost, but does not set any reasonable safeguards against GGT using this even if the risk is minimal and/or far off or the injury or damage minor. **Proposed clause 34** (which is a relocation from current clause 8.4(b) and as such was more clearly linked to clause 8.4(a)) is no longer clear that it applies only to interruptions or reductions under proposed clause 33 (current clause 8.4(a)). This creates a risk of overlap and uncertainty with proposed clause 32 that did not exist under the current T&Cs. Proposed clause 34 should be amended to expressly link its application to proposed clause 33. Also, a provision comparable to proposed clause 32(c) should be added to proposed clause 34 to make it clear that GGT has some obligation to get things back to normal, even in emergencies.	*the new indemnity proposed to replace proposed clause 16 and the payment exceptions proposed by reinstatement of current clauses 9.3 and 9.6(d)).* *Amend proposed clause 33 to change "risk of injury or damage" to "real and imminent risk of serious injury or damage".* *Amend proposed clause 34 to read as follows:* *"Service Provider shall as soon as reasonably practicable inform the User and other Users of the circumstances giving rise to the interruption or reduction referred to in clause [33] and must use all reasonable endeavours consistent with the standard of a reasonable and prudent pipeline operator to overcome the interruption or reduction in the Services and return them to normal as soon as possible."*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
35 &36	Proposed clauses 35 and 36. These clauses are consistent with the RBP AA T&Cs and are to ensure the User's operations are consistent with the operation of the Pipeline.	**Proposed clause 35** provides for a vague, uncertain and potentially wide and onerous obligation requiring Users to ensure their "*arrangements for Gas supply to the Receipt Point and Gas acceptance at the Delivery Points are compatible with Service Provider's Pipeline operations.*" It matches clause 37 of the RBP AA T&Cs but the Authority is of the view that it is unnecessary and unreasonable given that Users must already observe various, more specific, obligations (e.g. for gas specification, balancing, overrun, variance and other operational matters) that should already ensure that there is compatibility with pipeline operation. Proposed clause 36 provides for another potentially wide and onerous obligation requiring Users to "*facilitate the Service Provider's access as reasonably required by the Service Provider to relevant charts, electronic and other data and records, including (without limitation) access to relevant measurement and SCADA information, at no cost to Service Provider*". The only apparent limitation on the scope of this potentially very wide and onerous obligation would seem to be "relevance", but it is not clear what the standard of relevance relates to. The Authority also notes the requirement to provide reasonable access is not mutual.	*Delete proposed clauses 35 and 36.*
Metering			
37-42	Clauses 11.1-11.9 deleted and replaced with clauses 37- 42 of revised AA T&Cs. Clauses 37-42 are consistent with those in the	No independent standard is set for the "Metering and Measurement Requirements". The Authority is of the view there needs to be a safeguard against GGT producing a set of self-serving requirements.	*Set an independent standard for the "Metering and Measurement Requirements", including so it is consistent with Appendix One and applicable Good Engineering and Operating Practice.*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	RBP AA T&Cs and better reflect the arrangements between Users and the Service Provider.	While GGT has retained as proposed Appendix One the Test Procedures that were in the First Schedule of the current T&Cs, Appendix One is not referred to in GGT's revised AA or T&Cs. The definition of "Metering and Measurement Requirements" should be amended so that they are in accordance with the requirements in Appendix One. While the defined term is "Metering and Measurement Requirements", GGT has used "Metering and Measuring Requirements" in proposed clauses 37 and 42. This needs to be corrected. **Proposed clause 38:** GGT's obligation to install, operate and maintain the metering equipment should refer to a relevant standard it must meet for doing this (e.g. "*in accordance with all applicable laws, standards, Good Engineering and Operating Practice and the Metering and Measurement Requirements*"). By comparison, current clause 11.3 required measuring equipment at inlet and outlet facilities to comply with "*the standard of a reasonable and prudent pipeline operator*". **Proposed clauses 38 and 39** seem to be inconsistent. It is not clear whether GGT or the User is to install, operate and maintain metering equipment at receipt points and delivery points. **Proposed clause 39:** if User is, at its cost, to provide, operate, validate and maintain all metering equipment (other than at GGT's compressor stations) the Authority is concerned that there is no mechanism for User to be reimbursed for a fair share of those costs by other users of the pipeline.	*Include an obligation in the T&Cs for GGT to publish the Metering and Measurement Requirements and make them available to Users.* *Use defined terms correctly (including by correcting references to "Metering and Measuring Requirements" in proposed clauses 37 and 42 and by creating a defined term for "Metering Equipment" and using it consistently).* *Amend proposed clause 38 to include a relevant objective standard GGT must meet when exercising its obligation to install, operate and maintain the metering equipment.* *Amend proposed clauses 38 and 39 to remove apparent inconsistency.* *Amend proposed clause 39 to provide for a fair and equitable sharing of metering costs between users.* *Delete proposed clause 40 because too vague and uncertain as to its precise meaning and scope and could potentially add a significant but unquantifiable cost burden for Users*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		The terms "Metering Equipment" (capitalized) and "metering equipment" (all lower case) are both used in the clauses. There is no definition of "Metering Equipment". **Proposed clause 40:** User's obligation to provide "*facilities which will permit co-ordination of activities….in the metering, Nomination, Scheduling and transportation of Gas*…" seems vague and uncertain as to its precise meaning and scope. The Authority is concerned this could potentially add a significant cost burden for Users if they are required to install, operate and maintain costly hardware and software systems. While the definition of "Metering and Measurement Requirements" in schedule C to the revised AA provides that they are specifications "published by Service Provider from time to time" and which are "made available to the User", there is no actual obligation in the T&Cs for GGT to publish the Metering and Measurement Requirements and make them available to Users. There do not appear to be any provisions in GGT's proposed T&Cs that are comparable to: • the "commingled gas" provisions for inlet and outlet points in current clauses 11.1 and 11.2. • provision for "alternative arrangements" that do not require metering expense (current clause 11.5).	*Reinstate the following provisions or provide adequate justification why they are not required or require variation*: • *current clauses 11.1 and 11.2 ("commingled gas" provisions for inlet and outlet points)* • *current clause 11.5 (alternative arrangements where metering not required).* • *current clause 11.6 (Check metering).* • *current clauses 11.7, 11.8 and 11.9 (Meter Testing)* • *current clause 5.6 (measurement variance)*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		• user's right to have "check metering" (current clause 11.6). • the meter testing provisions (current clauses 11.7, 11.8 and 11.9). • measurement variance (current clause 5.6).	
Quality			
43	Current clause 10.1 relocated to proposed clause 43 and revised. Clause expanded to incorporate references to agreement made between User and Service Provider and WA law.	While GGT has relocated the content of current clause 10.1 to the start of proposed clause 43, that content would be improved by clearly stating which party has the obligation to ensure all gas received at the receipt point complies with the gas specification. Proposed clause 43 also expands current clause 10.1. The additional last sentence of proposed clause 43 now includes a *unilateral* right for GGT to vary the gas specification if it is "*authorised or required to do so by law or any Authority*". The Authority considers this may be acceptable where GGT is *required* by law or a Governmental Authority (as defined) to amend the specification (although GGT's right to make the change is arguably already covered by the preceding sentence in proposed clause 43). However, the Authority does not think it is acceptable for GGT to *unilaterally* vary the gas specification simply because it is *authorised* (but not *required*) by law or an *Authority* to do so. Also, as the term "Authority" is not defined, it should be amended to use the defined term "Governmental Authority".	*Amend proposed clause 43 to:* • *clearly state which of the parties is obliged to ensure gas received at the receipt point complies with the gas specification;* • *delete "authorised or";* and • *change "Authority" (not a defined term) to "Governmental Authority" (defined term)*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
44	Relocates current clause 10.2 to new clause 44 – no change to content. Structural change only to accord with structure of RBP AA T&Cs.	While GGT has relocated the content of current clause 10.2 to new clause 44, that content would be improved by clearly stating: • which party has the obligation (i.e. GGT). • a standard for the modification of the gas specification "to reflect any change in the gas quality arising from the odorisation, compression or transmission of the Gas or the injection of other additives necessary for the operation of the Pipeline".	*Amend proposed clause 44 to:* • *delete "All" at the start of the clause and replace it with "Service Provider shall ensure that all"; and* • *insert at the end of the clause after "Pipeline": " -in accordance with Good Engineering and Operating Practice".*
45	Relocates and revises current clause 10.3. Clauses 45 – 48 of the revised AA T&Cs reflect the provisions in the RBP AA T&Cs. The concepts are similar to current AA, but expanded and provide for firmer processes and provide for notification obligations for non-spec gas.	**Proposed clause 45** (notification obligation) – should be extended to cover gas offered for *delivery* at delivery points (not just gas offered for *transportation*).	*Amend proposed clause 45 as follows:* *"The User and Service Provider must each notify the other immediately on becoming aware that Gas offered for transportation or delivery at any Delivery Point is or may be Non-Specification Gas"*
46	Relocates and revises current clause 10.3. Clauses 45 – 48 of the revised AA T&Cs reflect the provisions in the RBP AA T&Cs. The concepts are similar to former AA, but expanded and provide for firmer processes and provide for notification	**Proposed clause 46:** (right to reject) – First sentence should be amended so that provision applies both ways – i.e. extended to allow User to refuse to accept non-spec gas for delivery at delivery point. Second sentence should be amended to allow User to be relieved of obligation to pay relevant charges for non-spec gas in circumstances where it has refused to accept it for delivery. Also, insert "reasonably" before "practicable" at beginning of third line and correct typo in first line (should be "accept *for* transport or delivery").	*Amend proposed clause 46 as follows:* *"Each of User and Service Provider may refuse to accept for transport or delivery, as the case may be, all or any portion of Non-Specification Gas and must advise the ~~User~~ other as soon as is reasonably practicable ~~after~~ of such refusal. ~~Such refusal~~ If Service Provider has refused to, or has been requested or instructed not to, transport or deliver all or any portion of Non-Specification Gas, the User is not required to pay any tariff*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	obligations for non-spec gas.		*or charge in respect of that Non-Specification Gas, even if ~~or~~ the Service Provider ~~not~~ transport~~s ing~~ or delivers ~~ing~~ all or any portion of the Non-Specification Gas ~~after acceding~~ contrary to ~~an~~ the User's instruction or request ~~from the User to reject receipts of such Gas, does not relieve the User from its obligation pay any tariff or charge."~~*
47	Relocates and revises current clause 10.3. Clauses 45 – 48 of the revised AA T&Cs reflect the provisions in the RBP AA T&Cs. The concepts are similar to former AA, but expanded and provide for firmer processes and provide for notification obligations for non-spec gas.	**Proposed clause 47:** Potentially requires User to indemnify GGT even where the loss was caused by negligence or other default on the part of GGT or anyone acting for or on GGT's behalf or by any matter beyond User's reasonable control. It also does not include any duty for GGT to mitigate its loss. Consistent with current clauses 10.4 and 18.2, the Authority's recommendations regarding the liability exclusion in clause 93, the indemnity in this clause should not be not limited by clause 93.	*Amend proposed clause 47 by adding the following at the end of the clause (after "Service Provider"):* *" and was not caused by any negligence, breach of contract or other default on the part of Service Provider, any of its related bodies corporate or any person acting for or on behalf of any of them or by any Force Majeure Event. The amount of this indemnity will be reduced to the extent Service Provider does not use reasonable endeavours to mitigate its loss. This indemnity is not limited by clause [93]"*
48	Relocates and revises current clause 10.3. Clauses 45 – 48 of the revised AA T&Cs reflect the provisions in the RBP AA T&Cs. The concepts are similar to former AA, but expanded and provide for firmer processes and provide for notification obligations for non-spec gas	**Proposed clause 48:** The Authority considers GGT's obligation to be "responsible for any loss" should be converted into an express indemnity by GGT, which should be expressly stated not to be limited by the liability exclusion in clause 93. Also, some corrections are required: correct "and delivery" at start of second line to read "or deliver" and correct "and deliver" in the third line to read "or deliver, as the case may be,". Consistent with the Authority's recommendations regarding the liability exclusion in clause 93, the indemnity in this clause should not be not limited by clause 93.	*Amend proposed clause 48 as follows:* *"If the User instructs the Service Provider in writing not to receive, transport ~~and~~ or deliver any Non-Specification Gas, and Service Provider continues to receive, transport ~~and~~ or deliver the Non-Specification Gas notwithstanding the instruction, User is not required to pay any tariff or charge in respect of that Non-Specification Gas and Service Provider is responsible for and indemnifies and holds harmless the User from and against all and any loss or damage suffered*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
			or incurred by ~~itself~~ Service Provider, the User or any other person as a result of the continued receipt, transportation or delivery of the Gas after the time at which the Service Provider, in accordance with Good Engineering and Operating Practice, could reasonably have stopped receipt, transportation or deliveries. The amount of this indemnity will be reduced to the extent the User does not use reasonable endeavours to mitigate its loss. This indemnity is not limited by clause [93]."
49	Relocates current clause 10.5– no change to content. Structural change only to accord with structure of RBP AA T&Cs.	Typographical error in first line of proposed clause 49.	*Amend proposed clause 49 to correct typographical errors in first line by inserting "that" after "accepts" and deleting apostrophe after "users".*
50	Relocates current clause 10.6 to clause 50 – no change to content Structural change only to accord with structure of RBP AA T&Cs.	While GGT has relocated the content of current clause 10.6, the Authority is concerned there is a potential argument (both under current clause 10.6 and proposed clause 50) that the clause excludes even the warranties expressly given by GGT in the contract concerning this subject matter.	*Amend proposed clause 50 by inserting the following at the start of the clause (in place of "The"): "Except as expressly stated in the Transportation Agreement, the"*
Connection to the Pipeline			
51	Relocates and updates current clause 6.1. Update to clause provides a positive obligation on Service Provider to connect User's Receipt and Delivery Facilities to	Current clauses 6.4(c)(10), 6.4(e)(1) and 6.4(f)(1) require the User to pay a Connection Charge in respect of the Outlet Facilities. The Connection Charge is defined in Appendix 1 as the amount payable by a User to enable Outlet Facilities to be connected to the Pipeline and is set out in item 3 of the current Fourth Schedule as:	*Amend proposed clause 51 to:* • *delete "the User's Receipt Facilities and" in the opening sentence.* • *set reasonable limits on the Connection Charge – being the costs GGT may recover from*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	the Pipeline at User's expense.	"*Users will be charged GGT's direct costs for the installation of facilities associated with the connection of the User's facilities to the Pipeline*." The first sentence of proposed clause 51 provides: "*Service Provider will at the User's expense connect the User's Receipt Facilities and the Delivery Facilities to the Pipeline.* " This indicates two potentially significant changes: • Users are now to be charged for connection of their *Receipt* Facilities, not just the Delivery Facilities; and • Users must bear the full expense of connection charges (including indirect costs), whereas previously GGT's "direct costs" were passed to Users, with no apparent requirement in new clause 51 for those costs to be incurred reasonably (cf. s 4.2.5(a) of the proposed AA – discussed below). **Proposed clause 51** of the T&Cs also overlaps with section 4.2.5(a) of the proposed AA which requires the User to pay "*a once-only Connection Charge…. being the costs reasonably incurred by Service Provider in establishing the new Connection, including the installation of new facilities associated with the connection of the User's facilities to the Pipeline*" The *direct* costs limitation that applies under current clause 6.4 is also missing from this proposed clause 4.2.5(a) (although there is at least a requirement for the	*Users for connection of their Delivery Facilities (e.g. only direct costs that have been reasonably and properly incurred in accordance with GEOP?)* • *clarify that Connection Charge is the only charge payable for connection (and there is no charge for connecting User's receipt facilities).* *Consider if Connection Charge provisions under section 4.2.5(a) of the proposed AA are necessary given overlap with proposed clause 51 of the T&Cs (or vice versa).* *Amend definitions given for "Receipt Facilities" and "Delivery Facilities" in proposed schedule C to give adequate definitions (e.g. how it is determined if something is/is not part of the facilities - e.g. used for what purpose, nominated by whom?).* *Consider use of:* • *"Technical Requirements for Delivery Facilities" in Appendix Three.* • *current definition of "Outlet Facilities" in old Appendix 1 used to incorporate by reference specifications contained in old*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		costs to be *reasonably incurred* by GGT - which is not present in proposed clause 51). The definitions given for "Receipt Facilities" and "Delivery Facilities" in new Schedule C are inadequate. GGT has also deleted current clause 6.2 claiming it is "Not required as description of Firm Service is in the body of the revised AA (s 2)". However, deleting current clause 6.2 would also remove current clause 6.2(c) which provided: "*The cost of operation and maintenance of the Inlet Facilities will be borne by GGT* " The Authority is concerned that if connection and ongoing upkeep of outlet facilities are dealt with by separate agreement (as GGT proposes), there are no safeguards of GGT potentially using this to take advantage of Users (e.g. by offering a less onerous connection agreement "package" if the User agrees to take an unregulated non-reference service). Also, by deleting current clause 6.4 in its entirety, GGT is also removing many provisions that have continued effect beyond the establishment of a new connection, including provisions relating to ongoing operation and maintenance of outlet facilities, access to the outlet facilities and maintaining insurances.	*clause 6.4. Consider if any of those specifications should be included in the definition of "Delivery Facilities" in proposed schedule C.* • *current definition of "Inlet Facilities" in current Appendix 1 used to incorporate by reference descriptions contained in current clause 6.2(b) (which GGT now proposes deleting). Consider if any of those descriptions should be included in the definition of "Receipt Facilities" in proposed Schedule C.* *Reinstate a provision to the same effect as current clause 6.2(c), so that the cost of operation and maintenance of the Receipt Facilities will be borne by GGT.*
Receipt Pressures			

