Access Arrangement Information for the Goldfields Gas Pipeline

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Economic Regulation Authority
WESTERN AUSTRALIA

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ACCESS ARRANGEMENT INFORMATION

1 INTRODUCTION

1.1 Introduction

1. This document comprises the Access Arrangement Information (**AAI**) for the revised Access Arrangement for the Goldfields Gas Transmission Pty Ltd (**GGT**) Goldfields Gas Pipeline (**GGP**) proposed and given effect from 1 July 2016 by the Economic Regulation Authority (**Authority**) pursuant to rule 64 of the National Gas Rules (**NGR**).

2. The purpose of this document is to set out the information necessary to enable users and prospective users of the GGP to understand the derivation of the elements of the Access Arrangement for the GGP for the third access arrangement period (**AA3**), which spans from 1 January 2015 to 31 December 2019, and for compliance with the NGR.

1.2 Description of the Goldfields Gas Pipeline

3. 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.

4. 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 that lead to increased capacity of the pipeline, as opposed to extensions of the pipeline that extends the geographic range of the pipeline.

5. The GGP's total gas transmission capacity is currently approximately 200 TJ/day:

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

6. 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.

7. The Covered Pipeline is the Pipeline and associated infrastructure, excluding the assets identified in the variations to Pipeline Licence 24 listed in the following paragraph, but including any expansion of the capacity of the Pipeline or extension of the capacity of the Pipeline that Service Provider has elected should be treated as part of the Covered Pipeline for any purpose under the NGL and, in respect of which, the ERA has consented to Service Provider's election.

8. The variations to Pipeline Licence 24 referred to in the preceding paragraph, and short descriptions of those variations, are listed in Table 1.

Table 1 Variations to Pipeline Licence 24

PL 24 Variation	Date	Description
9P/05-6	23 January 2006	Solar Centaur C40 compressor package and associated infrastructure at existing compressor station site at Paraburdoo (Paraburdoo Unit 2).
3P/07-8	7 May 2008	Solar Centaur C50 gas compressor package and associated infrastructure at existing scraper station site at Wyloo West.
STP-PLV-0014	30 August 2012	Custody transfer meter station and connection point on the Newman Lateral at Yarnima. Custody transfer meter station and connection point on the GGP at Boonamichi Well.
2P/08-9	3 November 2008	Solar Centaur C50 gas compressor package and associated infrastructure at existing scraper station site at Ned's Creek.
STP-PLV-0015	5 September 2012	Solar Centaur C50 gas compressor package and associated infrastructure at existing compressor station site at Yarraloola. Solar Centaur C50 compressor package and associated infrastructure at existing compressor station site at Paraburdoo.
STP-PLV-0016	7 September 2012	Two Solar Centaur C50 gas compressor packages and associated infrastructure at existing scraper station site at Turee Creek.

9. Pipeline Licence 24 is available from the Petroleum and Geothermal Register, which can be accessed from the website of the Western Australian Department of Mines and Petroleum (http://www.dmp.wa.gov.au/3959.aspx).

10. The Covered Pipeline and its associated infrastructure include:

- DN 400 mm main pipeline section (Yarraloola to start of Newman Lateral), and DN 350 mm main pipeline section (start of Newman Lateral to Kalgoorlie);
- DN 200 mm 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
- Perth head office;
- maintenance bases and depots in Karratha, Newman, Leinster, and Kalgoorlie;
- Supervisory Control and Data Acquisition (SCADA) system;
- satellite data communications system;
- satellite telephone system; and

- operations, maintenance, commercial, quality, safety, and environmental management systems.

11. Gas is received into the GGP from the following two separate receipt points at Yarraloola. One is close to the Harriet Joint Venture meter station near Compressor Station One on the Dampier to Bunbury Natural Gas Pipeline. The other is on the pipeline (GGP-DBNGP Interconnect Pipeline) between Compressor Station One on the Dampier to Bunbury Natural Gas Pipeline and Yarraloola.

12. Gas can be delivered from the Covered Pipeline to users at:

- Paraburdoo;
- Newman;
- Plutonic;
- Wiluna;
- Jundee;
- Mount Keith;
- Cosmos;
- Leinster;
- Thunderbox;
- Jaguar;
- Leonora (Leonora, Murrin Murrin);
- Cawse;
- Parkeston;
- Kalgoorlie; and
- Kalgoorlie South.

1.3 Interpretation

13. Unless the contrary intention is expressed, words or phrases in this document have the same meaning as those defined in Schedule C (Definitions and Interpretation) of the Access Arrangement for the GGP.

14. A reference in this document to:

- **Earlier Access Arrangement Period** means the second Access Arrangement Period (20 August 2010 – 31 December 2014) which preceded the Current Access Arrangement Period; and
- **First Access Arrangement Period** means the first Access Arrangement period (1 January 2000 – 19 August 2010).

15. Where a word or phrase has not been defined in this document then, unless the contrary intention is expressed, the word or phrase is to be given the meaning prescribed in the *National Gas Access (Western Australia) Law*, the National Gas Rules (as relevant).

1.4 Structure and Compliance

16. This document follows the structure of rule 72 of the NGR. Rule 72 sets out specific requirements for Access Arrangement Information relevant to revenue and price regulation. The specific requirements for Access Arrangement Information for an Access Arrangement Period, which commences at the end of the Earlier Access Arrangement Period, are summarised in Table 2 of this Access Arrangement Information.

