GOLDFIELDS GAS PIPELINE

Supporting Information to Proposed Revisions to Access Arrangement

Submitted to Economic Regulation Authority 23 March 2009

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Contents

Attachments

1 Introduction

1.1 Preamble

This Submission is lodged by Goldfields Gas Transmission Pty Ltd ("GGT") in support of the proposed revisions to the Access Arrangement ("Revised Access Arrangement") and Access Arrangement Information ("AAI") for the Goldfields Gas Pipeline ("GGP") lodged on 23 March 2009. The Revised Access Arrangement and AAI were prepared and lodged pursuant to Section 2 of the National Third Party Access Code for Natural Gas Pipeline Systems ("Code").

Projections in this Submission have been prepared to meet the requirements of the Code and are based on a number of assumptions. GGT does not make any representation or warranty as to the accuracy of the assumptions.

The following points apply throughout the Submission:

- Totals shown in tables may not equal the sum of the elements of the tables due to rounding;
- Years shown in tables refer to calendar years unless otherwise indicated;
- Financial values shown in tables are nominal values unless otherwise indicated; and
- References to the Authority or ERA refer to the relevant regulator, being the Economic Regulation Authority.

1.2 Confidentiality

Some information in this Submission has been omitted to protect the commercial interests of shippers on the pipeline. This information has been provided to the ERA on a confidential basis. Consistent with Section 2.8 of the Code, GGT has categorised or aggregated some information to the extent necessary to ensure the disclosure of the information is not unduly harmful to the legitimate business interests of the Service Provider or a User or Prospective User. However, additional information has been provided confidentially to the Authority, including information in an uncategorised or unaggregated form.

1.3 History

During 1992, a number of companies independently undertook studies investigating the feasibility of constructing a natural gas pipeline to supply the East Pilbara and Goldfields regions of Western Australia. They did this with the objective of providing a cheaper source of energy to mining operations in these regions.

Electrical power had been supplied to the Kalgoorlie and Kambalda areas by the State Energy Commission of Western Australia ("SECWA", later Western Power Corporation), while remote sites such as Mount Keith and Leinster were supplied by local, company owned, diesel power stations. A number of pipeline options were considered, including links from the Dampier to Bunbury Natural Gas Pipeline ("DBNGP"), to supply gas from fields in the Carnarvon Basin to mining and related operations in the Goldfields.

In April 1993, the Western Australian State Government separately called for expressions of interest for the construction of a natural gas pipeline from the Pilbara to the Goldfields.

The Western Australian State Government received expressions of interest from a number of parties regarding the development of the new pipeline. Following a competitive selection process which took into account factors including proposed tariff arrangements and tariff levels, the Goldfields Gas Transmission Joint Venture ("GGTJV") was selected as the preferred proponent of the new pipeline - the GGP.

The GGTJV was granted a pipeline licence (WA: PL 24) on 27 January 1995 to design, construct, and operate a pipeline of approximately 1380 kilometres in length to transport natural gas from the DBNGP's Compressor Station One at Yarraloola to Kalgoorlie, via the East Pilbara and North East Goldfields regions of Western Australia.

Construction and commissioning of the pipeline was done progressively, from north to south. Gas was first delivered to Newman in June 1996, Mount Keith and Leinster in August 1996, and Kalgoorlie and Kambalda in September 1996. The pipeline was officially opened by the then Premier, the Hon. Richard Court, on 4 October 1996.

At the commencement of pipeline operation, all gas being transported was ultimately consumed by the owners of the GGP, i.e., the members of the GGTJV. However, from 1997 onwards, a number of Third Party pipeline users contracted with GGT for gas transportation services.

The GGP as originally constructed incorporated two compressor stations - at Yarraloola (the pipeline inlet), and at Ilgarari (near the GGP's half way point). This compression was sufficient to accommodate the original GGTJV loads plus the early Third Party pipeline users.

However, as Third Party use of the GGP increased, the pipeline's utilisation progressively approached maximum capacity. In order to accommodate new load, the GGTJV installed the Wiluna Compressor Station in 2000 - 2001. Further load increases required the installation of the Paraburdoo Compressor Station in 2003 - 2004.

The Paraburdoo Compressor Station as originally constructed comprised one compressor set, labelled "PCS" for the purposes at hand. However, still further load increases required the installation of a second additional compressor set at the Paraburdoo Compressor Station in 2006 - 2007. This second compressor set is (correspondingly) labelled "PAC".

Two further Compressor Stations, Wyloo West and Ned's Creek, are currently (March 2009) under construction. This additional compression is being installed primarily to accommodate incremental requirements of existing pipeline users, and to maintain system security.

1.4 The covered pipeline

In July 2005, the Authority approved the GGP's first (current) Access Arrangement, covering the period 2005 - 2009. At that time, the project to install the PAC compressor at the Paraburdoo Compressor Station was in its early stages.

In accordance with the provisions of the Extensions and Expansions policy in the approved GGP Access Arrangement, GGT elected to exclude from coverage under the Code the (incremental) capacity provided by the (at that time future) operation of the PAC compressor set.

This action has resulted in the physical capacity of the GGP being subdivided into two categories - "covered" capacity and "uncovered" capacity. The covered capacity is that which is provided by pipeline facilities in place at the time of the approval of the first (current) Access Arrangement (spanning 2005 - 2009), and the uncovered capacity is (currently) that provided by the PAC compressor set.

GGT has elected that the capacity provided by the Wyloo West Compressor Station not be covered and expects to similarly elect that the capacity provided by Ned's Creek Compressor Station will not be covered under the Code or its successor, the National Gas Law and associated National Gas Rules.

1.5 Outline of submission

The total costs for GGP are the total of:

- Return on Capital;
- Return of Capital; and
- Non capital costs; including
  - APA Operations operating costs;
  - GGT operating costs;
  - APA Commercial services costs;
  - APA and BBP corporate costs; and
  - Costs for risk included in cash flows, such as costs for insurance, self insurance and asymmetric risk.

The paper is set out in the following sections:

- Introduction;
- GGP corporate structure and operating arrangements;
- Capital base (including historical and forecast capital costs);
- Cost of capital;
- Historical and forecast non - capital costs;
- Costs allocation and tariff development; and
- Appendices and attachments.

2 GGT commercial and operating arrangements

2.1 Introduction

In considering the costs structure of the GGP it is necessary to have an understanding of the current commercial and operating arrangements underpinning the GGP. These arrangements underpin many of the operating and services costs required to operate the pipeline.

Costs directly driven by these commercial and operating arrangements are a combination of:

(i) APA Operations (undertaken by APT Pipelines (WA) Pty Ltd ("APTPWA") Operating Costs;

(ii) GGT Operating Costs; and

(iii) APA Commercial (undertaken by APT Goldfields Pty Ltd ("APTG") Services Costs.

These costs are derived annually through a comprehensive planning and review process, including development of annual Commercial Services Program and GGT Asset Management Plan. Both of these programs describe in detail the specific tasks to be undertaken to ensure the safe and efficient operation of the pipeline and the proper conduct of the business of the GGTJV.

"[Information Confidential]"

GGT's budgeting process is a rigorous process with a number of iterations, designed to ensure that GGT is able to properly evaluate and assess the level of proposed costs, to ensure that the final documents submitted to the Management Committee contains a programme and budget for the safe operation of the pipeline, at an efficient price.

APTG has a direct incentive (discussed later in this Submission) to ensure that GGP operating costs are no higher than is necessary for the safe and efficient operation of the GGP.

As an example of the approach taken, the Submission below contains a detailed description of the review and planning process applicable to the establishment of the APTPWA operating costs.

These processes and fee structures are designed to result in the GGTJV considering and establishing an annual budget which ensures:

(i) all proposed work is necessary;

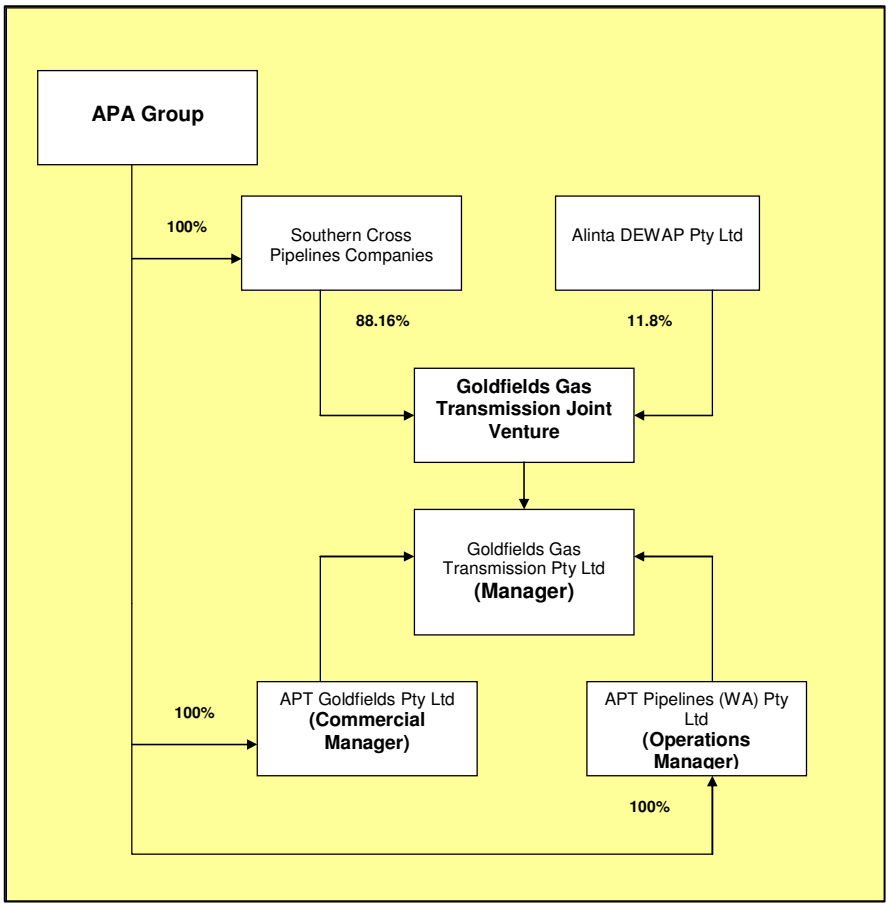
(ii) the work is performed at actual cost plus recovery of overhead costs and margin at agreed commercial rates; and

(iii) there is no incentive on service providers to undertake unnecessary work or to fail to take the opportunity to achieve efficiencies.

2.2 GGTJV corporate ownership structure

Figure 2.1 shows the relationships between the entities involved in the ownership, management and operation of the GGP:

Figure 2.1: GGTJV Corporate Ownership Structure



The GGTJV contractual arrangements are discussed in Appendix A1.

3 The capital base

3.1 Initial Capital Base

The Initial Capital Base for the GGP was approved on 14 July 2005 by the Authority as $513.7 million.

This capital base has been rolled forward by actual capital expenditure (see section 3.3) and the depreciation included in the 2005 Approved Access Arrangement (see section 3.4) as shown in Table 3.3 below.

3.2 Linepack

GGT has maintained the value of the linepack, as per the value in the Initial Capital Base approved by the Authority on 14 July 2005.

GGT had estimated the investment in linepack as at 31 December 1999 as being $1.125 million. The estimate reflected the then current value of the stock of gas required for pipeline operation that had accumulated since commissioning of the GGP.

In establishing the initial capital base of the revisions to the proposed Access Arrangement, and in determining the proposed reference tariff for the period 2010 to 2014, we assumed that no further investment was made in linepack after 1 January 2000. Throughput has increased since that time, and this assumption probably understates both the quantity and value of linepack during the Access Arrangement period.

Therefore, GGT recommends the Authority to use this same value in rolling forward the capital base.

3.3 New facilities investment 2000-2009

The Initial Capital Base has been rolled forward by the amount of actual capital expenditure incurred from 2000 to 2009, as shown in Table 3.1. GGT submits that this capital expenditure passes the Code's New Facilities Investment test, as discussed more fully in Appendix A2.

Table 3.1: New Facilities Investment, 2000-2009 ($m)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009 F
Capital expenditure	3.6	8.4	1.1	10.1	6.1	1.4	2.1	1.8	1.7	7.1

3.4 Depreciation

The Initial Capital Base has been rolled forward by the amount of depreciation included in the 2005 Approved Access Arrangement, as shown in Table 3.2. The depreciation has not been adjusted for differences between forecast and actual capital expenditure, on the grounds that the approved amount of depreciation was reflected in the approved Reference Tariffs.

Table 3.2: Depreciation, 2000-2009 ($m)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009 F
Depreciation	10.4	10.6	10.8	10.9	11.2	11.4	11.6	11.9	12.1	11.6

3.5 Summary

Table 3.3 summarises the roll forward of the capital base from 2000 to 2009.

Table 3.3: Asset Base Roll Forward, 2000-2009 ($m)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009 F
Opening asset value	513.7	507.3	505.8	495.5	496.1	490.3	480.0	470.5	460.3	450.4
Capital expenditure	3.6	8.4	1.1	10.1	6.1	1.4	2.1	1.8	1.7	7.1
Change in working capital	0.3	0.7	-0.7	1.4	-0.7	-0.2	0.0	-0.2	0.5	0.3
Depreciation	10.4	10.6	10.8	10.9	11.2	11.4	11.6	11.9	12.1	11.6
Closing asset value	**507.3**	**505.8**	**495.5**	**496.1**	**490.3**	**480.0**	**470.5**	**460.3**	**450.4**	**446.2**

3.6 Forecast capital expenditure

GGT forecasts to undertake capital expenditure in the forecast period, as discussed more fully in Appendix A3. The forecast capital expenditure is summarised in Table 3.4.

Table 3.4: Forecast New Facilities Investment, 2010-2014 ($m, nominal)

	2010	2011	2012	2013	2014
Pipeline and laterals	0.0	0.0	0.0	0.0	0.0
Mainline valve and scraper stations	0.0	0.0	0.0	0.0	0.0
Compressor stations	4.0	1.8	0.8	0.9	0.9
Receipt and delivery point facilities	0.1	0.1	0.1	0.1	0.1
SCADA and communications	0.5	1.9	1.9	0.5	0.5
Cathodic protection	0.1	0.0	0.0	0.0	0.0
Maintenance bases and depots	0.0	0.0	0.0	0.0	0.0
Remote Accommodation	0.0	0.0	0.0	0.0	0.0
Other assets	2.3	1.4	0.8	1.2	0.6
Total	**7.0**	**5.2**	**3.7**	**2.7**	**2.1**

3.7 Forecast depreciation

Depreciation is calculated on a straight line basis according to the rates specified in the Access Arrangement Information.

3.7.1 Asset lives

GGT has maintained the existing life of the GGP for this Revised Access Arrangement. However, in light of the Global Financial Crisis and its continued and potential adverse impacts on Users of the GGP, GGT reserves its right to seek an amendment to its Revised Access Arrangement and reduce the life of the GGP to reflect its economic life.

The forecast depreciation is summarised in Table 3.5.

Table 3.5: Forecast Depreciation, 2010-2014 ($m, nominal)

	2010	2011	2012	2013	2014
Pipeline and laterals	6.8	6.8	6.8	6.8	6.8
Mainline valve and scraper stations	0.2	0.2	0.2	0.2	0.2
Compressor stations	2.6	2.8	2.8	2.9	2.9
Receipt and delivery point facilities	0.1	0.1	0.1	0.1	0.1
SCADA and communications	0.1	0.2	0.4	0.6	0.6
Cathodic protection	0.0	0.0	0.0	0.0	0.0
Maintenance bases and depots	0.2	0.2	0.2	0.2	0.2
Remote Accommodation	0.3	0.3	0.3	0.3	0.3
Other assets	0.5	0.7	0.8	0.8	0.9
Total	**10.8**	**11.2**	**11.6**	**11.9**	**12.0**

3.8 Forecast capital base roll forward

The forecast capital base roll forward is summarised in Table 3.6.

Table 3.6: Forecast Capital Base Roll Forward, 2010-2014 ($m, nominal)

	2010	2011	2012	2013	2014
Opening asset value	446.2	443.6	437.5	429.5	420.7
Capital expenditure	7.0	5.2	3.7	2.7	2.1
Change in working capital	1.2	-0.2	-0.1	0.3	0.2
Depreciation	10.8	11.2	11.6	11.9	12.0
Closing asset value	**443.6**	**437.5**	**429.5**	**420.7**	**411.0**

4 Cost of capital

4.1 Introduction

Sections 8.30 and 8.31 of the Code require the cost of capital used in determining the Reference Tariff to:

> *provide a return commensurate with prevailing conditions in the market for funds and the risk involved in delivering the Reference Service.*

The methodology used by GGT is a weighted average cost of capital (WACC) approach based on the capital asset pricing model (CAPM). The cost of capital used is a pre-tax nominal weighted average of the cost of debt and cost of equity.

This approach is consistent with the revenue and tariff modelling supporting the Access Arrangement Revisions submitted.

The cost of equity has been determined using the CAPM. The cost of debt has been determined as the sum of the risk free rate of return, an estimate of the corporate debt margin, and an estimate of the ongoing costs of raising debt.

4.2 GGT Approach to cost of capital

In identifying the cost of capital GGT has applied the "ranges approach". This approach was previously used by the Authority in the Goldfields Gas Transmission (GGT) Final Decision, and was described by the Authority as follows[1];

> *The Authority accepts that its task is to consider whether the Rate of Return used for the derivation of Reference Tariffs in the revised Access Arrangement falls within the range of rates commensurate with the prevailing market conditions and the relevant risk. This Rate of Return will comply with the Code if the value used is within the range of values that different minds acting reasonably might attribute to the Rate of Return, applying the methodology of the CAPM that was chosen by GGT. In undertaking this task, the Authority has given consideration to the range of values within which the Rate of Return might be supported by reasonable minds as being commensurate with prevailing conditions in capital markets*.

In applying the ranges approach to the cost of capital GGT has undertaken the following steps:

[1] Economic Regulation Authority 2005 Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline p63 paragraph 282

- used cost of equity and cost of debt approaches as outlined above;
- used recent observable market data for those WACC parameters where the data underpinning the parameters is readily observable. These parameters have no ranges;
- used empirical evidence for WACC parameters where the empirical evidence is strong. These parameters have no ranges;
- set ranges for parameters where these parameters are not readily observable and empirical evidence is uncertain; and
- calculated cost of equity and cost of debt to give a range of outcomes.

In particular it should be recognised that:

- the methodologies used by GGT are consistent with the requirements of the Code for determining the best estimate of the cost of capital and are also generally consistent with the approach taken in the previous Access Arrangement;
- GGT estimates of the values for variables are consistent with empirical evidence; and
- GGT estimate of the equity beta value has sought to exclude non-systematic risks. These non-systematic risks are included in cash flows.

4.3 AER electricity WACC review

Prior to undertaking a detailed discussion on the various WACC parameters and the derivation of the WACC it should be noted that the Australian Energy Regulator ("AER") is currently undertaking a review of WACC parameters which will be used in the determination of WACCs in electricity regulatory decisions over the next five years.

This AER review does not directly impact on the establishment of the WACC for the GGP, or indeed any gas asset. This is recognised by the AER which has stated in its Explanatory Statement[2]

> *The outcome of the AER's WACC review applies only to electricity determinations, and has no direct or formal applicability to gas access arrangements.*
>
> *… Nonetheless, given the similarity of issues, the AER may use the outcome of this review for the consideration of WACC issues in future gas access arrangement reviews*

[2] AER, 2008, Explanatory Statement: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters December 2008 p21

GGT believes that in the case of the GGP, the similarity of many of the issues is not great. Electricity networks regulated by the AER serve broadly based, stable markets with a necessary commodity, whereas the GGP serves mining markets in remote locations which often have access to alternative fuels.

