

15 January 2021

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# **Abbreviations**

AER	Australian Energy Regulator
AGP	Amadeus Gas Pipeline
СЫ	Consumer Price Index, All Groups Weighted Average Eight Capital Cities
est	estimate
GJ	Gigajoule
MDQ	Maximum Daily Quantity
NGR	National Gas Rules
PTRM	Post-tax Revenue Model
RFM	Roll Forward Model
TJ	Terajoule
TJ/d	Terajoule per day



### 1 Introduction

This Access Arrangement Information is for the Amadeus Gas Pipeline (**AGP**). It has been prepared by the pipeline service provider, APT Pipelines (NT) Pty Limited (ACN 075 733 336) (**Amadeus**). Amadeus is a wholly owned entity within APA Group.

A draft decision on proposed revisions to the AGP Access Arrangement (Draft Decision), made by the Australian Energy Regulator (**AER**) in November 2020, required 15 specific amendments to make the revision proposal acceptable to the regulator. A period ending on 15 January 2021 was fixed for Amadeus to revise its proposal in response to the Draft Decision.

Amadeus has made all of the amendments required by the Draft Decision and, on 15 January 2021, submitted to the AER a revised proposal (**Revised Proposal**). This Access Arrangement Information is part of Amadeus's Revised Proposal. It has been prepared, in accordance with rules 42 and 43(1) of the National Gas Rules (**NGR**), to provide users and prospective users with sufficient information to:

- to understand the background to the access arrangement revision proposal
- to understand the basis and derivation of the various elements of the access arrangement revision proposal.

The revised access arrangement is expected to commence on 1 July 2021.

This document follows the scheme of NGR rule 72 in its setting out the access arrangement information for a full access arrangement proposal.

#### 1.1 Basis of information in the access arrangement information

Unless otherwise stated, all information in the Revised Proposal is provided in real June 2021 dollars.

Past values are have been recast to values at June 2021 prices using the Consumer Price Index (**CPI**), All Groups Weighted Average Eight Capital Cities for the June quarter, published by the Australian Bureau of Statistics.

A CPI forecast for the period to June 2021 has been made using the forecast increase in the CPI for the year to June 2021 published by the Reserve Bank of Australia in its November 2020 *Statement on Monetary Policy*.



#### 1.2 Financial models

In April 2020, the AER published, in accordance with NGR rules 75A and 75B, the following financial models:

- Roll Forward Model (gas transmission service provider version) (RFM)
- Post-tax Revenue Model (gas transmission service provider version) (PTRM).

Amadeus has used the RFM, without modification, to calculate the opening capital base for the AGP at commencement of the access arrangement period (1 July 2021).

In April 2020, the AER initiated a review of the regulatory treatment of inflation. This review was close to completion at the end of November 2020, and the Draft Decision advised that the AER:

- intended to consult, under the NGR, on changes to the PTRM if the outcome of the review were a different method for estimating expected inflation, and if rule changes were not required
- expected to apply amendments to the PTRM in its final decision on the Amadeus Access Arrangement revision proposal.<sup>1</sup>

The AER's final position on the regulatory treatment of inflation was announced on 17 December 2020. A different method is to be used for the estimation of expected inflation, but the adoption of this method does not require changes to the NGR. It does, however, require changes to the PTRM, and the AER has prepared an amended model (AER – Attachment B – Draft amended gas transmission PTRM – December 2020) for consultation in accordance with NGR rule 75.<sup>2</sup>

Anticipating incorporation of the new method of estimating expected inflation in the PTRM in the way the AER has proposed in the amended model released for consultation, Amadeus has used that model when determining the total revenue.

<sup>&</sup>lt;sup>1</sup> Australian Energy Regulator, Draft Decision, Amadeus Gas Pipeline Access Arrangement 2021 to 2026, Attachment 3, page 6.

<sup>&</sup>lt;sup>2</sup> Available from the AER website, at <u>Gas revenue models (transmission and distribution) -</u> <u>April 2021 amendment | Australian Energy Regulator (aer.gov.au)</u>.



Amadeus has used the AER's draft amended gas transmission PTRM, without modification, for the calculation of regulatory depreciation, the estimated cost of corporate income tax (including adjustment for the value of imputation credits), total revenue, and the X-factors for the path of the AGP reference tariffs.

#### 1.3 Structure of the document

The remaining parts of this Access Arrangement Information are as follows:

- Section 2: Information for the earlier access arrangement period
- Section 3: Opening capital base
- Section 4: Projected capital base
- Section 5: Forecast capacity and utilisation
- Section 6: Forecast operating expenditure
- Section 7: Allowed rate of return
- Section 8: Estimated cost of corporate income tax
- Section 9: Incentive mechanism
- Section 10: Proposed approach to setting reference tariffs
- Section 11: Reference tariff variation mechanism
- Section 12: Incentive mechanisms
- Section 13: Total revenue and reference tariffs.



# 2 Information for the earlier access arrangement period

#### 2.1 Capital expenditure

Capital expenditure (by asset class), over the earlier access arrangement period (2016-17 to 2020-21) is shown in Table 1. Expenditures for 2016-17 to 2019-20 are actual expenditures. Estimated expenditure is shown for 2020-21.