17. Information in respect of each of the specific requirements shown in Table 2 is provided in sections 3 to 14 of this document.

18. Section 2 sets out, in accordance with the requirement of Rule 73, the basis on which financial information in presented in the document.

Table 2 Specific requirements for access arrangement information

NGR	Requirement
Rule 72(1)(a)	Expenditure and pipeline usage over the Earlier Access Arrangement Period: (i) Capital Expenditure (by asset class) over the Earlier Access Arrangement Period; (ii) Operating Expenditure (by category) over the Earlier Access Arrangement Period; and (iii) pipeline usage over the Earlier Access Arrangement Period, in terms of minimum, maximum and average demand and user numbers for each receipt or delivery point.
Rule 72(1)(b)	Explanation of how the capital base is arrived at, and demonstration of how the capital base increased or diminished over the Earlier Access Arrangement Period.
Rule 72(1)(c)	Projected capital base over the Current Access Arrangement Period including: (i) a forecast of Conforming Capital Expenditure for the period and the basis for the forecast; and (ii) a forecast of depreciation, including a demonstration of how the forecast is derived on the basis of the proposed depreciation method.
Rule 72(1)(d)	To the extent practicable, a forecast of pipeline capacity and utilisation of pipeline capacity over the Current Access Arrangement Period, and the basis on which the forecasts have been derived.
Rule 72(1)(e)	A forecast of Operating Expenditure over the Current Access Arrangement Period, and the basis on which the forecast has been derived.
Rule 72(1)(f)	Key performance indicators to be used by the service provider to support expenditure to be incurred over the Current Access Arrangement Period.
Rule 72(1)(g)	The proposed return on equity, return on debt and allowed rate of return for each regulatory year of the Current Access Arrangement Period, including any departure from the methodologies set out in the rate of return guidelines and the reasons for that departure.
Rule 72(1)(h)	The estimated cost of corporate income tax and the proposed value of imputation credits.
Rule 72(1)(i)	Efficiency gains or losses carried over as a result of the operation of an incentive mechanism in the Earlier Access Arrangement Period.
Rule 72(1)(j)	The approach to setting tariffs, including: (i) the basis for setting Reference Tariffs, the method used to allocate costs, and a demonstration of the relationship between costs and tariffs; and (ii) a description of other pricing principles employed.
Rule 72(1)(k)	The rationale for the Reference Tariff Variation Mechanism.
Rule 72(1)(l)	The rationale for any incentive mechanism.
Rule 72(1)(m)	The total revenue to be derived from pipeline services for each regulatory year of the Current Access Arrangement Period.

2 BASIS ON WHICH FINANCIAL INFORMATION IS PROVIDED [Rule 73]

19. Financial information in this document is provided on a nominal basis.

3 EXPENDITURE AND PIPELINE USAGE OVER THE EARLIER ACCESS ARRANGEMENT PERIOD [Rule 72(1)(a)]

3.1 Capital expenditure over Earlier Access Arrangement Period [Rule 72(1)(a)(i)]

20. Capital Expenditure, by asset class, during the Earlier Access Arrangement Period, is shown in Table 3.

Table 3 Capital expenditure by asset class Earlier Access Arrangement Period (Nominal $ million)

Nominal $ million	2010	2011	2012	2013	2014	AA2
Pipeline and laterals	(0.030)	0.000	0.000	0.026	0.000	(0.005)
Main line valve and scraper stations	0.000	0.000	0.000	0.000	0.000	0.000
Compressor stations	0.134	0.047	0.151	0.478	0.703	1.513
Receipt and delivery point facilities	0.000	0.000	0.000	0.136	0.188	0.323
SCADA and communications	0.022	0.244	0.487	0.364	1.167	2.284
Cathodic protection	0.000	0.000	0.000	0.000	0.000	0.000
Maintenance bases and depots	0.025	0.000	0.000	1.056	0.018	1.099
Other assets	0.016	0.023	0.026	0.534	0.061	0.660
Total	**0.167**	**0.315**	**0.664**	**2.593**	**2.136**	**5.874**

3.2 Operating expenditure over the Earlier Access Arrangement Period [Rule 72(1)(a)(ii)]

21. Operating Expenditure, by category, during the Earlier Access Arrangement Period, is shown in Table 4.

Table 4 Operating expenditure by category Earlier Access Arrangement Period (Nominal $ million)

Nominal $ million	2010	2011	2012	2013	2014	AA2
Pipeline operations	7.285	16.626	17.439	18.347	19.255	78.953
Commercial operations	1.111	3.165	3.249	3.336	3.424	14.285
Regulatory costs	0.422	0.507	0.510	1.314	2.118	4.880
Insurance	0.000	0.000	0.000	0.000	0.000	0.000
Corporate overheads	2.103	5.826	5.796	5.858	5.999	25.582
Total	**10.921**	**26.124**	**26.993**	**28.856**	**30.797**	**123.700**

3.3 Pipeline usage over the Earlier Access Arrangement Period [Rule 72(1)(a)(iii)(A) and (B)]

22. Usage of the GGP over the 2010 to 2014 period is shown in Table 5.

Table 5 Minimum, maximum and average demand by category (2010 – 2014)

	2010	2011	2012	2013	2014
Reserved capacity					
Minimum Demand (TJ/day)	105.2	104.8	104.7	102.7	108.4
Maximum Demand (TJ/day)	106.1	105.5	105.6	106.7	109.5
Average Demand (TJ/day)	105.7	105.2	105.2	104.5	108.9
Through put					
Minimum	84.0	81.3	80.6	80.6	90.0
Maximum	87.0	84.1	84.8	84.6	89.5
Average	85.6	82.4	82.5	83.5	89.7

23. Numbers of receipt points, delivery points and users are summarised in Table 6.

Table 6 Numbers of receipt points, delivery point and users (2010-2014)

	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

4 OPENING CAPITAL BASE FOR CURRENT ACCESS ARRANGEMENT PERIOD [Rule 72(1)(b)]

24. The Opening Capital Base for the Current Access Arrangement Period (the capital base at 1 January 2015) has been determined in accordance with the formula in Rule 77(2), which is as follows:

> ***"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], 84 [speculative capital expenditure account] or 86 [re-use of redundant assets];

less:

d) depreciation [of the capital base] 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.”