Thus in the case of WACC parameters relating to individual assets and the risks associated with these assets, such as equity beta and credit rating, GGT parameters and their values should be considered on their own merits, or by comparison to other relevant comparators, such as infrastructure serving mining markets, rather than by comparison to east coast electricity networks. As such GGT does not believe it is reasonable to consider the AER electricity WACC review submissions and findings in relation to these variables.

However, in the case of WACC parameters which relate to market wide factors and variables, such as the Market Risk Premium, GGT believes it is reasonable to consider the AER electricity WACC review submissions, while not being bound to its outcomes.

Similarly, in the case of overarching factors impacting on the cost of capital, such as the current financial crisis, GGT believes it is reasonable to consider the AER electricity WACC review submissions, while not being bound to its outcomes.

4.4 The financial crisis and its impact on pipeline infrastructure investment

In the last 15 to 20 months the global capital markets have experienced some of the most challenging conditions in history. In particular there has been a significant increase in credit risk pricing and reduced liquidity, combined with an increase in risk aversion by capital providers. These challenging conditions continue to prevail and are having a significant impact on the price of capital and access to capital markets.

In considering WACC variables GGT seeks that the Authority recognise the impact that the financial crisis is having on both the financial environment in which GGT must raise capital and on users of the GGP.

The financial crisis and its impact on the determination of the cost of capital has been widely addressed in the AER WACC Review by numerous parties[3], with most

[3] The APA Group has been actively involved in this process. In particular the APA Group is

- a member of the "Financial Investor Group" which made a submission to the AER Review entitled "Submission to the AER's WACC Parameter Review: the Investors Perspective January 2009"" This submission focussed on the broad impacts of the financial crisis rather than detailed discussion of WACC parameters. The submission is available at the website below: http://www.aer.gov.au/content/index.phtml/itemId/726823
- a member of the Australian Pipeline Industry Association which was a major contributor to the JIA Network Industry Submission AER Proposed Determination Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution February 2009. The submission focussed on all relevant aspects including the financial crisis which is discussed throughout the submission, but in particular from pages 11 to 16. The submission is available at the website below: http://www.aer.gov.au/content/index.phtml/itemId/726694

of these parties stressing the need for the financial crisis to be viewed as a major factor when considering the regulatory determination of the cost of capital. To do otherwise would be to disconnect the regulatory regime from "real world" financial markets.

The financial crisis and the resulting illiquid financial markets are resulting in investors taking a very conservative approach to assessing opportunities for future capital investments. As debt and equity providers are becoming more risk averse higher returns are being required for any risk. Any future investments will require higher returns to both debt and equity for them to be considered.

In particular, debt providers are reducing their risk exposures and resulting in equity providers taking more risk, and therefore increasing equity risk premiums.

The illiquid nature of debt markets has recently been demonstrated in the context of Western Australian infrastructure, as the Western Australian Government has sought Commonwealth assistance to raise $1.3 billion for infrastructure investment, as the investor demand for state bonds has disappeared[4].

GGT believes that any reduction in the cost of capital or cost of capital variables in the current environment would provide clear signals to investors to reduce investments in Australian infrastructure in general and Western Australian gas pipelines in particular.

In light of the financial crisis it should be recognised that the Code requires that the cost of capital provide a return commensurate with prevailing conditions in the market for funds.

Thus the Authority should take the impact of the financial crisis as one of its prime considerations in making its decision on cost of capital, as the financial crisis is currently the most important prevailing condition in the market for funds. If the financial crisis is not properly considered by the Authority it will impact on the perception of the current regulatory regime as being a stable and predictable regime and will result in a significant increase in the level of regulatory risk perceived by investors.

Australian gas pipeline infrastructure competes for capital with a broad range of infrastructure investment opportunities, both locally and internationally. If prospective returns from investing in West Australian regulated energy infrastructure are not competitive or if the regulatory regime is viewed as being unpredictable, then capital, which is now scarce due to the financial crisis, will move to investments of which offer better returns for similar risk.

As well as impacting on the ability of infrastructure providers to raise capital the financial crisis is also impacting users of the GGP. In the minerals sector served by the GGP product prices (with the exception of gold) have generally halved with nickel prices reducing to circa 20% - 25% of previous highs following the financial crisis. Consequently the GGP demand outlook is uncertain. This may be further compounded by rationalisation of the industry. Thus the impact of the financial crisis

[4] Australian Financial Review, 18 March 2009, "Credit Squeeze: WA seeks federal help to raise $1.3bn" page 1 and page 4

in increasing the uncertainty of the demand outlook for the GGP should also be considered.

4.5 Cost of capital parameters

The cost of capital parameters which are used in calculating a range for the WACC are outlined below:

4.5.1 Parameters where No Ranges Used

This section outlines those parameters which are:

- observable parameters in financial markets;
- parameters supported by agreed methodologies; or
- parameters supported by strong empirical evidence.

Nominal risk free rate of return – Parameter value - 4.27% - This is the 20 working day average of Australian Government 10-year bonds from 2 February 2009 to 27 February 2009 (i.e., 20 working days).

GGT believes that for long lived infrastructure assets 10 year bond rates are the appropriate risk free rates. The Authority seems to generally align with this position as it has used 10 year bond rates as the proxy for the risk free rate in the previous GGP regulatory decision.

GGT recognises that the nominal risk free rate parameter value will be amended in Draft and Final Decisions to reflect the then current market conditions.

GGT recognises that the AER electricity WACC review has raised issues related to the term of the risk free rate and whether it should be five years or ten years[5]. On this issue GGT strongly supports arguments put forward by infrastructure industry groups that evidence, precedent and theory all supports a position of ten years rather than five years. Amongst other arguments, the industry showed that the evidence relied on to support an argument for the use of five year rates was flawed and that energy infrastructure businesses seek to issue long-term debt as a matter of preference over shorter terms, and that a ten year risk free rate is consistent with market risk premium derivation.

Expected inflation - Parameter value - 2.4% - As outlined in further detail in Appendix A4.6 of this Submission GGT is using an inflation forecast of 2.4%, based on a report provided by Synergies, which is provided at Attachment 1. More detail on the derivation of the inflation forecast is provided in this Attachment.

[5] This position can be found expanded on at some length in JIA, 2009, Network Industry Submission AER Proposed Determination Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution February 2009 pp53-78 and in Attachment 3 through to Attachment 9 to the JIA paper. The paper can found at the following website:
http://www.aer.gov.au/content/index.phtml/itemId/726694

Until recently Australian regulators based estimates of inflation on the inflation implied by the difference between ten year nominal and indexed bond yields. Due to issues in the indexed bond market regulators are now using inflation forecasts based on the RBA's forecasts for the next two years and the mid-point of the target range for inflation after that.

GGT understands that a similar approach has also been used by the Authority in recent rail infrastructure decisions.

The inflation forecasts used in this Submission are based on the RBA's 6 February 2009 Statement of Monetary Policy are 2.4%.

GGT acknowledges that this inflation forecast may be amended in Draft and Final Decisions to reflect the then current RBA forecasts.

Debt margin over risk free rate – Parameter value - 3.60% - The debt margin for a BBB- corporate bond over the nominal risk free rate is 3.6%. This parameter does not include the cost of raising debt which is addressed as a separate variable below.

GGT has based the value of the debt margin parameter on a report provided by Synergies. The report is attached at Attachment 2.

Determining the debt margin involves assuming an appropriate "notional" credit rating for the asset which reflects the risk of default, and then determining an appropriate debt margin based on the difference between the current cost of debt for an asset of that "notional" credit rating, and the risk-free rate.

The attached Synergies report recommends a credit rating of BBB- for the GGP. This recommendation is based on the Standard and Poor's credit ratings of companies that own and operate Australian gas pipelines, credit ratings assumed in previous regulatory determinations and the GGP's exposure to the mining industry coupled with its 60% debt gearing[6].

GGT recognises that his is lower than the BBB+ rating previously determined by the Authority. However, current market credit rating data combined with assumed credit ratings for other regulated pipelines, suggest that a BBB+ rating is not supportable for the GGP. A rating of BBB- should be adopted for the purposes of calculating the debt margin.

In calculating the debt margin Synergies have then used an approach that has been previously employed by the AER in estimating debt margins for BBB rated bonds. As there is a difference in the perceived risk of default between a BBB and a BBB- rating, the cost of debt will also vary accordingly. To the extent that BBB bond yields reflect the average cost faced by an issuer with this credit rating, Synergies have then made an adjustment for the difference between the cost of issuing BBB and BBB- debt. Synergies then used the approach to estimate that the applicable debt margin consistent with the credit rating and other parameters is 3.60 %.

[6] GGT notes that the Authority recently recommended a credit rating of BBB for a 35% geared asset serving the mining industry in its 2009, Draft Determination Weighted Average Cost of Capital for The Pilbara Infrastructure's Railway from the Cloud Break Iron Ore Mine in the Pilbara to Port Hedland. GGT believes a 60% geared asset serving the mining industry should therefore be viewed as having a lower credit rating than this recent benchmark.

GGT acknowledges that the debt margin estimation may be amended in Draft and Final Decisions to reflect the then current debt market positions.

Of particular concern to GGT is the ongoing financial crisis. Current estimates of the debt margin using the AER's methodology may not accurately reflect the ongoing impact of the financial crisis, particularly in relation to the ability for companies to raise debt in an illiquid and risk averse market.

Debt to equity ratio - Parameter value – The debt to equity ratio is 40% equity and 60% debt. This ratio is set at 40% equity and 60% debt. This is generally consistent with recent regulatory decisions, including the previous regulatory decision on GGP.

The AER electricity WACC review has also supported the 40% equity and 60% debt gearing position.

Market risk premium - Parameter value - 7% - The Market Risk Premium ("MRP") is set at 7%.

The value of the MRP for use in calculating the WACC for the GGP has been set at 7%.

This GGT position is based on the extensive work undertaken by the energy infrastructure industry and consultants to support the Joint Industry Associations (JIA)[7] submission to the AER WACC Review[8] . As noted above GGT believes it is reasonable to consider the AER electricity WACC review submissions in cases where the WACC parameters relate to market wide factors and variables, such as the MRP.

In developing its submissions on MRP the JIA sought advice from recognised experts, who examined both the latest empirical evidence and the underlying economic and finance theory relevant to determining a value for MRP.

GGT recognises that the MRP value historically used by regulators has been 6%.

In their initial submission the JIA argued that the MRP should be 7%.

[7] The industry associations involved in the JIA are the Energy Networks Association (ENA), the Australian Pipeline Industry Association (APIA) and Grid Australia

[8] The work referred to includes:

- JIA, 2008, Network Industry Submission AER Issues Paper Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution September 2008 in particular chapter 5 pp78-97 and Appendix G Market Risk Premium Value Adviser Associates This can found at this website:

http://www.aer.gov.au/content/index.phtml/itemId/722310

- JIA, 2009, Network Industry Submission AER Proposed Determination Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution February 2009, particularly Chapter pp79 -96 and Attachment J Value Adviser Associates, Market Risk Premium, January 2009. This can be found at this website:

http://www.aer.gov.au/content/index.phtml/itemId/726694

GGT recognises that the AER electricity WACC review raised issues related to the value of MRP and in the draft decision the AER continued to set the value of the MRP at 6%.[9] The AER rejection of the JIA arguments to increase the MRP to 7% was largely based on data quality and methodological issues, which raised concerns within the AER about a lack of 'persuasive evidence' to change[10]. The JIA does not accept these AER arguments and has refuted them in some detail[11]. In addressing these issues the JIA have analysed and assessed historic MRP values, forward looking MRP values, cash-flow analysis and survey data.

While the use of historic data to support an estimate of MRP value is valid, it should be recognised that the current economic environment is one where the forward looking MRP over the period until the next GGP Access Arrangement Revision is likely to be well above 7%, given the financial crisis and the need for higher equity returns.

The financial crisis is resulting in a step change in the cost of equity needed to attract investment, and there is little possibility of the forward looking MRP being as low as 6% in the near to medium future. As a consequence, maintaining an assumption of 6% MRP in circumstances where the forward-looking MRP is substantially higher will drive investment away from regulated pipeline infrastructure. Such an approach is clearly inconsistent with providing a return commensurate with prevailing conditions in the market for funds.

Further to estimating the value of the forward looking MRP, Officer and Bishop present evidence of a large increase in the risk faced by share investors[12] since mid 2007 and point to evidence from both the debt and equity market that signifies that the current near to medium term MRP is well above 6%. For example they refer to research that shows the range of values for the short to medium term MRP is 8% to 18%.

Similarly the most recent estimates from cash flow measures consistently show a forward looking MRP well above 7% for the near to medium term[13].

Both theory and evidence are demonstrating that the forward MRP must have risen.

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[9] AER, 2008, AER, 2008, Explanatory Statement: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters December 2008 pp8-10, p14

[10] AER, 2008, Explanatory Statement: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters December 2008 pp136-180

[11] JIA, 2009, Network Industry Submission AER Proposed Determination Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution February 2009 pp81-95

[12] JIA, 2009, Network Industry Submission AER Proposed Determination Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution February 2009, Attachment J Officer, B and S Bishop "Market Risk Premium: Further Comments" January 2008 pp6-10

[13] JIA, 2009, Network Industry Submission AER Proposed Determination Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution February 2009, pp89-90

GGT believes an MRP of 7% best reflects the long term forward looking MRP. However, the current economic climate is one where the forward looking MRP over the period until the next GGP Access Arrangement review is likely to be well above 7%.

The MRP should be set at 7%. An MRP of 6% will make future investment unattractive.

Recent data suggests that a forward looking MRP of 7% is conservative given the financial crisis.

Statutory corporate tax rate - Parameter value - 30% - This rate is 30%.

Valuation of imputation credits (also known as gamma) - Parameter value - 20% - The gamma is set at 20%.

The value of imputation credits or gamma for use in calculating the WACC for the GGP has been set at 20%.

This position is based on the extensive work undertaken by the energy infrastructure industry and consultants to support the JIA submission to the AER WACC Review[14]. As noted above GGT believes it is reasonable to consider the AER electricity WACC review submissions in cases where the WACC parameters relate to broader factors and variables, such as the value which shareholders ascribe to imputation credits.

In developing its submission and its position of gamma the JIA sought advice from recognised experts who examined both the latest empirical evidence and the underlying economic and finance theory relevant to determining a benchmark value of imputation credits.

GGT recognises that the AER electricity WACC review has raised issues related to the value of gamma and in their draft decision they ascribed a value of 65% to

[14] The work referred to includes:

- JIA, 2008, Network Industry Submission AER Issues Paper Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution September 2008 in particular chapter 5 pp149-182 and Appendix K The Valuation of Imputation Credits NERA Economic Consulting and Appendix L The impact of franking credits on the cost of capital of Australian firms SFG Consulting . This can found at this website:
  http://www.aer.gov.au/content/index.phtml/itemId/722310
- JIA, 2009, Network Industry Submission AER Proposed Determination Review of the Weighted Average Cost of Capital (WACC) parameters for electricity transmission and distribution February 2009, particularly Chapter pp140-156 and Attachment P Strategic Finance Group Consulting, Market practice in relation to franking credits and WACC, Attachment Q NERA Economic Consulting, AER's Proposed WACC Statement – Gamma, Attachment R Strategic Finance Group Consulting, Using redemption rates to estimate theta, Attachment S Strategic Finance Group Consulting, The value imputation credits as implied by the methodology of Beggs and Skeels (2006), Attachment T Strategic Finance Group Consulting, The consistency of estimates of the value of cash dividends
- This can be found at these websites:
  http://www.aer.gov.au/content/index.phtml/itemId/726694
  http://www.aer.gov.au/content/index.phtml/itemId/726698

gamma[15]. In arriving at this draft conclusion the AER did not appear to fully consider the information put forward by the JIA and the weight of financial academic literature.

In their response to the AER the JIA indicate that they believe that the AER and its consultants have made a series of theoretical and methodological errors that result in an assumed value of gamma that is substantially overstated.

The JIA have provided substantial additional information to further support their position that the gamma should be 20% (or lower). This evidence provides information and arguments addressing the following aspects of the AER's WACC Review draft decision:

- The information supplied by the JIA demonstrates that the 100% payout ratio assumed by the AER in deriving a value for gamma is incorrect.
- The information supplied by the JIA demonstrates that the theta value (i.e., the market value of imputation credits) assumed by the AER is incorrect, both theoretically in its definition of the market and methodologically in the statistics it has used to estimate a value for theta.
- The error in this latter point is compounded by the AER's rejection of market studies which did not align with the AER draft decision gamma value.
- The JIA supported an independent study, more extensive than the studies relied on by the AER. This study found that the AER's value of theta was incorrect.
- The information supplied by the JIA demonstrates that the dominant market practice is for Australian firms and valuation professionals to use a gamma of zero when estimating WACC.
- The information supplied by the JIA demonstrates that the AER's approach is inconsistent as it assumes an estimated value of cash dividends of 75-80 cents per dollar in deriving some WACC parameters (such as gamma) and 100 cents per dollar in deriving other parameters (such as return on equity).

Overall the JIA strongly argued that the AER has given insufficient regard to theoretical arguments, empirical studies and market practices in arriving at a value for gamma in its draft decision. The JIA presents persuasive evidence that suggests that the value of gamma is between 0% and 20%.

The JIA demonstrated that the value of gamma is between 0% and 20%. The JIA selected a gamma value of 20%. This value is seen as conservative and could be lower.

This 20% value has been used by the GGT in deriving the WACC for the GGP.

[15] AER, 2008, Explanatory Statement: Electricity transmission and distribution network service providers: Review of the weighted average cost of capital (WACC) parameters December 2008 page 13-14

4.5.2 Parameters Where Ranges Used

Debt Raising Costs – Parameter value range - 0.125% - 0.3%

In considering the parameter value for the cost of debt raising activities GGT has taken into account a report provided by Synergies. The report is attached at Attachment 3.

Ongoing debt raising costs are separate to the debt margin cost discussed above. The most common regulatory assumption used for ongoing debt raising costs in regulatory decisions has been an inclusion of a 0.125% point adjustment to the cost of debt to take account of these costs.

However, the financial crisis has made debt more difficult to raise impacting on debt raising costs, and the previous benchmark of 0.125% basis points is likely to be below the costs actually being incurred given the problems in raising debt due to the financial crisis APA's current actual debt raising costs are well above 0.125%. Adviser fees alone are estimated to be approximately 0.30%.

Given the lack of certainty on these costs given the financial crisis and its impact on debt raising activities GGT is applying a ranges approach to the estimation of the cost of ongoing debt raising activities. The costs of ongoing debt raising costs is estimated to be between 0.125% and 0.3%, although given APA's recent experience it should be assumed that the costs are towards the upper end of this range at the current time.

Equity Beta – Parameter value range - 1.0-1.8 - The beta measure used is the equity beta.

The range of parameter values for the GGP equity beta is 1.0 to 1.8. The GGT have based the range of values of the equity beta parameter on an extensive report provided by Synergies. The report addresses both qualitative and quantitative issues in deriving an equity beta for the GGP. The report is attached at Attachment 4.

Under the CAPM framework, risk is divided into systematic risk and non-systematic risk. Systematic risk is reflected in the equity beta values used in CAPM. Non-systematic risks are typically modelled in the cash flows. This is the approach that has been used in deriving a range of equity beta values for GGP.

Equity beta derivation is susceptible to estimation error as equity beta estimates are obtained by regressing a firm's historical returns against the historical returns for a market index over the same time period. The statistical approaches used typically produce estimation errors. Consequently it the equity beta is expressed as a range rather than a point estimate to take the possibility of error into account.

In deriving a range of values for the equity beta GGT has sought to take account of the systematic risks of the GGP business, given the prevailing market conditions.