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
52-54	Relocated to clauses 52-54 and revised. Clauses 52-54 are consistent with the RBP AA and other APA Group access arrangements. Proposed clauses 53 and 54 are consistent with the RBP AA T&Cs.	**Inlet pressure risk:** Current clause 6.3(b) set clear limits for Users as regards receipt point delivery pressure. Proposed clause 52 removes that certainty for Users and gives GGT very wide discretion to effectively set whatever pressure it likes from time to time. The Authority is concerned that this places a much greater inlet pressure compliance risk on Users than under the current AA. **Inlet temperature risk:** Current clause 6.3(a) set clear temperature limits for Users delivering gas at receipt point of not more than 45°C and not less than 2°C. There is no reference in proposed clauses 52-54 of any temperature requirements for delivery of gas to GGT. This could create uncertainty for Users. **Indemnity re breach of inlet pressure obligation** This indemnity is new. It is unlimited (being expressly not subject to the exclusion of liability for indirect loss etc in proposed clause 93 - see proposed clause 93(c)(iv)). Also, while the indemnity is expressed not to apply where loss or damage was caused by GGT's negligence, there is no similar exception for any other blameworthy conduct on the part of GGT or anyone acting for or on GGT's behalf (e.g. breach of contract, willful default), nor is there any express exception for matters beyond the User's reasonable control (given that the Force Majeure provisions are drafted with exceptions that may mean they do not apply to this indemnity). There is also no duty for GGT to take reasonable steps to mitigate its loss (as would apply in a damages claim). GGT has provided no good reason	***Proposed clause 52 (inlet pressure risk):*** *Reinstate current clause 6.3(b) or amend proposed clause 52 so that Users have certainty about what they must comply with and can plan accordingly.* ***Proposed clause 53 (indemnity)*** *Delete proposed clause 53.* ***Proposed clause 54 (non-compression receipt point facilities)*** *Amend proposed clause 54 to clarify that it does not affect GGT's responsibility for installing facilities downstream of the Receipt Point or the Receipt Facilities themselves (e.g. delete "or other facilities").*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		why Users should be exposed to such a wide indemnity in these circumstances. The Authority considers GGT should rely instead on a damages claim. **Proposed clause 54** Proposed clause 54 provides: "*Service Provider is under no obligation to install inlet compression or other facilities to permit the entry of User's Gas into the Pipeline*." While GGT's denial of responsibility for installing inlet compression may be reasonable, its attempt to exclude its responsibility for " *other facilities to permit the entry of User's Gas into the Pipeline* " seems to go too far as it could literally extend to a denial of responsibility by GGT for installing facilities downstream of the Receipt Point or even the Receipt Facilities themselves.	
Possession of gas and responsibility			
55-59	Relocated to clause 55 and updated. Proposed clauses 57-59 added. Proposed clause 55 is essentially unchanged, however concept of System Use Gas has been incorporated, which is consistent with the RBP AA T&Cs. Proposed clauses 57-59 incorporate allocation of	**Generally:** Provisions for possession of gas and title to gas should be grouped together in the T&Cs and the section heading needs to be amended to include a reference to "title". Consistent with the Authority's Required Amendment 2, title to gas must transfer to GGT at the receipt point and must pass to the User at the delivery point. Current clauses 14.3 and 14.4 should be reinstated in this section. **Proposed clause 55:** The words "*net of any System Use Gas provided by the User*" added at the end of the first sentence make no sense. If GGT does not take	*Change section heading to read "Possession of gas, responsibility and title".* *Reinstate current clauses 14.3 (title transfer) and 14.4 (title re-transfer).* *Amend proposed clause 55 by deleting the words "net of any System Use Gas provided by the User" at the end of the first sentence.* *Delete proposed clause 57.*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	responsibility for the gas and introduce the concept of the practicality of commingled gas.	control and possession of System Use Gas when it is delivered at the receipt point then who does? **Proposed clause 57:** (disclaimer of GGT's responsibility for loss of *User's gas* while in GGT's control or possession) is not really necessary and should be deleted, given that the transfer of title provision in current clause 14.3 is being reinstated, so there never will be any situation where GGT has control or possession of a *User's* gas (because gas transferred to GGT will belong to GGT). New clause 57 is redundant and should be deleted. **Proposed clause 58:** is not necessary. If it is retained, the Authority is of the view that it should expressly carve out situations where GGT may have liability in respect of gas prior to its supply at the receipt point or after its delivery at the delivery point. For example, GGT may have such liability in respect of non-specification gas which it has been told not to receive at the receipt point or which it seeks to deliver at the delivery point without user consent. **Proposed clause 59:** (GGT's right to commingle gas in the GGP): is not necessary and should be deleted, given that the transfer of title provision in current clause 14.3 is being reinstated. Proposed clause 59 is redundant and should be deleted.	*Add the following at the beginning of proposed clause 58: "Subject to clauses [44] and [48] and all applicable laws, and unless Service Provider otherwise undertakes or agrees, "* *Delete proposed clause 59.*
Warranties and Representations			
60	Relocates and updates current clause 12.1.	The reduction in User warranties in proposed clause 60 is to be welcomed. However, the Authority notes that	*Accepted*.

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	Warranties and representations by User have been reduced to those which are required by Service Provider.	GGT requires even fewer warranties (2 not 4) from users under its RBP AA T&Cs (yet has not sought to align the GGP AA T&Cs to the RBP AA T&Cs in this respect). The Authority also notes that the warranties (e.g. all necessary approvals, unencumbered title to gas when supplied, no legal default and no pending material proceedings) address risks that are also faced by Users in respect of GGT and therefore, could reasonably be expected to also be given by GGT (with necessary changes). This already occurs, for example, in relation to the T&Cs for the DBNGP. Further, given that Users are now being expected to lodge gas as line pack for the duration of the agreement, they potentially have a greater exposure to risks of operator insolvency and operation in accordance with laws. However, the Authority has not received any submissions specifically concerning whether GGT should also give warranties and on this basis is prepared to continue with the position under the current AA2 T&Cs.	
61	Relocates current clause 12.2 – no change to content	Acceptable	*Accepted.*
62	Relocates current clause 12.3 – no change to content. Structural change only to accord with structure of RBP AA T&Cs.	The relocation is acceptable, but the Authority notes that GGT does not require any such obligation (settlements for royalties) from users under its RBP AA T&Cs.	*Delete proposed clause 62 unless GGT can provide good justification why it requires this obligation under the GGP AA T&Cs.*
63-64	Relocates current clause 12.4 to clauses 63 – 64 and revised. Clauses 63-64 updated to incorporate	The Authority queries whether there is a genuine need for proposed clauses 63-64. While they restate (with some minor changes) the provisions in current clause	*Delete proposed clauses 63-64 unless GGT can provide good justification why it requires this obligation under the GGP AA T&Cs.*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	language used in other APA Group access arrangements.	12.4, GGT does not require any such obligations from users under its RBP AA T&Cs.	
Title			
65	Proposed clause 65 inserted. This clause is consistent with that in the RBP AA T&Cs and is beneficial for the User.	Proposed clause 65 could be improved by specifying a reasonable period during which a User can exercise its rights under the clause. As currently drafted the right arises "on termination of a Transportation Agreement" but it is not specified for how long the right continues.	*Amend proposed clause 65 by inserting the following words immediately after "On" at the start of the clause: "and at any time during a period of not less than [12] months after"*
66	Deletes and replaces current clauses 14.3 and 14.4. In the current AA T&Cs, title passed from User to Service Provider at the Receipt Point. This is not the case in any other APA Group access arrangement (wherein title does not pass) and there is no legislative basis for this distinction.	Title must transfer to GGT at the receipt point and to the User at the delivery point. Proposed clause 66 must be deleted and the title transfer provisions in current clauses 14.3 and 14.4 should be reinstated. See the Authority's Required Amendment 2. Doing so is consistent with clause 63 of the RBP AA T&Cs (APA's national standard), which states: "*In Western Australia title to the Gas received by the Service Provider on behalf of the User at the Receipt Points passes to the Service Provider and title to the Gas delivered by the Service Provider on behalf of the User at the Delivery Points passes to the User*".	*Delete proposed clause 66.* *Reinstate current clauses 14.3 and 14.4.* *See the Authority's Required Amendment 2.*
Allocation of receipts and deliveries			
67	Not referred to in GGT's log of changes. Apparently based on clause 64 of RBP AA T&Cs	Proposed clause 67 allows GGT to allocate gas between multiple users at the receipt point or a delivery point where the hourly quantities do not match scheduled quantities on a pro rata basis according to each user's scheduled quantities as a proportion of the	*Amend proposed clause 67 to provide that GGT is to allocate any discrepancy first to the user(s) (if any) which GGT is aware caused the discrepancy (to the extent GGT reasonably believes they caused it) and*