Table 1: Capital expenditure by asset class: 2016-17 to 2020-21 (\$m, nominal)

		2016-17	2017-18	2018-19	2019-20	2020-21 est.	Total
Pipelines	\$m	2.072	0.206	0.666	3.698	0.050	6.692
Compressors	\$m	0.000	0.000	0.000	0.000	0.000	0.000
Meter Station	\$m	1.650	0.662	1.905	3.229	1.715	9.161
SCADA	\$m	0.012	0.095	0.505	0.000	0.632	1.244
O&M Facilities	\$m	1.594	1.178	1.524	2.469	1.914	8.679
Buildings	\$m	0.000	0.000	0.000	1.060	0.000	1.060
Land and Easement	\$m	0.000	0.000	0.000	0.000	0.000	0.000
Leased Assets	\$m	0.000	0.000	0.000	0.000	0.000	0.000
Capital expenditure	\$m	5.327	2.141	4.601	10.457	4.311	26.837

#### 2.2 Operating expenditure

Operating expenditure (by category), over the earlier access arrangement period (2016-17 to 2020-21) is shown in Table 2 below. Expenditures for 2016-17 to 2019-20 are actual expenditures. Estimated expenditure is shown for 2020-21.

#### 2.3 Pipeline usage over the earlier access arrangement period

#### 2.3.1 Minimum, maximum and average demand for each delivery point

The minimum, maximum, average and total demand for each delivery point, during the earlier access arrangement period, are shown in Table 3.



# Table 2: Operating expenditure by category: 2016-17 to 2020-21 (\$m, real Jun-2021)

		2016-17	2017-18	2018-19	2019-20	2020-21 est.	Total
Base operating expenditure	\$m	11.061	8.653	9.385	9.754	7.698	46.550
Category specific forecasts							
Corporate costs	\$m	1.453	1.443	1.679	1.461	1.638	7.675
In-line inspection costs	\$m	0.005	1.601	0.790	0.524	0.343	3.263
Excavation costs	\$m	0.001	0.067	0.001	0.662	0.000	0.730
	\$m	1.459	3.111	2.470	2.646	1.981	11.668
Lease payments	\$m	0.429	0.433	0.430	0.000	0.000	1.292
Debt raising costs	\$m	0.069	0.069	0.068	0.068	0.069	0.343
Operating expenditure	\$m	13.017	12.267	12.354	12.468	9.748	59.853



# Table 3:Actual and estimated minimum, maximum and average<br/>demands for each delivery point: 2016-17 to 2020-21

			2016-17	2017-18	2018-19	2019-20	2020-21
							est
Darw in Channel Island	Minimum	TJ/d	19.7	21.0	19.8	14.3	19.8
	Maximum	TJ/d	48.2	48.4	46.0	42.5	46.0
	Average	TJ/d	33.3	33.5	30.2	26.6	28.8
	Total	TJ/d	12,151.6	12,244.7	11,010.1	9,749.3	10,516.2
Darw in City Gate (distribution system)	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	0.2	0.2	0.2	0.2	0.2
	Average Total	TJ/d TJ/d	0.1 18.2	0.1 18.6	0.1 23.2	0.1 22.4	0.1 22.2
Darw in City Gate (into Wickham Point Pipeline)	N fini internet	T 1/4	0.0	5.4	0.0	0.0	4.0
Darw in City Gate (into Wickham Point Pipeline)	Minimum Maximum	TJ/d TJ/d	0.0 23.9	5.1 35.3	0.0 55.1	0.0 42.4	1.6 23.9
	Average	TJ/d	11.8	16.7	18.6	18.2	12.9
	Total	TJ/d	4,321.3	6,090.7	6,798.8	6,656.1	4,708.5
		<b>T</b> 1/1	0.0	0.4	0.0	0.0	0.0
Darw in Tow nend Road	Minimum	TJ/d	0.2	0.1	0.0	0.0	0.0
	Maximum Average	TJ/d TJ/d	0.8 0.5	0.8 0.5	0.7 0.2	0.3 0.2	0.7 0.2
	Total	TJ/d	188.4	187.6	88.6	65.4	68.8
Proc Occal		<b>T</b> 1/1					
Pine Creek	Minimum Maximum	TJ/d TJ/d	0.0 6.0	0.0 5.9	0.6 6.0	1.1 6.0	0.6
		TJ/d	5.2	4.6	6.0 4.7	4.9	6.0 4.7
	Average Total	TJ/d	5.2 1,885.9	4.6	4.7	4.9	1,716.2
Katherine	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	6.5	5.2	8.3	5.9	8.3
	Average Total	TJ/d TJ/d	1.0 351.5	0.8 298.7	1.4 524.6	1.1 401.7	1.3 460.7
Daly Waters	Minimum	TJ/d	1.3	0.5	0.0	0.0	0.0
	Maximum	TJ/d TJ/d	9.4	9.7	11.0	10.5	11.0
	Average Total	TJ/d	6.8 2,481.5	7.3 2,663.4	7.6 2,783.5	8.3 3,039.1	8.0 2,629.5
Elliot	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
Ellot	Maximum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Average	TJ/d	0.2	0.1	0.2	0.2	0.2
	Total	TJ/d	37.3	34.5	41.7	42.8	38.7
Warrego (NGP)	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
Wallego (Nol)	Maximum	TJ/d	0.0	0.0	94.2	89.5	94.2
	Average	TJ/d	0.0	0.0	52.0	67.5	77.1
	Total	TJ/d	0.0	0.0	15,750.2	24,710.4	28,141.5
Tennant Creek	Minimum	TJ/d	0.4	0.0	0.6	0.0	0.3
	Maximum	TJ/d	1.7	1.7	1.7	1.8	1.7
	Average	TJ/d	1.1	1.1	1.2	1.1	1.1
	Total	TJ/d	391.6	394.4	426.7	417.0	403.5
Tanami Road	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	0.0	0.0	8.5	8.0	8.5
	Average	TJ/d	0.0	0.0	3.5	6.6	6.6
	Total	TJ/d	0.0	0.0	737.7	2,421.2	2,426.8
Palm Valley Interconnect (Alice Springs)	Minimum	TJ/d	2.8	1.8	0.2	0.2	0.2
	Maximum	TJ/d	9.4	7.7	8.3	7.5	8.3
	Average	TJ/d	5.2	5.4	5.3	3.2	4.3
	Total	TJ/d	1,910.0	1,963.2	1,931.5	1,172.4	1,562.2

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#### 2.3.2 User numbers at delivery points

The numbers of pipeline users at each delivery point over the earlier access arrangement period are presented in Table 4. (The numbers for 2020-21 are estimates.)