In deriving a range of values for the equity beta Synergies used both first principles analysis and comparable companies' analysis.

The first principles analysis undertaken by Synergies is a qualitative assessment of the GGP's systematic risk factors and assesses their likely impact on the asset beta. This analysis considers the nature of the product and the customer, the pricing structure, the duration of contracts, market power, the nature of regulation, growth options and operating leverage.

The first principles analysis concludes that GGP's systematic risk is higher than other regulated gas pipeline businesses in Australia given its exposure to mining companies and activities and while this exposure is somewhat mitigated by long-term take-or-pay contracts this protection is only as strong as the underlying financial strength of the counterparty.

As the first principles assessment is largely qualitative it does not result in a range of estimates for equity beta. However, the analysis enables comparisons to be made with other relevant businesses, as well as the market as a whole.

The quantitative assessment by Synergies is based on the examination of comparable companies. The comparable companies' analysis undertaken by Synergies identified appropriate companies that are of relevance to GGP given its relatively unique risk profile for a regulated Australian pipeline. The companies selected include Australian and foreign energy transmission and distribution businesses and Australian mining businesses.

The Authority expressed concerns with the beta estimate submitted by GGT as part of the previous review which placed reliance on the betas of mining companies.[16] GGT believes that GGP has a different risk profile to mining companies, however, as mining companies form the entirety of GGP's market and drive GGP's revenues and returns, their risk profile should be taken into account.

Synergies assess the equity beta for GGP in the following way.

1. Use an appropriate benchmark equity beta for an 'average' gas transmission business as a starting point.

   At a gearing of 60% an equity beta of at least 1.0 is the most reasonable estimate for an 'average' gas transmission business serving a broad mix of residential, commercial and industrial customers.

   This equity beta value is consistent with decisions for many east coast regulated gas pipelines.

2. Adjust this equity beta to reflect the unique risk profile of the GGP based on its exposure to the mining sector.

   There is no standardised approach that can be applied to adjust the 'gas transmission risk' equity beta of 1.0 to take account of GGP's exposure to the mining sector.

   Mining sector equity beta estimates are significantly above the equity beta of an average gas pipeline business reflecting the higher risks in the mining sector.

[16] Economic Regulation Authority (2004), Amended Draft Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline, July, p.60.

Approximately 83% of GGP's revenues are subject to take-or-pay arrangements. The remaining 17% is variable. It is this 17% of revenues that will definitely be influenced by activity in the mining sector. However, the fact that this 17% of revenues is sensitive to demand from the mining sector does not necessarily imply that 17% of GGP's returns are sensitive to activity in this sector (noting GGP's very high fixed operating costs for example).

These 83% and 17% proportions are used to derive a range of equity betas for the GGP. At the low end of the range is an equity beta of 1.0 (assuming 60% gearing). This assumes that none of GGP's returns are influenced by the performance of the mining sector. At the high end of the range is an equity beta of 1.8 (assuming 60% gearing). This assumes that 17% of GGP's returns are influenced by the performance of the mining sector.

GGT believes it would be inappropriate to assume no relationship exists between the GGP's returns and the mining industry risk. GGT believe that considering the risk profile of the underlying industry is an appropriate approach to apply when the business is only servicing this industry.

The approach above is seen as conservative as it assumes that the vast majority of the GGP's returns are driven by the same factors that influence the returns on an average gas transmission business.

4.6 Range for parameters

The values of the parameters, including ranges, are shown in Table 4.1 below.

Table 4.1: WACC Parameters

CAPM Parameter	High	Low
Nominal Risk Free Rate	4.27%	4.27%
Inflation Rate	2.40%	2.40%
Cost of Debt Margin over Risk Free Rate	3.60%	3.60%
Cost of raising debt	0.30%	0.125%
Nominal pre-tax cost of debt	8.17%	8.00%
Real pre-tax cost of debt	5.63%	5.46%
Market Risk Premium	7.00%	7.00%
Corporate Tax Rate	30%	30%
Value of imputation credits (gamma)	20%	20%
LT Proportion of Equity Funding	40%	40%
LT Proportion of Debt Funding	60%	60%
Equity Beta	1.8	1.0

4.7 Range for WACC

The cost of capital calculated values are shown below. Table 4.2 shows the range of Rate of Return values derived from the parameters shown in Table 4.1.

Table 4.2: Weighted Average Cost of Capital Range

Cost of Capital Measure	High	Low
Nominal Cost of Equity	16.87%	11.27%
Pre-Tax Nominal WACC	13.78%	10.73%
Pre-Tax Real WACC	11.11%	8.13%

From the table above GGT will use a Pre-Tax Nominal WACC in the range 13.78% to 10.73%.

4.8 Selection of a point in the range

The Authority previously stated[17] :

> *… the range of values that different minds acting reasonably could attribute to the cost of equity and WACC is narrower than the ranges that the extremes of ranges in CAPM parameters would suggest.*

and[18]

> *… the Authority is of the view that the range of values that would comply with the Code should not include the values that lie within the lower 10 percent or upper 10 percent of the range that may be derived by the application of the extremes of values for each of the parameters of the CAPM.*

GGT has adopted this approach. The pre tax real WACC range of 13.8% - 10.7% is truncated, as per the Authority process outlined above. The range is 3.1% in all - taking 0.3% off the top and bottom of the range gives a revised range of 13.5% to 11.0%.

Within this range a pre tax nominal WACC of 13.5% has been used as the cost of capital parameter in determining Reference Tariffs.

The reason for going to the upper end of the truncated ranges relates to:

[17] Economic Regulation Authority 2005 Final Decision on the Proposed Access Arrangement for the Goldfields Gas Pipeline p65 paragraph 288
[18] Ibid p66 paragraph 293

- the fact that WACC estimation is imprecise, and the probability of estimating a WACC that is different from the 'true' WACC is high. It is then important to consider the consequences of any regulatory error. If prices are set too low, the resulting under-investment is worse from an economic and social perspective than if prices are set too high. Given this, the estimation of the regulated WACC should seek to minimise the probability that the true WACC is higher than the estimate. Consideration of the asymmetric consequences of regulatory error results in a selection of the cost of capital towards the upper bound of the cost of capital range; and
- the fact that price cap regulation exposes the GGP to greater volume risk in the long-term compared to some comparators.

In conclusion, it is important to give regard to the imprecise nature of WACC estimation and the consequences which can arise if the regulated WACC underestimates the true value. This approach ensures that sufficient incentive is provided to invest, but it should not result in over-compensation provided the WACC is selected from within the bounds of a reasonable range.

4.9 Conclusion

The cost of capital selected is a pre tax nominal WACC of 13.5%.

GGT believes the cost of capital range and cost of capital parameter value selected are consistent with the Reference Tariff principles, and that the Cost of Capital parameter selected falls within the range of rates commensurate with the prevailing market conditions and the relevant risk.

5 Non Capital costs

5.1 Historical Non Capital costs

Table 5.1 contains GGT's Non Capital Costs that was approved on 14 July 2005 by the Authority. In 2004, GGT incurred actual costs of $19.1 million, which was in excess of the Authority's approved cost of $14.4. This 2004 actual cost should be considered when reviewing the actual costs incurred by GGT during the period 2005 to 2008 and GGT's Current Forecast for 2009 that is discussed in Appendix A4.1, as a basis for its Non Capital Costs Forecasts for the period of 2010 to 2014, which is discussed in Appendix A4.7.

Table 5.1: Approved GGT's Non Capital Costs – 2000 to 2004 ($m)

Calendar Year	2000	2001	2002	2003	2004
Operations and Maintenance	9.0	8.6	9.6	12.0	10.3
Administration and General	0.4	2.0	2.5	2.3	2.3
Corporate Overheads	1.7	1.7	1.9	2.1	1.8
Total	**11.1**	**12.2**	**14.0**	**16.4**	**14.4**

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Table 5.2 provides a comparison between actual Non Capital Costs incurred by GGT during the period 2005 to 2008 and GGT's Current Forecasts for 2009 ("Actuals") as opposed to forecasts for period 2005 to 2009 based on GGT's Programme and Budget for 2004/05 ("Authority Approved Forecast"), which were submitted to the Authority by GGT on 23 June 2005.

GGT's Actuals for Non Capital Costs of $103.0 million are 13.5% higher than the Authority Approved Forecast for Non Capital Costs of $90.8 million.

A more detailed view of Table 5.2 is shown in Appendix A4.1.

Table 5.2: GGT's Non Capital Costs – Actuals versus Authority Approved Forecast – 2005 to 2009 ($m)

Calendar Year	2005		2006		2007		2008		2009	
	Actuals	Authority Approved Forecast	Actuals	Authority Approved Forecast	Actuals	Authority Approved Forecast	Actuals	Authority Approved Forecast	2009 Forecasts	Authority Approved Forecast
Operations and Maintenance	"[Information Confidential]"	12.5	"[Information Confidential]"	12.2	"[Information Confidential]"	11.9	"[Information Confidential]"	13.9	"[Information Confidential]"	14.4
Administration and General		3.4		2.7		2.8		2.8		3.8
Corporate Overheads		2.0		2.0		2.1		2.1		2.2
Total	**17.8**	**17.9**	**18.5**	**16.9**	**20.1**	**16.8**	**21.1**	**18.9**	**25.5**	**20.3**

More detailed information on the reasons for variations between Actuals and Authority Approved Forecast by each cost area and by business unit and/or cost centre is provided in Appendix A4.1.

5.2 Forecast Non Capital costs

Table 5.3 contains GGT's Non Capital Costs for the period 2010 to 2014 ("Current Forecasts"), which totals $147.8 million, which can be recalculated as an average annual cost of $29.6 million. This average annual cost is 16.0% higher than GGT's 2009 Forecasts for Non Capital Costs of $25.5 million.

The major reasons for GGT's Current Forecasts being higher than what would normally be expected due to inflationary increases are that GGT:

(i) is scheduled to undertake an intelligent pigging program in 2013 and 2014, as agreed with the DoIR;

(ii) has made an allowed for Self Insurance;

(iii) **"[Information Confidential]"**; and

(iv) has made an allowance for Asymmetric Risk.

It should also be noted that GGT's Non Capital Costs mainly escalate due to rises in labour and material costs, which are forecast to rise at rates higher than GGT's forecast for inflation (as detailed in Appendix A4).

A more detailed view of Table 5.3 is shown in Appendix A4.9.

Table 5.3: GGT's Non Capital Costs – 2010 to 2014 ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Operations and Maintenance	16.8	17.6	18.4	21.2	22.1
Administration and General	3.2	2.7	2.8	3.7	4.6
Corporate Overheads	6.3	6.4	6.5	6.5	6.5
Asymmetric Risk	0.5	0.5	0.5	0.5	0.6
Total	**26.8**	**27.2**	**28.2**	**31.9**	**33.7**

GGT has developed this Current Forecasts based on its December 2008 Forecast and its view of future increase in labour costs, materials costs and CPI. The forecast escalators will be discussed separately in Appendix A4.

More detailed information on the Forecast Non Capital Costs by each cost area and by business unit and/or cost centre is provided in Appendix A4.

6 Development of Reference Tariffs

6.1 Definition of Reference Service

6.1.1 Code requirements

Section 3.3 of the Code requires that an Access Arrangement must include a Reference Tariff for at least one Service that is likely to be sought by a significant part of the market.

The Code defines a Reference Service as a service specified in an access arrangement and for which a Reference Tariff has been specified in that access arrangement.

The ACCC commented in the Roma-Brisbane Pipeline Access Arrangement draft decision (p108) that "the intent of the Code is that the cost of providing a reference service should be recovered through the reference tariff."

The language of the Code is quite clear that the Service Provider is expected to stand at the ready to provide the Reference Service at the request of a Prospective User. Indeed, the arbitration provisions in Section 6 of the Code can require the Service Provider to provide the Reference Service at the Reference Tariff.

6.1.2 Negotiated service and Reference Service

GGT currently provides negotiated (non-reference) services to a number of shippers. Contracts for these shippers have been negotiated over the history of the pipeline, and GGP's obligations to provide capacity in satisfaction of those contracts remain in force.

GGT considers that the definition of a particular Service is a carefully balanced package of services, price, terms and conditions. This is clearly reflected in each unique Negotiated Service contract. Therefore, the Reference Service is defined by the suite of service characteristics, price and terms and conditions that are included in the Access Arrangement. To the extent the features of a service differ from those specified in the Access Arrangement, the service is not (and cannot be) a Reference Service. A request for service under terms and conditions that differ from those in the Access Arrangement is, by definition, a request for a non-reference service.

The Authority has previously accepted that pre-contracted Services are to be considered as Non-Reference Services. In the (Authority-drafted and -approved) Access Arrangement for the Dampier-Bunbury Natural Gas Pipeline, the Authority included in the Definition of Non-Reference Services:[19]

[19] Revised Access Arrangement for the Dampier to Bunbury Natural Gas Pipeline – Economic Regulation Authority, 15 December 2005

6. SERVICES POLICY

6.1 Services

Operator offers the following Services on the DBNGP:

(a) Reference Service …

(b) Non-Reference Services …

(iv) Non-Reference Services also include services provided by Operator under contracts entered into prior to commencement of the Access Arrangement Period.

Following the precedent established by the Authority in the DBNGP Access Arrangement, GGT has defined pre-contracted Services as being Non-Reference Services.

GGT has therefore defined the Reference Service in terms of the capacity available to provide that Reference Service, and calculated the Reference tariff accordingly.

6.2 Capacity available to provide Reference Service

In late 2008 / early 2009, pipeline users reduced their pipeline utilisation by 4.25 terajoules per day ("TJ/d") at the GGP inlet. This means that this capacity is now available for use by other pipeline users.

For the purposes of determining the Reference Tariff for the period 2010 to 2014, GGT forecasts that 4.12 TJ/d of the currently unutilised covered pipeline capacity will become utilised on 1 January 2010, and will remain utilised for the full duration of the 2010 to 2014 Access Arrangement period.

This value of 4.12 TJ/d (as distinct from the 4.25 TJ/d which has been relinquished) reflects variations in MDQ's of existing contracts. The capacity available is dependent on existing covered pipeline users' contracted MDQs and it must be calculated on the highest contracted MDQ during each year. Therefore, GGT has determined that 4.12 TJ/day is available for the Reference Service over the period 2010 to 2014 by determining this amount based on the average of the least capacity available each year.

For the purposes of determining the Reference Tariff for the period 2010 to 2014, GGT forecasts that all of the currently unutilised covered pipeline capacity will become utilised on 1 January 2010, and will remain utilised for the full duration of the 2010 to 2014 Access Arrangement period.

6.2.1 Load factor

Load factor is calculated as being throughput (TJ/day) divided by MDQ (TJ/day) and represented as a percentage. The average historical load factor of the GGP for 2000 to 2008 inclusive is 85%. GGT has assumed that because of the global financial crisis, the forecast load factor has been assumed to be 2 percentage points lower over the forecast period 2010 to 2014.

6.3 Reference Tariff cost allocation process

GGT has allocated its costs according to Section 8.38 of the Code, ensuring that the Total Revenue to be recovered under the Reference Tariff reflects the costs incurred (including capital costs) that are directly attributable to the Reference Service. This is consistent with the requirements under the Code.

GGT has applied those principles through the following process:

- Attribution of direct costs
  - Only costs that are directly attributable to the provision of a particular category of services are directly attributed to that category of services.
- Allocation of shared costs
  - Shared costs incurred in providing several categories of services are allocated between or within those categories using an appropriate causal allocator; and
  - Shared costs are allocated between the Reference Service and Negotiated Services.
- Not allocate cost more than once
  - No costs are allocated more than once.

Considering the nature of GGT's costs, it is convenient to discuss the allocation of common costs before the attribution of specific costs.

6.3.1 Accounting policies and basis of allocation to covered pipeline

Accounting Principles

GGT accounts have been prepared on the basis of incurring 100% of the operational costs as advised by APTPWA, APTG and GGT Operations.

An audit of the GGTJV Special Purpose Financial Reports is conducted each financial year, by an independent auditor.

The methodology for presenting the actual data for capital and Non Capital costs for the GGTJV, for the terms and scope of the access arrangements, has been in accordance with the GGTJV Special Purpose Financial Reports.

Basis of Allocation

The methodology used for allocating Capital Costs and Non Capital Costs to the covered pipeline are discussed separately below.

Capital Costs

The approved GGT Access Arrangement in effect from 1 August 2005 provides for an election to exclude capacity expansions resulting from installation of additional compression and therefore any capital attributed to cost of these expansions is excluded when the Reference Tariff is determined.

On 3 October 2006, GGT elected under clause 10.3(c) of the GGT Access Arrangement that the additional capacity created by the Paraburdoo compressor expansion (i.e., installation of second compressor at Paraburdoo and referred to as "PAC") will not be covered under the Code. On 20 November 2006, the Economic Regulatory Authority published a notice advising the public that it would not include the cost of adding the new compressor at Paraburdoo in the capital base for the GGP when the current Access Arrangement is considered in 2009. Accordingly, the cost of this compressor does not feature in the discussion of New Facilities Investment in Section 3.3 of this Submission.

Similarly, GGT has elected under clause 10.3(c) of the GGT Access Arrangement to exclude the expansion of the GGP caused by the installation of compression at Wyloo West, and intends to similarly elect to exclude any capacity expansion arising from the planned Ned's Creek compressor station, and the Yarraloola De-bottlenecking Project ("herein referred to as "YDP") from the covered pipeline. Accordingly, these projects do not feature in the forecast of capital expenditure discussed in Section 3.6 of this Submission.

Therefore, GGT has excluded any capital costs that relate to the abovementioned expansions from the Capital Costs of the covered pipeline.

Non Capital Costs

The total Non Capital Costs for GGT are a combination of:

(a) GGT Operations Costs;
(b) APTPWA Operations Costs;
(c) APTG Commercial Costs; and
(d) SCP Costs / Other Lateral Costs.

Costs derived from the work that GGT staff or its contractors perform other than as manager of the GGTJV are not recovered from the GGTJV but are charged to the relevant party. For example work undertaken in relation to laterals owned by Southern Cross Pipelines Companies ("SCP") or other parties, rather than the GGTJV, is charged directly to the relevant party and are not included in the Access Arrangement. SCP Costs and Other Lateral Costs do not relate to the GGP and have therefore been excluded from the Non Capital Costs allocated to the covered pipeline.

In the allocation of total Non Capital Costs incurred by GGT (reference items (a) to (c) above) that GGT considers are attributable to the covered pipeline, GGT has reduced the Non Capital Costs in the following business unit / cost centres:

- Operations (Field Services);
- Major Expenditure Jobs (MEJ's); and
- APA Commercial Management Fee.

The allocation methodology to "Operations (Field Services)", "Major Expenditure Jobs (MEJ's)" and "APA Commercial Management Fee" will be discussed separately below:

Operations (Field Services):

APTPWA has advised GGT that the additional operational costs for running PAC comprise circa 1% of the total Operations (Field Services) annual cost. PAC commenced full operations in early 2007 and so GGT has reduced Operations (Field Services) costs, as per the audited Special Purpose Financial Reports by 1% from 1 January 2007.

Major Expenditure Jobs (MEJ's)

GGT has reduced the Non Capital Costs of MEJ's allocated to the covered pipeline by excluding any MEJ's that are for expansion projects and non-covered pipeline related projects such as:

- PAC;
- Yarraloola De-bottlenecking;
- Paraburdoo Lateral;
- SCP Projects; and
- Recoverable Projects.