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		scheduled quantities for all users. While on its face this appears reasonable, it does not deal reasonably with the situation where GGT is fully aware which user(s) have caused the scheduling discrepancy. Where GGT is aware who caused the discrepancy (e.g. because they have shut down their plant and are therefore not taking scheduled gas at a delivery point), the Authority is of the view that it is fair and reasonable for the re-allocation to be confined to the "defaulting" user(s) and the "non-defaulting" user(s) be allocated as per their scheduled quantities. (While such an alternative allocation methodology could be implemented by *unanimous* agreement of all users at a receipt point or delivery point under proposed clause 68, there is a risk that the necessary *unanimous* agreement could not be obtained where a habitually "defaulting" user exists.)	*otherwise (if there is any remaining discrepancy that GGT is not reasonably able to attribute to any particular user(s)) pro-rata between all users.*
68	Not referred to in GGT's log of changes. Apparently based on clause 65 of RBP AA T&Cs	**Proposed clause 68** allows *all* users at a receipt point or delivery point to agree an alternative allocation methodology.	*Accepted.*
69	Not referred to in GGT's log of changes. Apparently based on clause 67 of RBP AA T&Cs.	**Proposed clause 69** allows GGT to comply with lawful directions or requirements of Governmental Authorities without liability to users (and even if contrary to a user's nomination. The Authority considers that this provision is acceptable, but the reference to "this Access Arrangement" in the first line should be changed to "the Transportation Agreement".	*Amend proposed clause 69 by replacing the reference to "this Access Arrangement" in the first line with "the Transportation Agreement".*
70	Not referred to in GGT's log of changes. Apparently based on clause 68 of RBP AA T&Cs	**Proposed clause 70** allows GGT to change the allocation methodology to reflect any allocation methodologies "imposed on Service Provider by a third party in respect of a particular Receipt Point or Delivery Point." This is too vague and uncertain. Further, it contains no safeguards against GGT "engineering" an	*Delete proposed clause 70.*

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		agreement with a third party in order to allow itself to unilaterally vary the allocation methodology. GGT has not provided any justification for this clause.	
Addition of Delivery Points			
71-76	Replace current clauses 6.9 and 6.10. Proposed clauses 71-76 reflect those in the RBP AA T&Cs in respect of User requesting new or additional delivery points. This proposed clause is consistent with other APA Group access arrangements.	The replacement provisions GGT is proposing in proposed clauses 71-76: • require User to give far more notice to GGT (12 months instead of 14 days); • give GGT greater discretion to refuse a request and/or impose conditions; • do not set a time limit for GGT to give its response (current clause 6.10 required acceptance within 30 days); • require User to pay GGT's costs in evaluating the request (not required under current clause 6.9); and • do not clearly state that User can transfer existing MDQ to the new delivery points (i.e. while proposed clause 72 requires User to notify GGT of proposed changes to existing MDQs and MHQs, current clause 6.9 is much clearer that User can request a transfer of all or part of its MDQ from one delivery point to another).	*Delete proposed clauses 71-76.* *Reinstate current clauses 6.9 and 6.10 in T&Cs.*
Dispute resolution			
77-83	Current clauses 22 and 23 in their entirety have been	The Authority considers that GGT's proposed clause 77 essentially prohibits a party commencing legal proceedings (except to seek urgent injunctions or other	*Delete proposed clauses 78-83.* *Reinstate current clauses 22 and 23.*

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	replaced with proposed clauses 77-83. The concept of referral of disputes to an expert or arbitrator has been replaced with referral to each party's representative and then senior representatives. This process is consistent with that set out in the Service Provider's standard agreements and in practice provides greater efficiencies and effectiveness than referral to experts and arbitration.	interlocutory relief which may be necessary e.g. to thwart an imminent breach of confidentiality) until the parties have complied with the procedures in proposed clauses 78-83. The procedure in proposed clauses 78-83 essentially seek to resolve a dispute by negotiation. But, if a resolution cannot be negotiated, the new process offers no alternative than to go to court. That is, it has the effect that a dispute escalates from negotiations to legal proceedings with no pre-agreed alternative dispute resolution option for a possibly less costly and/or quicker means of resolution than court proceedings. While the parties can always agree at the time to try some other form of mediation or arbitration, this would require them to agree to do so at a time when they are already in dispute and it may be more difficult to reach agreement, especially if it is in the interests of one of them to delay or prolong the dispute. Proposed clause 77 has some potential benefit in that it forcibly requires a period of negotiation before the parties go to court. However, clauses 22 and 23 of the current access arrangement terms and conditions offer pre-agreed mechanisms for resolving disputes by negotiation (current clause 22.2), expert determination and/or arbitration that may (or may not) provide quicker and less costly resolutions than going to court. They do not contain an equivalent to proposed clause 77, but if a party chose to go to court ignoring the provisions in existing clauses 22 or 23, then it may be in breach of contract. Further, if the dispute is one which could have gone to arbitration under the arbitration agreement in clauses 22.3(b) and 23, then the other party could challenge the court proceedings and require the court	*Proposed clause 77 may be retained, if desired.* *Amend all references to "Commercial Arbitration Act 1985" in clause 23 of the current access arrangement terms and conditions to "Commercial Arbitration Act 2012".*

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		to refer the dispute to arbitration, under section 8 of the Commercial Arbitration Act 2012. The Authority considers that GGT has not provided a good justification for its proposal to replace expert determination and arbitration with referral to each party's representative and then senior representatives (with court proceedings being the next likely step if those senior representatives cannot resolve the dispute). In place of proposed clauses 77-83, the provisions in clauses 22 and 23 of the current access arrangement terms and conditions should therefore be reinstated together with a version of GGT's proposed new clause 77 requiring the dispute to be referred to senior representatives of the parties for negotiation in the first instance. All references in clause 23 of the current access arrangement terms and conditions to the Commercial Arbitration Act 1985 should be changed to the current version of that Act which is the Commercial Arbitration Act 2012. Submissions from BHPB and Santos strongly oppose this proposal. Santos submits this "provides no protection to the Shipper" and BHPB submits this change is "unnecessary and may delay the effective resolution of disputes" as expert determination and arbitration processes are "likely to be lower cost and more efficient methods of resolving disputes than litigation"	
	Current clause 15.2 deleted. This concept relates to a dispute which is covered under proposed clauses 77 – 83. This	Current clause 15.2 provides a mutual (but especially valuable for the User) right to effectively audit the relevant books of the other to verify a disputed invoice, measurement or procedure. Such an audit could be a	*Reinstate current clause 15.2.*

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	specific clause is not required.	helpful adjunct to any dispute resolution procedure and should not be given up lightly for Users.	
Default			
84-86	Replaces current clauses 16.1–16.6. The Default/Termination provisions have been substantially amended to simplify and streamline the process. In addition, instead of setting out two separate rights for the User and Service Provider, there are mutual rights. This approach is consistent with other APA Group access arrangements and the RBP AA T&Cs.	Acceptable in principle, but the drafting of proposed clause 84 should be improved for clarity. The Authority notes that the cure period for financial default is now longer (7 business days, not 7 days) and the cure period for non-financial default is (in the absence of intervening public holidays) likely to be marginally shorter (21 business days, not 30 days). The Authority also notes that proposed clause 85 basically covers the same ground as current clause 16.4 (if changed to apply both ways, not just to GGT and the Owners). However, the Authority considers that current clause 16.4 (once it is changed to apply both ways, not just to GGT and the Owners) is marginally wider, in that it refers to "rights and remedies" (not just "remedies", as in proposed clause 85) and to "the Service Agreement, at law, at equity or otherwise" (not just "legal or equitable", as in proposed clause 85).	*Amend proposed clause 84 to clarify:* • *the date from when each cure period runs;* • *that only the non-defaulting party can terminate for a financial default that is not remedied within the cure period; and* • *that the "compensation" payment obligation in new clause 84(b) (which is, in effect, a form of indemnity) is to be limited so that it is expressly subject to the limitations of liability in new clauses 93 and 94 and so that the defaulting party is not required to compensate (indemnify) the non-defaulting party for any loss to the extent caused by the non-defaulting party or any of its related bodies corporate or any person acting for or on behalf of any of them or by any Force Majeure Event. Also, the amount of compensation is to be reduced to the extent the non-defaulting party fails to use reasonable endeavours to*

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			mitigate its loss arising from the event of default and its consequences. *Amend proposed clause 85 to ensure it extends to rights and remedies arising under the Transportation Agreement, at law, in equity or otherwise.*
Billing & Payment			
87	Replaces current clause 13.1 (invoicing). Current clause 13.1 amended to take into account the practice of monthly billing and not necessarily requiring the issue of invoices on the 10th day of each month. In addition, language in this section has been updated to reflect references to Charges and the "Billing Period" concept has been removed. These changes are all consistent with the other APA Group access arrangements and the RBP T&Cs.	GGT has -deleted its obligation to issue invoices by the 10th of each month following the preceding billing period and replaced it with an obligation to render "monthly" invoices, with no time limit set for when an invoice must be given in respect of a billing period. This could potentially allow GGT to issue invoices long after the relevant billing period (so long as the invoice was rendered "monthly"). This effectively exposes Users to uncertainty and risk that previously they did not have. The Authority notes that "Billing Period" under the existing T&Cs is also essentially monthly (but also allows for a shorter first billing period where the agreement doesn't start at the beginning of a calendar month).	*Amend proposed clause 87 to reinstate old clause 13.1 requirements. For example, proposed clause.87 could be amended as follows:* *"On or before the 10th day of each Month Service Provider shall render to the User an ~~monthly~~ invoice~~s~~ in the form of a Tax Invoice~~s to the User~~ in respect of the Charges and any other amounts payable to Service Provider under the Transportation Agreement incurred in the immediately preceding Month, together with any outstanding invoiced amounts in respect of any previous Months ~~or Access Arrangement~~."*
	Current clause 13.2 (contents of invoice) is not included in the RBP AA T&Cs and invoice contents	If minimum invoice contents are not prescribed in the T&Cs (as per current clause 13.2), how will Users be sure to receive sufficient basic information to be able to check the accuracy of an invoice?	*Reinstate current clause 13.2 requirements.*

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	do not need to be so prescribed.		
88-89	Proposed clause 88 replaces current clause 13.4 (payment) and current clause 13.8 (default interest). The proposed clause is simplified and is as per the RBP AA T&Cs. Current clause 13.8 (default interest) concept contained in proposed clause 88. Proposed clause 89 relocates and revises current clauses 13.5 (disputed invoices) and 13.6 (interest on disputed amount). The concept of a disputed invoice is retained however the language of this clause is revised to be consistent with the RBP AA T&Cs.	The proposed clause 88 payment terms appear slightly less onerous for Users. See our comments at current clause 13.4 above However, the Authority notes that: • whereas current clause 13.8 provided for default interest to apply both ways on late payments, proposed clause 88 only applies to require the User to pay default interest on late payments. There is no longer any obligation for GGT to pay interest when it is late making a payment (unless in the limited circumstances of disputed invoices or adjustments for errors in invoices under proposed clauses 89 and 90). As there may be other circumstances where GGT has to make payments (eg line pack refund payment or compensation for a default) GGT should also have the same obligation as Users to pay default interest on late payments. • the default interest rate for late payments has changed. The proposed new rate is the CBA corporate overdraft rate plus two percentage points, whereas under the existing AA T&Cs it is the Bill Rate plus five percentage points (where "Bill Rate" means, *on any Business Day, the 90 Business Day domestic dealer's bill rate as published in the Australian Financial Review on the last Business Day of the preceding Month, or if that rate is not*	*Amend proposed clause 88 to:* • *include a right for User not to pay where there is a manifest error in the invoice (as per current clause 13.5(a)); and* • *amend the last sentence to read "Late payment will attract an interest charge in accordance with clause [insert number of reinstated current clause 13.8]".* *Reinstate current clause 13.8 requirements (mutual obligation to pay default interest on overdue payments).*

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		published, then the rate agreed by the parties or, if either party is a defaulting party, as determined by the non–defaulting party in good faith to be representative of the domestic dealer's bill rate on that Business Day). The Authority has not received any submissions specifically concerning the change in default interest rate. • proposed clause 88 does not include a right for User not to pay where there is a manifest error in the invoice (as per current clause 13.5(a)). Proposed clause 89 does not contain the 14 day time limit for disputing invoices that exists under current clause 13.5. It also does not contain the User's right (under current clause 13.5(a)) not to pay in the event of a manifest error (so, unless GGT issued an adjustment note, the User would still have to pay within 14 days even if there is a manifest error). The Authority also notes that the default interest rate for payment of disputed amounts (proposed clauses 89 & 90) has also changed in the same way as the default interest rate for late payments (proposed clause 88) - see comments above).	
90	Relocated and revised current clause 13.7 (incorrect invoices). The clause has been simplified to be consistent with that in the RBP AA T&Cs but there	GGT claims that "*there is essentially no change to the process set out in the former clause 13.7*", however that is not correct. Proposed clause 90 introduces a 12 month time limit on making adjustments for errors in invoices, which effectively acts as a time bar on claims. No such time	*Amend proposed clause 90 to include the following words at the end of the clause:* *" if and to the extent such errors result in the User being undercharged."*