Note: “conforming capital expenditure” means capital expenditure that complies with the new capital expenditure criteria stated in rule 79 of the NGR.

25. During the Earlier Access Arrangement Period:

- no Capital Contributions made by a User have been added into the Opening Capital Base in accordance with Rule 82 of the NGR;
- no amount has been withdrawn from a speculative capital expenditure account (as defined in rule 84(1)) which should be added to the Capital Base in accordance with Rule 84 of the NGR;
- no redundant assets were identified or removed from the Capital Base;
- no assets were disposed of from the Capital Base; and
- there has been no re-use of redundant assets requiring an amount to be added to the Capital Base in accordance with Rule 86 of the NGR.

26. For the purpose of determining the Opening Capital Base for the Current Access Arrangement Period, depreciation of the Conforming Capital Expenditure made, during the Earlier Access Arrangement Period, is the forecast of depreciation made for the purpose of determining the Total Revenue and Reference Tariffs for the Earlier Access Arrangement Period.

27. The Opening Capital Base for the Current Access Arrangement Period is $390.362 million. The way in which the Opening Capital Base for the Current Access Arrangement Period has been determined is demonstrated in Table 7.

Table 7 Opening capital base for Current Access Arrangement Period (Nominal $ million)

Nominal $ million	2010	2011	2012	2013	2014
Opening Capital Base (AA2)	436.016	432.263	421.283	410.055	400.488
Plus: Capital Expenditure	0.167	0.315	0.664	2.593	2.136
Less: Depreciation	(3.920)	(11.294)	(11.892)	(12.160)	(12.262)
Plus: Non-Depreciable Variation	0.000				
Closing Capital Base (AA2)	432.263	421.283	410.055	400.488	390.362
Opening Capital Base at 1 January 2015					**390.362**

5 PROJECTED CAPITAL BASE [Rule 72(1)(c)]

28. The projected Capital Base for the Current Access Arrangement Period is, in accordance with Rule 78, to be determined using the following formula:

> "78. Projected capital base
>
> (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."

29. No Pipeline assets of material value are expected to be disposed of during the Current Access Arrangement Period.

5.1 Forecast Conforming Capital Expenditure [Rule 72(1)(c)(i)]

30. Table 8 shows forecast Conforming Capital Expenditure during the Current Access Arrangement Period.

Table 8 Forecast of Conforming Capital Expenditure (Nominal $ million)

Nominal $ million	2015	2016	2017	2018	2019	AA3
Pipeline and laterals	2.635	1.319	0.159	0.000	0.093	4.206
Main line valve and scraper stations	0.000	0.537	0.000	0.000	0.000	0.537
Compressor stations	0.855	0.755	0.000	0.195	0.285	2.089
Receipt and delivery point facilities	0.269	0.000	0.442	0.322	0.000	1.034
SCADA and communications	0.219	0.154	0.096	0.022	0.024	0.516
Cathodic protection	0.105	0.038	0.036	0.031	0.033	0.243
Maintenance bases and depots	0.167	0.000	0.000	0.000	0.000	0.167
Other assets	0.464	0.070	0.036	0.026	0.026	0.622
Non-depreciable assets	0.000	0.000	0.000	0.000	0.000	0.000
Total	**4.715**	**2.872**	**0.769**	**0.597**	**0.461**	**9.414**

5.2 Forecast of Depreciation [Rule 72(1)(c)(ii)]

31. Depreciation over the Current Access Arrangement Period is to be calculated in accordance with the current cost accounting (**CCA**) depreciation method, consistent with the Australian Energy Regulator's Post Tax Revenue Model method – where: first, the real opening capital base in any year is divided by the remaining asset life to calculate the real depreciation for the regulatory year; second, indexation is applied to the real depreciation to convert it to nominal terms; and third, the nominal depreciation is adjusted for the resulting double count of inflation by subtracting the value ascribed to inflation from the opening regulatory asset base for that regulatory year. The regulatory depreciation is to be the sum of the Post Tax Revenue Model calculation of the:

    i. depreciation on the Opening Capital Base over the Current Access Arrangement Period; and

    ii. depreciation of the forecast Capital Expenditure for the Current Access Arrangement Period (being the amount of forecast Capital Expenditure used for the purpose of determining Tariffs for the Current Access Arrangement Period).

32. Depreciation for the Current Access Arrangement Period on Conforming Capital Expenditure for that period has been determined using the straight line method with the lives in each class of asset shown in Table 9.

33. An adjustment is applied in the capital expenditure accounts to correct the RAB for any over-depreciation in the Earlier Access Arrangement Period, arising from differences between forecast and actual capital expenditure in that period. This is done by applying a 'positive' depreciation amount in the first year of the Current Access Arrangement Period of an equivalent amount to the total 'negative' over-depreciation accumulated during the Earlier Access Arrangement Period.