APA Commercial Management Fee:

The APA Commercial Management Fee charged by APTG for the provision of commercial services is paid on the basis of management of costs and a margin on GGTJV revenues. The major proportion (over 90%) of the fee is attributable to GGTJV revenues. Therefore, GGT has based its allocation of costs, as per the audited Special Purpose Financial Reports for "APA Commercial Management Fee" over the "covered pipeline based on the following formula:

$$RAPACMF = APACMF \times \left(\frac{\sum_{i=1}^{n} CPURC_i \times NOD \times CPUD_i}{\sum_{i=1}^{m} TPURC_i \times NOD \times TPUD_i} \right);$$

where,

$RAPACMF$:	means revised APA Commercial Management Fee;
$APACMF$:	means actual APA Commercial Management Fee;
$CPURC_i$:	means the reserved capacity (MDQ) for each covered pipeline User (i);
$CPUD_i$:	means the distance (kilometres) for each covered pipeline User (i);
$TPURCi$:	means reserved capacity (MDQ) for each GGP User (i) on the covered pipeline and the non-covered pipeline on an annual basis;
$TPUD_i$:	means the distance (kilometres) for each GGP User (i) on the covered pipeline and non-covered pipeline; and
NOD:	number of days in each year.

Once this process has been completed, the remaining costs relate entirely to the covered pipeline, and are then attributed and allocated to the Services provided by the covered pipeline as discussed more fully below.

GGT's application of this process has been subject to independent external review.

6.3.2 Allocation of common costs

Consistent with the nature of shared infrastructure assets, the vast majority of costs are incurred to provide service to all Users. For example, it is not possible to specifically attribute pipeline costs or inlet facilities to particular loads.

GGT has developed a causal allocator for shared costs. GGT considers that pipeline costs are driven by a number of clearly identifiable criteria:

- capacity demanded, which dictates the size of the pipeline in question and the need for compression on that pipeline; and
- length of haul, which drives the length of the pipeline and the cost of compression.

GGT's capital and operating costs have been allocated on the basis of the amount of the GGP being used, and the capital and operating cost of compressors required to "push" the gas further along the GGP. Therefore, shared pipeline and compression costs, opex etc has been allocated between the Reference Service and Negotiated Services on the basis of "capacity kilometres".

It is also not possible to directly attribute most of the operating and general and administrative costs to specific services. Therefore, except as described below, these costs have been allocated on the same basis of allocation as the pipeline and operating costs.

6.3.3 Directly attributable costs

In contrast to most general and administrative costs, regulatory costs can be directly attributed to specific types of services.

There are three categories of regulatory costs to be considered:

- the Authority "standing charge", which does not vary with the level of regulatory activity;
- the Authority "service charge" which varies depending on the amount of regulatory activity being expended on that particular service provider; and
- GGT's and the Owners' regulatory costs, primarily incurred in the development and administration of this Access Arrangement.

The Authority's standing charge is associated with the administration of the regulatory framework in general. As the GGP was built before the National Gas Law and the Code came into force, it would be reasonable to argue that the current regulatory framework did not influence the commercial negotiations surrounding the construction of the GGP. Therefore, the volumes associated with the "foundation" users should not bear regulatory costs. A similar argument would apply to any third party pipeline users who signed a contract prior to the Code coming into force in Western Australia.

It would be reasonable to argue that any Users who signed a contract after the Code came into force did so under the protections of that regime. Therefore, the costs of administering the regime in general (the Authority's standing charges) are allocated to all Users who signed a contract after the commencement of the regime. This includes Prospective Users, who would be seeking access to the GGP within the protections of the general regulatory framework.

In contrast, the Authority's service charge, and GGT's and the Owners' regulatory costs, are incurred almost entirely in the context of the current Access Arrangement, and should be reasonably assigned to those Users who will benefit from the Access Arrangement process.

For Users that have an existing contract, the relationship between the service provider and the shipper is governed by the contract rather than the Access Arrangement.[20] These Users take a Negotiated Service, on the basis that the Terms and Conditions of the Service differ from those defining the Reference Service in the proposed Revised Access Arrangement.

The Access Arrangement, including the definition of a Reference Service and Reference Tariff, is a forward-looking document, and in that respect provides a useful service to Prospective Users in negotiating access to the GGP.

One of the key goals of defining a Reference Service and providing the Reference Tariff is to allow a fallback position to which users may insist on being served in the event that negotiations for access are not successful. To this end, the Reference Tariff forms an important "stake in the ground" to guide negotiations for those Prospective Users who choose to negotiate a service other than the Reference Service.

[20] Even where these services were Reference Services under the Access Arrangement in effect when they were first contracted, that Access Arrangement will have expired on the commencement of the Revised Access Arrangement, and again the relationship will be governed by the contract.

Therefore, only Prospective Users seeking to negotiate access to the available capacity of the GGP benefit from an approved Access Arrangement, including a definition of Reference Services and Reference Tariffs, being in place. Costs associated with the development of the Access Arrangement are therefore attributed to the Reference Service.

6.3.3.1 Summary – allocation of regulatory costs

In summary, Regulatory Costs are assigned to the different categories of Services as shown in Table 6.1 below:

Table 6.1: Summary – Allocation of Regulatory Costs

Service	Authority's Standing Charge	Authority's Service Charge	GGT and Owners' Regulatory Costs
Negotiated Service - Pre – 2000 Contracts	X	X	X
Negotiated Service - 2000 - 2009 Contracts	✓	X	X
Reference Service	✓	✓	✓

A review of the contracts in place (refer to Table 6.2 below) allows us to demonstrate the principles discussed above. It should be noted that the actual allocation is based on an analysis of the date of contract, the capacity demanded and the distance of pipeline used. The Reference Service is deemed to be for delivery at Kalgoorlie, the southern limit of the GGP.

Table 6.2: Summary of the GGP Covered Pipeline Capacity

Contracts	Capacity
New load since 2000	7.6 TJ/day
Available capacity for Reference Service	4.1 TJ/day
Total Covered Pipeline Capacity	108 TJ/day

NB. Numbers rounded

The regulatory costs are therefore attributed as shown in Table 6.3 (this illustrative analysis ignores distance factors):

Table 6.3: Allocation of Regulatory Costs

Service	ERA Standing Charge	ERA Service Charge	GGT & Owners' Regulatory Costs
Negotiated Service - Pre – 2000 Contracts	0%	0%	0%
Negotiated Service - 2000 - 2009 Contracts	46% (=3.5/7.6)	0%	0%
Reference Service	54% (=4.1/7.6)	100%	100%

NB. Numbers rounded

6.4 Total costs allocated to Reference Service

The total cost of providing all Services for the covered pipeline for the period 2010 to 2014 is shown in Table 6.4.

Table 6.4: Total Revenue ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Return	60.2	59.9	59.1	58.0	56.8
Depreciation	10.8	11.2	11.6	11.9	12.0
Non Capital costs	26.8	27.2	28.2	31.9	33.7
Total Revenue	**97.9**	**98.3**	**98.8**	**101.7**	**102.5**

Following the cost allocation procedure described above, the total cost of providing Reference Services for the period 2010 to 2014 is shown in Table 6.5.

Table 6.5: Total Revenue applicable to Reference Service ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Total Revenue	**4.6**	**4.0**	**4.0**	**4.9**	**5.7**

The present value of these costs using a discount rate of 13.5% is $15.9 million.

6.5 Calculation of Reference Tariffs

The Reference Tariff has been designed to recover the Reference Service Revenue as described above in Section 6.4.

Consistent with the requirements of Section 8.3(b) of the Code, the Reference Tariff is derived so that the present value of the forecast annual revenue (obtained by applying the Reference Tariff, adjusted quarterly to reflect movements in expected inflation, to the forecast volumes for the Reference Service) is $15.9 million.

This forecast annual revenue to be recovered from providing the Reference Service is shown in Table 6.6.

Table 6.6: Annual Revenue from Reference Tariff ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Total Revenue	**4.4**	**4.5**	**4.6**	**4.7**	**4.8**

The present value of these revenues using a discount rate of 13.5% is $15.9 million.

6.5.1 Transportation Tariff Components

As described more fully in Section 9 of the General Terms and Conditions, the Reference Tariff for the Firm Service has three components which have been designed to broadly reflect the fixed and variable components of transportation costs through the covered pipeline.

The three components of the Reference Tariff are:

- Toll Charge (expressed in $/GJ MDQ);
- Capacity Reservation Charge (expressed in $/GJ MDQ km); and
- Throughput Charge (expressed in $/GJ throughput km).

The Reference Service Revenue is allocated to the Toll Charge, the Capacity Reservation Charge and the Throughput Charge in the proportions shown in Table 6.7.

Table 6.7: Reference Tariff structure

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

6.5.2 Transportation Tariffs

From 1 January 2010 onward the Transportation Tariff (Reference Tariff) for the Firm Service, when applicable is shown in Table 6.8:

Table 6.8: Reference Tariffs from 1 January 2010

Toll $/GJ	Capacity Reservation $/GJ km	Throughput $/GJ km
0.311318	0.001915	0.000515

(exclusive of Goods and Services Tax) and adjusted in accordance with Clause 5 of the Access Arrangement.

A1 Appendix 1 "[Information Confidential]"

A1.1 "[Information Confidential]"

A1.2 "[Information Confidential]"

"[Information Confidential]"

A1.3 "[Information Confidential]"

"[Information Confidential]"

Table A1.1: "[Information Confidential]"

"[Information Confidential]"

A1.4 "[Information Confidential]"

A2 Appendix 2 Actual capital costs – 2000 to 2009

Minor capital expenditure is required during the life of any pipeline. This capital expenditure covers the replacement of miscellaneous capital equipment and enhancements of peripheral and utility systems and equipment.

In addition to minor capital expenditure, GGT completed major capital projects with the construction of compressor stations at Wiluna in 2000/2001 at a cost of $11.1 million and at Paraburdoo in 2003/2004 at a cost of $12.3 million.

Table A2.1 contains GGT's actual Capital Costs that was approved on 14 July 2005 by the Authority.

Table A2.1: GGT's Actual Capital Costs – 2000 to 2004 ($m)

Calendar Year	2000	2001	2002	2003	2004
Pipeline and laterals	0.0	0.0	0.0	0.0	0.0
Main line valve and scraper stations	0.0	0.0	0.0	0.0	0.0
Compressor stations	2.9	8.1	0.6	9.8	4.1
Receipt and delivery point facilities	0.2	0.1	0.1	0.1	0.0
SCADA and communications	0.0	0.0	0.1	0.1	0.4
Cathodic protection	0.0	0.0	0.0	0.0	0.0
Maintenance bases and depots	0.0	0.0	0.0	0.0	0.0
Other assets	0.5	0.2	0.4	0.2	1.6
Total	**3.6**	**8.4**	**1.1**	**10.1**	**6.1**

Table A2.2 provides a comparison between GGT's Actuals of Capital Costs, as opposed to GGT's Authority Approved Forecast of Capital Costs, which were approved by the Authority on 14 July 2005.

It should be noted that in the Authority Approved Forecast post 2007, GGT collapsed the forecasted capital costs into the "Other Assets" category.

In addition to minor capital expenditure (i.e., projects where the Capital Costs are less than $250,000), GGT has carried out (2005 to 2008) and proposes to carry out in 2009 various projects, which could be considered, as major capital projects (i.e., Capital Costs greater than or equal to $250,000) on the GGP.

GGT has incorporated a new Capital Cost category of "Remote Accommodation" to take account of the Accommodation Project (refer to Appendix A2.6) being currently undertaken. GGT considers that "Remote Accommodation" has a 15 year life.

Table A2.2 reveals that there is variation between GGT's Authority Approved Forecast for "Capital Costs" when compared to actual costs. GGT's actual costs of $14.2 million are 9.0% lower than the Authority Approved Forecast of $15.6 million.

The main reasons for this variation are discussed by Capital Costs category in the following sub-sections.

Table A2.2: GGT's Capital Costs – Actuals versus Authority Approved Forecast – 2005 to 2009 ($m)

Calendar Year	2005		2006		2007		2008		2009	
	Actuals	Authority Approved Forecast	Actuals	Authority Approved Forecast	Actuals	Authority Approved Forecast	Actuals	Authority Approved Forecast	2009 Forecasts	Authority Approved Forecast
Pipeline and laterals	0.3	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.0	0.0
Main line valve and scraper stations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Compressor stations	0.6	0.4	0.9	3.6	0.4	3.7	0.4	0.0	1.3	0.0
Receipt and delivery point facilities	0.0	0.0	0.4	0.0	0.5	0.0	0.0	0.0	0.0	0.0
SCADA and communications	0.0	0.1	0.4	1.0	0.2	1.0	0.7	0.0	0.5	0.0
Cathodic protection	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.0
Maintenance bases and depots	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Remote accommodation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0
Other assets	0.4	1.1	0.3	0.7	0.5	0.8	0.2	1.6	1.0	1.7
Total	**1.4**	**1.6**	**2.1**	**5.3**	**1.8**	**5.4**	**1.7**	**1.6**	**7.1**	**1.7**

A2.1 Code Requirements

Sections 8.15 through 8.17 of the Code guide the decisions on whether capital expenditure can be considers as New Facilities Investment and added to the Capital Base under Section 8.9(b) of the Code:

New Facilities Investment

8.15 The Capital Base for a Covered Pipeline may be increased from the commencement of a new Access Arrangement Period to recognise additional capital costs incurred in constructing, developing or acquiring New Facilities for the purpose of providing Services (New Facilities Investment).

8.16 (a) Subject to sections 8.16(b) and sections 8.20 to 8.22, the Capital Base may be increased under section 8.15 by the amount of the actual New Facilities Investment in the immediately preceding Access Arrangement Period provided that:

(i) that amount does not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice, and to achieve the lowest sustainable cost of providing Services; and

(ii) one of the following conditions is satisfied:

(A) the Anticipated Incremental Revenue generated by the New Facility exceeds the New Facilities Investment; or

(B) the Service Provider and/or Users satisfy the Relevant Regulator that the New Facility has system-wide benefits that, in the Relevant Regulator's opinion, justify the approval of a higher Reference Tariff for all Users; or

(C) the New Facility is necessary to maintain the safety, integrity or Contracted Capacity of Services. …

8.17 For the purposes of administering section 8.16(a)(i), the Relevant Regulator must consider:

(a) whether the New Facility exhibits economies of scale or scope and the increments in which Capacity can be added; and

(b) whether the lowest sustainable cost of delivering Services over a reasonable time frame may require the installation of a New Facility with Capacity sufficient to meet forecast sales of Services over that time frame

GGT has taken a three-step approach to satisfying the New Facilities Investment test. GGT will demonstrate its processes in:

- Identification of need;
- Evaluation of Alternatives; and
- Efficient execution and construction.

The following sub-sections will outline GGT's commercial and engineering justifications for these pipeline expansions.

A2.2 Pipelines and laterals

For the "Pipelines and Laterals" Capital Costs category, in the Authority Approved Forecast, GGT did not include any expenditure for the 2005 to 2009 period. GGT's Actuals of $0.7 million was incurred for the major capital projects discussed separately in the following sub-sections.

A2.2.1 Kumarina ROW rehabilitation works

Scope:

Rectification works (at a cost of $0.3 million) of the GGP easement (ROW) at Kumarina, as a result of flooding of the Gascoyne River North Branch caused by cyclonic activity. The rectification works that was carried out by GGT involved constructing diversion bunding that was designed by Worley Pty Ltd, which would direct any future flood waters from similar events caused by cyclonic activity, to an area of natural flood plain to the West of the ROW. The rectification works involved the extraction of clay from an established borrow pit on Kumarina Station and the removal, use and relocation of gravel material from the Gascoyne River beds in the area.

Major Benefits/ Justification:

The GGP, whilst not exposed at the time, ran the risk of exposure and potential damage from further erosion, as a result of future flooding caused by cyclonic activity. Furthermore, the ROW in this area was not traversable by vehicle and inspection on foot would have been the only means of completing mandatory ROW patrols.

The restoration and diversion work as completed would safeguard the integrity of the GGP at this location and whilst recommended rehabilitation would require long term quarantine of the area (3 years), the ROW was capable of supporting normal vehicular activity after this time.

GGT submits that this expenditure was necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code.

A2.2.2 GGT ILI project – verification digups

Scope:

Verification digups (at a cost of $0.3 million) in 2007 and 2008 of selected DCVG and Intelligent Line Inspection (“ILI”; i.e., intelligent pig) features, which was identified on GGP by the ILI Project completed in 2005 by GGT.

Major Benefits/ Justification:

Correspondence between APTPWA and DoIR during 1st Quarter of 2006 had discussed the possibility of significantly deferring the scheduling of the next ILI program. To facilitate this APTPWA intended to manage the recently inspected GGP in the following manner:

- validation of current ILI and DCVG data by means of extensive verification program (i.e., this project);
- in 5 years time, 2010, a confirmatory survey such as Close Interval Protection Survey ("CIPS") and/or DCVG shall be carried out; and
- the next ILI program inspection shall be carried out in 10 years from when the previous ILI program was carried out.

GGT submits that this expenditure was necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code.

A2.3 Compressor stations

For the "Compressor Stations" Capital Costs category, GGT's Actuals of $3.6 million were lower than the Authority Approved Forecast of $7.7 million, due to the major capital projects discussed separately in the following sub-sections.

The projects for 2009 illustrate the capital expenditure required to secure existing supply at the Yarraloola Compressor Station. The Yarraloola Compressor Station has duty and standby reciprocating compressor units. Engineering studies undertaken to date as part of the Yarraloola De-bottlenecking FEED project have identified several areas of concern, which may impact on the ongoing operability and compliance at this compressor station.

As a result of these studies the following projects in Appendices A2.3.5 and A2.3.6 will be initiated. The estimates are very preliminary at this stage until further detailed engineering can be completed. Similar projects will be carried out at the Ilgarari Compressor Station in 2010 (refer to Appendices A3.1.6 and A3.1.7).

Specific significant projects are discussed below.

A2.3.1 Wiluna compressor station

On the 16 February 2000, the GGTJV approved the installation of a single compressor at Wiluna. Table A2.3 provides a summary of the actual capital costs GGT incurred in constructing this new compressor station.

Table A2.3: GGT's Actual Capital Costs – Wiluna Compressor Station ($m)

Wiluna costs	Actuals
Project Development	0.7
Project Management	1.3
Engineering	0.5
Materials (incl. compressor)	4.3
Construction	3.2
Commissioning	0.1
Operations Establishment	0.4
Margin	0.6
Total	**11.1**

The following information is provided in satisfaction of the New Facilities Investment test.

A2.3.1.1 Background

As at the 16 February 2000, the GGP, as it was currently configured with compressor stations at Yarraloola and Ilgarari, had a capacity to transport nominally 85 TJ/d of gas (inlet flow). During 2000, GGT predicted that increases in the quantities of gas to be transported through the GGP would necessitate an enhancement of the capacity of the GGP, through the installation of additional compression. Given the lead time to meet market requirements it was necessary to commit at this point in time to the construction of the Wiluna compressor station.

A2.3.1.2 Pipeline capacity required

Although the total commitment for transportation of gas through the GGP already exceeded the capacity of the GGP, the actual requirements of the pipeline owners for transportation of gas had been well below their entitlements. This had freed up capacity to meet third party requirements and had allowed the installation of additional compression to be delayed. However, by the end of 2000 it was expected that the requirement for capacity in the GGP from the current Users would have risen to nominally 91 TJ/d, a level that could not be reliably achieved without enhancement of the GGP's capacity.

A2.3.1.3 Pipeline capacity expansion options

The logical method for expanding the capacity of the GGP was to install additional compression. Looping at this stage was not considered the most cost effective alternative.