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	is essentially no change to the process set out in the current clause 13.7.	bar on claims to rectify invoices exists under old clause 13.7. Indeed, current clause 13.7(a) provides a claim may be made where an overcharge or undercharge is discovered "at any time". The 12 month limit in current clause 13.7(b) only applies to claims for interest (not to claims for refund/payment of over- or undercharged amounts). Any time bar on *Users* bringing claims that they have been overcharged is not acceptable. That is because the matters that may give rise to an overcharge in an invoice (e.g. metering data and billing calculations) are largely within the control of GGT, not Users. So Users should not be penalized for this by having their claims time barred. However, a time bar should be placed on GGT claiming against Users for undercharges, since GGT is better placed than Users to determine if an undercharge has occurred and should not be allowed to sit on its hands about claiming for one. The fact that the 12 month time limit is calculated from date of delivery of gas (not date of invoice) should also encourage GGT to invoice Users promptly so that GGT maximizes the time remaining under its 12 month limit in which to determine if the invoice contains an undercharge.	
Information Interface			
91	User is granted non-exclusive, non-transferrable, non-	Proposed clause 91 grants a licence for users to "access" the Information Interface for certain specified purposes. It should also expressly allow them to *use* the Information Interface for those purposes.	*Amend proposed clause 91:* • *to ensure the licence includes an express right to access and use*

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	assignable access to information interface for purpose of submitting nominations and obtaining information regarding receipts, deliveries, balances and gas flows.	The specified licensed purposes are limited to "*the purposes of submitting Nominations and for receiving information regarding receipts, deliveries, balances and Gas flows under the Transportation Agreement*". These need to be widened to include *all* of the things that a user may reasonably be expected to require the Information Interface to do. For example, if the parties are intending that users use the Information Interface for exchanging imbalances and otherwise trading the User's contracted capacity with other Users in accordance with the Terms and Conditions (including clause 108), then this should be expressly included as one of the licensed purposes. Also, the Authority requires particular "information regarding receipts, deliveries, balances and Gas flows under the Transportation Agreement" to be specified (e.g. "historical and real-time information") to ensure that users are provided with the information they need to perform their relevant obligations regarding receipts, deliveries, balancing and gas flows under the agreement. Proposed clause 91 also needs to specify the duration of the licence and this should continue beyond the term of the agreement if reasonably required in order for the user to recover line pack or exercise any other post-termination rights. If the "information interface" is to provide this functionality for users as a substitute for GGT's notification obligation in current clause.5.4, then as users will be placing reliance on the Information Interface in order to exercise rights and perform obligations under the agreement, the T&Cs will need to	*(not just access) the Information Interface;* • *to ensure that the specified licensed purposes include all purposes for which the User will reasonably require the Information Interface in order to exercise its rights and perform its obligations under the agreement, including for exchanging imbalances and otherwise trading the User's contracted capacity with other Users in accordance with the Terms and Conditions (including clause 108);* • *to ensure that the types of information that the Information Interface is capable of providing/receiving includes all types of information (e.g. historical and real-time) that the user will reasonably require in order to exercise rights and perform obligations under the agreement relating to the specified licensed purposes;* • *to specify the duration of the licence (which may have to continue beyond the term of the agreement if reasonably necessary in order for the user to recover line pack or exercise any other post-termination rights); and*

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		include warranties from GGT as to the quality, availability and fitness for purpose of the Information Interface, so that users are no worse off by this change. Although no submissions were received on this issue, the Authority queries whether the Information Interface is compatible with Users' existing systems or if they must outlay additional expense in order to install and use it (e.g. hardware, software and/or staff training)?	• *to include reasonable warranties from GGT as to the quality, availability throughout the term, and fitness for purpose of the Information Interface* *Also amend:* • *proposed clause 17 to clarify that GGT may provide information relevant to that clause via the Information Interface (if that is what is intended) – see the Authority's recommendation at proposed clause 17 above.* • *proposed clause 18 to clarify that capacity trading to correct imbalances may take place using the Information Interface – see the Authority's recommendation at proposed clause 18 above.*
92	Employees of the user must be approved by the service provider before access may be provided. User liable for any loss incurred by GGT resulting from use (except where it is caused by negligence by GGT)	GGT has not justified why GGT has to approve the user's employees to use the Information Interface (especially given that the User is to be liable for any loss) nor has GGT stated the criteria it will use to assess approval or the safeguards against GGT unreasonably preventing approval. GGT has not justified why the user is to have liability for "any loss" (which, as clause 93 is currently drafted, is expressly not limited by the exclusion of liability for consequential loss etc. in clause 93) that GGT incurs from "use of the Information Interface" (which is not	*Delete proposed clause 92.*

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		expressly limited to use by the User) other than to the extent caused by GGT's negligence (which could mean the User is still liable despite any other blameworthy conduct by GGT such as breach of contract, statutory duty or willful default or if the loss was caused by a third party). The Authority is of the view that this puts potentially extremely wide liability and risk upon the user without any good justification from GGT.	
Limitation of Liability & Indemnity			
93	Relocated to clause 93 and updated. The position remains that neither party is liable to the other for consequential losses however the revised AA T&Cs provide carve outs for a number of matters which are within the control of the relevant party. This position is consistent with the RBP AA T&Cs.	The carve outs GGT has included in proposed clause 93 for "*matters which are within the control of the relevant party*" " include carve-outs that do not exist under the current AA T&Cs. As they mostly relate to the User, this would give the User unlimited liability for matters that it does not have unlimited liability for under the current AA T&Cs. For example, under clause 93 of GGT's proposed new terms and conditions, the User would have unlimited liability for: • "Gross Negligence" or "Willful Misconduct" (whereas under current clause 18.2, the liability limitation to direct loss extended to excluding a party's liability for all loss including negligence); • liability relating to rates, Charges and other payments under the Transportation Agreement; • liability relating to Imbalances;	*Amend proposed clause 93 (consequential loss exclusion):* • *to make it expressly subject to the liability cap provision (proposed clause 94), but otherwise operate despite any other provision to the contrary in the agreement.* • *to extend the protection to related bodies corporate of the User (not just GGT's) and their respective directors, officers, employees, agents and contractors.* • *to replace "Gross Negligence" in paragraph (a) with simple "negligence" (as per the limitation in current clause 18.2(a)).* • *to restrict the carve-out in paragraph (b) expressly to payment liabilities arising in relation to the transportation agreement.*

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		• liability relating to the receipt, transportation or delivery of Overrun Quantities; • liability relating to the User's obligation to deliver Gas which meets the quality required by the Gas Specification or any other quality as the law in Western Australia requires; • liability relating to a failure to supply Gas at Receipt Points within a specified pressure range; • liability relating to the indemnity described in clause 95 of the Terms and Conditions; • liability relating to the use of the Information Interface by the User's employees who have been authorised for use by the Service Provider. Also, as GGT's proposed new AA T&Cs include many more indemnities by the User than under the existing AA T&Cs, the above carve-outs mean that the liability limitation in proposed clause 93 will not apply to the User's liability relating to those various indemnities given by User in relation to imbalances (proposed clause 20), non-specification gas (proposed clause 47), receipt point pressure (proposed clause 53), third party claims (proposed clause 95) and its "Gross Negligence" and "Willful Misconduct" (proposed clause 96). None of these indemnities contain protections for the User, such as requiring GGT to take reasonable steps to mitigate its loss (as would apply in a damages claim) or to	• *to restrict the carve-outs in paragraph (c) to just the User's liability for its obligations to provide gas at the receipt point within the gas specification (GGT's proposed clause 43) and to indemnify GGT where User has requested and GGT has agreed to transport and deliver non-specification gas (GGT's proposed clause 47). All other carve-outs in paragraph (c) should be deleted. (This is consistent with the carve-out in current clause 18.2 in relation to current clause 10.4.)* • *by adding as a new carve-out in paragraph (d), GGT's liability arising in respect of its obligations to deliver gas at delivery points within the gas specification (GGT's proposed clause 44) and not to receive, transport or deliver non-specification gas against the User's instructions (GGT's proposed clause 48). (This is the converse of the carve-out for the User's obligation regarding non-spec gas and is also consistent with GGT's stated reasoning that parties should take responsibility for matters "within the control of the relevant party").*

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		off-set from the indemnity claim any loss caused by GGT or anyone acting for or on its behalf). This potentially exposes the User to greater liability than under the existing AA T&Cs. Given the extent of the above carve-outs from the liability limitation in proposed clause 93, there may not actually be many circumstances where Users would get the benefit of the liability limitation in practice. By comparison, under the current AA T&Cs, the liability limitation in current clause 18.2 (Direct Losses Only) only has one carve-out, being that it does not apply to limit the User's liability in relation to the indemnity given in current clause 10.4 regarding non-specification gas. Accordingly, GGT's proposed revised AA T&Cs would appear to provide far greater exposure for Users to unlimited liability than under the existing AA T&Cs. Further, GGT's reason for extending the carve-outs to "matters which are within the control of the relevant party" does not extend to all the matters that are within the control of GGT. For example, GGT has not explained why the carve-outs do not extend to include GGT's liability relating to its obligations: • to deliver gas at the delivery point that meets the gas specification (see proposed clause 44); • not to continue receiving, transporting or delivering non-spec gas contrary to User's instructions (see proposed clause 48); and	• *by adding as a new carve-out in paragraph (e), GGT's liability arising in respect of its obligations to deliver gas at a delivery point within a specified pressure range (see comments at current clause 6.5 above).*

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		• to deliver gas at a delivery point within a specified pressure range (see comments at current clause 6.5 above).	
94	Replaced with proposed clause 94. The concept in clause 18.1 of the current AA T&Cs is replaced with a liability cap of 10% of the contract value over the life of a Transportation Agreement in proposed clause 94. This position is consistent with the RBP AA T&Cs.	Proposed new clause 94 sets an overall cap on just GGT's liability (excluding for Gross Negligence or Willful Misconduct) of 10% of contract value over the life of the contract. Current clause 18.1(c) set an overall cap on the liability for both parties at the amount of 1 years' service charges. The Authority is of the view that any new liability cap should be set at an appropriate level and apply mutually (not just to GGT, although, as GGT is service provider and the liability limitations are expressed not to apply to the User's payment obligations, it is GGT that would most likely be placing reliance on them in practice). Even if GGT is successful in having a minimum 5 year contract term, 10% of 5 years' contract value would be less than 1 full years' charges. All the more so if the minimum contract term is reduced to 1 year (as User's have submitted should be the case).	*Amend proposed clause 94 (liability cap):* • *to make it expressly operate despite any other provision to the contrary in the agreement, e.g.by adding the following sentence to new clause 94: "This clause 94 applies despite any other provision of the Transportation Agreement to the contrary, including any contrary provision in clause 93."* • *to make liability cap apply both ways (as per current clause 18.1(c)) and to reinstate liability cap at amount equal to 1 year of charges (as per current clause 18.1(c)(1)) – although some form of assumption presumably needs to be expressly stated in order to quantify what the variable charges would be for this purpose for a year (e.g. assumed full MDQ taken throughout year with no imbalance, variance or overrun charges?).* • *to extend the protection to related bodies corporate of the User (not just GGT's) and their respective directors, officers,, employees, agents and contractors (as per*

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			limitation in current clause 18.1(c)). • *to reinstate the principle that neither party is to be liable for any liability or loss suffered by the other to the extent that the negligence of the other party contributed to that liability or loss (as per current clause 18.1(c)(2)).*
95-96	Replace current 18.3 (proximate losses). Proposed clauses 95 and 96 set out the indemnities and are in accordance with the RBP AA T&Cs.	The User's liability under current clause 18.3 (proximate losses) is geographically limited to activities in or about the locations specified in current clause 18.4. However, the indemnities in proposed clause 95 have no such geographic limitation and consequently potentially extend the liability for Users much more widely. Further, proposed clause 95 purports to apply to liabilities arising not only during but also after the expiry of the transportation agreement. GGT provides no real justification for these changes. The Authority requires proposed clause 95 to be amended: • so it does not apply to liability arising after the transportation agreement ends; • by including a geographic proximity limitation on the User's liability under proposed clause 95 (as per those set out in current clause 18.4); • so the indemnity in proposed clause 95(a) contains a limitation (as per current clause	*Amend proposed clause 95:* • *so that indemnity does not apply to liability arising after the termination of the transportation agreement.* • *so that User's liability is limited by reference to certain specified geographic locations (as per current clause 18.4).* • *by inserting the following words (taken from current clause 18.3(b)) immediately after "indemnify" on line four of paragraph (a): "does not apply in respect of any liability to the extent that the liability is unrelated to any fault, action or omission on the part of the User or persons under the direct control of the User and ".* • *by inserting the following words immediately after "Agreement" on*