Table 9 Asset lives for the derivation of forecast depreciation

Asset category	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	10
Cathodic protection	15
Maintenance bases and depots	50
Other assets	10

34. The forecast of Straight Line Current Cost Accounting (CCA) depreciation for the Current Access Arrangement Period in Nominal $ million is shown in Table 10.

Table 10 Forecast of depreciation (Nominal $ million)

Nominal $ million	2015	2016	2017	2018	2019
Pipeline and laterals	6.827	7.050	7.172	7.279	7.385
Main line valve and scraper stations	0.204	0.213	0.227	0.230	0.234
Compressor stations	2.317	2.772	2.838	2.880	2.928
Receipt and delivery point facilities	0.100	0.133	0.135	0.152	0.165
SCADA and communications	(0.065)	0.384	0.378	0.374	0.262
Cathodic protection	(0.520)	0.130	0.134	0.138	0.141
Maintenance bases and depots	0.202	0.211	0.214	0.217	0.220
Other assets	(1.982)	0.218	0.204	0.179	0.151
Total Straight Line CCA depreciation	**7.084**	**11.110**	**11.301**	**11.449**	**11.486**

35. Table 11 shows the value of Regulatory Depreciation which adjusts for the double count of inflation.

Table 11 Forecast of depreciation (Nominal $ million)

Nominal $ million	2015	2016	2017	2018	2019	Total
Regulatory Depreciation	1.384	5.362	5.590	5.808	5.921	24.065
Straight Line CCA Depreciation	7.084	11.110	11.301	11.449	11.486	52.430
Less: Inflationary Gain	(5.699)	(5.748)	(5.712)	(5.641)	(5.565)	(28.365)

5.3 Projected Capital Base [Rule 72(1)(c)]

36. The determination of the projected Capital Base for the Current Access Arrangement Period is set out in Table 12.

Table 12 Projected Capital Base for Current Access Arrangement Period (Nominal $ million)

Nominal $ million	2015	2016	2017	2018	2019
Opening Capital Base (start of period)	390.362	393.693	391.203	386.382	381.172
Inflation	5.699	5.748	5.712	5.641	5.565
Opening Capital Base (end of period)	396.062	399.441	396.915	392.024	386.737
Plus: Capital Expenditure	4.715	2.872	0.769	0.597	0.461
Less: Straight Line CCA Depreciation	(7.084)	(11.110)	(11.301)	(11.449)	(11.486)
Closing Capital Base	**393.693**	**391.203**	**386.382**	**381.172**	**375.712**

6 FORECAST DEMAND [Rule 72(1)(d)]

37. The current capacity of the covered pipeline is 109 TJ/day.

38. The current capacity of the GGP and GGT's forecast of contracted pipeline capacity and throughput for the third access arrangement period are shown in Table 13.

Table 13 Forecast capacity and throughput 2015-2019

TJ/d	2015	2016	2017	2018	2019
Pipeline Capacity (TJ/day)	109.00	109.00	109.00	109.00	109.00
Average Contracted Capacity (TJ/day)	97.56	102.17	99.80	102.50	102.50
Maximum Contracted Capacity (TJ/day)	97.89	103.70	101.00	102.50	102.50
Throughput (TJ/day)	71.12	76.61	74.93	76.91	76.91

7 FORECAST OPERATING EXPENDITURE [Rule 72(1)(e)]

39. Forecast Operating Expenditure over the Current Access Arrangement Period is shown in Table 14.

Table 14 Forecast Operating Expenditure by category (Nominal $ million)

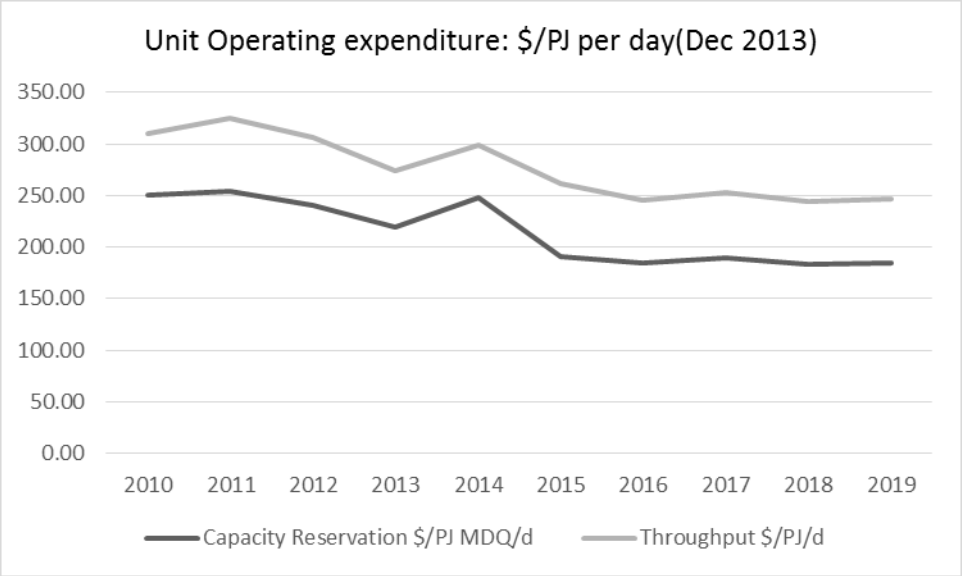
Nominal $ million	2015	2016	2017	2018	2019	Total
Pipeline operations	11.121	11.704	12.292	12.006	11.845	58.968
Commercial operations	2.515	2.590	2.631	2.670	2.709	13.115
Regulatory costs	1.132	0.893	0.637	0.893	1.466	5.021
Insurance	0.522	0.530	0.538	0.545	0.553	2.688
Corporate overheads	3.921	3.978	4.036	4.095	4.155	20.186
Total forecast operating expenditure	**19.211**	**19.695**	**20.135**	**20.210**	**20.728**	**99.978**