There were numerous options available for GGT in terms of the preferred approach to compression enhancement. The principal considerations were:

- Compressor design – To meet GGT's requirements it would be possible to use either reciprocating (gas engine driven) compressors or centrifugal (gas turbine driven) compressors. Reciprocating compressors have a lower unit cost, higher efficiency and a shorter lead time than centrifugal compressors. However, the lower unit cost is offset by the higher maintenance requirement of reciprocating compressors and the associated need for installation of redundant capacity. With the exception of the GGP's existing compression, centrifugal compressors have been used exclusively in Australian long-distance, remote pipeline applications. Subject to confirmation of costs, centrifugal compressors are recommended for future use on the GGP;
- Compressor size and design – The greatest level of operational flexibility and reliability is achieved through the installation of multiple small compressor stations, although the use of fewer, larger stations allows savings on infrastructure and operating costs. Similarly, the use of multiple small compressor units at a compressor station gives flexibility advantages, while larger units can give cost economics. The GGP was designed on the basis that it could eventually have nine compressor stations (including the existing two) and this configuration is still reasonable. Solar Saturn 20 T1600 compressors, the smallest available centrifugal compressor, are well sized to meet current and future GGT requirements. Larger units are not cost competitive as it would not be possible to fully utilise their installed power; and
- Compressor location – To meet current market requirements in a manner consistent with longer term expectations for expansion of the GGP, the logical location for the next compressor station was at Wiluna Scraper Station being KP865 on the GGP. Installation of a single Solar Saturn 20 at Wiluna would increase the capacity of the GGP to nominally 93 TJ/d. At this flow rate, the power of the Ilgarari and Wiluna compressor stations will be fully utilised.

A2.3.1.4 Justification of equipment selection

The Solar Saturn compressor package was selected to be installed due to the following advantages:

- at the time of construction, AGL had seven of these units installed around Australia and had two spare Saturn engines. There were potential synergies in spare parts holding, maintenance and training by standardisation on equipment;
- AGL have found these units to be very reliable and operate with no installed spare units at any of their Saturn compressor sites; and
- Solar had a well established presence in Australia and working relationship with AGL.

A2.3.1.5 Approval

The GGTJV approved the installation of a single Solar Saturn 20 T1600 gas turbine compressor station at Wiluna at a total GGT capital cost of $10.8 million **"[Information Confidential]"**.

A2.3.1.6 "[Information Confidential]"

A2.3.1.7 NFI test

GGT submits that the Wiluna compressor meets the New Facilities Investment test on the grounds that:

- the construction tender process provides assurance that the amount does not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice; and
- given that the investment was driven by requests for increased capacity from Users, it would be reasonable to expect that the Anticipated Incremental Revenue generated by the New Facility would exceed the New Facilities Investment.

A2.3.2 Paraburdoo compressor station

On the 5 June 2002, the GGTJV approved the installation of a single compressor at Paraburdoo. Table A2.4 provides a summary of the actual capital costs GGT incurred in constructing this new compressor station.

Table A2.4: GGT's Actual Capital Costs – Paraburdoo Compressor Station ($m)

Paraburdoo costs	Actuals
Project Development	0.1
Project Management	1.0
Engineering	0.8
Materials (incl. compressor)	4.1
Construction	4.9
Commissioning	0.3
Operations Establishment	0.4
Margin	0.8
Total	**12.3**

The following sub-sections will outline GGT's commercial and engineering justifications for this pipeline expansion.

A2.3.2.1 Background

As at the 5 June 2002, the GGP, as it was currently configured with compressor stations at Yarraloola, Ilgarari and Wiluna, had the capacity to transport nominally 93 TJ/d of gas (inlet flow). **"[Information Confidential]"**

An application for a Firm Capacity of **"[Information Confidential]"** TJ/d was expected to be received from **"[Information Confidential]"** in the next one month for supply of gas to the **"[Information Confidential]"**. As the pipeline capacity was fully contracted, this application would necessitate an enhancement of the capacity of the pipeline through the installation of a new compressor at Paraburdoo to enable GGT to offer and contract Firm Service to **"[Information Confidential]"**.

GGTJV has previously given a conditional approval for the installation of a new compressor at Paraburdoo contingent upon the securing of new load to justify its addition.

A2.3.2.2 Pipeline capacity required

Although the total commitment for transportation of gas through the GGP already exceeded the capacity of the pipeline, the actual requirements of the pipeline owners for transportation of gas have been well below their entitlements. This had freed up capacity to meet third party requirements, and had allowed the installation of additional compression to be delayed.

However, load forecast involving allocation of throughput capacity for each of the shippers and users shows that the requirement for capacity in the GGP was expected to rise to nominally 104.5 TJ/d by the last quarter of 2003. This is at a level that couldn't be reliably achieved without further enhancement of the pipeline's capacity.

The drivers for the need of the next capacity expansion were mainly:

- **"[Information Confidential]"**; and
- pursuit of new loads, of which **"[Information Confidential]"** were the most prospective, and these projects could only come about if there was firm capacity available to be contracted. **"[Information Confidential]"**

A2.3.2.3 Pipeline capacity expansion options

The logical method for expanding the capacity of the GGP was to install additional compression. Looping was not considered the most cost effective alternative at this stage. There were numerous options available in terms of the preferred approach to compression enhancement. The principal considerations were:

- Compressor design – To meet GGT's requirements, it would be possible to use either reciprocating (gas engine driven) compressors or centrifugal (gas turbine driven) compressors. Reciprocating compressors have a lower unit cost, higher efficiency and a shorter lead-time than centrifugal compressors. However, the lower unit cost is offset by the higher maintenance requirement of reciprocating compressors, and the associated need for installation of redundant capacity. Centrifugal compressors have been widely used in long-distance, remote pipeline applications in Australia and are recommended for future use on the GGP.
- Compressor size and number – The greatest level of operational flexibility and reliability is achieved through the installation of multiple small compressor stations, although the use of fewer, larger stations allows savings on infrastructure and operating costs. Similarly, the use of multiple small compressor units at a compressor station gives flexibility advantages, while larger units can give cost economies. The GGP was designed on the basis that it could eventually have nine compressor stations (including the existing three), and this configuration is still reasonable. Solar Saturn 20 T1600 compressors, the smallest available centrifugal compressor, are well sized to meet current and

future GGT requirements. Larger units are not cost-effective as it would not be possible to fully utilise their installed power.

- Compressor location – To meet current market requirements in a manner consistent with longer term expectations for expansion of the GGP, the location for the next compressor station is Paraburdoo Scraper Station at KP305 on the GGP. Installation of a single Solar Saturn 20 at Paraburdoo will increase the capacity of the GGP to nominally 107.7 TJ/d distributed.

A2.3.2.4 Justification of equipment selection

The Solar Saturn compressor package was selected to be installed due to the following advantages:

- at the time of construction, AGL had eight of these units installed around Australia and has two spare Saturn engines. There were potential synergies in spare parts holding, maintenance and training by standardisation on equipment;
- AGL had found these units to be very reliable and operate with no installed spare units at any of their Saturn compressor sites; and
- Solar had a well established presence in Australia and working relationship with AGL.

A2.3.2.5 Approval

It was proposed that the management of the design and construction of the Paraburdoo compressor station **"[Information Confidential]"**. It was expected that a proposal for this work would be developed based on the Wiluna proposal, incorporating the budget price estimate and schedule (this is reflected in the lower project development cost for the Paraburdoo compressor compared to the Wiluna compressor). **"[Information Confidential]"**

The GGTJV Management Committee resolved to approve the installation of the Paraburdoo Compressor Station (comprising one Solar Saturn 20 T1600 gas turbine driven centrifugal compressor and other associated infrastructure) in principle contingent upon GGT securing the gas transportation load associated with the **"[Information Confidential]"**.

"[Information Confidential]"

A2.3.2.6 Management of construction

On 13 March 2003, GGT executed the Asset Delivery Agreement with **"[Information Confidential]"**.

"[Information Confidential]"

A2.3.2.7 NFI test

GGT submits that the Paraburdoo compressor meets the New Facilities Investment test on the grounds that:

- the construction tender process provides assurance that the amount does not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice; and
- given that the investment was driven by requests for increased capacity from Users, it would be reasonable to expect that the Anticipated Incremental Revenue generated by the New Facility would exceed the New Facilities Investment.

A2.3.3 Ilgarari ESD/fire and gas system replacement

Scope:

During 2004/05, GGT identified via a FEED that the ESD/Fire and Gas System at Ilgarari and Yarraloola needed to be replaced due to the age of the existing equipment and the number of unwarranted trips due to either gas or fire detection system failing, i.e., existing systems were causing a number of unwarranted trips due to the false detection of gas on site.

In 2005, GGT decided to initially carry out a project initially on the Ilgarari Compressor Station. During the period 2005 to 2009, GGT's Actuals of $0.8 million was expensed and is forecast to be spent on this project (i.e., GGT propose to commence similar work at Yarraloola in 2010 – refer to Appendix A3.1.9).

Justification / Major Benefits:

This project was required to improve the reliability of fire and gas detectors at the Ilgarari Compressor Station. The new detectors would allow for more diagnostic information to be obtained, which has aided in troubleshooting, as well as preventing spurious trips due to faults. The new detectors and fire and gas PLC would allow for improved functionality to be utilised and improved alarming while maintaining existing ESD functionality.

GGT submits that this expenditure was necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code.

A2.3.4 Critical turbine station spare parts

Scope:

In 2006, GGT recognised a need to procure additional spare parts, which were identified, as critical to the reliability of the existing gas turbine compressor stations at Wiluna and Paraburdoo.

Spares that were identified as critical were assessed as such through a review of previous industry history, personnel knowledge of failure, other known potential failure modes and with input from OEM suppliers. In the period, 2006 to 2008, GGT incurred Capital Costs of $0.4 million under this project.

Justification / Major Benefits:

Lack of availability of spare parts can have a serious impact on the ability to operate the GGP to its contracted obligations, particularly for single gas turbine compressor stations. Outages can have a detrimental effect on GGT's ability to provide Services.

GGT submits that this expenditure was necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code.

A2.3.5 Yarraloola crankshaft change out at Unit 1

Scope:

In late 2008 / early 2009, GGT identified a need to change out the crankshaft of the (reciprocating) compressor unit 1 at the Yarraloola Compressor Station.

One of the compressor engines has AISI 1046 crankshaft material. The crankshaft material on unit 2 had been changed to a new crankshaft material AISI 4140. The engine shaft stress limit for AISI 1046 crankshaft is lower than that for the AISI 4140 crankshaft.

Torsional analysis studies have showed that the AISI 1046 crankshaft stress limit is exceeded by the current compressor and engine configuration. Hence the Unit 1 crankshaft material will need to be changed out during the next major service. This will be a significant project.

GGT's Current Forecast for this project is $0.6 million for 2009.

Justification:

Crankshaft failures have previously occurred at Yarraloola unit 2. When the crankshafts failed, the engine manufacturer, Waukesha, offered a new crankshaft material AISI 4140 to replace the old AISI 1046 material. However, unit 1 at Yarraloola still has the old crankshaft materials. Torsional analysis studies conducted by Beta Machinery Analysis in 2008 identified that the old crankshaft material falls significantly short of the torsional stress limit.

Following the failure of Unit 2 crankshaft at Yarraloola, the torsional vibration dampers (TVD) at both Units 1 and 2 at Yarraloola were replaced with new dual dampers. The old damper removed from Unit 1 was found to have the internals solidified (i.e. it had failed) and hence the Unit 1 crankshaft may have already sustained some damage, which has yet to propagate to a full failure.

If this project is not carried out then failure of the crankshaft can lead to catastrophic failure and permanent damage to engine. This can lead to loss of redundancy at Yarraloola Compressor Station for a period of approximately 6-7 months. Due to the criticality of the Yarraloola Compressor Station for operation of the GGP, any maintenance or unplanned shutdown at Yarraloola can lead to loss of supply on the GGP. Replacing an engine is a costly exercise.

Major Benefits:

Implementation of this project will provide the following benefits:

- prevent the likelihood of torsional failure, which can result in catastrophic engine failure which will lead to a downtime of approximately 32 weeks;
- securing the operation of the GGP to meet contractual obligations;
- prevent loss of redundancy at Yarraloola Compressor Station;
- safeguarding of operational personnel and equipment;
- replacing the crankshaft during the next 48,000 hour service in 2009 is more cost effective due to personnel, plant and equipment been mobilised to site; and
- less expensive than replacing the engine.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The plan to conduct this work at the next scheduled service demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice

A2.3.6 Yarraloola crankshaft/engine-compressor coupling modifications / TVD temperature monitoring

Scope:

In late 2008 / early 2009, GGT identified a need to modify the crankshaft coupling at Yarraloola.

Torsional analysis studies have identified the existing compressor and engine system exceeds recommended torsional vibration levels. In order to resolve this issue, several options are available, such as installing a flywheel on the compressor crankshaft and changing the coupling.

GGT's Current Forecast for this project is $0.2 million for 2009.

Justification:

Crankshaft failures have occurred at the Yarraloola and Ilgarari units. Torsional analysis studies conducted by Beta Machinery Analysis in 2008 identified that the old crankshaft material does not meet the torsional stress limit.

It has been identified that changing the coupling and installing a compressor flywheel can increase the torsional stress limit of the existing configuration. Monitoring the TVD temperature continuously is the only means by which to identify any possible problems with the crankshaft before failure.

If this project is not carried out then failure of the crankshaft can lead to catastrophic failure and permanent damage to the engine. This can lead to loss of redundancy at Yarraloola compressor station for a period of approximately 6-7 months. Due to the criticality of the Yarraloola compressor station for operation of the GGP, any maintenance or unplanned shutdown at Yarraloola can lead to loss of supply on the GGP. Replacing an engine is a costly exercise.

Major Benefits:

Implementation of this project will provide the following benefits:

- prevent likelihood of torsional failure which can result in catastrophic engine failure which will lead to a downtime of approximately 32 weeks;
- securing the operation of the GGP to meet contractual obligations;
- prevent loss of redundancy at Yarraloola Compressor Station;
- safeguarding of operational personnel and equipment;
- replacing the crankshaft during the next 48,000 hour service in early 2010 is more cost effective due to personnel, plant and equipment been mobilised to site; and
- less expensive than replacing the engine.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The plan to conduct this work at the next scheduled service demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice

A2.4 Receipt and delivery point facilities

For the "Receipt and Delivery Point Facilities", GGT did not include any expenditure for the 2005 to 2009 period. GGT's Actuals of $0.9 million was incurred for the major capital projects discussed separately in the following sub-sections.

A2.4.1 DBNGP Interconnect

Background:

Prior to this project being carried out all gas transported on the GGP was sourced from the East Spar Joint venture and Harriet Joint venture via the Apache managed production facilities located on Varanus Island.

Following the successful takeover of WMC by BHP Billiton Pty Ltd ("BHPB") it was agreed by Dampier to Bunbury Pipeline Pty Ltd ("DBP"), GGT and BHPB under commercial arrangements to install an interconnection of the DBNGP and the GGP to enable gas to be supplied to BHPB under its existing gas supply arrangements with the North West Shelf Gas Joint Venture ("NWSGJV").

It was agreed by all parties including DoIR that the connecting pipeline be included as a variation to both GGT's and DBNGP's existing pipeline licences, as the connecting pipe will not require a new easement as the route stays within existing easements, which have previously been cleared for native title and vegetation issues.

Scope:

In 2007, GGT completed the DBNGP Interconnect Project where GGT upgraded the existing Yarraloola PLC and DBNGP tie-in at a cost of $0.4 million.

Justification:

Modification was required to receive flow measurement data and instrumentation status data from the DBP interconnect and to allow control of a new ESD shutdown valve. The existing PLC CPU has insufficient processing capacity for the additional inputs and data.

Major Benefits:

Implementation of this project has provided the following benefits:

- securing the operation of the GGP to meet contractual obligations; and
- offered additional gas receipt facilities where users can diversify gas supply arrangements.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The conduct of this work with existing compounds, utilising existing native title and environmental clearances, demonstrates that the cost would not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice

A2.4.2 Yarraloola gas chromatograph upgrade

Scope:

Between April 2006 and May 2007, GGT completed an upgrade of the gas chromatograph ("GC") and flow computers at the Yarraloola Compressor Station at a cost of $0.3 million.

Justification:

The GC and flow computer upgrades at the Yarraloola Compressor Station were necessary due to the existing GC and flow computer equipment no longer being supported by their respective manufacturers therefore spare parts were no longer available.

At that time, the technology was superseded and this would have subjected the metering system at the Yarraloola Compressor Station to considerable risk should one of the equipment fail. Given that the Yarraloola Compressor Station is the inlet to the GGP any metering errors would have cascaded through all custody transfer points along the GGP.

Major Benefits:

Implementation of this project will provide the following benefits:

- securing the operation of the GGP to meet contractual obligations;
- reduce costs, as the new control units on the existing GC will extend the serviceable life of the units for another 10 years and new flow computers offer certified custody transfer applications and are a quarter of the price of a repaired existing unit;
- allow remote monitoring of the device by GGT previously not available; and
- accommodate OEM diagnostic support previously not available.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The decision to replace the unit rather than proceed with the more costly repair demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A2.5 SCADA and communications

For the "SCADA and Communications" Capital Costs category, GGT's Actuals of $1.9 million were lower than the Authority Approved Forecast of $2.1 million, as GGT was able to complete the following capital projects at lower cost than originally forecast.

A2.5.1 WA control room integration

Scope:

In 2006 and part of 2007, GGT carried out a project to integrate and relocate the GGP / Midwest control room with the Parmelia Pipeline control room at a cost of $0.3 million (GGP's portion of capital costs).

Justification:

When the APA Group acquired the Parmelia Pipeline assets the proposed benefits included synergies, particularly by integrating the operation and management of the entire GGT, Midwest Pipeline and Parmelia Pipeline to APTPWA.

APA Group requested that APTPWA progress any potential synergies and savings, as a result of this acquisition, while also establishing alternatives for technical elements that were problematic or near their "end of life" for either of the pipeline control systems.

It was established that one of the main pipeline operational functions that offered the greatest synergies and savings could be derived from the combination of the GGP and Midwest Pipeline Control Room with the Parmelia Pipeline Control Room.

A combined control room will enable 24 hour / 7 days per week coverage of the GGP and Midwest control system. With the cross training of the operations staff the GGP and Midwest Pipeline Control Room monitoring can be increased to 24 hour / 7 days per week without incurring the additional costs that would be required if it were to remain separated from the Parmelia Pipeline Control Room.

Major Benefits:

The main benefits to be gained from combining and moving the backup control rooms can be seen as follows:

- Non Capital Costs savings in the order of circa $0.6 million per annum comprising savings in personnel, logistics and communications;
- 24 hour / 7 days per week coverage of all three pipelines;
- a fully operational and accessible backup control centre for all three pipelines;
- improved power backup for the main combined control room; and
- foundation for a combined SCADA system and other system improvements.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The plan to align this work with the end of life for existing systems demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice

A2.5.2 GGP satellite communications upgrade

Background

Natural gas pipeline Supervisory Control and Data Acquisition ("SCADA") systems are employed to eliminate the need for continuous staff presence to monitor and control facilities located at remote pipeline locations. As such, they:

- reduce operating expenditure by substantially reducing staff numbers and costs associated with maintaining staff in remote locations;
- promote safety by reducing the need for travel and occupation of potentially hazardous environments; and
- facilitate efficient pipeline operation by acquiring, processing, and displaying operating data for the entire pipeline in 'real time', thus providing a holistic and up to date 'picture' of pipeline system operation.

Pipeline SCADA systems may be thought of in general terms as being comprised of three components:

(i) a Master Station, usually located in a Gas Control Centre, which acquires and processes data from remote sites, displays this data to pipeline operators, and provides data to other electronic information systems;

(ii) Remote Terminal Units ("RTUs"), which collect field data and process it so that it may be transmitted to the Master Station; and

(iii) wide area data communications bearers, operating over substantial geographic extent, which facilitate data communications between the Master Station and the relevant RTUs.