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		18.3(b)) that it is not to apply in respect of any liability to the extent that the liability is unrelated to any fault, action or omission on the part of the User or persons under the direct control of the User; and • so the indemnity in proposed clause 95(b) contains a similar carve-out in respect of Gross Negligence and Willful Misconduct on the part of GGT or its related bodies corporate as that already contained in proposed clause 95(a). This would be consistent with the concept in proposed clause 96 that each party is responsible for its own Gross Negligence and Willful Misconduct.	*line four of paragraph (b): "except that the obligation to indemnify will be reduced in proportion to the extent that the loss or damage is caused by the Gross Negligence or Willful Misconduct of the Service Provider or its Related Bodies Corporate".* *Amend proposed clause 96 to provide that the amount of the indemnity is to be reduced to the extent the indemnified party fails to take reasonable steps to mitigate its loss.*
	Current clause 18.4 (locations) deleted. Not required in accordance with revised liability/indemnity position.	Deletion is not acceptable. See comments on proposed clause 95 above.	*See recommended amendments to proposed clause 95 above.*
	Current clause 18.5 (refunds and credits) deleted. Not required in accordance with revised liability/indemnity position.	GGT has not provided any adequete explanation as to why current clause 18.5 has been deleted. It seems to be a valuable provision for Users.	*Reinstate current clause 18.5.*
	Current clause 18.6 (no liability for fault of others) deleted. The concept is incorporated in proposed clause 95(a).	The justification that GGT has provided for deleting current clause 18.6 only really relates to the first sentence of current clause 18.6. The second sentence of current clause 18.6 should be reinstated. It provides that: "*Where negligence is found to have been contributory each party will bear responsibility in accordance with that party's proportionate fault.*" This would seem to be a	*Reinstate second sentence of current clause 18.6: "Where negligence is found to have been contributory each party will bear responsibility in accordance with that party's proportionate fault."*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		reasonable provision to preserve.	
97	Current clause 18.7 (each limitation separate) relocated to clause 97. Structural change only to accord with structure of RBP AA T&Cs.	Relocation is acceptable.	*The Authority accepts relocation to proposed clause 97.*
Force majeure			
98	Current clause 17.1 relocated to clause 98 and updated. This clause has been simplified and amended so that it relates to the extent performance is prevented by an FM Event rather than specifying failure to accept or deliver gas or perform obligations. This is consistent with other APA Group access arrangements and the RBP AA T&Cs.	**Proposed clause 98** is acceptable. The Authority also notes proposed clause 16 grants GGT extensive rights to interrupt or curtail in circumstances that go beyond force majeure and the provisions in proposed clauses 31 & 32 (please refer to the Authority's comments in proposed clause 16, above).	*Proposed clause 98 accepted.* *Delete proposed clause 16.*
99	Current clause 17.2 relocated to 99 and updated. Concept remains the same but the language used is that in the RBP AA T&Cs. Clause 100 has also been introduced to be consistent	**Proposed clause 99** gives GGT a discretion (albeit acting reasonably) to determine the reduction in Toll Charge or Capacity Reservation Charge where GGT fails to deliver due to FM, whereas current clause 17.2(b) does not, requiring GGT to include a credit for the value of the Toll Charge and Capacity Reservation Charge for the period of FM.	*Amend proposed clause 99 to remove GGT's discretion as to the amount of the reduction in Toll Charge or Capacity Reservation Charge where GGT fails to deliver due to FM (i.e. revert to current clause 17.2(b) principle that GGT must credit User with the full value of those charges for the period of FM).*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	with RBP AA T&Cs to specify which events do not relieve a party of liability under the Force Majeure provisions.		
100	Current clause 17.3 deleted. Not required.	The Authority is not satisfied that GGT has provided sufficient justification as to why current clause 17.3 is not required. While proposed clause 100 goes some way to addressing current clause 17.3(c), it does not expressly require any efforts to mitigate or remove the *effects* of the FM (as is required by old clause 17.3(c)). Current clauses 17.3(a), (b) and (d) also need to be reinstated, as presumably Users will want GGT to give them notice and details of the FM (17.3(a)), allow them to examine and investigate the event (17.3(b)) and tell them when it's over (17.3(d)).	*Amend proposed clause 100(b) to add a requirement to "mitigate or remove the effects of the Force Majeure Event" (as per current clause 17.3(c)).* *Add provisions to reinstate current clauses 17.3(a), (b) and (d).*
101	Relocates and updates current clause 17.4. Amended to incorporate timeframes used in other APA Group access arrangements and to be consistent with the RBP AA T&Cs.	On balance the Authority is of the view that the new timeframes seem more likely to favour GGT at the expense of Users. Proposed clause 101 requires a FM event to have prevented performance of an obligation for 12 months plus a further 7 days consultation before a party can terminate on 2 months' notice (i.e. 14 months and 7 days in all). This is altogether longer than under old clause 17.4, which requires the FM to last 6 months plus a further 3 months consultation (i.e. 9 months in all) before a party can terminate on 3 months' notice (i.e.12 months in all). It also allows a party claiming FM twice as long (12 months instead of 6 months) before it even has to consult with the other party, and the consultation period is significantly shorter (7 days, not 3 months). Given that, on balance, FM provisions tend to favour the service provider in practice (i.e. GGT), these	*Reinstate timeframes from current clause 17.4.*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		changes would seem to worsen the position for Users where a protracted FM event affects GGT.	
	Current clause 8.5 deleted. Not required as force majeure provisions in clauses 98 – 101 deal with consequences of a force majeure event.	Current clause 8.5 provides Users with potentially valuable protection in the event gas transportation is interrupted due to FM, in that it positively requires GGT to use reasonable endeavours (consistent with the standard of a reasonable and prudent pipeline operator) to *maintain* transportation services so that a User with a Firm Service can deliver and take gas pro-rata with all Firm Service Users, unless GGT and all such Users otherwise agree. Current clause 8.5 also lists some specific matters GGT must take into account "in a fair and reasonable manner" when doing that. This provides much more substance to what GGT must do (and therefore enhances the protection for Users) than the bare requirements of GGT's proposed new clauses 98-101, which in this respect simply require GGT to "use all reasonable endeavours to remedy the situation" (proposed clause 100(b)). Current clause 8.5 is therefore a valuable addition for Users to the FM provisions sought by GGT and also to the current FM provisions in current clause 17 if they are retained without being replaced by GGT's proposed clause 98-101 (see discussion on current clause 17 below).	*Reinstate current clause 8.5*
Assignment			
102	Relocates and updates current clause 20.1. Clause updated to include right to assign obligations as well as rights and to also provide that consent	Appears reasonable, however requires some minor amendment to clarify that it is subject to new clauses 103-110 and to apply the extended definition of "assign" in those clauses also.	*Amend definition of "assign" on line 2 of proposed clause 102 so that it also applies where "assign" is used in clauses 103 to 110.*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	cannot be withheld if the assignee is financially and technically capable of performing the assigned rights and obligations. The clause also extends the right to assign to novate, transfer or otherwise dispose. The updates to this clause are consistent with the RBP AA T&Cs and provisions under Rule 105 of the NGR.		*Amend new clause 102 to make it expressly subject to all of new clauses 103-110.*
103	Relocates current clause 20.2 – no change to content. Structural change only to accord with structure of RBP AA T&Cs.	Appears acceptable.	*Accepted.*
104	Relocates and updates current clause 20.3. Proposed clause 104 updated so that the form of covenant must be in a form reasonably acceptable to the non-assigning party and the concept of "deed of covenant" has been removed to enable flexibility in the type of document used.	GGT's replacement of concept of "deed of covenant" with just "covenant" raises potential issues of enforceability. Suggest inserting "legally enforceable" immediately before "covenant" in line 2 of proposed clause 104.	*Amend proposed clause 104 to insert "legally enforceable" immediately before "covenant" in line 2.*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
105	Relocates current clause 20.4 – no change to content. Structural change only to accord with structure of RBP AA T&Cs.	Relocation appears acceptable	*Suggest minor change to wording of clause 105(b)(iii) to improve readability: "the Owners resolve that this is desirable…"*
106	Relocates current clause 20.5 – no change to content. Structural change only to accord with structure of RBP AA T&Cs.	Relocation appears acceptable	*Accepted*
107	Proposed clause. Proposed clause 107 to address change in control of a party. This clause is consistent with such clause in the RBP AA T&Cs.	While GGT has not offered any adequete justification for adding a change in control provision, the Authority accepts that such a restriction is usual where restrictions are placed on assignment (as it acts as a safeguard against a party by-passing the restrictions on assignment by effecting a change in control). However, the proposed change of control provision in proposed clause 107, does not have the same safeguards around withholding of consent as exist for an assignment under proposed clause 102 (and NGR 105(4)). Further, while GGT claims that proposed clause 107 "is consistent with such clause in the RBP AA T&Cs", it in fact omits paragraph (e) from the relevant clause in the RBP AA T&Cs (clause 100) which provides that the provision preventing the Affected Party from enforcing the transportation agreement before it obtains consent for the change of control "does not affect the Affected Party's obligations under the Transportation Agreement". It is not clear why GGT has omitted this provision.	*Amend proposed clause 107 as follows:* • *Add a sentence at the end of proposed clause 107 to the effect that "The Service Provider must not withhold its consent under this clause 107 unless it has reasonable grounds, based on technical or commercial considerations, for doing so."* • *Add a provision as per para 100(e) from the RBP AA T&Cs (which provides that the provision preventing the Affected Party enforcing the transportation agreement before it obtains consent for the change of control "does not affect the Affected Party's obligations under the Transportation Agreement").*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		Given that, unlike with the RBP AA T&Cs, GGT is acting as agent for several Owners, it needs to be made clear that the change in control restriction applies to GGT and each Owner, not just GGT.	• *Add a provision to make clear that not only GGT but also any of the Owners can be an "Affected Party" (i.e. clarify that the change in control restriction applies to GGT and each Owner, not just GGT).* *It would also improve the readability of proposed clause 107 if the introductory paragraph were split into three paragraphs as is done in clause 100 of the RBP AA T&Cs.*
108	Relocates and updates current clause 20.6. Proposed clause 108 is streamlined and simplified but the same concepts remain. Required under the new AA and provisions under Rule 105 of the NGR.	The Authority requires the words "Notwithstanding clause 102" to be inserted at the beginning of proposed clause 108 to put beyond doubt that (consistent with rule 105(2) of the NGR) proposed clause 108 takes precedence over proposed clause 102. The Authority notes that similar wording is used in proposed clauses 103 and 106. **Proposed clause 108** accords with rule 105(2) of the NGR, except that the requirement in proposed clause 108(b)(iii) for the User to give GGT notice of "*any other details (other than price) reasonably requested by Service Provider*" does not appear to be an NGR requirement. GGT has not explained why it has included this requirement for additional details in proposed clause 108(b)(iii), nor has the Authority received any submissions specifically concerning this requirement for additional details. While these additional words are not included in rule	*Amend new clause 108 by inserting at the beginning of that clause: "Notwithstanding clause 102".*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		105(2) of the NGR, the Authority notes that the requirement is subject to a reasonableness test and the Authority considers their inclusion to be acceptable. Proposed section 6.2 of the AA must also be amended to be consistent with this change.	
109		GGT has not explained why proposed clause 109 is considered necessary nor has the Authority received any submissions specifically concerning this requirement. The Authority notes that while rule 105(2) of the NGR already requires the user to "immediately give notice" of the subcontract (and hence new clause 108(b) does this too), proposed clause 109 is not required by rule 105 of the NGR. However, the Authority notes that under current clause 20.6(a)(2), an assignee must notify GGT of the transferred capacity "prior to utilising" the transferred capacity. A pre-notification requirement is not expressly permitted or required by the NGR, and no such additional requirement has been included by GGT in the capacity trading requirements in section 6 of the proposed revised AA. Including the requirement here could be discriminatory and thereby inconsistent with the NGR.	*Delete proposed clause 109.*
110	Current clause 20.7 deleted, but replaced with proposed clause 110. Proposed clause 110 is required under the new AA and provisions under rule 105 of the NGR.	The Authority requires the words "Notwithstanding clause 102" be inserted at the beginning of proposed clause 110 to put beyond doubt that (consistent with rule 105(3) of the NGR) proposed clause 110 takes precedence over proposed clause 102. The Authority notes that similar wording is used in proposed clauses 103 and 106. Proposed clause 110 adds various requirements to be satisfied by Users wishing to assign MDQs. The	*Amend proposed clause 110:* • *to insert "Notwithstanding clause 102" at the beginning of proposed clause 110;* • *to ensure proposed clause 110(a) is consistent with proposed section 6.3(a) of the revised AA, including:*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		specification in advance of conditions for giving consent or which are to apply if consent is given is in principle consistent with rule 105(6) of the NGR. The Authority has not received any submissions specifically concerning these requirements. The requirement in proposed clause 110(b) that the assignee must execute a "Firm Transportation Agreement acceptable to Service Provider" is unclear. The term "Firm Transportation Agreement" is not defined. The words "acceptable to the Service Provider" are too subjective and have no safeguard against GGT acting unreasonably. While the opening paragraph of proposed clause 110 requires that GGT must not unreasonably withhold its consent to an assignment of MDQ, under rule 105(4) of the NGR, the prescribed reasonableness test is even more restrictive than that: GGT must not withhold its consent "unless it has reasonable grounds, based on technical or commercial considerations, for doing so". Accordingly, the Authority requires the inclusion of a new clause 110(h) which ensures the more stringent test is applied. Proposed clause 110(g) requires that the user wishing to assign must not be in default under the Transportation Agreement. To be consistent with rule 105 of the NGR, that requirement must be reasonable based on technical or commercial considerations and also be consistent with the NGO. The Authority is of the view that provided the existence of the default is an objective test, this restriction is acceptable. Further, current clause 20.7(d) requires GGT to give its	- *Amend so GGT will only be allowed reimbursement of costs etc that it has "reasonably and properly incurred".* • *to ensure proposed clause 110(b) is consistent with proposed section 6.3(b) of the revised AA, including:* - *by deleting "Firm" from line 1 of proposed clause 110(b);* - *by adding "(acting reasonably based on reasonable commercial or reasonable technical considerations)" after "Service Provider" in line 2 of proposed clause 110(b);* • *to ensure proposed clause 110(c) is consistent with proposed section 6.3(c) of the revised AA, including by amending proposed clause 110(c) to clarify the meaning of "reasonable requirements";* • *to ensure proposed clause 110(d) is consistent with proposed section 6.3(d) of the revised AA;* • *to ensure proposed clause 110(e) is consistent with proposed section 6.3(e) of the revised AA;* • *to ensure new clause 110(f) is consistent with proposed section*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		consent to a transfer within 30 days or specify reasonable technical or commercial conditions to be complied with in order to obtain consent. Proposed clause 110 does not contain any such time limit. The Authority notes that the NGR does not specifically require the inclusion of such a time limit; however GGT has not provided any justification for removing it and the Authority is of the view that inclusion of such a time limit promotes the efficient operation and use of the pipeline consistent with the NGO.	*6.3(f) of the revised AA, including by adding the words "(acting reasonably, based on reasonable commercial or reasonable technical considerations)" after "Service Provider" at the end of proposed clause 110(f);* • *to ensure proposed clause 110(g) is consistent with proposed section 6.3(g) of the revised AA, including;* - *by amending proposed clause 110(c) to clarify the meaning of "reasonable requirements";* • *to add the following as proposed clause 110(h) so as to satisfy NGR rule 105(6): "Service Provider must not withhold its consent under this clause 110 unless it has reasonable grounds, based on technical or commercial considerations, for doing so."; and* • *to include a requirement for GGT to notify the User whether or not GGT consents to an assignment under proposed clause 110, within 30 days of GGT's receipt of the User's request for that assignment*
Confidentiality			
111-113	Current clauses 21.1 – 21.3 have been replaced with proposed clauses 111-113	Proposed clauses 111-113 appear reasonable but do not include the specific carve-outs for permitted disclosures in paragraphs (a) to (g) of current clause	*Amend proposed clause 112 to include as a new paragraph (e), the permitted disclosure provisions from current clause*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
	The revised clauses replicate what has been approved by the AER in the RBP AA T&Cs. The obligations have been simplified and consent for disclosure is now required unless certain circumstances exist. This is consistent with the confidentiality provisions in other APA Group access arrangements.	21.2. In particular, there are now no permitted disclosures to prospective transferees of capacity (current clause 21.2(d) and prospective new owners of a User (current clause 21.2(f)). In such cases, a User would now have to seek GGT's prior written consent which would not only give GGT advance notice of the sale but also an opportunity to delay/block it. There is no clear statement that the confidentiality obligations are to survive termination of the agreement.	*21.2.* *Add a proposed clause to provide that the obligations of confidentiality in the Terms and Conditions survive the expiry or earlier termination of the Transportation Agreement and continue afterwards in full force and effect.*
Appendix One – Test Procedures			
	Replaces current First Schedule	The Authority notes that, on the proposed drafting of the T&Cs, Appendix One is not invoked. However, this will be corrected if the Authority's recommendations concerning the Metering provisions (new clauses 37-42) are followed.	*Follow the Authority's recommendations concerning the Metering provisions (proposed clauses 37-42)*
Appendix Two – Gas Specification			
	Replaces current Second Schedule	The Authority notes that the figures for the Wobbe Index and Gross Heating Value in the Gas Specifications have been changed. Refer to the Authority's Required Amendment 2 for discussion on the Gross Heating Value change. The Authority notes that the figure for the minimum Wobbe Index has also changed in the gas specification in	*Refer to the Authority's Required Amendment 2. The Authority also does not accept GGT's proposal to increase the Wobbe index to 46.5 MJ/m³ and the previous value of 46.0 MJ/m³ should be reinstated.*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
		Appendix 2 of the proposed terms and conditions, from 46.0 MJ/m³ to 46.5 MJ/m³.	
Appendix Three – Technical Requirements for Delivery Facilities			
	Replaces current Fifth Schedule		
Schedule A - Details			*The **Details** must also be included in the Order Form/Form of Agreement*
Schedule C - Defined Terms & Interpretation			
			Separate set of Defined Terms and Interpretation clauses is required for the T&Cs to ensure Transportation Agreement is fully standalone. See the Authority's Required Amendment 21.
			Defined terms need to be amended to ensure correct cross references to terms defined in T&Cs once provisions currently in the main body of the AA are reinstated into the T&Cs.
			*Insert a defined term for date of actual commencement of Firm Service (e.g. "**Commencement Date**"?)*
			*Amend definition of **Connection Charge** to limit it to GGT's direct costs reasonably and properly incurred by Service Provider in*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
			establishing the new Connection, including the installation of new facilities associated with the connection of the User's facilities to the Pipeline in accordance with Good Engineering and Operating Practice.
			*Seems unnecessary to have definitions for both "**Day**" and "**Gas Day**" when they essentially cover the same ground.*
			*Define **Delivery Point MDQ** by reference to the MDQ applicable to the User at a particular Delivery Point (in case the delivery point has multiple users) and specify how it is to be determined (e.g. as specified in Order Form?)*
			*Define **Delivery Point MHQ** by reference to the MDQ applicable to the User at a particular Delivery Point (in case the delivery point has multiple users).*
			*Amend definition of "**Firm MDQ**" so that it refers to "the User", not "Users"*
			*Add definition for **Order Form** or **Form of Agreement** (the form of which should be scheduled to the AA).*
			*Consider if a new definition of **Metering Equipment** is required*
			*Consider if the definition of **Other Tariff Charges** is still required.*
			*Amend definition of **Receipt Facilities** to better describe the facilities to be caught by the definition e.g. facilities required for or in*