Delivery Point	2016-17	2017-18	2018-19	2019-20	2020-21
Channel Island	1	1	1	1	1
Darwin City Gate (to distribution system)	1	1	2	2	2
Darwin City Gate (to Wickham Point Pipeline)	1	1	1	1	1
Townend Road	1	1	1	1	1
Pine Creek	2	2	2	2	2
Katherine	1	1	1	1	1
Mataranka	0	0	0	0	0
Daly Waters	2	2	2	2	2
Elliot	1	1	1	1	1
Warrego (to Northern Gas Pipeline)	0	0	5	5	3
Tennant Creek	1	1	1	1	1
Tanami Road	0	0	1	1	1
Palm Valley interconnect (to Alice Springs)	1	1	1	1	1

Table 4: Numbers of users at delivery points: 2016-17 to 2020-21



# 3 Opening capital base

The access arrangement period (2021-22 to 2025-26) commences, on 1 July 2021, at the end of the earlier access arrangement period.

The opening capital base at 1 July 2021 has been determined by "rolling forward" the capital base from commencement of the earlier access arrangement period in accordance with NGR rule 77(2).

The capital base has been rolled forward to 1 July 2021 using the gas transmission service provider version of the AER's RFM.

The RFM takes, as its starting point, the opening capital base approved by the AER in its 2016 Final Decision on the last proposed revisions to the AGP Access Arrangement.

Key steps in the capital base roll forward are:

- conforming capital expenditure for the earlier access arrangement period, adjusted for any difference between estimated and actual capital expenditure included in that opening capital base, and for any benefit or penalty associated with any difference between the estimated and actual capital expenditure, is added to the capital base
- amounts are added in accordance with rule 82 (capital contributions), rule 84 (speculative capital expenditure) and rule 86 (re-use of redundant assets) - Amadeus has not added any amount in accordance with any of these rules
- regulatory depreciation, calculated within the RFM using the AER's indexed straight line method, is subtracted
- the value of any asset disposals is subtracted Amadeus has subtracted the value of disposals.

The roll forward of the AGP capital base, from 1 July 2016, is shown in Table 5.



		2016-17	2017-18	2018-19	2019-20 (est.)	2020-21 (est.)
Opening capital base	\$m	115.817	119.354	119.722	122.574	131.256
Net actual/estimated CAPEX Regulatory depreciation Adjustments	\$m \$m \$m	5.337 -1.800	1.902 -1.534	4.724 -1.872	10.630 -1.947	4.375 -4.908 -4.713
End of year asset value	\$m	119.354	119.722	122.574	131.256	126.010

#### Table 5: Roll forward of the AGP capital base (\$m, nominal)

The asset value at the end of the last year of the earlier access arrangement period, \$126.010 million, is the opening capital base for the access arrangement period (2021-22 to 2025-26).



# 4 Projected capital base

Projection of the capital base forward, over the access arrangement period, is similar to roll forward of the capital base during the earlier access arrangement period:

- forecast conforming capital expenditure is added to the opening capital base (which, for the first year of the access arrangement period, is from the RFM)
- if necessary, adjustments are made for capital contributions, speculative capital expenditure and re-use of redundant assets
- regulatory depreciation, calculated using the AER's indexed straight line method, is subtracted from the capital base
- the forecast value of any pipeline asset disposal is subtracted from the capital base.

Amadeus's forward projection of the AGP capital base for the period 2021-22 to 2025-26 is summarised in Table 6. The calculations summarised in the table have been made using the draft amended gas transmission service provider version of the PTRM, which was released, by the AER, for consultation, on 17 December 2020 (see section 1.2 above).

		2021-22	2022-23	2023-24	2024-25	2025-26
Projected capital base	\$m	126.010	127.113	127.641	128.407	129.065
Net capital expenditure	\$m	3.094	2.766	3.229	3.362	3.447
Regulatory depreciation	\$m	-1.990	-2.238	-2.463	-2.704	-2.983
Adjustments	\$m					
End of year asset value	\$m	127.113	127.641	128.407	129.065	129.529
Rate of return		4.64%	4.45%	4.26%	4.07%	3.88%
Return on capital base	\$m	5.851	5.660	5.441	5.230	5.011

Table 6:	AGP projected capital base and return on capital base: 2021-22
	to 2025-26 (\$m, nominal)



The return on the projected capital base shown in Table 6 is the product of:

- the projected capital base the forecast total investment in the pipeline at the beginning of the year
- the allowed rate of return.

Estimation of the allowed rate of return is explained in section 7 below.

The forecast of conforming capital expenditure for the access arrangement period, which is an input to the PTRM, is shown in Table 7.

Table 7: AGP forecast capital expenditure: 2021-22 to 2025-26 (\$m, real Jun-2021)

		2021-22	2022-23	2023-24	2024-25	2025-26	Total
Pipelines	\$m	0.429	0.429	0.374	0.409	0.258	1.898
Compressors	\$m	0.000	0.000	0.000	0.000	0.000	0.000
Meter Station	\$m	0.809	0.838	1.220	0.956	0.842	4.665
SCADA	\$m	0.000	0.000	0.000	0.000	0.000	0.000
O&M Facilities	\$m	1.813	1.419	1.480	1.777	2.065	8.554
Buildings	\$m	0.072	0.072	0.072	0.072	0.072	0.362
Corporate Assets (IT Software)	\$m	0.000	0.000	0.000	0.000	0.000	0.000
Land and Easement	\$m	0.000	0.000	0.000	0.000	0.000	0.000
	\$m	3.123	2.759	3.146	3.215	3.237	15.480

Regulatory depreciation calculated for the purpose of projecting the capital base forward over the access arrangement period (as shown in Table 6) has been calculated using the indexed straight line method, which is embedded in the PTRM. The calculation of depreciation is summarised in Table 8.