Scope

In 2006, the wide area data communications systems servicing the GGP SCADA system incorporated two wide area satellite data communications systems. The primary system provided a permanent connection with the relevant RTUs, and the secondary system implemented a dial up backup communications path to and from the relevant RTUs. The primary and secondary satellite communications systems employed geographically diverse hubs and spatially diverse satellites in the interests of maintaining system security.

In 2006, the primary satellite communications system was 10 years old, and embodied superseded technology which was (then) no longer supported. As such, the primary satellite communications system was at the end of its product life cycle. Its reliability was progressively declining, as its probability of failure was increasing and the ability to effect repairs was declining. The secondary, dial up, satellite communications system embodied technology which was (then) current and supported. However, this system was not operational. The GGP's then sub-contract operator Agility had reported difficulties in making the backup communications system function as originally intended.

As a consequence, GGT embarked on a project to replace the GGP's primary and secondary SCADA data communications systems with an integrated, fault tolerant satellite data communications system.

In April 2007 Agility issued a Request for Quotation ("RFQ") for the replacement of the GGP SCADA data communications bearers to four satellite communications service providers - Ursys, Satellite Services Pty Ltd ("SSPL"), Orion, and Newsat. All four responded to the RFQ.

Initial tender evaluation was performed by Agility, with Walker Newman Pty Ltd ("Walker Newman") providing specialist technical support. Orion and Newsat were rejected at the initial screening stage, leaving two satellite communications service providers - Ursys and SSPL - under consideration.

Tenders were evaluated against several sets of criteria.

The Ursys and SSPL proposals were essentially cost neutral over a 5 year horizon (i.e., typical initial contract term) whilst the SSPL proposal offered a small cost advantage over a 10 year horizon (i.e. typical practical product life).

The Ursys and SSPL proposals were both technically robust. Both offered an interleaved satellite configuration, whereby every second remote location was to be serviced by one satellite, with every other remote location serviced by the other satellite. However, the specific topologies of the Ursys and SSPL proposals differed, with the SSPL proposal offering advantages in both time to reconfigure remote sites 'blinded' by (a single) satellite failure, and required spares inventories.

A related consideration was incremental expansion cost. The SSPL proposal offered greater scalability, as new SCADA sites could be accommodated by using existing data communications bandwidth, or by the procurement of incremental bandwidth. In contrast, the Ursys proposal employed a 'per site' pricing model (only), which did not accommodate more efficient use of existing bandwidth.

Tender evaluation identified the importance of vendor operational support. After evaluating the 'in service' support capabilities of Ursys and SSPL and conducting reference checks with end users of both companies' equipment and 'in service' support, SSPL was identified as offering the better service.

Security of data communications systems was identified as an increasingly important consideration.[21] While terrorism was identified as perhaps the most widely publicised threat to infrastructure such as telecommunications,[22] risks deriving from vandalism (both physical and software 'viruses'), 'hacking', operator error, and 'inbuilt' software and (to a lesser extent) hardware defects were seen to be greater. Considerations of security also extended to commercial (as distinct from physical) failure. The possibility that operators of commercial satellite hubs may cease or substantially reduce operation due to business difficulties was considered. The SSPL proposal was identified as offering greater security due to its inherent configuration.

Simplicity is always a consideration when assessing risk (both physical and commercial). The SSPL proposal was identified to be simpler than the Ursys proposal in terms of both physical configuration and commercial arrangement.

On the basis of the evaluation summarised above, the SSPL tender was accepted and subsequently implemented.

Installation and commissioning was completed in October 2008. GGT has incurred actual costs of $0.5 million on this project to 31 December 2008.

Justification

[21] Demonstrated by current initiatives by Federal Government agencies.
[22] And indeed high pressure natural gas pipelines.

Failure to upgrade the relevant SCADA data communications bearers and associated equipment would have exposed GGT to the progressively increasing probability of loss of functionality of the SCADA system serving the GGP.

Reliable operation of the SCADA systems serving the GGP is critical to its operating regimes. Prolonged loss of SCADA system functionality would require continuous manning of many remote pipeline locations. Such action would incur substantial costs and create correspondingly substantial resourcing problems.

Communications satellites are typically very reliable. However, failure of a communications satellite is a catastrophic event, as the time and cost to replace such a satellite is substantial. Consequently, the replacement satellite data communications system incorporated redundancy of critical components so that a single point of failure could be tolerated.

Major benefits

Replacement of the GGP's SCADA data communications system permitted the operation of the GGP to continue on a 'business as usual' basis. As such, the benefits of remote monitoring and control of facilities distributed along the length of the pipeline, as distinct from continuous manning of those locations, have been maintained.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The robust tender evaluation process demonstrates that the cost did not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice

A2.6 Remote accommodation

For the "Remote Accommodation", GGT did not include any expenditure for the 2005 to 2009 period. GGP Actuals of $3.9 million in 2009 are to be incurred to undertake the capital project discussed in the following sub-sections.

A2.6.1 Remote accommodation – Leinster base, Wiluna and Paraburdoo compressor stations

Background:

In early 2008, GGT identified that the existing remote accommodation facilities on the GGP were now antiquated and in need of upgrading. Additionally, due to increased facilities constructed since the construction of the GGP and customers connecting to the GGP since that date, the operating philosophy of the GGP has altered from the original operational requirements. There are now more customers on the GGP pipeline and therefore the remote sites are required to be more frequently manned and some existing sites are now utilised as permanent operational bases.

This revised philosophy is linked to establish good standard industry practice and to meet the contracted response times as required under contracted obligations to

GGT's customers. This assists with achieving the lowest sustainable costs for providing services.

There had been numerous expressions of concern regarding the current status of the accommodation. In general it has become industry best practice in the Resources Industry to offer a "home from home" environment in these remote locations.

It has been highlighted that upgraded accommodation will create a healthier and more supported working environment. There have been numerous expressions of concern regarding the poor current status of the accommodation with regard to health, safety and hygiene.

The upgraded accommodation may assist to alleviate high staff turnover, which GGT has been affected by during the period 2005 to 2008 due to the resources boom. It has become apparent that GGT must meet the remote accommodation standards of the mining industry if it is to attract and retain skilled staff. The improved accommodation is also expected to improve job satisfaction and employee engagement.

The accommodation upgrade has been incorporated into the Enterprise Bargaining Agreement (EBA) negotiations due to the current condition of the existing accommodation and the improved requirements for remote location accommodation.

The proposed sites for the new accommodation are at the Leinster Base, Wiluna Compressor Station and the Paraburdoo Compressor Station. GGT's Actuals of the Capital Costs are $3.9 million for this new accommodation. GGT commenced this project in April 2008 where it sought and received competitive tenders from three companies for the construction and installation of accommodation at these three locations, where construction is scheduled to commence in April 2009. GGT's actuals for the Accommodation Project in 2008 were $0.1 million, which has been retained under the "Maintenance Bases and Depots" Capital Cost category as per the information provided to the independent auditor of GGT's 2005 to 2008 actuals.

The following sub-sections discuss the project scope, justification and major benefits of these accommodation upgrades for each location.

A2.6.1.1 Leinster base accommodation

Scope:

The project scope involves the following work:

(i) dismantling and removing the existing accommodation units at the Leinster Base;

(ii) relocation of some existing infrastructure is required and the preparation of the existing site;

(iii) installation of the new accommodation facilities is to be in the same location as the existing facilities; and

(iv) the new accommodation is to be built "in situ" with as much preparation and pre fabrication work as possible to be carried out off site.

GGT's Current Forecasts for the Leinster Base Accommodation are $1.5 million.

Justification:

In the past, Leinster Base has not been predominantly utilised as a 'manned' operations base, however, with the aging of the operating assets now requiring more frequent maintenance activities to be undertaken, the Leinster Base has now become a more focussed operations base and is permanently manned.

Due to increased BHP Billiton Nickel West Pty Ltd ("BHPBNW") focus in the northern goldfields region, the local accommodation in the town of Leinster is owned and managed by BHPBNW for their nickel mining operations. Therefore accommodation is only available on a short term basis when it is available. The priority is given to meet the requirements of BHPBNW around their maintenance, project and shut-down activities. The accommodation, when available is expensive and not suitably equipped for meal preparation and required facilities of more permanent operational personnel.

Staff retention has been an issue in some areas and the poor existing accommodation at the Leinster Base has been identified as part of the reason for some of the operations personnel to seek alternate employment.

The new accommodation design has been completed to best suit the requirements of the remote and arid areas where it is to be installed. The new accommodation design will be implemented at all sites to provide a consistent accommodation package which will be beneficial from construction, Industrial Relations and ongoing maintenance perspective.

Major Benefits:

The implementation of this upgrade will establish good industry practice and achieve the lowest sustainable cost for providing services. The new accommodation will create a healthier and more supportive working environment.

There have been numerous expressions of concern regarding the poor current status of the accommodation with regard to health, safety and hygiene. This upgrade will alleviate these concerns and the high staff turnover while improving job satisfaction and employee engagement.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The rigorous tender process demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A2.6.1.2 Wiluna compressor station accommodation

Scope:

The project scope involves the following work:

(i) dismantling and removing the existing accommodation units at the Wiluna Compressor Station;

(ii) preparation of the existing site and installation of the new accommodation facilities is to be in the same location as the existing facilities; and

(iii) the new accommodation is to be built "in situ" with as much preparation and pre fabrication work as possible to be carried out off site.

GGT's Current Forecasts for the Wiluna Compressor Station Accommodation are $1.2 million.

Justification:

In the past, it has not been a requirement to permanently man the Wiluna Compressor Station, however due to new customers connecting to the covered pipeline in the northern goldfields region since the construction of the GGP and also with the aging of the operating assets now requiring more frequent maintenance activities to be undertaken, both within the compressor station compound and the adjacent pipeline, the Wiluna Compressor station has now become a more permanently manned site.

Local accommodation in the town of Wiluna is not suitable for permanent accommodation and is only available at the local hotel which introduces additional health and safety issues. The local accommodation is expensive and not suitably equipped for meal preparation and required facilities of more permanent operational personnel.

Staff retention has been an issue in some areas and the poor accommodation at the Wiluna Compressor Station has been identified as part of the reason for some of the operations personnel to seek alternate employment.

The new accommodation design has been completed to best suit the requirements of the remote and arid areas where it is to be installed. The new accommodation design will be implemented at all sites to provide a consistent accommodation package which will be beneficial from construction, Industrial Relations and ongoing maintenance purpose.

Major Benefits:

The implementation of this upgrade will establish good industry practice and achieve the lowest sustainable cost for providing services. The new accommodation will create a healthier and more supportive working environment.

There have been numerous expressions of concern regarding the poor current status of the accommodation with regard to health, safety and hygiene. This upgrade will alleviate these concerns and the high staff turnover while improving job satisfaction and employee engagement.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The rigorous tender process demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A2.6.1.3 Paraburdoo compressor station accommodation

Scope:

The project scope involves the following work:

(i) dismantling and removing the existing accommodation units at the Paraburdoo Compressor Station;

(ii) preparation of the existing site and installation of the new accommodation facilities is to be in the same location as the existing facilities; and

(iii) the new accommodation is to be built "in situ" with as much preparation and pre fabrication work as possible to be carried out off site.

GGT's Current Forecasts for the Paraburdoo Compressor Station Accommodation are $1.2 million.

Justification:

In the past, it has not been a requirement to permanently man the Paraburdoo Compressor Station, however with the aging of the operating assets now requiring more frequent maintenance activities to be undertaken, both within the compressor station compound and the adjacent pipeline, the Paraburdoo Compressor station has now become a more permanently manned site.

Local accommodation in the town of Paraburdoo is controlled by Rio Tinto for their Iron Ore Mining Operations in the adjacent region. Accommodation is seldom available and only on a short term basis when it is available. Additionally, the accommodation available is at the local hotel which introduces additional health and safety issues.

The priority for this accommodation is given to meet the requirements of Rio Tinto around their maintenance, project and shut-down activities. The accommodation, when available is expensive and not suitably equipped for meal preparation and required facilities of more permanent operational personnel.

Paraburdoo township is located approximately 30 minutes away via unsealed roads and access is via the Paraburdoo mine site. Therefore it is preferred to be accommodated at the compressor station to minimise travel through an operational mine site, which raises health and safety issues.

Staff retention has been an issue in some areas and the poor accommodation at the Paraburdoo Compressor Station has been identified as part of the reason for some of the operations personnel to seek alternate employment.

The new accommodation design has been completed to best suit the requirements of the remote and arid areas where it is to be installed. The new accommodation design will be implemented at all sites to provide a consistent accommodation package which will be beneficial from construction, Industrial Relations and ongoing maintenance purpose.

Major Benefits:

The implementation of this upgrade will establish good industry practice and achieve the lowest sustainable cost for providing services. The new accommodation will create a healthier and more supportive working environment.

There have been numerous expressions of concern regarding the poor current status of the accommodation with regard to health, safety and hygiene. This upgrade will alleviate these concerns and the high staff turnover while improving job satisfaction and employee engagement.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The rigorous tender process demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A2.7 Other assets

For the "Other Assets" Capital Costs category, GGT's Actuals of $2.5 million were lower than the Authority Approved Forecast of $5.9 million.

It should be noted that GGT in its Authority Approved Forecast for the "Other Assets" Capital Cost category, post 2007 collapsed the forecasted Capital Costs into the "Other Assets" category and therefore, accounting for a major proportion of variation.

GGT has incorporated only one major capital project over this period, which is discussed below.

A2.7.1 ROW rectification works

Background:

In 2005, GGT incurred Capital Costs for rectification of the ROW at Kumarina. This cost has for historical and independent cost review, which has recently been undertaken by Deloitte Touche Tohmatsu been retained under the "Pipelines and Laterals" Capital Cost category.

GGT is now of the opinion that this Capital Cost is erroneously incorporated under this Capital Cost category, as it does not believe that these works have a depreciable life in keeping with "Pipelines and Laterals" Capital Cost category.

GGT considers that these Capital Costs in the future are best incorporated under the "Other Assets" Capital Cost category, which has a depreciable life of 10 years, which is more in keeping with this type of capital project.

Scope:

GGT has incorporated in its Current Forecasts of $0.4 million in 2009 based on these historical actuals for Pipelines and Laterals over the period of 2005 to 2009 and the pattern of GGT's expenditure over the period of 2005 to 2008 to cover the damage caused by cyclonic activity with ensuing repair to the GGP ROW.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The plan to conduct this work at the next scheduled service demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice

A3 Appendix 3 Forecast capital costs

Table A3.1 contains GGT's Forecast Capital Costs for the period 2010 to 2014.

Table A3.1: GGT's Forecast Capital Costs – 2010 to 2014 ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Pipeline and laterals	0.0	0.0	0.0	0.0	0.0
Main line valve and scraper stations	0.0	0.0	0.0	0.0	0.0
Compressor stations	4.0	1.8	0.8	0.9	0.9
Receipt and delivery point facilities	0.1	0.1	0.1	0.1	0.1
SCADA and communications	0.5	1.9	1.9	0.5	0.5
Cathodic protection	0.1	0.0	0.0	0.0	0.0
Maintenance bases and depots	0.0	0.0	0.0	0.0	0.0
Remote accommodation	0.0	0.0	0.0	0.0	0.0
Other assets	2.3	1.4	0.8	1.2	0.6
Total	**7.0**	**5.2**	**3.7**	**2.7**	**2.1**

GGT has developed this Current Forecast of Capital Costs (shown in Table A3.1 above) based on its December 2008 Forecast and its view of future increases in labour costs, materials costs and CPI, as per Appendices A4.3 to A4.6,

Minor capital expenditure is required during the life of any pipeline. This Current Forecast of Capital Costs covers the replacement of miscellaneous capital equipment and enhancements of peripheral and utility systems and equipment. In addition to minor capital expenditure, proposes to carry out, which could be considered, as major capital projects on the GGP.

GGT's Current Forecast of Capital Costs is comprised of:

- major capital expenditure projects (greater than $250,000);
- minor capital expenditure projects (less than $250,000); and
- "Stay-in-Business" capital expenditure by Capital Cost category.

At best GGT is able to forecast specific projects and their capital expenditure requirements for the next two years other than those national projects to be implemented by the APA Group. To be able to provide Capital Costs over a five year period, GGT has had to determine what its "Stay-in-Business" Capital Costs are over this period, where these costs are over and above those specific projects earmarked to be undertaken.

GGT has determined the quantum of its "Stay-in-Business" Capital Costs based on its historical actuals over the period of 2005 to 2008. GGT, has more specifically, determined the "Stay-in-Business" Capital Costs by calculating the arithmetic average of actual costs during the period 2005 to 2008 in December 2008 Dollars. This average is then escalated by the "Cost Escalator" shown in Table A4.12 in Section A4.5.

The following sub-sections discuss in more detail the major capital projects and the forecasted amount of "Stay-in-Business" Capital Costs that GGT plan to undertake and require during this period by Capital Cost category.

A3.1 Compressor stations

For the "Compressor Stations" Capital Costs category, GGT's Current Forecasts of $8.4 million comprising various individual capital projects and "Stay-in-Business Compressor Stations Capital Costs" discussed separately in the following sub-sections.

The following projects illustrate the capital expenditure required to secure existing supply at both Yarraloola and Ilgarari Compressor Stations. Yarraloola and Ilgarari Compressor Stations have two identical duty-standby reciprocating compressor units each. Engineering studies undertaken to date as part of the Yarraloola De-bottlenecking FEED Project, have identified several areas of concern, which may impact on the ongoing operability and compliance at these compressor stations. As a result of these studies the following "Stay-in-Business" capital projects will be initiated, as outlined below. The estimates are very preliminary at this stage until further detailed engineering can be completed.

A3.1.1 Yarraloola automatic variable pockets

Scope:

Installation of hydro pneumatically actuated Automatic Variable Volumetric Pockets ("AVVP") units on the compressor cylinders for capacity control, which will improve the operational flexibility of the compressors when process conditions change and thereby significantly improve the overall efficiency at the compressor station.

GGT's Current Forecasts of Capital Costs of $0.8 million to be expended in 2010.

Justification:

Changing the compressor configuration from single unit to dual unit operation or when operating process conditions change requires the pockets to change position. Manually changing the position will require personnel to be on site, and the unit to be shutdown before manually turning the pockets. This will require physical exertion and poses a risk to the health and safety of personnel. The process is expected to take approximately one to two hours, excluding travel time to and from site. AVVP units on the compressors will enable the pocket adjustment and/or switch between a single unit to a parallel operation to be automatic. This will eliminate the need for the site to be manned and for the compressor to be shutdown and purged to enable

the process of adjusting the pockets or switching between single and parallel operation.

Another issue is the pressure drop of 0.5 - 1.0 MPa currently across the Apache flow control valves. AVVP units will enable flow control on the compressors, enabling the Apache Flow Control Valve ("FCV") to be set at 100% open and hence reduce or remove the pressure drop induced by the FCV at the moment. This will improve the efficiency of the compressor station and increase its capacity. This will assist in enabling the GGP to meet its current contractual obligations.

The potential impacts if this project is not carried out are:

(i) if the compressors were switched from single unit operation to dual unit operation without adjusting the position of the variable pockets on the compressor cylinders to 100% open, the engine speed will drop below its minimum limit of 750 rpm and the compressor will shutdown on these low speeds. Conversely, when the engines are set up for dual unit operation and they require running in single unit operation, without pockets being adjusted, the engine will hit its maximum speed and will not be able to meet the required capacity; and

(ii) an upgrade to the compressor station will be required due to inefficiency induced by the pressure drop across the FCV. If this is to be avoided by running the compressors on flow control without the automatic pockets, the compressors may run into restricted speed ranges, which have been previously identified to cause high levels of torsional vibration. This can lead to crankshaft failure.

GGT considers this project necessary, as a result of:

- Ariel Performance software simulation results;
- January 2008 Engine Test results conducted in house; and
- the cost of third unit installation.