Section in GGT's revised T&Cs	GGT's comments	Authority's consideration and comments	Authority's required amendment
			relation to receipt of Gas into the Pipeline in accordance with Good Engineering and Operating Practice?
			*Define **Receipt Point MDQ** by reference to the MDQ applicable to the User at a particular Receipt Point (in case the receipt point has multiple users) and specify how it is to be determined (e.g. as specified in Order Form?)*
			*Define **Receipt Point MHQ** by reference to the MHQ applicable to the User at a particular Receipt Point (in case the receipt point has multiple users) and specify how it is to be determined.*
			*Consider if a defined term is required for date of actual termination of Firm Service (e.g. "**Termination Date**"?)*
			*Amend definition of **Transportation agreement** to capture one for the Firm Service, e.g. by adding: "and, as regards the Firm Service, means a contract entered into between the Service Provider and a User using the [Order Form/Form of Agreement] and the Terms and Conditions, and where used in relation to such a User, means that User's contract for the Firm Service"*
			Amend the interpretation provisions in Part C.2 of Schedule C to provide to the effect that the words "includes", "including" and "for example" are not used as words of limitation.

Part 2 – Provisions the Authority requires to be added to GGT's Terms and Conditions

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
Term of Transportation Agreement			
	Current clause 3.1 (Term and Termination) deleted. This provision is not required as each Transportation Agreement will refer to the Term.		*Amend T&Cs to reinstate a provision such as current clause 3.1, setting out the term. For example:* *"The Transportation Agreement shall come into force on the Date of Transportation Agreement and, subject to earlier termination in accordance with these Terms and Conditions, shall expire on the Termination Date."*
Enhancements not operational			
	Old clause 3.2 (Enhancements not operational) deleted. This provision is not required in the AA T&Cs as it is inconsistent with the description of the Firm Service.	If GGT means the Firm Service being "subject to there being sufficient Spare Capacity" (AA clause 2.2.1), this should not require any enhancements to capacity. If enhancements apart from capacity may be required (e.g. metering at delivery points), then clause 3.2 of former AA should be retained.	*Amend T&Cs to reinstate current clause 3.2, setting out consequences if any enhancements are not operational.*
Firm Service			
	Old clause 4.3 deleted and replaced by new section 2.2.1 of the revised AA.	The T&Cs and Order Form should be "standalone" and so must contain all of the terms and conditions, including a full description of the Firm Service. See the Authority's Required Amendment 21.	*Include full description of Firm Service in the T&Cs.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
			See the Authority's Required Amendment 21.
MDQ and MHQ			
	Proposed section 2.2.2 of the revised AA.	The Authority is of the view that proposed sections 2.2.2(a) and 2.2.2(b) do not clearly state how the user must "establish" "Firm MDQ and Firm MHQ" and "MDQ and MHQ" for multiple delivery points, respectively. As per the current AA T&Cs, the Authority considers that the revised AA can specify how the quantities are to be "established" in the following way: • for MDQ, as specified by the user in the user's Order Form (or other contractual document); and • for MHQ, as mathematically derived from the MDQ by application of a formula. In proposed section 2.2.2(c), GGT has revised the MHQ formula such that the MHQ is to be no greater than MDQ ÷ 24 x 1.1 (as opposed the current formula – MDQ ÷ 24 x 1.2). This will have the effect of reducing the maximum figure a user can have for its MHQ. GGT did not provide any evidence to support its claims that the variation to the MHQ formula is to be in line with other APA contracts on the GGP and more in line with load profiles for industrial customers and to facilitate more efficient utilisation of the pipeline. Nor did the GGT provide any evidence to justify the proposed variation based on the NGO.	*MDQ and MHQ provisions should be included in the T&Cs in full.* *Amend proposed section 2.2.2(a) of the revised AA to clarify precisely how the User is to "establish" a Firm MDQ and Firm MHQ for each contract year. For example, the User's MDQ for each contract year should be set out in the User's Order Form (or similar document lodged by the User and forming part of the transportation agreement) and the Firm MHQ should be determined from that by application of a formula specified in the T&Cs (as is the case under the existing AA T&Cs – see definitions of "MDQ" and "MHQ" in Appendix 1 of the current AA).* *Amend proposed section 2.2.2(b) of the revised AA to clarify precisely how a User with multiple delivery points is to "establish" a MDQ and MHQ for each delivery point.* *Amend proposed section 2.2.2(c) of the revised AA to reinstate the existing MHQ formula from the definition of MHQ in Appendix 1 to the current AA.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		No submissions were received which specifically ment the proposed revision to the MHQ formula – however, BPB Billiton submitted that the amendments to the T&Cs generally represent a significant deterioration in the rights of both new and existing users from the current AA, that no compelling rationale has been provided for the changes and absent clearly articulated reasons, the previous terms and conditions should remain. BPB Billiton notes that the proposed amendments would be contrary to the achievement of the NGO. Without adequate justification for the proposed change, the current MHQ formula should be reinstated. In proposed section 2.2.2(d)(i) of the revised AA, System Use Gas and User's Linepack need to be expressly excluded from the determination of whether the Service Provider has *received* more than the "Firm MDQ" on any gas day. Also, the current drafting in proposed section 2.2.2(d)(iii) does not exclude System Use Gas and User's Linepack contributions from the receipt point MHQ restriction. The Authority notes that GGT is proposing that the service provider dictates the timing and quantity of System Use gas and the linkepack a user must provide without necessarily providing users with adequate notice. Proposed section 2.2.2(d)(iii) should be amended to exclude System Use gas and User's Linepack so as to ensure that users are not	*Amend new section 2.2.2(d)(i) of the revised AA so as to contain the same exclusion for System Use Gas and User's Linepack as regards receival of gas (not deliveries) as exists in new section 2.2.2(d)(ii)).* *Amend new section 2.2.2(d)(iii) so as to exclude System Use Gas and User's Linepack contributions from the receipt point MHQ restriction.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		prejudiced for exceeding receipt point MDQ and MHQ limits.	
Overruns			
	Change to terminology of "Overrun" to align terminology and approach to other APA access arrangements and relocated to section 2.2.4 of the revised AA. New section 2.2.4 "Overruns" Replaces section 4.4 "Supplementary Quantity Option" of General Terms and Conditions of the current AA. Change to align terminology and approach with other APA Group access arrangements	It is not clear why GGT has removed the overrun provisions from T&Cs and put them into sections 2.2.4 and 4.2.2 of the revised AA. They need to be fully included in the T&Cs. **Effect of overrun on MDQ** Current clause. 7.3(d) should be reinstated in place of new section 2.2.4(l). Proposed section 2.2.4(l) of GGT's revised AA is potentially worse for users because: It applies to exceeding receipt point MDQ or delivery point MDQ, whereas current clause 7.3(d) only applies to exceeding delivery point MDQ; It requires a user to exceed its MDQ by over five per cent on any 12 occasions each year (which need not be consecutive), whereas current clause 7.3(d) requires 30 consecutive days of excesses (although they need not be more than five per cent), so current clause.7.3(d) arguably gives a user a greater buffer before action is taken; and It applies even if the overrun is an Authorised Overrun, whereas under current clause 7.3(d) the SQO quantity (equivalent of authorised overrun) is subtracted from the calculation of "Daily Overrun Quantity" so it is only unauthorised overruns that can trigger the threshold. If the threshold is triggered, then the user's MDQ is increased by average of the "highest daily quantities" irrespective of whether or not any of those quantities	*Overrun provisions should be included in the T&Cs in full.* *Amend new AA section 2.2.4(e) to clarify that User may, but need not, Nominate its Authorised Overrun with its monthly Nomination for the Firm Service (at least 3 Days before the Month start) but must Nominate its Authorised Overrun by no later than the Nomination Deadline of 4.00pm on the day before the relevant gas day.* *Amend overruns charging mechanism (including rates) to ensure users are no worse off than under existing AA. This includes reinstating old clauses 9.6(b) and 9.6(e)) and amending Authorised Overrun Charge rate so it is no worse for users than the rate applicable for SQO under the existing AA and providing an Unauthorised Overrun Charge rate which leaves users no worse off than under existing AA.* *Amend to make expressly clear in the drafting if Authorised Overrun is or is not intended to be on a take or pay basis.* *Delete the indemnities for unauthorised overrun in section 2.2.4(k) and section 4.2.2(f) of GGT's revised AA.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		were authorised, whereas under current clause.7.3(d) the user's MDQ is to be increased by the average of the "Daily Overrun Quantity" (which specifically does not include authorised overruns). **Authorised Overrun** GGT has deleted the supplementary quantity option (SQO) provision from the current AA (see current clauses.4.4 & 9.4) and replaced it with the "Authorised Overrun" process in its revised AA (see new sections 2.2.4 & 4.2.2). Both the SQO and Authorised Overrun processes are at GGT's discretion and are fully interruptible. In its AA Supporting Information (at page 12, paragraph (c)), GGT claim the supplementary quantity option has been removed because it has "never been used in gas transportation agreements". If the supplementary quantity option is broadly equivalent to authorised overrun then GGT's claim seems unlikely. In any case, GGT's change leads to some subtle, but potentially significant, differences between the current and proposed regimes for dealing with overrun. For example, under current clause 4.4(b), the User has to give at least 18 hours' notice of its supplementary quantity option (i.e. authorised overrun) prior to the relevant gas day. However, under the overrun provisions in the proposed AA, the User must give notice of its overrun requirement "as part of the User's Nomination for the Firm Service" (see proposed AA section 2.2.4(c)) or else the overrun will be treated as unauthorised overrun (with potentially higher rates to pay). As the "User's Nomination for the Firm Service" is a two stage process requiring monthly Nomination	*Delete new section 2.2.4(l) of the revised AA and reinstate old clause. 7.3(d) in the T&Cs.* *Extend the circumstances where Users are excused from payment of the Overrun Charge (see new clause 4.2.2(a) of the revised AA) to cover situations where Overrun is caused to any extent (not just "solely caused") by GGT or by any Related Body Corporate of GGT or by any person acting for on behalf of any of them, or is caused by any event beyond the reasonable control of the User.* *System Use Gas and User's Linepack gas quantities also need to be expressly included in the calculation of "Authorised Overrun" for gas receival (but excluded from the calculation of the Authorised Overrun Charge) so that Users do not end up paying Overrun Charges (new section 4.2.2 of revised AA) or having their MDQ forcibly increased (new section 2.2.4(l) of revised AA) because of their System Use Gas and User's Linepack gas contributions.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		(at least 3 Days before the Month start – see proposed clause 6) with the potential to revise that Nomination by no later than the Nomination Deadline of 4.00pm on the day before the relevant gas day (see proposed clause 7), this may mean the User has to give much more notice of its proposed overrun than under the current AA if it is to avoid it being treated as unauthorised overrun (with potentially higher rates to pay for that consequence). Under the current SQO process, the user would have to pay a "Supplementary Quantity Option Charge" in addition to the usual transportation charges for the SQO overrun gas (see current clause.9.4 and item 4 of Fourth Schedule); and the Toll Charge and Capacity Reservation Charge for the nominated overrun are expressed to be payable on a take or pay basis (see current clause 4.4(e)). Under the proposed Authorised Overrun process, the user pays an Authorised Overrun Charge in addition to the usual transportation charges for the overrun gas (see proposed section 4.2.2(c)). The drafting is not entirely clear whether it is intended that users must pay Toll Charge and Capacity Reservation Charge for the nominated overrun on a take or pay basis. It would be more transparent for users if GGT made it expressly clear in its drafting if Authorised Overrun is or is not intended to be on a take or pay basis. So, as regards SQO/Authorised Overrun, it would appear that, while GGT is changing the terminology here, most of the substance remains the same, except for: • the notice requirements (see below);	