#### 2021-22 2022-23 2023-24 2024-25 2025-26 Expected inflation 1.87% 1.87% 1.87% 1.87% 1.87% Cumulative expected inflation 1.0187 1.0378 1.0573 1.0771 1.0973 Projected capital base \$m 126.010 127.113 127.641 128.407 129.065 Real straight line depreciation Pipelines 1.471 1.476 1.481 1.486 1.491 \$m 0.370 0.370 0.370 0.370 0.370 Compressors \$m Meter Station 0.497 0.514 0.538 0.558 \$m 0.480 SCADA \$m 0.025 0.025 0.025 0.025 0.025 **O&M** Facilities 1.854 1.460 1.616 1.732 2.006 \$m Buildings \$m 0.104 0.105 0.107 0.108 0.110 Corporate Assets (IT Software) \$m 0.000 0.000 0.000 0.000 0.000 Land and Easement \$m 0.000 0.000 0.000 0.000 0.000 Leased assets \$m 0.363 0.363 0.363 0.363 0.363 4.272 4.451 4.591 4.745 4.923 \$m Nominal (indexed) depreciation \$m 4.352 4.620 4.854 5.110 5.402 Inflation on capital base 2.361 2.382 2.392 2.406 2.419 \$m 2.983 **Regulatory depreciation** \$m 1.990 2.238 2.462 2.704

#### Table 8: AGP regulatory depreciation: 2021-22 to 2025-26



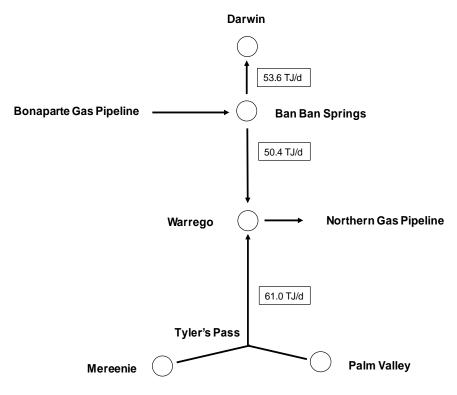
# 5 Forecast capacity and utilisation

The AGP is a transmission pipeline and user demand is principally a demand for pipeline capacity for the provision of firm transportation service. Demand for the transportation and delivery of volumes of gas derives from users' decisions to use their contracted capacities.

#### 5.1 Forecast pipeline capacity

Interconnection with the Northern Gas Pipeline, in January 2019, has segmented the capacity of the AGP in the way shown in Figure 1.

Figure 1: AGP gas flows and capacity for firm transportation service after January 2019



The segment capacities shown in Figure 1 have been used to derive the nameplate rating of the AGP.

The nameplate rating of the AGP – its capacity to provide firm transportation service under the operating conditions in effect since interconnection with the Northern Gas Pipeline – is 165.0 TJ/d.



Forecast capacity for the provision of firm service during the access arrangement period (2021-22 to 2025-26) is shown in Table 9.

Table 9: Firm service capacity forecast: 2021-22 to 2025-26

		2021-22	2022-23	2023-24	2024-25	2025-26
Capacity	TJ/d	145.0	145.0	145.0	145.0	145.0

The capacity of the Northern Gas Pipeline is reported to be 90.0 TJ/d. The capacity of the AGP is, in these circumstances, used to the maximum extent when users with pre-existing agreements have access to capacity of 145.0 TJ/d at AGP receipt points. The segment capacities may total 165.0 TJ/d, but the utilisation of those capacities is constrained by capacity at the delivery point into the Northern Gas Pipeline at Warrego. An aggregate receipt point capacity of 145.0 TJ/d in pre-existing agreements effectively uses all of the capacity available for the provision of firm transportation service in the AGP.

#### 5.2 Minimum, maximum and average demand for each delivery point

Pipeline capacity utilisation – minimum, maximum and average demand at each delivery point – during the access arrangement period 2021-22 to 2025-26 is shown in Table 10 below.