8 KEY PERFORMANCE INDICATORS [Rule 72(1)(f)]

40. The key performance indicators to be used by GGT to support expenditure to be incurred over the Current Access Arrangement Period are shown in Figure 1 and Figure 2.

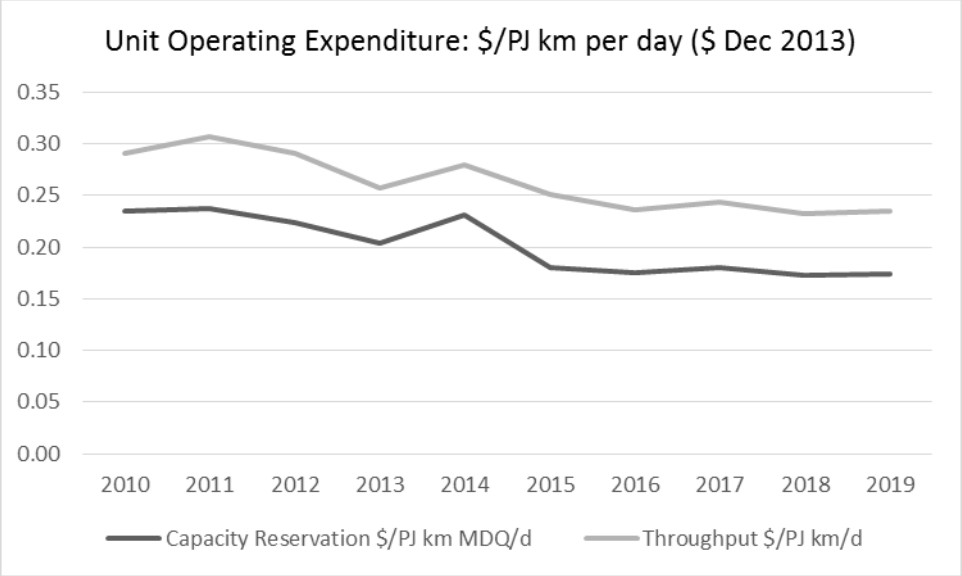
41. Figure 1 shows actual and forecast unit operating expenditure, ($/PJ per day, for capacity reservation and throughput), in real December 2013 dollars, over the period 2010 to 2019.

Figure 1 Unit operating expenditure: $/PJ per day ($ December 2013)



42. Figure 2 shows actual and forecast unit operating expenditure, ($/PJ km per day of capacity reservation and throughput) in real December 2013 dollars, over the period 2010 to 2019.

Figure 2 Unit operating expenditure: $/PJ km per day ($ December 2013)



9 RATE OF RETURN [Rule 72(1)(g)]

9.1 Rate of Return

43. The input parameter values for the nominal after tax (vanilla) Weighted Average Cost of Capital (**WACC**) as the rate of return for the Current Access Arrangement Period for the calendar year 2016 are shown in Table 15.

Table 15 Rate of Return as at 31 May 2016

WACC as at 31 May 2016	2016
Nominal Risk Free Rate	1.82%
Real Risk Free Rate	0.35%
Inflation Rate	1.46%
Debt Proportion	60%
Equity Proportion	40%
Debt Risk Premium (10 year trailing average)	2.713%
5 year IRS (effective yield)	2.116%
Return on Debt; 5 year Interest Rate Swap Spread	0.296%
Return on Debt; Debt Issuing Cost (0.125%) + Hedging (0.114%)	0.239%
Return on Debt	**5.07%**
Australian Market Risk Premium	7.40%
Equity Beta	0.70%
Corporate Tax Rate	30%
Franking Credit (gamma)	40%
Nominal After Tax Return on Equity	**7.00%**
Nominal After Tax WACC	**5.84%**
Real After Tax WACC	4.32%

Source: Economic Regulation Authority

44. The nominal after tax WACC rate of return for 2016 is 5.84 per cent. This rate is applied in the tariff modelling for the Final Decision for calendar years 2016, 2017, 2018 and 2019. The nominal after tax WACC rate of return for 2015, applied in the tariff modelling for the Final Decision, is 5.73 per cent (this differs only in regard to the estimate of the debt risk premium (**DRP**)).

Annual Updating

45. The estimate of the nominal after tax WACC will be annually updated during the Access Arrangement period in order to account for the annual update to the debt risk premium component of the WACC. The first annual update of the WACC will apply as part of the tariff variation for the 2017 calendar year with subsequent annual updates in the 2018 and 2019 calendar years. The annual update will be determined

based on the formulas set out in detail in Appendix 3 of the Final Decision.[1] The resulting annual adjustment to the rate of return will be incorporated in the Annual Tariff Variation for the years 2017, 2018 and 2019.

46. 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.
- 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 GGT 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 3 of the Final 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 annual tariff variation.