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		• the proposed new Authorised Overrun Charge rate appears worse for users than the existing "Supplementary Quantity Option Charge" rate; and • under the SQO process, the Toll Charge and Capacity Reservation Charge for the nominated overrun are expressed to be payable whether or not the user actually delivers or accepts the SQO overrun gas (i.e. on a take or pay basis - see current clause 4.4(e)), whereas this is arguably the same, but less clearly the case, with Authorised Overrun under the revised AA (and so the revised AA is potentially less transparent in this respect). **Overrun charges and indemnities** GGT has deleted current clause 9.6(b). Under current clause 9.6(b), GGT is only entitled to impose overrun (and imbalance) charges where it is reasonably considered that the imbalance or overrun has caused GGT or any User loss or damage or exposed the GGP to significant risk that threatens the integrity of the GGP. GGT has not provided any good justification for the removal of these restrictions. The replacement provisions GGT is proposing in proposed sections 2.2.4 and 4.2.2 of the revised AA: • contain a formula for the "Authorised Overrun Charge" (based on 120% (i.e. a **1.20** multiplier) of transportation tariffs, multiplied by authorised overrun quantities at delivery points). This formula is different from the formula used	

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		for the "Supplementary Quantity Option Charge" in old clause 9.4(e) (based on a multiplier of **1.05** times transportation tariffs – which may be varied by GGT - see item 4 of Fourth Schedule to Appendix 3 of existing AA)). So (subject to any differences between the old and new transportation tariffs) it would seem Users are worse off under GGT's proposed new "Authorised Overrun Charge". GGT has not provided any good justification for this proposed change; • contain a formula for the "Unauthorised Overrun Charge". Contrary to what is stated in new section 4.2.2(d)(i) of the revised AA, there is no "*Unauthorised Overrun Rate set out in the Details*". As GGT has not provided the Unauthorised Overrun Rate, the Authority cannot determine to what extent users are or are not to be potentially worse off. The Authority is therefore unable to approve the Unauthorised Overrun Rate or the Unauthorised Overrun Charge. GGT needs to disclose its proposed Unauthorised Overrun Rate so that the true effect of GGT's proposed changes on Users can be determined. • contain indemnities for unauthorised overrun by the User in clauses 2.2.4(k) and 4.2.2(f) of the revised AA which are both unlimited (see new clause 93(c)(ii))	