# Table 10: Forecast minimum, maximum and average demands and totalvolume by delivery point: 2021-22 to 2025-26

			2021-22	2022-23	2023-24	2024-25	2025-26
			Forecast	Forecast	Forecast	Forecast	Forecas
Darw in Channel Island	Minimum	TJ/d	19.8	19.8	19.8	19.8	19.8
	Maximum	TJ/d	46.0	46.0	46.0	46.0	46.0
	Average	TJ/d	29.7	30.7	31.7	32.7	33.7
	Total	TJ	10,852.7	11,200.0	11,590.1	11,928.3	12,310.0
Darw in City Gate (distribution system)	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	0.2	0.2	0.2	0.2	0.2
	Average	TJ/d	0.1	0.1	0.1	0.1	0.1
	Total	TJ	22.2	22.2	22.2	22.2	22.2
Darw in City Gate (into Wickham Point Pipeline)	Minimum	TJ/d	1.6	1.6	1.6	1.6	1.6
	Maximum	TJ/d	23.9	23.9	23.9	23.9	23.9
	Average	TJ/d	13.3	13.7	14.2	14.6	15.1
	Total	ΤJ	4,859.2	5,014.7	5,189.3	5,340.7	5,511.6
Darw in Tow nend Road	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	0.7	0.7	0.7	0.7	0.7
	Average	TJ/d	0.2	0.2	0.2	0.2	0.2
	Total	TJ	68.8	68.8	69.0	68.8	68.8
Pine Creek	Minimum	TJ/d	0.6	0.6	0.6	0.6	0.6
	Maximum	TJ/d	6.0	6.0	6.0	6.0	6.0
	Average	TJ/d	4.9	5.0	5.2	5.3	5.5
	Total	TJ	1,771.1	1,827.8	1,891.5	1,946.7	2,009.0
Katherine	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	8.3	8.3	8.3	8.3	8.3
	Average	TJ/d	1.3	1.3	1.4	1.4	1.5
	Total	TJ	475.4	490.6	507.7	522.5	539.2
Daly Waters	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	11.0	11.0	11.0	11.0	11.0
	Average	TJ/d	8.0	8.0	8.0	8.0	8.0
	Total	ТJ	2,629.5	2,629.5	2,629.5	2,629.5	2,629.5
Elliot	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	0.2	0.2	0.2	0.2	0.2
	Average	TJ/d	0.1	0.1	0.1	0.1	0.1
	Total	ТJ	38.7	38.7	38.7	38.7	38.7
Warrego (Northern Gas Pipeline)	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	94.2	94.2	94.2	94.2	94.2
	Average Total	TJ/d TJ	77.1 28,141.5	77.1 28,141.5	77.1 28,218.6	77.1 28,141.5	77.1 28,141.5
	Total	10	20,141.0	20,141.0	20,210.0	20,141.0	20,141.0
Tennant Creek	Minimum	TJ/d	0.3	0.3	0.3	0.3	0.3
	Maximum	TJ/d	1.7	1.7	1.7	1.7	1.7
	Average	TJ/d	1.1	1.1	1.1	1.1	1.1
	Total	TJ	403.5	403.5	403.5	403.5	403.5
Tanami Road	Minimum	TJ/d	0.0	0.0	0.0	0.0	0.0
	Maximum	TJ/d	8.5	8.5	8.5	8.5	8.5
	Average Total	TJ/d TJ	6.6 2,426.8	6.6 2,426.8	6.6 2,433.5	6.6 2,426.8	6.6 2,426.8
Palm Valley Interconnect (Alice Springs)	Minimum Maximum	TJ/d TJ/d	0.2 8.3	0.2 8.3	0.2 8.3	0.2 8.3	0.2 8.3
	Average	TJ/d	4.3	4.3	4.3	4.3	4.3
		, .	7.0	4.0	1.0	4.0	-7.0
	Total	ТJ	1,562.2	1,562.2	1,566.4	1,562.2	1,562.2

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#### 5.3 Capacity available for interruptible service

Interruptible service can be made available using any unused part of the AGP capacity which has been contracted to users with pre-existing agreements. That capacity can be made available to other users subject to recognition of rights, in the pre-existing agreements, for gas to be scheduled ahead of gas scheduled for others.

The capacity potentially available for the provision of interruptible service using the AGP during the period 2020-21 to 2025-26 is shown in Table 11.

		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Ban Ban Springs - Darwin Ban Ban Springs - Warrego	TJ/d TJ/d	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
Capacity: Tyler's Pass - Warrego Firm transportation service: Tyler's Pass - Warrego	TJ/d TJ/d	61.0 22.6	61.0 22.6	61.0 22.6	61.0 22.6	61.0 22.6	61.0 22.6
Palm Valley, Mereenie - Warrego	TJ/d	38.4	38.4	38.4	38.4	38.4	38.4
Capacity available for interruptible service	TJ/d	38.4	38.4	38.4	38.4	38.4	38.4

Table 11: AGP capacity available for interruptible service 2021-2026

Around 38 TJ/d of capacity is expected to be available for the provision of interruptible service (see Table 11), but the demand for that capacity is uncertain.

Forecast demand for interruptible service during the period 2021-22 to 2025-26 is shown in Table 12.

Table 12: Forecast demand for interruptible service: 2021-22 to 2025-26

		2021-22	2022-23	2023-24	2024-25	2025-26
Interruptible service	TJ/d	15.0	15.0	15.0	15.0	15.0



# 6 Forecast operating expenditure

Forecast operating expenditure over the access arrangement period is shown in Table 13.

Table 13: Forecast operation expenditure: 2021-22 to 2025-26 (\$m, real Jun-2021)

		2021-22	2022-23	2023-24	2024-25	2025-26	Total
Trended base year OPEX	\$m	7.685	7.667	7.654	7.641	7.628	38.275
Separately forecast costs							
In-line inspection (pigging) costs	\$m	0.205	0.358	0.358	0.102	0.113	1.135
Excavation costs	\$m	0.000	0.000	0.000	0.000	0.000	0.000
Controllable OPEX	\$m	7.889	8.025	8.012	7.743	7.741	39.410
Corporate costs	\$m	1.638	1.638	1.638	1.638	1.638	8.190
Debt raising costs	\$m	0.061	0.060	0.059	0.058	0.057	0.294
Forecast OPEX	\$m	9.588	9.723	9.709	9.439	9.435	47.894

Amadeus has forecast operating expenditure for the AGP, over the period 2021-22 to 2025-26, using the base, step and trend method.

When applying the base, step and trend method, Amadeus has:

- taken 2017-18 as the base year
- removed from the base year (2017-18) total operating expenditure costs which are non-recurrent, and which must be separately forecast
- trended the recurrent base year costs forward across the access arrangement period (2021-22 to 2025-26), applying a series of indices to reflect expected increases in costs
- separately forecast, and added to the forecast of recurrent operating expenditure, forecasts for non-recurrent:
  - in-line inspection costs
  - excavation costs

The forecast of total operating expenditure for the period 2021-22 to 2025-26 includes a forecast of debt raising costs. This forecast of debt raising costs is the forecast generated by the PTRM.