Major Benefits:

To maintain the integrity of contracted capacity and establish good industry practice while achieving a lower sustainable cost to provide services.

Use of AVVP will enable flow control operation on the compressors which will enable the Apache FCV to be set at 100% open, hence reducing the compression ratio on the compressors. This will also allow the compressor to self-select its speed and hence operate more efficiently.

In summary, this project will deliver:

- requirement to meet the current shipper demands;
- operational flexibility;
- reduced costs – i.e., lower fixed cost than third and/or larger unit and lower operating costs than having a manned site;
- improved efficiency;

- improved health and safety; and
- increased fuel efficiency.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The decision to undertake this project rather than install a third unit demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.1.2 Yarraloola air fuel ratio controllers

Scope:

GGT propose to install Altronic EPC-100E Air Fuel Ratio ("AFR") controllers, which enable the engine to adjust its air fuel ratio for optimum engine performance and prevent high exhaust temperatures. The Altronic AFR units monitor the exhaust temperature and oxygen content and improve reliability of the engines. The current AFR units are obsolete and inefficient and have been removed from operation.

GGT's Current Forecasts of Capital Costs of $0.2 million to be expended in 2010.

Justification:

Engine performance testing completed in January 2009 indicated that the engines were unable to reach speeds of above 1130 rpm without running into high temperatures.

The engines have been registering high boost pressure alarms at relatively low speeds (e.g. 900 - 1000rpm). The temperature and hence air density varies throughout the day. The gas quality varies due to varying blends of Apache and DBP Interconnect supplies. The speed fluctuates throughout the day due to changing linepack and hence fluctuating discharge pressure at the compressors, which conversely affects the load on the compressor. Hence it is not possible to tune the engines with manual combustion (O2) analysers once every few days and expect the engine to maintain an optimal carburettor setting throughout the day.

Engine valves burn out regularly and this could be due to the engine running leaner (these are rich burn engines), which could be increasing the combustion temperature due to the air fuel ratio being closer to the stoichiometric air fuel ratio. Manual tuning poses the additional problem of having to tune the left bank and right bank separately and achieving balance as these are V16 engines.

Potential impacts if this project is not carried out are:

(i) the engine does not develop rated power and consequently creating reduced capacity;

(ii) the engine fails to achieve its maximum speed of 1200rpm or speeds above 1050 rpm reliably and hence there will be a failure to meet demand despite it being within the rated capability of the engines; and

(iii) possible engine detonation due to incorrect air fuel ratio on the engines. This can have health and safety consequences if the detonation leads to gas leakage and personnel are present at site if/when this occurs.

- From the January 2009 engine test results and SCADA alarms, GGT has identified that this project necessary.

Major Benefits:

To maintain the integrity of contracted capacity and establish good industry practice while achieving a lower sustainable cost to provide services.

The AFR controller will assist the engine to operate closer to its maximum speed of 1200 rpm instead of being restricted at 1110-1130rpm.

In summary, this project will deliver:

- requirement to meet the current shipper demands;
- operational flexibility;
- reduced costs – i.e., lower fixed cost than third and/or larger unit and lower operating costs than having a manned site;
- improved efficiency and integrity; and
- improved health and safety.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The decision to proceed with this project rather than install a third or larger unit, or permanently man the site, demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.1.3 Yarraloola compressor hazardous area declassification

Scope:

Yarraloola compressor enclosures are currently classified as Zone 1. Electrical equipment with Zone 2 certification is installed on both compressor engines. The compressor enclosures require to be declassified to Zone 2 to ensure compliance. Declassification will be achieved by either creating sufficient natural ventilation or through means of forced ventilation.

GGT's Current Forecasts of Capital Costs of $1.0 million to be expended in 2010.

Justification:

Altronic ignition module installed on the engines were found to be non compliant to Hazardous Area Zone 1 requirements.

If this project is not carried out then:

(i) possible non compliance of hazardous area ("HA") Australian Standards and APA Group specifications; and

(ii) possible breach of pipeline license conditions.

The following list of HA standards and specifications are required to be met by GGT:

- AS 60079.1- Classification of Hazardous Areas;
- AS 2430 Classification of Hazardous Areas;
- AS 60079.10- Classification of Hazardous Areas – General;
- AS/NZS 2403.3- Classification of Hazardous Areas – Specific Occupancies;
- IEC 60079- Series - Hazardous Area Electrical Equipment;
- AGI-MP-111 EEHA Main Standard; and
- AGI-MP-121 EEHA Assessment of Non-ANZ/IEC/AUSEX Equipment Standard.

Major Benefits:

The majority of electrical equipment supplied for the compressors and engines only have Zone 2 equivalent certification. Finding alternate equipment which satisfies Zone 1 requirements will reduce the product availability as well as prove to be an expensive design, procurement and certification exercise. The replacement for the existing Altronic ignition modules may be less effective and lead to engine trips and other problems which can interfere with the operability of the compressors.

Declassifying the compressor enclosures to Zone 2 will ensure safety for all equipment installed within the compressor buildings, instead of the piece-meal approach of seeking statement of opinion to certify individual electrical equipment for Zone 1 compliance. This is a safer alternative.

In summary, this project will deliver:

- improved efficiency and integrity;
- Code and Pipeline Licence compliance; and
- improved health and safety.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The decision to declassify the site rather than replace the existing equipment demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.1.4 Ilgarari automatic variable pockets

Scope:

Installation of hydro pneumatically actuated Automatic Variable Volumetric Pockets (“AVVP”) units on the compressor cylinders for capacity control, which will improve the operational flexibility of the compressors when process conditions change and thereby significantly improve the overall efficiency at the compressor station.

GGT’s Current Forecasts of Capital Costs of $0.8 million to be expended in 2011.

Justification:

Changing the compressor configuration from single unit to dual unit operation or when operating process conditions change requires the pockets to change position. Manually changing the position will require personnel to be on site, and the unit to be shutdown before manually turning the pockets. This will require physical exertion and poses a risk to the health and safety of personnel. The process is expected to take approximately one to two hours, excluding travel time to and from site. AVVP units on the compressors will enable the pocket adjustment and/or switch between a single unit to a parallel operation to be automatic. This will eliminate the need for the site to be manned and for the compressor to be shutdown and purged to enable the process of adjusting the pockets or switching between single and parallel operation.

Potential impacts if this project is not carried out then if the compressors were switched from single unit operation to dual unit operation without adjusting the position of the variable pockets on the compressor cylinders to 100% open, the engine speed will drop below its minimum limit of 750 rpm and the compressor will shutdown on these low speeds. Conversely, when the engines are set up for dual unit operation and they require running in single unit operation, without pockets being adjusted, the engine will hit its maximum speed and will not be able to meet the required capacity. GGT considers this project necessary, as a result of:

- Ariel Performance software simulation results;
- January 2008 Engine Test results conducted in house; and
- the cost of third unit installation.

Major Benefits:

To maintain the integrity of contracted capacity and establish good industry practice while achieving a lower sustainable cost to provide services.

In summary, this project will deliver:

- requirement to meet the current shipper demands;
- operational flexibility;
- reduced costs – i.e., lower fixed cost than third and/or larger unit and lower operating costs than having a manned site;
- improved efficiency;
- improved health and safety; and
- increased fuel efficiency.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The decision to undertake this project rather than install a third unit demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.1.5 Ilgarari air fuel ratio controllers

Scope:

GGT propose to install Altronic EPC-100E Air Fuel Ratio ("AFR") controllers, which enable the engine to adjust its air fuel ratio for optimum engine performance and prevent high exhaust temperatures. The Altronic AFR units monitor the exhaust temperature and oxygen content and improve reliability of the engines. The current AFR units are obsolete and inefficient and have been removed from operation.

GGT's Current Forecasts of Capital Costs of $0.3 million to be expended in 2011.

Justification:

Engine performance testing completed in January 2009 indicated that the engines were unable to reach speeds of above 1130 rpm without running into high temperatures.

The engines have been registering high boost pressure alarms at relatively low speeds (e.g. 900 - 1000rpm). The temperature and hence air density varies throughout the day. The gas quality varies due to varying blends of Apache and DBP Interconnect supplies. The speed fluctuates throughout the day due to changing linepack and hence fluctuating discharge pressure at the compressors, which conversely affects the load on the compressor. Hence it is not possible to tune the engines with manual combustion (O2) analysers once every few days and expect the engine to maintain an optimal carburettor setting throughout the day.

Engine valves burn out regularly and this could be due to the engine running leaner (these are rich burn engines), which could be increasing the combustion temperature due to the air fuel ratio being closer to the stoichiometric air fuel ratio. Manual tuning poses the additional problem of having to tune the left bank and right bank separately and achieving balance as these are V16 engines.

Potential impacts if this project is not carried out then:

(i) the engine does not develop rated power and consequently creating reduced capacity;

(ii) the engine fails to achieve its maximum speed of 1200rpm or speeds above 1050 rpm reliably and hence there will be a failure to meet demand despite it being within the rated capability of the engines; and

(iii) possible engine detonation due to incorrect air fuel ratio on the engines. This can have health and safety consequences if the detonation leads to gas leakage and personnel are present at site if/when this occurs.

From the January 2009 engine test results and SCADA alarms, GGT has identified that this project necessary

Major Benefits:

To maintain the integrity of contracted capacity and establish good industry practice while achieving a lower sustainable cost to provide services.

The AFR controller will assist the engine to operate closer to its maximum speed of 1200 rpm instead of being restricted at 1110-1130rpm.

In summary, this project will deliver:

- requirement to meet the current shipper demands;
- operational flexibility;
- reduced costs – i.e., lower fixed cost than third and/or larger unit and lower operating costs than having a manned site;
- improved efficiency and integrity; and
- improved health and safety.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The decision to proceed with this project rather than install a third or larger unit, or permanently man the site, demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.1.6 Ilgarari compressor hazardous area declassification

Scope:

Ilgarari compressor enclosures are currently classified as Zone 1. Electrical equipment with Zone 2 certification is installed on both compressor engines. The compressor enclosures require to be declassified to Zone 2 to ensure compliance. Declassification will be achieved by either creating sufficient natural ventilation or through means of forced ventilation.

GGT's Current Forecasts of Capital Costs of $0.2 million to be expended in 2010.

Justification:

Altronic ignition module installed on the engines were found to be non compliant to Hazardous Area Zone 1 requirements.

If this project is not carried out then:

(i) possible non compliance of hazardous area ("HA") Australian Standards and APA Group specifications; and

(ii) possible breach of pipeline license conditions.

The following list of HA standards and specifications are required top be met by GGT:

- AS 60079.1- Classification of Hazardous Areas;
- AS 2430 Classification of Hazardous Areas;
- AS 60079.10- Classification of Hazardous Areas – General;
- AS/NZS 2403.3- Classification of Hazardous Areas – Specific Occupancies;
- IEC 60079- Series - Hazardous Area Electrical Equipment;
- AGI-MP-111 EEHA Main Standard; and

- AGI-MP-121 EEHA Assessment of Non-ANZ/IEC/AUSEX Equipment Standard.

Major Benefits:

The majority of electrical equipment supplied for the compressors and engines only have Zone 2 equivalent certification. Finding alternate equipment which satisfies Zone 1 requirements will reduce the product availability as well as prove to be an expensive design, procurement and certification exercise. The replacement for the existing Altronic ignition modules may be less effective and lead to engine trips and other problems which can interfere with the operability of the compressors.

Declassifying the compressor enclosures to Zone 2 will ensure safety for all equipment installed within the compressor buildings, instead of the piece-meal approach of seeking statement of opinion to certify individual electrical equipment for Zone 1 compliance. This is a safer alternative.

In summary, this project will deliver:

- improved efficiency and integrity;
- Code and Pipeline Licence compliance; and
- improved health and safety.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The decision to declassify the site rather than replace the existing equipment demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.1.7 Ilgarari crankshaft change out at Unit 1

Scope:

In late 2008 / early 2009, GGT identified a need to change out the crankshaft of compressor unit 1 at Ilgarari.

One of the compressor engines has AISI 1046 crankshaft material. The crankshaft material on unit 2 has been changed to a new crankshaft material AISI 4140. The engine shaft stress limit for AISI 1046 crankshaft is lower than that for the AISI 4140 crankshaft. Torsional analysis studies shows the AISI 1046 crankshaft stress limit is exceeded by the current compressor and engine configuration. Hence the Unit 1 crankshaft material will need to be changed out during the next major service. This will be a significant project.

GGT's Current Forecast of Capital Costs for this project is $0.6 million for 2010.

Justification:

Crankshaft failures have previously occurred at Ilgarari unit 1. When the crankshafts failed, the engine manufacturer, Waukesha, offered a new crankshaft material AISI 4140 to replace the old AISI 1046 material. However, unit 2 at Ilgarari still has the old crankshaft materials. Torsional analysis studies conducted by Beta

Machinery Analysis in 2008 identified that the old crankshaft material falls significantly short of the torsional stress limit.

Following the failure of Unit 2 crankshaft at Yarraloola, the torsional vibration dampers (TVD) at both Units 1 and 2 at Yarraloola were replaced with new dual dampers. The old damper removed from Unit 1 was found to have the internals solidified (i.e. it had failed) and hence the Unit 1 crankshaft may have already sustained some damage which has yet to propagate to a full failure. This has implications for the unit at Ilgarari.

If this project is not carried out then failure of the crankshaft can lead to catastrophic failure and permanent damage to engine. This can lead to loss of redundancy at Ilgarari compressor station for a period of approximately 6-7 months. Due to the criticality of the Ilgarari compressor station for operation of the GGP, any maintenance or unplanned shutdown at Ilgarari can lead to loss of supply on the GGP. Replacing an engine is a costly exercise.

Major Benefits:

Implementation of this project will provide the following benefits:

- prevent likelihood of torsional failure which can result in catastrophic engine failure which will lead to a downtime of approximately 32 weeks;
- securing the operation of the GGP to meet contractual obligations;
- prevent loss of redundancy at Ilgarari Compressor Station;
- safeguarding of operational personnel and equipment;
- replacing the crankshaft during the next 48,000 hour service in early 2010 is more cost effective due to personnel, plant and equipment been mobilised to site; and
- less expensive than replacing the engine.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The plan to conduct this work at the next scheduled service demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice

A3.1.8 Ilgarari crankshaft/engine-compressor coupling mods

Scope:

In late 2008 / early 2009, GGT identified a need to modify the crankshaft coupling at Ilgarari.

Torsional analysis studies have identified the existing compressor and engine system exceeds recommended torsional vibration levels. In order to resolve this issue, several options are available, such as installing a flywheel on the compressor crankshaft and changing the coupling.

GGT's Current Forecast of Capital Costs for this project is $0.2 million for 2010.

Justification:

Crankshaft failures have occurred at Yarraloola and Ilgarari units. Torsional analysis studies conducted by Beta Machinery Analysis in 2008 identified that the old crankshaft material significantly exceeds the torsional stress limit of the old crankshaft material for the current configuration and the new crankshaft material will exceed this limit only marginally. It has been identified that changing the coupling and installing a compressor flywheel can increase the torsional stress limit of the existing configuration. Monitoring the TVD temperature continuously is the only means by which to identify any possible problems with the crankshaft before failure.

If this project is not carried out then failure of the crankshaft can lead to catastrophic failure and permanent damage to engine. This can lead to loss of redundancy at Ilgarari Compressor Station for a period of approximately 6-7 months. Due to the criticality of the Ilgarari Compressor Station for operation of the GGP, any maintenance or unplanned shutdown at Ilgarari can lead to loss of supply on the GGP. Replacing an engine is a costly exercise.

Major Benefits:

Implementation of this project will provide the following benefits:

- prevent likelihood of torsional failure which can result in catastrophic engine failure which will lead to a downtime of approximately 32 weeks;
- securing the operation of the GGP to meet contractual obligations;
- prevent loss of redundancy at Ilgarari Compressor Station;
- safeguarding of operational personnel and equipment;
- replacing the crankshaft during the next 48,000 hour service in early 2010 is more cost effective due to personnel, plant and equipment been mobilised to site; and
- less expensive than replacing the engine.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The plan to conduct this work at the next scheduled service demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice

A3.1.9 Yarraloola ESD/fire and gas system replacement

Scope:

During 2004/05, GGT identified via a FEED that the ESD/Fire and Gas System at Ilgarari and Yarraloola needed to be replaced due to the age of the existing equipment and the number of unwarranted trips due to either gas or fire detection system failing, i.e., existing systems were causing a number of unwarranted trips due to the false detection of gas on site. In 2005, GGT decided to initially carry out this project initially on the Ilgarari Compressor Station. GGT expects to complete the work at the Ilgarari Compressor Station in 2009 (refer to Appendix A2.3.3).

GGT propose to commence similar work at Yarraloola in 2010 and expect the project to be completed in 2 years.

GGT's Current Forecast of Capital Costs for this project is $0.4 million.

Justification / Major Benefits:

This project is required to improve the reliability of the fire and gas detectors. The new detectors will allow for more diagnostic information to be obtained, which aids in troubleshooting, as well as preventing spurious trips due to faults. The new detectors and fire and gas PLC will allow for improved functionality to be utilised and improved alarming while maintaining existing ESD functionality.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code.

A3.1.10 Stay-in-business compressor station capital costs

Scope:

GGT has incorporated "Stay-in-Business Compressor Station Capital Costs" of $3.6 million for the period of 2010 to 2014 based on Compressor Station actual capital costs over the period of 2005 to 2008.

A3.2 Receipt and delivery point facilities

For the "Receipts and Delivery Point Facilities" Capital Costs category, GGT's Current Forecasts of Capital Costs of $0.3 million for the period of 2010 to 2014 comprising individual capital projects and/or "Stay-in-Business Receipts and Delivery Point Facilities Capital Costs" discussed separately in the following sub-section.

A3.2.1 Stay-in-business receipts and delivery point facilities capital costs

GGT has incorporated "Stay-in-Business Receipts and Delivery Point Facilities Capital Costs" of $0.3 million for the period of 2010 to 2014 based on Receipts and Delivery Point Facilities actual capital costs over the period of 2005 to 2008.

A3.3 SCADA and communications

For the "SCADA and Communications" Capital Costs category, GGT's Current Forecasts of Capital Costs of $5.6 million for the period of 2010 to 2014 comprising individual capital projects and/or "Stay-in-Business SCADA and Communications Capital Costs" discussed separately in the following sub-sections.

A3.3.1 SCADA replacement

Background:

The current GGP SCADA system was based on the MacroView software that was developed in the mid 1990s. MacroView was originally developed by Vector International in the 1990s for the Unix Operating System. Until recently MacroView has only ever had a minor presence in Australia being sold under licence. In October 2008, Sentient Computing Pty Ltd ("Sentient"), (a West Australian company) acquired the rights to use the MacroView SCADA/HMI system in the coal, oil, gas, mining, production and power industries.

Sentient purchased the rights to use and develop the source code to MacroView until 2012 also provide the support for the GGP system. However Sentient have only modest plans for the marketing of MacroView and within the Australasia region, there is only limited support for MacroView.

GGT has identified this as a major risk in continuing with the MacroView platform and a program to replace the SCADA system in the financial year 2011-2012 has commenced.

Scope:

Replacement of GGP's SCADA system in 2011/12 at GGT's Current Forecast of Capital Costs of $2.9 million.

This forecast is based on the cost of circa $2.5 million (2008 dollars) that the APA Group incurred in replacing the SCADA system for the Moomba Sydney Pipeline (MSP). The MSP and associated laterals have a similar length to the GGP and has a similar number of data points and remote stations.

Justification:

Failure to upgrade GGP's SCADA system would have exposed GGT to the progressively increasing probability of loss of functionality of the existing SCADA system serving the GGP.