Nominal After Tax (Vanilla) WACC

47. The nominal vanilla WACC is calculated using the conventional form:

$$WACC = \frac{D}{V}\ \mathrm{R}_D + \frac{E}{V}\ \mathrm{R}_E$$

where

$\frac{D}{V}$ is the benchmark gearing level or debt D as a proportion of total asset value V;

R_D is the cost of debt financing;

$\frac{E}{V}$ is the proportion of total asset value funded by shareholders equity calculated as $\left(1-\frac{D}{V}\right)$; and

R_E is the return on shareholders' equity.

48. Each of the parameters are calculated as follows.

[1] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline*, 30 June 2016, p. 562.

9.1.1 Gearing

49. Gearing of 60 per cent debt and 40 per cent equity will be applied for the purpose of determining the WACC. This parameter is fixed for the duration of the Access Arrangement.

9.1.2 Return on Debt

50. The return on debt is calculated as follows:

$$\text{Cost of Debt} = \text{Nominal Risk Free Rate} + \text{5 year IRS spread} + \text{Debt Risk Premium} + \text{Issuing costs} + \text{Hedging costs}$$

Nominal risk free rate

51. The nominal risk free rate is estimated based on 20 trading days of Commonwealth Government Securities (**CGS**) yield observations interpolating a tenor of 5 years for each day. The 5 year interest rate swap (**IRS**) rate is based on 20 trading days of rate observations. The CGS interpolations and IRS spread observations are averaged and annualised to account for the semi-annual basis on which bond coupons are paid. The 20 day averaging period ends on and includes 31 May 2016. Both of these parameters are fixed for the duration of the Access Arrangement.

52. As at 31 May 2016 the nominal risk-free rate was 1.82 per cent and 5 year swap rate was 2.116 per cent. The 5 year IRS spread is calculated as the difference between these figures.

Debt Risk Premium

53. This is the only parameter in the WACC that is annually updated and thus drives the year to year change in the annual update of the rate of return.

Trailing Average

54. The DRP is estimated using a simple 10 year trailing average, consisting of a DRP for the 'current' year (that is, the year in which the WACC is being determined) and a DRP for each of the 9 prior years. The DRP is defined as the spread of the BBB band cost of debt at a 10 year tenor in excess of the 10 year IRS swap rate.[2]

Reserve Bank of Australia versus Authority Estimates

55. The DRP estimate for the 'current' year is produced using the Authority's revised bond yield approach. At the outset of the Access Arrangement, the DRP estimates for the 9 previous years are based on Reserve Bank of Australia (**RBA**) 'spread to swap' estimates for the BBB band, which have been linearly extrapolated to an effective tenor of 10 years. With each subsequent annual update the Authority's

[2] In previous Access Arrangements the Authority defined the DRP as the spread between the cost of debt and *risk free rate of return* as opposed to the *IRS rate*.

latest 'current' DRP estimate based on the revised bond yield approach will phase out the earliest years' RBA based DRP estimate in the trailing average. After 10 years all 10 DRP estimates in the trailing average will be those based on the revised bond yield approach. Further details on the statistical methods can be found in the Rate of Return section (see pages 143 - 299) and Appendix 3 in the Final Decision.[3]

Automatic formula for the annual update of the DRP

56. The 'current year' WACC to be included in each annual update will be calculated using the automatic formulas set out in Appendix 3 in the Final Decision. The averaging period for each annual update is based on a 20 business day period between 1 July and 31 October in each relevant year. The exact 20 days averaging period for each relevant year is nominated by the service provider in advance and will remain confidential.

Issuing costs

57. The estimate of debt raising costs is 0.125 per cent per annum. The debt raising cost estimate covers:[4]

- 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.

Hedging costs

58. An amount of 11.4 basis points per annum is allocated to meet the costs of entering into interest rate swap arrangements for the purpose of hedging changes in the 5 year IRS and the underlying risk free rate.[5]

9.1.3 Return on Equity

59. The return on equity is estimated at the start of the access arrangement and is based on the following models:

- The Sharpe Lintner Capital Asset Pricing Model (**CAPM**) is utilised to estimate the return on equity.

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[3] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline*, 30 June 2016, p. 562.

[4] Economic Regulation Authority, *Explanatory Statement for the Rate of Return Guidelines*, 16 December 2013, p. 199.

[5] Chairmont Consulting, *ERA Hedging Costs in the Cost of Debt*, 13 May 2015.

- The Black CAPM is relevant for informing the theory of the return on equity. Given it is not reliable and practical to estimate a robust return on equity using this model, the model is not used directly.
- The DGM is a relevant model for informing the market return on equity and also the forward looking market risk premium (**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 is used for conditioning the estimates used for the CAPM or as a cross check for the return on equity.

60. 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. The return on equity is estimated using the Sharpe Lintner CAPM in the following form:

$$E_t(R_i) = R_{F,t} + \beta_i \times MRP_t$$

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.

Risk free rate of return

61. The nominal risk free rate is estimated based on 20 trading days of Commonwealth Government Securities (**CGS**) yield observations interpolating a tenor of 5 years for each day. The CGS interpolations are averaged and annualised to account for the semi-annual basis on which bond coupons are paid. The 20 day averaging period ends on and includes 31 May 2016.

62. As at 31 May 2016, the nominal risk-free rate was 1.82 per cent.

Market Risk Premium

63. The various models and information outlined in paragraph 59 are used to estimate ranges and inform a point estimate for the MRP of 7.40 per cent. Further details on the methods and decision process can be found in the Rate of Return section in the Final Decision (see pages 143 - 299).[6]

[6] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline*, 30 June 2016, p.178.