# 7 Allowed rate of return

Amadeus has applied the AER's December 2018 Rate of Return Instrument when determining the allowed rate of return.

#### 7.1 Rate of return

The rate of return is to be a nominal "vanilla" weighted average of a rate of return on equity and a rate of return on debt:

$$k_t = k^e \times (1 - G) + k_t^d \times G$$

where:

- kt is the rate of return in regulatory year t
- k<sup>e</sup> is the rate of return on equity for the access arrangement period
- $k_{t^{d}}$  is the rate of return on debt for regulatory year t; and
- G is the gearing ratio.

#### 7.2 Rate of return on equity

In accordance with clause 4 of the Rate of Return Instrument, Amadeus has calculated the rate of return on equity component (k<sup>e</sup>) of the rate of return using the asset pricing model:

$$k^{e} = k^{f} + \beta \times MRP$$

where:

- k<sup>f</sup> is the risk free rate of return for the access arrangement period;
- β (beta) is the equity beta; and
- MRP is the market risk premium.

Amadeus has estimated the risk free rate of return (k<sup>f</sup>) as a simple average of the yields on Australian Government Securities with terms to maturity of 10 years over a placeholder averaging period.

The estimate of the risk free rate is 0.91%.

Clause 4 of the Rate of Return Instrument sets a value of beta of 0.6, and sets the market risk premium at an effective annual rate of 6.1%.



Using these values, and the asset pricing model of clause 4 of the Rate of Return Instrument, the rate of return on equity is 4.57%:

$$0.91\% + 0.6 \times 6.1\% = 4.57\%$$

#### 7.3 Rate of return on debt

The return on debt in regulatory year t of the access arrangement period ( $k_t^{d}$ ), the Rate of Return Instrument advises, is to be a trailing average of rates of return on debt for a period of 10 years.

A transition into the trailing average is required, and the first regulatory year of the transition period for the AGP is the period of 12 months from 1 July 2016.

Amadeus has calculated the trailing average for 2021-22, which is to be the allowed rate of return on debt until that allowed rate is updated, as:

$$k_{2021-22}^{d} = \left(5 \times k_{2016-17}^{d} + \sum_{i=1}^{5} k_{i}^{d}\right)$$

where:

- k<sup>d</sup><sub>2016-17</sub> is 5.56%
- k<sub>i</sub><sup>d</sup>, i = 1, 2, 3, 4 are the previously updated rates of return on debt for 2017-18, 2018-19, 2019-20 and 2020-21, respectively, 5.09%, 4.50%, 4.26% and 2.85%
- $k_{id}$ , i = 5, is the estimate of the on-the-day rate of return on debt for 2021-22.

Amadeus has calculated the on-the-day rate of return on debt for 2021-22 in the way required by clauses 10 to 22 of the Rate of Return Instrument, using data for the placeholder averaging period. The on-the-day rate is 2.40%.

k<sup>d</sup><sub>2021-22</sub> is, then, 4.69%.

The trailing average evolves over the subsequent years of the access arrangement period so that the rate of return on debt varies as shown in Table 14 below.



#### 7.4 Gearing

The Rate of Return Instrument requires that the gearing ratio be set at a value of 0.6, and Amadeus has used this value when calculating the rate of return.

#### 7.5 Rate of return

In calculating the return component of total revenue for the AGP, Amadeus has used the rates of return over the access arrangement period shown in Table 14.

#### Table 14: Rate of return

2021-22	2022-23	2023-24	2024-25	2025-26
4.69%	4.38%	4.06%	3.74%	3.43%
4.64%	4.45%	4.26%	4.07%	3.88%
	6) 6 6 6 6 6 6 6 6 7 6 7 6 7 6 7 6 7 6 7	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	6 6 6 4.69% 4.38% 4.06%	6 6 6 4.69% 4.38% 4.06% 3.74%



## 8 Estimated cost of corporate income tax

An estimate of the cost of corporate income tax, adjusted for the value of imputation credits available to certain classes of equity investors, has been included in the total revenue.

Amadeus has calculated the estimated cost of corporate income tax during the access arrangement period using the PTRM. The model returns the estimated cost of tax, and the net tax allowance, in each year of the access arrangement period (Table 15).

Table 15: Estimated cost of corporate income tax and net tax allowance: 2021-22 to 2025-26 (\$m, nominal)

		2021-22	2022-23	2023-24	2024-25	2025-26	Total
Tax payable (from PTRM) Value of imputation credits	\$m \$m	0.051 -0.030	0.000 0.000	0.000 0.000	0.000 0.000	0.000 0.000	0.051 -0.030
Net tax allowance	\$m	0.021	0.000	0.000	0.000	0.000	0.021

The net tax allowance is the estimated cost of tax less the value of imputation credits. Those credits have been valued at 58.5% of the cost of tax, in accordance with paragraph 27 of the AER's December 2018 Rate of Return Instrument.



### 9 Incentive mechanism

Amadeus has amended the efficiency carryover mechanism of section 8 of the AGP Access Arrangement in accordance with the requirements of the Australian Energy Regulator's November 2020 Draft Decision on proposed revisions to the access arrangement.

The efficiency gains and losses calculated in the way required by the Draft Decision, which are building blocks of total revenue in each year of the access arrangement period, are summarised in Table 16.

Table 16: Efficiency gains and losses: 2021-22 to 2025-26 (\$m, nominal)

		2021-22	2022-23	2023-24	2024-25	2025-26	Total
Efficiency gains and losses	\$m	2.034	2.616	0.000	0.945	0.831	6.426



# 10 Approach to setting reference tariffs

In the period 2021-22 to 2025-26, Amadeus will offer:

- the firm service reference service of the AGP Access Arrangement
- an interruptible service reference service, as required by the AER's December 2019 reference service proposal decision for the AGP.