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		and do not require GGT to take reasonable steps to mitigate any loss before claiming under the indemnity. The indemnities for unauthorised overrun in section 2.2.4(k) and section 4.2.2(f) of GGT's revised AA should be deleted. There were no such indemnities for overrun in AA2 and GGT has not provided any good justification why it requires these indemnities in addition to the overrun charges; and • contain circumstances where Users are excused from payment of the Overrun Charge (see new clause 4.2.2(a) of the revised AA) that need to be extended to cover situations where Overrun is caused to *any* extent (not just "solely caused") by GGT or any person acting for on GGT's behalf (not just by GGT alone) or is caused by any event beyond the reasonable control of the User.	
Metered Quantities of Gas Used for Purposes of Transportation Agreement			
	Current clause 5.6 deleted. Clause not required for provision of Firm Service.	GGT has not provided any justification why GGT thinks this provision is not required for the Firm Service. Current clause 5.6 contains a deeming provision that deemed the measured quantities of gas at inlet points and outlet points to be true and correct unless shown	*Reinstate current clause 5.6.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		to be outside prescribed limits set out in current First Schedule (Test Procedures). (Those Test Procedures are now set out in proposed Appendix One, but new Appendix One does not appear to be referred to in the revised AA.)	
Transportation Charges			
	Current clause 9.4 relocated to new section 4 of the revised AA. Description of the Firm Service more appropriate to include in the body of the AA.	A description of the Firm Service (including all charges for the Firm Service) should be included in the T&Cs. The rates for the transportation charges have changed (compare item 1 of Fourth Schedule to Appendix 3 of current AA (subject to adjustment in accordance with clause 5 of current AA) with Details in Schedule A to the revised AA).	*A description of the Firm Service (including all charges for the Firm Service) should be included in the T&Cs.* *GGT's proposed rates are not accepted unless shown to be reasonable and consistent with NGR.*
Other Charges			
	Current clause 9.5 relocated to section 4.2 of the revised AA. Description of the Firm Service more appropriate to include in the body of the AA.	A description of the Firm Service (including all charges for the Firm Service) should be included in the T&Cs. The rates for the other charges have changed (compare items 3 & 4 of Fourth Schedule to Appendix 3 of current AA with Details in Schedule A to the revised AA).	*A description of the Firm Service (including all charges for the Firm Service) should be included in the T&Cs.* *GGT's proposed rates are not accepted unless shown to be reasonable and consistent with NGR.*
	Current clause 9.6 revised and replaced with section 4.2 of the revised AA. These charges have been replaced by imbalance and overrun charges as described	These charges should be included in the T&Cs. GGT has **not** included the following provisions from current clause 9.6: Current clause 9.6(b) – restriction on GGT charging for imbalances or overruns charges unless reasonable view that the imbalance/overrun causes loss or	*Include all charges provisions in T&Cs in full - See the Authority's **Recommendation [XX]*** *Reinstate current clauses 9.6(b), (d) & (e) provisions into T&Cs.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
	in section 4.2 of the revised AA.	damage to GGT or any user or exposes the GGP to significant risk threatening pipeline integrity; Current clause 9.6(d) - waiver of User's liability for imbalance and variance charges where liabilities incurred during interruption or reduction of service for which GGT directly responsible; Current clause 9.6(e) – rebate of 95% of "quantity variation charges" (i.e. transportation tariff, imbalance charge, overrun charges and variance charge) in excess of GGT's direct costs arising from the User's acts/omissions which caused the overrun or imbalance, to any other user of the reference service who did not cause the particular "quantity variation charges" to occur (only applies where more than on user of reference service). The rates for the imbalance and overrun charges have changed (apparently in GGT's favour) – see our comments at current clause 7 above.	*GGT's proposed new rates are not accepted unless shown to be reasonable and consistent with NGR.* *Amend overruns charging mechanism (including rates) to ensure users are no worse off than under current AA. This includes reinstating current clauses 9.6(b) and 9.6(e)) and amending Authorised Overrun Charge rate so it is no worse for users than the rate applicable for SQO under the current AA and providing an Unauthorised Overrun Charge rate which leaves users no worse off than under current AA.* *Amend imbalance charging mechanism (including rates) to ensure users are no worse off than under current AA. This includes reinstating current clauses 9.6(b), 9.6(d) and 9.6(e)) and imbalance allowance thresholds and charging rates such that users are no worse off.*
Daily Variation Charge		See proposed section 4.2.4 of the revised AA. It is not clear why GGT has removed variance provisions from T&Cs and put them into AA. They should be kept together with rest of T&Cs for user transparency reasons. The replacement provisions GGT is proposing in section 4.2.4 of the revised AA: Contain a formula for the "Daily Variation Allowance" (**5% of MDQ** for applicable Delivery Point/Receipt Point) which is different from that used for the "Variance Tolerance" in current clause 7.5 (greater of	*Include all charges provisions in T&Cs in full.* *Amend s 4.2.4 of the revised AA and the T&Cs to:* *Put all provisions dealing with variance into the T&Cs;* *Amend the proposed provisions for Daily Variance Charges (including the formulae for "Daily Variation Allowance" and "Daily Variance Charge" to ensure users are no worse off than under existing AA (including by*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		8% of User's nomination for applicable Delivery Point/Receipt Point and **1TJ**). In cases where User is nominating at or near its MDQ, this would seem to indicate that the User would be worse off under GGT's proposed s 4.2.4 of the revised AA as regards its variation allowance (and the consequent potential for paying extra charges). Contain a formula for the "Daily Variation Charge" (uses a "Daily Variation Rate" multiplier of 250% (i.e. **2.5**) of toll tariff + capacity reservation tariff + throughput tariff) which is different from the formula used for the "Variance Charge" in item 5(e) of the Fourth Schedule to Appendix 3 of the current AA (uses a multiplier of "**2.0**" of toll tariff + capacity reservation tariff + throughput tariff). So (subject to any differences between the current and proposed transportation tariffs) it would seem Users are worse off under the proposed new "Daily Variation Charge" because it uses a greater transportation tariff multiplier (2.5 times instead of 2.0 times). Also, its AA Supporting Information (at page 12, paragraph (c)), GGT claim that variation notices have been removed because they are "obsolete" and have "never been used in gas transportation agreements".	*adding a 21 day cure period before charges arise as per current clause 5.3(c)).*
Surcharge			
	Proposed section 3.3 "Surcharge". Details of how and under what condition a surcharge may be charged	As this is another potential charge for Users, a clear reference to it as a possible charge should also be included in the T&Cs for transparency so that Users are aware they may have to pay the surcharge.	*Include in T&Cs*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
Capital Contributions			
	Proposed section 3.4 links the charging of capital contributions with the requirements of the NGR	As this is another potential charge for Users, clear reference to it should be included in the T&Cs for transparency.	*Include in T&Cs*
Basis of Charges			
	Current clause 9.3 deleted. Proposed section 4.4 in revised AA only partially reinstates.		*Reinstate provision in T&Cs as per current clause 9.3 (including the exceptions stated in it)*
Waiver of Charges			
	Current clause 9.6(d) deleted		*Reinstate provision in T&Cs as per current clause 9.6(d).*
Rebate of Charges			
	Current clause 9.6(e) deleted		*Reinstate provision in T&Cs as per current clause 9.6(e)*
Refunds and Credits			
	Current clause 18.5 (refunds and credits) deleted. Not required in accordance with	GGT has not provided any good reason why current clause 18.5 has been deleted. It seems to be a valuable provision for Users where GGT has caused a supply interruption lasting more than 48 hours.	*Reinstate current clause 18.5.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
	revised liability/indemnity position.		
Reference Tariff and Reference Tariff Variation Mechanism			
	Current clause 9.8 deleted and incorporated into the revised AA (s 4.5 and Sch A). Reference Tariff Variation Mechanism in revised AA replaces the formula in clause 9.8. Operation of quarterly inflation adjustment not materially changed from current AA	Appropriate for T&Cs to cross refer to Reference Tariff Variation Mechanism in AA so that each transportation agreement entered into using the T&Cs can have its tariffs varied by whatever Reference Tariff Variation Mechanism applies from time to time under the AA	*Change accepted.*
	Current clause 9.9 relocated to section A4 of the revised AA Replaced with Cost Pass-through Tariff Variation Mechanism as described in Chapter 11 of the GGP AA Supporting Information.	Appropriate for T&Cs to cross refer to Cost Pass-through Tariff Variation Mechanism in AA so that each transportation agreement entered into using the T&Cs can have its tariffs varied by whatever Cost Pass-through Tariff Variation Mechanism applies from time to time under the AA.	*Change accepted.*
Multiple Delivery Points			
	Current clause 9.7 relocated to section 4.3 of the revised AA. Description of the Firm Service	This provision should be included in the T&Cs. See our comments at current clause 9.1 above.	*Relocate to T&Cs.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
	more appropriate to include in the body of the AA.		
Rounding			
	Current clause 9.10 (rounding) relocated to section A3 of the revised AA. All detailed provision relevant to the expression of the Reference Tariff are included in Schedule A of the revised AA.	This provision should also be included in the T&Cs.	*Relocate to T&Cs.*
GST			
	Current clause 9.11 replaced with text under section 4.7 of the revised AA.GST provisions simplified in line with those in the RBP AA and included in body of the AA.	The replacement form of GST provision that GGT is proposing only operates in favour of GGT to enable them to charge GST on amounts payable by User. Current clause 9.11, on the other hand, operates to cover GST on taxable supplies going either from GGT to User or vice versa. Given that the revised AA does contemplate supplies from Users to GGT (e.g. for System Use Gas and User's Linepack) and payments by GGT to Users (e.g. in respect of leftover User's Linepack at end of contract), the GST provision should be drafted to cover taxable supplies going both ways. The GST provision should be included in the T&Cs.	*Either reinstate current clause 9.11 or revise proposed GST provision to cover taxable supplies going both ways.* *Include GST provision in T&Cs.*
Proper Books and Records			
	Current clause 15.1 deleted. Not required to be stated, but in any event is covered by proposed clause 36.	GGT is seeking to replace an obligation in current clause 15.1 to keep proper books and records that applied to *both* parties, with an obligation in proposed clause 36 that applies to just the User to give GGT	*Reinstate current clause 15.1.* *Delete proposed clause 36.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		access to data and records (with no actual obligation to keep proper records). See our comments after current clause 8.4 above concerning proposed clause 36.	
Independent Examination			
	Current clause 15.2 deleted. This concept relates to a dispute which is covered under proposed clauses 77 – 83. This specific clause is not required.	Current clause 15.2 provides a mutual (but especially valuable for the User) right to effectively audit the relevant books of the other to verify a disputed invoice, measurement or procedure. Such an audit could be a helpful adjunct to any dispute resolution procedure and should not be given up lightly for Users.	*Reinstate current clause 15.2.*
Check Metering			
	Current clause 11.6 deleted.		*Reinstate current clause 11.6. See the Authority's recommendations on proposed clauses 37-42 (Metering) above*
Meter Testing			
	Current clause 11.7 deleted.		*Reinstate current clause 11.7. See the Authority's recommendations on proposed clauses 37-42 (Metering) above*
Special Test			
	Current clause 11.8 deleted.		*Reinstate current clause 11.8. See the Authority's recommendations on proposed clauses 37-42 (Metering) above*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
Test Procedures			
	Current clause 11.9 deleted.		*Reinstate current clause 11.9. See the Authority's recommendations on proposed clauses 37-42 (Metering) above*
Receipt Facilities	Current clause 6.2		
	Current clause 6.2 deleted. Not required as description of Firm Service is in the body of the revised AA (s 2).	GGT has failed to mention that deleting current clause 6.2 would also remove current clause 6.2(c) which provided: "*The cost of operation and maintenance of the Inlet Facilities will be borne by GGT* "	*Reinstate current clause 6.2(c).*
	Changing receipt points (AA section 6.4)	Provisions dealing with changing receipt points are currently contained only in the AA. They should also be included in the T&Cs.	*Amend T&Cs to include provisions (matching those in the current AA) dealing with changing receipt points.*
Delivery Points			
	Current clause 6.4 deleted. Relates to Connection Charges as described in the revised AA (section 4.2.5(a)). Connection Charges are described as being the costs reasonably incurred by Service Provider in establishing the new Connection. Arrangements for these charges are appropriately subject to a	The Authority is concerned that if connection and ongoing upkeep of outlet facilities were dealt with by a separate agreement (as GGT proposes), there are no safeguards of GGT potentially using this to take advantage of Users (e.g. by offering a less onerous connection agreement "package" if the User agrees to take an unregulated non-reference service). Also, by deleting current clause 6.4 in its entirety, GGT is removing many provisions that have continued effect beyond the establishment of a new connection, including provisions relating to ongoing operation and	*The Authority rejects GGT's proposed separate agreement approach.* *Reinstate the T&Cs provisions dealing with operation and maintenance of outlet facilities, access to the outlet facilities and maintaining insurances.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
	separate agreement between Service Provider and User and precede the Transportation Agreement.	maintenance of outlet facilities, access to the outlet facilities and maintaining insurances.	
	Changing delivery points (AA section 6.4)	Provisions dealing with changing delivery points are currently contained only in the AA. They should also be included in the T&Cs.	*Amend T&Cs to include provisions (matching those in the AA) dealing with changing delivery points.*
Pressure of Gas at Delivery Point			
	Current clause 6.5 deleted. Not relevant to include in the T&Cs as can relate to individual delivery points.	Current clause 6.5 set a minimum delivery pressure obligation for GGT. If such an obligation is simply deleted from the T&Cs how will GGT be compelled to include such an obligation in individual Transportation Agreements?	*Reinstate provision similar to current clause 6.5 requiring GGT to delivery at least at that minimum pressure.*
Ownership, Possession and Access to Delivery Facilities			
	Current clause 6.6 deleted. Relates to connection assets to which a number of different arrangements could apply. Arrangements are appropriately subject to a separate agreement between Service Provider and User and precede the Transportation Agreement.	See comments on current clause 6.4 above.	*No difficulty if current clause 6.6 (obligations for User) is deleted. But see comments on current clause 6.4 above as to whether GGT should be allowed to have (unregulated) agreement dealing with connection and upkeep of outlet facilities outside the transportation agreement.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
Compliance			
	Current clause 6.7 deleted. Relates to connection assets to which a number of different arrangements could apply. Arrangements are appropriately subject to a separate agreement between Service Provider and User and precede the Transportation Agreement.	No problem for users if current clause 6.7 (obligations for User) is deleted but see comments on current clause 6.4 above.	*GGT is not permitted to have an (unregulated) agreement dealing with connection and upkeep of outlet facilities outside the transportation agreement.*
Service Provider's obligations as regards delivery facilities			
	Current clause 6.8 deleted. This matter is addressed in section 2.2 of the revised AA.	Current clause 6.8 provides: "*If new Outlet Facilities are required by the User, the Outlet Facilities installed by GGT (at the User's cost) will comply with the technical specifications required by a reasonable and prudent pipeline operator*." It is not clear which part of section 2.2 of the revised AA GGT is referring to as none of them seem to specifically deal with new delivery facilities required by a User. While section 2.2.6 deals generally with technical specifications for connecting to the pipeline, it appears to be limited to dealing with prospective users, not existing users (i.e. "*The Firm Service is offered subject to a Prospective User complying with technical specifications for connecting to the Pipeline*	*Reinstate currentclause 6.8 in T&Cs.* *Delete Appendix Three to the revised AA ("Technical Requirements for Delivery Facilities")* *The Authority requires GGT to:* • *Replace section 2.2.6 with existing clause 6.8 of the existing terms and conditions and to reinstate clause*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		which are referred to in a Transportation Agreement."). Nor does the Transportation Agreement clearly set out any technical specifications (e.g. it does not appear to contain any cross-reference to or other provision adopting the "Technical Requirements for Delivery Facilities" in Appendix Three). The Authority also notes that section 2.2.6 places on the User a compliance obligation that current clause 6.8 placed on GGT (albeit at the User's cost). GGT has not provided an adequate justification for this proposed change.	*6.8 into GGT's proposed revised terms and conditions; and* • *Delete Appendix Three to the revised AA ("Technical Requirements for Delivery Facilities")*
Title to Gas			
	Current clauses 14.3 & 14.4 (title transfer and re-transfer) deleted. Not required given title does not pass pursuant to proposed clause 66. Proposed section 2.2.8 "Title to the Gas" Makes clear that title in and to gas does not pass to the service provider on receipt of gas. This is a variation to the current AA and is discussed in respect of clause 66 of the terms and conditions later in this table.	Current clauses 14.3 & 14.4 are required because title must transfer. See the Authority's Required Amendment 2	*Delete proposed clause 66.* *Amend section 2.2.8 of revised AA to clarify that title to gas does pass to GGT at receipt point and will pass from GGT to User at delivery point.* *Reinstate current clauses 14.3 & 14.4 in T&Cs.* *See the Authority's Required Amendment 2.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
Contents of Invoices			
	Current clause 13.2 (contents of invoice) is not included in the RBP AA T&Cs and invoice contents do not need to be so prescribed.	If minimum invoice contents are not prescribed in the T&Cs (as per current clause 13.2), how will Users be sure to receive sufficient basic information to be able to check the accuracy of an invoice?	*Reinstate provision stipulating contents of invoice that are sufficient to allow User to verify accuracy of invoiced charges.*
Insurances			
	Current clause 19 deleted. Not consistent with APA standard form contracting approach and the RBP AA T&Cs.	The Authority recommends including insurance provisions as per current clause 19 in the T&Cs. If no insurance requirements are specified in the T&Cs then that creates an unsatisfactory lack of clarity and certainty as to what insurances would be required by GGT under the process contemplated proposed section 2.1.3(b) of GGT's revised AA.	*Reinstate requirements in current clause 19 in the T&Cs.*
Security			
	Current clause 20.9 (security) not required.	GGT has not provided any good justification why it thinks current clause 20.9 is “not required”. Current clause 20.9 permits either party to charge or mortgage its interest in the transportation agreement, provided that any assignment of the transportation agreement upon enforcement of the charge or mortgage is made subject to, and conditional upon the proposed assignee agreeing to be bound by the transportation agreement. If current clause 20.9 is removed then this may have implications for a party's ability to raise loan funds based on its interest in the transportation agreement.	*Reinstate current clause 20.9 or provide good justification for why it is not required.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		The Authority has not received any submissions specifically concerning the removal of current clause 20.9.	
Notices			
	Current clause 24 deleted. This is a boilerplate clause and not required to be in the AA T&Cs.	We do not agree with GGT's claim that boilerplate clauses are not required to be in the AA T&CS.	*Reinstate currentclause 24*
Waiver			
	Current clause 25 deleted. This is a boilerplate clause and not required to be in the AA T&Cs.	See comments at current clause 24.1 above.	*Reinstate current clause 25*
Entire agreement			
	Current clause 26 deleted. This is a boilerplate clause and not required to be in the AA T&Cs.	See comments at current clause 24.1 above.	*Reinstate current clause 26*
Severability			
	Current clause 27 deleted. This is a boilerplate clause and not required to be in the AA T&Cs.	See comments at current clause 24.1 above.	*Reinstate current clause 27*
Governing law			
	Current clause 28 deleted. The governing law will be	See comments at current clause 24.1 above.	*Reinstate current clause 28*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
	Western Australian given the location of the asset. This clause is not required however as it is a boilerplate clause and not required to be in the AA T&Cs.		
Order Form/Form of Agreement			
	Current Appendix 2.2 (Order Form) deleted and definition of Order Form in current Appendix 1 not included in proposed Schedule C.	GGT's revised AA is unclear as to the precise documents to be used for a Transportation Agreement. Section 5 (Queuing) contemplates that, if there is an auction for spare capacity, then a prospective user seeking the Firm Service (reference service) must submit a completed "auction application registration form" together with the schedule D T&Cs (see sections 5.2.3(c) & (d)). While section 5.2.3(d)(iii) states that the T&Cs must be "in a form that is capable of immediate acceptance by Service Provider", that is not something GGT has created with their schedule D T&Cs. Nor has GGT set out in its revised AA the form of the "auction application registration form" or any other document that prospective users seeking the Firm Service must use with the Schedule D T&Cs in order to create a binding contract without the need for negotiation. The "registration of interest" form in schedule B of the AA is merely a preliminary document to be used in the queuing process (see section 5.1 of GGT's revised AA) and is not apparently itself intended to form part of the Transportation Agreement. If GGT dispenses with the Order Form, then it needs to include with its revised AA some other "form of	*Reinstate Order Form or another "form of agreement' template document that should be scheduled to AA and can be completed and submitted by prospective users together with the schedule D T&Cs so as to form a binding contract (without negotiation), if accepted by GGT.*

Provisions Missing from T&Cs	GGT's comments	Authority's consideration and comments	Authority's recommendation
		agreement" type of document that can be completed and submitted by prospective users together with the schedule D T&Cs so as to form a binding contract (without negotiation), if accepted by GGT. That form of agreement document (which could be an order form) needs to be included with the AA so that the full T&Cs of the reference service are included with the AA (as required by rule 48 of the NGR) and can be reviewed by the ERA.	