Equity Beta

64. The equity beta is estimated as being 0.70. Further details on the methods and decision process can be found in the Rate of Return section in the Final Decision (see pages 143 - 299).[7]

9.2 Inflation

65. This parameter is not used in the calculation of the nominal after tax WACC, but is used an input in the nominal post-tax financial model used for tariff determination. Inflation is implied through using the conventional Fisher equation to discount the real risk free rate out of the nominal risk free rate outlined in paragraph 51. The real risk free rate is calculated using Treasury indexed bond yield observations and the same method outlined for the nominal risk free rate. The Treasury indexed bonds pay a quarterly coupon and so are annualised accordingly. This parameter is fixed for the duration of the Access Arrangement.

9.3 Gamma

66. This parameter is not used explicitly in the calculation of the nominal after tax WACC, but is used as an input to modify historical equity returns data, which in turn are used in determining the MRP. It is also an input in the nominal post-tax financial model used for the tariff determination. Gamma is estimated as being 0.40 and is fixed for the duration of the Access Arrangement. Further details on the methods and decision process can be found in the Gamma section in the Final Decision (see pages 300 to 344).[8]

10 ESTIMATED COST OF INCOME TAX [Rule 72(1)(h)]

10.1 Calculating the Cost of Tax

67. Rule 87A of the NGR elaborates on how to calculate the estimated cost of corporate income tax:

> 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 the following formula:
>
> $$ETC_t = (ETI_t \times r_t)\ (1 - \gamma)$$
>
> Where
>
> ETI_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;

[7] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline*, 30 June 2016, p. 189.

[8] Economic Regulation Authority, *Final Decision on Proposed Revisions to the Access Arrangement for the Goldfields Gas Pipeline*, 30 June 2016, pp.300 - 344.

r_t is the expected statutory income tax rate for that regulatory year as determined by the AER; and

γ is the value of imputation credits.

68. Taxable income was determined as assessable income less tax deductible costs recognised by the Australian Tax Office (**ATO**) as follows:

Smoothed tariff revenue	
minus	Approved forecast operating expenditure.
minus	Depreciation of the tax asset base (**TAB**), which excludes capital contributions, and customer commercial meter sets. Tax depreciation is applied on a straight-line basis.
minus	Debt servicing costs, calculated by multiplying the debt portion of the opening regulatory asset base (**RAB**) by the debt to equity ratio (assumed at 60 per cent) and the nominal hybrid trailing average cost of debt (based on the trailing average estimate of the debt risk margin, annually updated, plus the 'on the day' nominal risk free rate).
equals	Estimated taxable income.

69. The expected statutory income tax rate is 30 per cent.

70. The estimated value of imputation credits is 40 per cent (0.40).

10.2 Setting the Tax Asset Value

71. The opening Tax Asset Base was $67.928 million ($ nominal) as at 1 January 2015.

10.3 Benchmark Cost of Tax

72. The cost of tax calculation, applying the approach and parameter set out in this section, is shown in Table 16.

Table 16 Estimated Cost of Corporate Income Tax Net of Imputation Credits

Nominal $ million	2015	2016	2017	2018	2019	Total
Revenue						
Tariff Revenue (smoothed)	**73.540**	**56.059**	**34.146**	**35.326**	**35.326**	**234.398**
Expenses						
Operating expenditure	(19.211)	(19.695)	(20.135)	(20.210)	(20.728)	(99.978)
Depreciation of the TAB	(24.946)	(25.174)	(4.541)	(2.973)	(2.802)	(60.437)
Debt servicing costs	(11.432)	(11.971)	(11.895)	(11.749)	(11.590)	(58.637)
Total - Expenses	**(55.589)**	**(56.840)**	**(36.572)**	**(34.931)**	**(35.119)**	**(219.052)**
Tax						
Net Income	**17.951**	**(0.781)**	**(2.426)**	**0.395**	**0.207**	**15.346**
Tax loss carried forward	0.000	(0.781)	(2.426)	0.000	0.000	(3.207)
Taxable income	**17.951**	**0.000**	**0.000**	**0.000**	**0.207**	**18.158**
Income tax expense (30%)	5.385	0.000	0.000	0.000	0.062	5.447
Value of Imputation Credits (0.40)	(2.154)	0.000	0.000	0.000	(0.025)	(2.179)
Cost of Tax Net of Imputation Credits	**3.231**	**0.000**	**0.000**	**0.000**	**0.037**	**3.268**

11 INCENTIVE MECHANISM [Rule 72(1)(i) and (l)]

73. No incentive mechanism operated in the Earlier Access Arrangement Period that gave rise to increments for efficiency gains, or decrements for efficiency losses, to be carried over and included in the total revenue for the Current Access Arrangement Period. No incentive mechanism will operate in the Current Access Arrangement Period.

12 APPROACH TO SETTING REFERENCE TARIFFS [Rule 72(1)(j)]

12.1 Tariff Classes

74. 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.

75. GGT will apply a three part tariff, which 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).

76. The toll charge and the capacity reservation charge are effectively access fees recovering the fixed costs of the Covered Pipeline. The throughput charge recovers variable costs.

77. By structuring the capacity reservation and throughput charges as distance-related charges, GGT has sought to make the reference tariff reflective of the costs of the resources used to provide pipeline services to individual users at different locations along the GGP.