Each of these reference services must have a reference tariff.

#### 10.1 Reference tariff structure

Amadeus has retained the existing structure of the firm service reference tariff. The tariff is a number of \$/GJ of contracted capacity (or maximum daily quantity, **MDQ**) for transportation between any receipt point and any delivery point on the AGP.

A simple price per GJ MDQ has been retained because the costs of providing the firm service are the fixed costs of investment in the pipeline, and operating and maintenance costs which do not vary with the volume of gas transported. These costs are appropriately allocated to users on the basis of the capacities they contract for firm service provision.

The reference tariff for the interruptible service has a similar – simple – structure. The interruptible tariff is a number of \$/GJ for the volume of gas transported between any receipt point and any delivery point on the pipeline.

A simple price per GJ is used because the costs of providing the interruptible service are the fixed costs of investment in the pipeline, and operating and maintenance costs which do not vary with the volume of gas transported. These costs are appropriately allocated to users on the basis of the volume of interruptible service they use.

A description of the way in which Amadeus set the reference tariffs for the firm and interruptible services, and a demonstration of the relationship between costs and tariffs, is provided in section 13.2 of this Access Arrangement Information.



#### 10.2 Method used to allocate costs

NGR rule 93 requires the allocation of the total revenue between reference and other services in the ratio in which costs are allocated between reference and other services.

Rule 95 further requires that a tariff for a transmission pipeline reference service be designed to generate from the provision of each reference service the portion of total revenue referable to that reference service.

The portion of total revenue referable to a particular reference service is to be determined as follows:

- costs directly attributable to each reference service are to be allocated to that service
- 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 AER.

With the AGP, there is a difficulty in applying this guidance.

Services provided under pre-existing agreements use all of the capacity available for the provision of firm transportation (and a small amount of the capacity available for interruptible service).

If, as is the case, no capacity is available for the provision of the firm service reference service, no part of total revenue can be allocated to that service, and no reference tariff can be determined.

To enable users and prospective users to understand the pricing of a firm service reference service, should capacity become available for that service, a firm service reference tariff is calculated for the AGP Access Arrangement by making the assumption that all of the capacity used to provide the firm transportation services of pre-existing agreements is capacity which would otherwise have been used for the firm service reference service.

Amadeus has allocated total revenue between the maximum quantity of firm transportation service under pre-existing agreements, and the forecast of the volume of interruptible service which might be expected during the access arrangement period (2021-22 to 2025-26).

Users with pre-existing agreements for firm transportation service have maximum transportation capacity of 145.0 TJ/d under these agreements.



Demand for interruptible services is not expected to exceed 15.0 TJ/d during the next access arrangement period.

Amadeus has used these quantities to allocate the total revenue between the firm service and the interruptible service for the purpose of setting reference tariffs for those services. (All of the total revenue has been attributed to the provision of the reference services. All costs are attributable to the reference services, but no cost is directly attributable to either the firm service or the interruptible service individually.)

Costs are allocated in a way which provides Amadeus with a reasonable opportunity to recover at least the efficient costs expected to be incurred in providing the firm service and the interruptible reference services. Providing Amadeus with a reasonable opportunity to recover at least its efficient costs provides effective incentives for:

- efficient investment in the AGP (the pipeline used to provide the provides reference services)
- the efficient provision of pipeline services.



# 11 Reference tariff variation mechanism

The reference tariff variation mechanism in the AGP Access Arrangement allows annual variation of the reference tariff for:

- current inflation
- a change in the rate of return on debt (as required by the Rate of Return Instrument)
- a material increase in costs attributable to one or more of a small number of specified events (including regulatory change, tax change, terrorism and natural disaster).

This mechanism can be applied, essentially unchanged, to vary annually both the firm service reference tariff and the interruptible service reference tariff.



# 12 Incentive mechanisms

No new incentive mechanism is proposed for the period 2021-22 to 2025-26.

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## 13 Total revenue and reference tariffs

#### 13.1 Total revenue

Total revenue for the AGP, for the access arrangement period (2021-22 to 2025-26), is summarised in Table 17.

Table 17: AGP total revenue 2021-22 to 2025-26 (\$m, nominal)

		2021-22	2022-23	2023-24	2024-25	2025-26
Return on capital base	\$m	5.851	5.660	5.441	5.230	5.011
Regulatory depreciation	\$m	1.990	2.238	2.463	2.704	2.983
Cost of corporate income tax	\$m	0.021	0.000	0.000	0.000	0.000
Efficiency gains and losses	\$m	2.034	2.616	0.000	0.945	0.831
Forecast operating expenditure	\$m	9.768	10.091	10.265	10.167	10.353
Total revenue	\$m	19.664	20.604	18.169	19.046	19.178
Smoothed total revenue	\$m	19.664	19.501	19.339	19.178	19.019
X factor		14.21%	2.65%	2.65%	2.65%	2.65%

Table 17 also shows the smoothed total revenue (which has present value equal to the present value of the total revenue, with the allowed rate of return as the discount rate), and the X factors which effect the smoothing. The smoothed total revenue and the X factors are calculated within the PTRM.

The components of total revenue for the access arrangement period are compared with the components in the earlier access arrangement period in Figure 2.



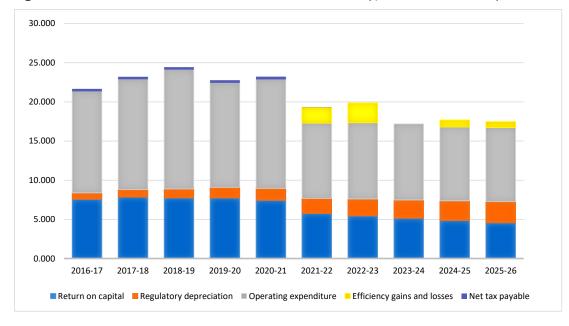


Figure 2: AGP total revenue: 2016-17 to 2025-26 (\$m, real Jun-2021)

#### 13.2 Reference tariffs

Reference tariffs for the AGP are shown in Table 18.

Table 18: AGP reference tariffs 2021-22 to 2025-26

		2020-21	2021-22	2022-23	2023-24	2024-25	2025-26
Firn service	\$/GJ MDQ	0.5470	0.3367	0.3339	0.3302	0.3284	0.3257
Interruptible service	\$/GJ	n.a.	0.3367	0.3339	0.3302	0.3284	0.3257

The firm service and interruptible service reference tariffs are nominally identical.

They are, however, substantially different: at the firm service load factor for the Amadeus Gas Pipeline (about 72%), the interruptible tariff represents a discount of about 28% on the firm service cost per GJ of gas delivered.

Reference tariff setting proceeds as follows:

- smoothed total revenue (from the PTRM) is allocated between the firm service reference service and the interruptible service reference on the basis of the demand forecast
- the existing firm service tariff structure (\$/GJ MDQ, postage stamp) is retained



- a postage stamp tariff is adopted for interruptible service, but in the form \$/GJ of gas delivered
- the firm service reference tariff in the first year of the access arrangement period is the portion of smoothed total revenue divided by the total firm service capacity (145.0 TJ/d): the tariff is \$0.3367/GJ MDQ
- over the access arrangement period, the firm service tariff follows a CPI - X price path: the assumed CPI increase is 1.87%, the X factors are 2.65% as calculated by the PTRM, and the tariff in the final year of the access arrangement period is forecast to be \$0.3257/GJ MDQ
- the interruptible service reference tariff in the first year of the access arrangement period is the portion of smoothed total revenue allocated to interruptible service, divided by the average quantity of interruptible service (15.0 TJ/d): the tariff is \$0.3367/GJ
- over the access arrangement period, the interruptible tariff follows a CPI X price path: the assumed CPI increase is 1.87%, the X factors are 2.65% as calculated by the PTRM, and the tariff in the final year of the access arrangement period is forecast to be \$0.3257/GJ
- forecast revenue from these firm service and interruptible service reference tariffs, over the access arrangement period, has a total present value of \$85.209 million (discounted at the time-varying rates of return in the PTRM); this is the present value of total revenue in the PTRM, and confirms the internal consistency of the tariff calculations.

These calculation for AGP reference tariff setting are summarised in Table 19.



#### 2021-22 2022-23 2023-24 2024-25 2025-26 365 365 366 365 365 Forecast Firm service TJ/d 145.00 145.00 145.00 145.00 145.00 Interruptible service TJ/d 15.00 15.00 15.00 15.00 15.00 160.00 160.00 160.00 160.00 160.00 TJ/d Firm service GJ 52,925,000 52,925,000 53,070,000 52,925,000 52,925,000 Interruptible service GJ 5,475,000 5,475,000 5,490,000 5,475,000 5,475,000 58,400,000 58,400,000 58,560,000 58,400,000 GJ 58,400,000 Input from Post-tax Revenue Model Smoothed total revenue \$m 19.664 19.501 19.339 19.178 19.019 p0, X factors X02 X03 X05 p0 X04 14.21% 2.65% 2.65% 2.65% 2.65% Inflation forecast 1.87% 1.87% 1.87% 1.87% 1.87% Rate of return 4.64% 4.45% 4.26% 4.07% 3.88% Reference tariff calculation Allocation of (smoothed) total revenue to reference services Firm service \$m 17.820 17.673 17.526 17.381 17.236 Interruptible service \$m 1.843 1.828 1.813 1.798 1.783 19.501 19.019 \$m 19.664 19.339 19.178 Reference tariff: firm service Total revenue allocated to firm \$m 17.820 17.673 17.526 17.381 17.236 52,925,000 Firm service GJ MDQ 52,925,000 53,070,000 52,925,000 52,925,000 Tariff: firm service \$/GJ MDQ 0.3367 0.3339 0.3302 0.3284 0.3257 Reference tariff: interruptible service Total revenue allocated to interruptible \$m 1.8435 1.8282 1.8130 1.7980 1.7831 Interruptible service GJ 5,475,000 5,475,000 5,490,000 5,475,000 5,475,000 Tariff: interruptible service \$/GJ 0.3367 0.3339 0.3302 0.3284 0.3257 Forecast revenue 17.526 17.236 Firm service \$m 17.820 17.673 17.381 Interruptible service 1.843 1.828 1.813 1.798 1.783 \$m \$m 19.664 19.501 19 339 19.178 19.019 \$m 77.221 PV(Firm service forecast revenue) PV(Interruptible service forecast revenue) 7.988 \$m PV(forecast revenue) \$m 85.209 PV(smoothed total revenue) (from PTRM) \$m 85.209 PV difference \$m 0.000

#### Table 19: AGP reference tariff setting: 2021-22 to 2025-26 (\$m, nominal)

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As shown in the last rows of Table 19:

- when discounted at the time-varying rates of return in the PTRM, the forecast revenue from firm service has a present value of \$77.221 million, and the forecast revenue from interruptible service has a present value of \$7.988 million; the forecast revenue from reference services has a present value of \$85.209 million
- this present value (\$85.209 million) is the present value of the total revenue (total cost of providing the services) from the PTRM.

As required by the NGR, costs have been allocated, and reference tariffs set, in a way which provides Amadeus with a reasonable opportunity to recover at least the efficient costs expected to be incurred in providing reference services.