78. The reference tariff has been established assuming allocation of the total revenue to the components of the reference tariff in the proportions shown in Table 17.

Table 17 Allocation of total revenue to reference tariff components

Tariff component	Proportion (%)
Toll charge	11.3
Capacity Reservation Charge	72.2
Throughput Charge	16.5

79. The toll charge of the proposed reference tariff has been calculated as the price during the period 1 July 2016 to 31 December 2019, which sets the present value of the forecast revenue from the charge equal to 11.3% of the present value of the total revenue over the Current Access Arrangement Period The discount rate used in calculating the 1 January 2015 present values of the forecast total revenue and revenue from each tariff component is the 2015 calendar year rate of return (5.73%) and the 2016 calendar year rate of return of 5.84% applying from 1 January 2016 to 31 December 2019.

80. The capacity reservation charge has been calculated as the price during the period from 1 July 2016 to 31 December 2019, which sets the present value of the forecast revenue from the charge equal to 72.2% of the present value of the total revenue over the Current Access Arrangement Period.

81. The throughput charge has been calculated as the price during the period from 1 July 2016 to 31 December 2019, which sets the present value of the forecast revenue from the charge equal to 16.5% of the present value of the total revenue over the Current Access Arrangement Period.

82. The proposed revised reference tariff for the Covered Pipeline is shown in Table 18.

Table 18 Proposed revised reference tariff effective 1 July 2016 (Nominal $)

Tariff component	Tariff
Toll Charge ($/GJ MDQ)	0.115668
Capacity Reservation Charge ($/GJ MDQ KM)	0.000616
Throughput Charge ($/GJ KM)	0.000226

13 REFERENCE TARIFF VARIATION MECHANISM [Rule 72(1)(k)]

83. The reference tariff is to vary over the course of the access arrangement period in accordance with the reference tariff variation mechanism of the proposed revised GGP Access Arrangement.

84. The reference tariff variation mechanism comprises:

(a) a scheduled reference tariff variation mechanism; and

(b) a cost pass-through variation of the reference tariff.

85. The scheduled reference tariff variation mechanism further provides for:

(a) quarterly scheduled variation of the reference tariff; and

(b) annual scheduled variation of the reference tariff.

13.1 Quarterly scheduled variation of the reference tariff

86. The quarterly scheduled variation of the reference tariff replaces, at the commencement of each quarter, the inflation that was assumed for tariff determination, with a measure of actual inflation obtained from the change in the Consumer Price Index six months prior.

87. The reference tariff is varied accordingly, so that it more closely reflects variations in the costs that the tariff is to recover. The quarterly tariff variation mechanism is intended to maintain efficient cost recovery during the access arrangement period.

88. The quarterly reference tariff variation formula is set out in section A1 of Schedule A to the approved access arrangement.

13.2 Annual scheduled variation of the reference tariff

89. The operation of the annual scheduled reference tariff variation mechanism, at the commencement of each year during the access arrangement period:

- effects the quarterly inflation adjustment of the reference tariff, in place of adjustment in accordance with the quarterly scheduled variation of reference tariffs;

- allows the service provider 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 (the weighted average tariff basket); and
- effects a change in the reference tariff following the annual adjustment of the return on debt and any approved Cost Pass-through Events.

90. The annual reference tariff variation formula is set out in section A2 of Schedule A to the approved access arrangement.

13.3 Cost pass-through variation of the reference tariff

91. The cost pass-through reference tariff variation 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. The events in respect of which costs may be "passed through" to a reference tariff variation are:

(a) a change in law or tax change event

92. Variation of the reference tariff to take into account changes in the costs of providing the reference service attributable to certain defined events ensures the tariff more closely reflects the costs which it is to recover. The cost pass-through variation mechanism is intended to maintain efficient cost recovery during the access arrangement period.

93. The cost pass-through reference tariff variation mechanism is set out in section 4.5.2 of the approved access arrangement.

14 TOTAL REVENUE [Rule 72(1)(m)]

94. Total Revenue has been determined using the "building block approach" in accordance with Rule 76, which states as follows

"***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 (See Divisions 4 and 5); and

b) depreciation on the projected capital base for the year (See Division 6); and

c) the estimated cost of corporate income tax for the year (see Division 5A); and

d) increments or decrements for the year resulting from the operation of an incentive mechanism to encourage gains in efficiency (See Division 9); and

e) a forecast of operating expenditure for the year (See Division 7)."

95. The building blocks of Total Revenue in each regulatory year of the Current Access Arrangement Period, and the Total Revenue in each year, are shown in Table 19.

Table 19 Total revenue (Nominal $ million) Building Blocks

Nominal $ Million	2015	2016	2017	2018	2019	Total
Operating Expenditure	19.211	19.695	20.135	20.210	20.728	99.978
Return on Capital Base	22.362	22.994	22.849	22.567	22.263	113.036
Regulatory Depreciation						
Depreciation	7.084	11.110	11.301	11.449	11.486	52.430
Inflationary Gain	(5.699)	(5.748)	(5.712)	(5.641)	(5.565)	(28.365)
Regulatory Corporate Income Tax						
Corporate Income Tax	5.385	0.000	0.000	0.000	0.062	5.447
Imputation Credits	(2.154)	0.000	0.000	0.000	(0.025)	(2.179)
Authority Approved Total Revenue	**46.189**	**48.052**	**48.574**	**48.585**	**48.949**	**240.348**