Reliable operation of the SCADA systems serving the GGP is critical to its operating regimes. Prolonged loss of SCADA system functionality would require continuous manning of many remote pipeline locations. Such action would incur substantial costs and create correspondingly substantial resourcing problems.

Major benefits

Replacement of the GGP's SCADA system in 2011/12 will permit the operation of the GGP to continue on a 'business as usual' basis. As such, the benefits of remote monitoring and control of facilities distributed along the length of the pipeline, as distinct from continuous manning of those locations, have been maintained.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code.

A3.3.2 Stay-in-business SCADA and communications capital costs

GGT has incorporated "Stay-in-Business SCADA and Communications Capital Costs" of $2.6 million for the period of 2010 to 2014 based on SCADA and Communications actual capital costs over the period of 2005 to 2008.

A3.4 Cathodic protection

For the "Cathodic Protection" Capital Costs category, GGT's Current Forecasts of Capital Costs of $0.2 million for the period of 2010 to 2014 comprising individual projects and/or "Stay-in-Business Cathodic Protection Capital Costs" discussed separately in the following sub section.

A3.4.1 Stay-in-business cathodic protection capital costs

GGT has incorporated "Stay-in-Business Cathodic Protection Capital Costs" of $0.2 million for the period of 2010 to 2014 based on Cathodic Protection actual capital costs over the period of 2005 to 2008.

A3.5 Other assets

For the "Other Assets" Capital Costs category, GGT's Current Forecasts of Capital Costs of $4.3 million for the period of 2010 to 2014 comprising individual projects and/or "Stay-in-Business Other Assets Capital Costs" discussed separately in the following sub-sections.

A3.5.1 ROW rectification works

GGT Current Forecasts of Capital Costs of $0.9 million for ROW Rectification Works based on Pipelines and Laterals actual costs and the pattern of GGT's expenditure over the period of 2005 to 2008 to cover the damage caused by cyclonic activity with ensuing repair to the GGP ROW. GGT has forecast this capital expenditure to occur in every second year for Other Assets in 2011 and 2013.

A3.5.2 Gas contract management and invoicing system

GGT currently forecasts gas contract management and invoicing system capital costs at $0.4 million (December $2008) to be implemented in 2010 and 2011.

This is an allocation of a broader APA Group project with an estimated capital cost of $2.5 million. This estimate may change as the scope of the project is finalised.

A gas contract management system and invoicing system is needed across the APA Group. Such a system would manage shipper receipts, shipper deliveries shipper imbalances, nominations, allocations, invoicing and other customer – pipeliner interfaces and management processes. The system would also facilitate and improve contract administration, communications with interconnecting parties and capacity modeling.

Current systems used on APA's pipelines are inadequate as they are largely Microsoft Excel or Microsoft Access based and are currently operating at the limits of this technology. Given increasing customer, regulator and internal demands for information these current systems need to be replaced by more sophisticated and stable systems in order to improve information reporting, information consistency, information integrity and support.

A gas contract management and invoicing system is in the process of being scoped and is currently estimated to have a capital cost of approximately $2.5 million dollars (December $2008). This estimate is based on the midpoint of current capital cost estimates and is broadly consistent with a recent gas contract management system implemented by SEAGas. GGT understands that, earlier this decade, the SEAGas pipelines implemented a similar system at a cost of approximately $1.0 million for a single pipeline.

Of the total estimated capital cost of $2.5 million dollars (December $2008) GGT would bear approximately 18% (i.e., $0.4 million). This allocation is based on the corporate cost allocation outlined in Appendix A4.8.

It should be recognised that this project is currently being finalised and costings may change in the near future.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The sharing of this cost among other pipelines demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.5.3 Asset management systems, document management systems and other IT

GGT currently forecasts of Capital Costs for new IT systems or substantial IT system upgrades costs at $0.2 million (December $2008) to be implemented in 2011 and 2012.

These new IT systems or substantial IT upgrades are to be implemented in relation to:

- Asset management systems; in particular current asset management systems require integration into current and future finance systems
- Document management systems; in particular current GGT document management systems will require upgrading and integration into the APA document management system in the next 5 years

In addition to the above costs, IT upgrades and new IT systems can be expected to occur over the next five years - particularly if bulletin boards, short term trading markets, emissions trading markets and similar regulatory changes are introduced in Western Australia.

The total costs of new IT systems are currently estimated at $1.1 million.

Of the total estimated capital cost of $1.1 million dollars ($December $2008) GGT would bear approximately 18% (i.e., approximately $0.2 million). This allocation is based on the corporate cost allocation outlined in Appendix A4.7

It should be recognised that these projects are currently being finalised and costings may change in the near future.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code.

The sharing of this cost among other pipelines demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.5.4 Finance transformation project

GGT currently forecasts of Capital Costs for new finance IT system capital costs at $0.4 million (December $2008) to be implemented in from 2009 through to 2013.

This is an allocation of a broader APA Group project with an estimated capital cost of $2.0 million.

The APA Group, which provides financial services to GGT, is currently going through a process of rationalising the multiple IT finance systems and applications it uses. (APA currently has three separate major finance systems being used. The technology used in some of these systems is such that significant increases in maintenance costs are expected if the systems are not upgraded or replaced). The project includes replacement and rationalisation of the systems and applications across APA including those systems and applications used to support GGT.

In particular the project seeks to establish common finance processes, common charts of accounts and a single source for all financial information.

In the longer term, beyond 2014, these new systems are expected to reduce costs applicable to GGT, as single systems across the whole of APA will lead to efficiency benefits and cost.

Total costs for the project were estimated at $8.0 million at the time of the Access Arrangement. These costs were based on total project cost estimates of $8.0 million provided by an external party. APA management then allocated these costs as $2 million for capital expenditure and $6 million to operating expenditure. These costs were spread over the period 2009 to 2013.

Of the total capital cost of $2.0 million dollars (December $2008) GGT would bear approximately 18% (i.e., $0.4 million). This allocation is based on the corporate cost allocation outlined in Appendix A4.7.

It should be recognised that this project is currently being finalised and capital costings are likely change in the near future, in particular cost timings, cost values and the split between capital and operating costs may change as the project is finalised.

It should also be recognised that the operating costs for this project are included in the APA corporate cost forecasts allocated to GGT in Appendix A4.7.5.

GGT submits that this expenditure is necessary to maintain the safety, integrity or Contracted Capacity of Services as envisioned in Section 8.16(a)(ii)(C) of the Code. The sharing of this cost among other pipelines demonstrates that the cost will not exceed the amount that would be invested by a prudent Service Provider acting efficiently, in accordance with accepted good industry practice.

A3.5.5 Perth office renovations

GGT's Current Forecast of Capital Costs includes $1.5 for the renovation of GGT's Perth Office to accommodate the return of APTPWA's Projects Division.

Justification:

APTPWA's Projects Division is currently located at Level 5, 190 St George's Terrace, Perth. The lease to this office space expires in May 2010 and at that time, the Projects Division will be housed back within GGT's Perth Office, which will have sufficient vacant space to accommodate them. This will result in a reduction to GGT's costs.

A3.5.6 Stay-in-business other assets capital costs

GGT has incorporated "Stay-in-Business Other Assets Capital Costs" of $2.6 million for the period of 2010 to 2014 based on Other Assets actual capital costs over the period of 2005 to 2008.

A4 Appendix 4 Non Capital costs

A4.1 Non Capital costs 2005 to 2009

Table A4.1 provides a detailed comparison between actual Non Capital Costs incurred by GGT during the period 2005 to 2008 and GGT's Current Forecasts for 2009 ("Actuals") as opposed to forecasts for period 2005 to 2009 based on GGT's Programme and Budget for 2004/05 ("Authority Approved Forecast"), which were submitted to the Authority by GGT on 23 June 2005.

GGT's Actuals for Non Capital Costs of $103.0 million are 13.5% higher than the Authority Approved for Non Capital Costs of $90.8 million.

Table A4.1: GGT's Non Capital Costs – Actuals versus Authority Approved Forecast – 2005 to 2009 ($m)

"[Information Confidential]"

The following sub-sections separately discuss the reasons for variations between GGT's Actuals and Authority Approved Forecast by each cost area and by business unit and/or cost centre.

A4.1.1 Operations and maintenance – 2005 to 2009

Table A4.1 reveals that there is insignificant variation between GGT's Actuals and the Authority Approved Forecast for "Operations and Maintenance" over the period 2005 to 2009. GGT's Actuals of $65.5 million are 1.1% higher than the Authority Approved Forecast of $64.8 million.

Even though there is an insignificant variation mentioned above, GGT has been materially affected by the resources boom and the resulting labour shortage, which has resulted in:

(i) GGT operating at below full complement of the required number of Full Time Equivalent ("FTE")s due to high staff turnover and difficulties attracting candidates to fill vacant positions; and

(ii) its existing cost structures encountering large labour and materials cost increases over this period due respectively to its endeavours to retain staff and effect the resources boom has had on the supply of materials required by GGT.

It must be clearly understood that GGT has been affected by difficulties offering salaries that are competitive with large resource-based companies involved in brownfield and/or greenfield projects.

Table A4.1 shows that "Operations and Maintenance Costs" are comprised of:

- APA Operations Costs (Agility);
- Major Expenditure Jobs ("MEJs"); and
- GGT Operating Costs.

Each of these cost areas will be discussed separately below.

A4.1.1.1 APA operations costs – 2005 to 2009

In managing its operational responsibilities, APTPWA maintains the GGP assets with due regard to:

(i) obligations under the Operating Agreement to ensuring expenditures on the pipeline assets are efficient, prudent and cost effective;

(ii) ensure the safe and reliable operation of the GGP and ensure that GGT meets all technical regulatory and environmental requirements;

(iii) accepted pipeline practice,

(iv) in accord with the requirements of the Australian Standard AS2885 Pipelines, Gas, Liquid and Petroleum – Design, Construction and Operation;

(v) in accord with the minimum requirements of the applicable regulators, Department of Industry and Resources ("DoIR") and Department of Commerce (Energy Safety Division); and

(vi) in accord with equipment manufacturers recommendations as appropriate to the GGP.

Table A4.1 shows that that there is insignificant variation between GGT's Actuals and the Authority Approved Forecast for "APA Operations Costs" over the period 2005 to 2009. GGT's Actuals of $43.1 million are 1.5% higher than the Authority Approved Forecast of $42.5 million.

However, in more detail, Table A4.1 reveals that down at the "Business Unit" level for "APA Operations Costs" that GGT's Actuals do vary when compared to the Authority Approved Forecast as follows:

- Administration (Business Services) – GGT's Actuals of $1.8 million are significantly lower than the Authority Approved Forecast of $3.3 million due to a combination of reduced staff levels and efficiencies gained by APA Group's purchase of the Agility contract / business;
- Operations (Field Services) – GGT's Actuals of $34.9 million are lower than the Authority Approved Forecast of $35.2 million due to:
  - GGT has removed the additional costs (circa $0.1 million for period following 1 January 2007) of operating the second compressor at Paraburdoo;
  - Labour Recoverable normally incorporated under GGT Operating Costs was directly incorporated in 2005 and the first 6 months of 2006 under the Operations (Field Services) Business Unit; and
  - even taking into account the significant rises in labour and materials costs, GGT's actuals costs were lower than forecast due to the fact that throughout this period "Field Services Business Unit" suffered due to difficulty in retaining staff caused by the resources boom in Western Australia over this period; and
- Engineering (Engineering & Projects) – GGT's Actuals of $6.4 million were higher than the Authority Approved Forecast of $4.1 million due to a combination of:
  - additional engineering staff (4 FTEs) recruited over the period of 2005 to 2007 to support the first compressor installed in 2003/2004 and ongoing compressor operations at Paraburdoo and further engineering and support staff (circa 4 FTEs) appointed in 2007 and 2008 to cover increase work demand due to ageing equipment; plus
  - labour and materials cost increases, which are explained in greater detail in Appendix A4.1.1.2.

A4.1.1.2 Labour and materials costs increases – 2005 to 2009

The following discussion provides evidential and substantive support to GGT's assertion that its labour and materials costs increased significantly during the period 2005 to 2008.

GGT has been affected like other Western Australian based companies by the resources boom over the period of 2005 to 2008. GGT has to compete with other resource based companies for retaining its existing and recruiting new professional, engineering and technical staff.

Historically, GGT's operations and maintenance costs increase due to cost increases in labour and materials. GGT has determined that its operational cost profile is related to labour (70%) and materials (30%) based on historical actuals.

Throughout this period of 2005 to 2008, various private organisations[23,24,25,26,27,28] and governments both State[29,30] and Federal[31,32,33] have published articles indicating that Australia and specifically the states of Western Australia and Queensland suffered from a skills shortage because of the unprecedented resources boom, which has resulted in labour costs increasing due to wages rising rapidly.

For example, in 2004, BHPB, at the time touted the Ravensthorpe Project's "low mining costs" and said it offered "just about the best risk-reward profile" of any similar nickel project in the world.[34] In 2005, it estimated cost the cost of this project to be US$1.1 billion.[35] In late 2006, BHPB increased Ravensthorpe's budget to A$2.2 billion as material and labour costs ballooned.[36] In its 2008 Annual Report, BHPB reported the cost to be US$2.2 billion, as a result of material and labour cost increases.

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[23] Quarterly Report period ending 31 December 2005, Mt Gibson Iron Limited

[24] Submission by Alcoa Of Australia to the State Infrastructure Strategy, February 2006

[25] Coping with the resources boom, November 2006, Hans Kunnen, Colonial First State

[26] Chairman's Address, Annual general Meeting, 17 November 2006, Gunson Resources Limited

[27] Discussion Paper: Gas Issues in Western Australia, June 2007, Economic Regulatory Authority Western Australia

[28] Form 6-K, Securities and Exchange Commission, March 2008, Rio Tinto

[29] Minerals and Energy Research News, Vol. 25, No. 2, July 2007, Minerals and Energy Research Institute of Western Australia

[30] Overview of demand for professionals, associate professionals and managers: Western Australia – June 2008, Labour Economics Office Western Australia , Department of Education, Employment and Workplace Relations

[31] Economic Conditions and Prospects, 11 October 2006, Glenn Stevens, Governor, Reserve Bank of Australia

[32] AIG Economy 2007 – Global Realities for Australia, 6 March 2007, Steven Kennedy and Phil Gordon, Treasury Dept., Federal Government

[33] Statement of Monetary Policy – May 2007, Reserve Bank of Australia

[34] High Costs Dig Into Mine Profits, 25 August 2008, Patrick Barta, The Wall Street Journal

[35] BHP Billiton Quarterly Report On Exploration And Development Activities, January 2005 to March 2005, 8 April 2008

[36] High Costs Dig Into Mine Profits, 25 August 2008, Patrick Barta, The Wall Street Journal

In its Minerals Industry Survey Report 2007, PriceWaterhouseCoopers indicated that between 2005/06 and 2006/07 there was a 16 percent increase in labour costs from $6.5 billion to $7.5 billion within the Mining Industry.

In August 2007, BHP Billiton Pty Ltd ("BHPB") was quoted as saying that labour shortages were a threat to Western Australia's global market share in the iron ore market.[37]

In fact, in 2008 the resources industry had to suffer labour cost increases of close to 20 per cent[38], which is well above the wage price increases reflected by Australian Bureau of Statistics.

In its 2007/08 review of financial results, BHPB indicated that (underlined and italicised for emphasis):

> *Strong global demand for resources continues to provide cost challenges for the whole industry. This is mainly due to shortages of skilled labour and rising prices for other inputs such as diesel, coke and explosives. However, our world-class orebodies, strong supplier relationships, systems and capabilities of our people have provided some relief against cost increases. In this environment, costs for the Group have increased by US$1,183 million. Approximately US$575 million of the increase in costs was due to higher fuel, energy and raw materials costs. Severe weather interruptions in Queensland also had an adverse cost impact. Other areas of cost increase include labour and contractor charges and shipping and freight costs.*[39]

In October 2008, Minara in an ASX release said "All companies in the resources sector have experienced sustained increased cost pressures across the board. In particular, labour, materials, freight and fuel have put upward pressure on the operating costs of Minara and others." [40]

Given the significant labour cost increases that have affected the Resources Industry and the fact that GGT has had to compete with the Resources Industry for these scare resources this has resulted in the above and below reported cost increases and forecast increases.

Table A4.2 highlights the percentage change in APTPWA actual and forecast costs between 2004/05 and 2008/09. Data is shown in financial years and is based on comparing GGT's annual December Forecast (includes 6 months of actuals) against the following year's Programme and Budget.

[37] Labour shortage is biggest threat to iron strength says BHP, 21 August 2007, The West Australian

[38] Performance is going down the mine, 10 December 2007, David Urn, Economist, The Australian

[39] Operating Results, http://www.bhpbilliton.com/annualreports2008/2008-business-review-and-annual-report/annual-report/operating-and-financial-review-and-prospects/operating-results/index.html

[40] Open Briefing: Minara. Operating & Financial Performance & Outlook, 9 October 2008

Table A4.2: Percentage Change in Operations Costs

Financial Year	% Change
2004/05	9.1
2005/06	8.7
2006/07	0.3
2007/08	19.0
2008/09	39.0

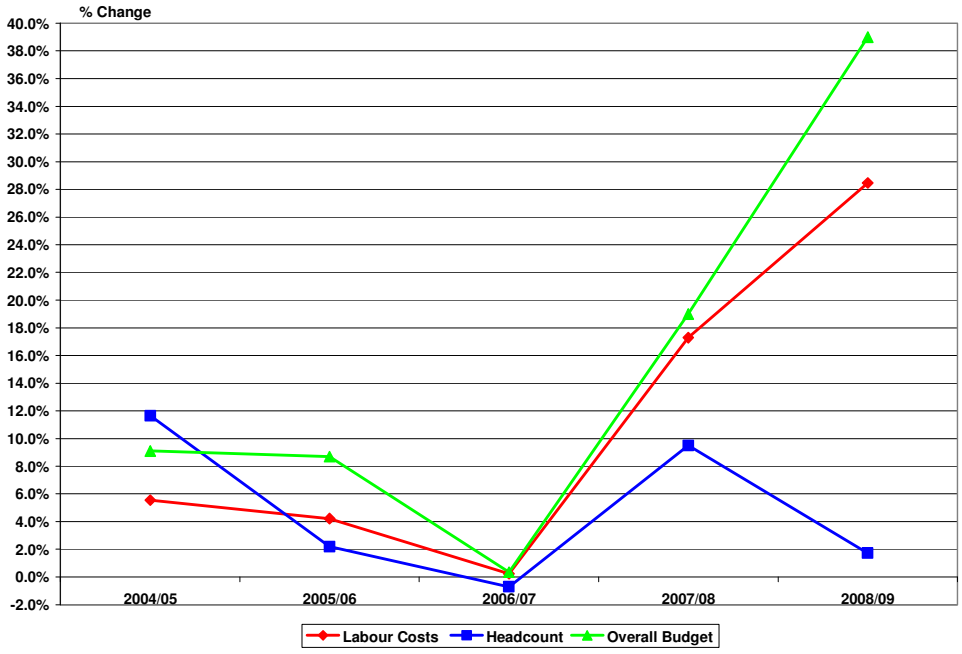
The large increases in APTPWA's Operations Costs for 2007/08 and forecasts for 2008/09 are directly related to:

- actual cost increases in labour accounting for 91% of the actual cost increase of 19% in 2007/08; and
- forecast cost increases in labour accounting for 73% of the forecast increase of 39% in 2008/09.

These cost increases equate to the cost increases affecting the Mining Industry in 2007 and Resources Industry in 2008 that was mentioned above in published articles.

With labour costs increases being the largest contributor to GGT's operating cost increase, Figure A4.1 below shows the relationship between operating overall budget increases, labour cost increases and headcount.

Figure A4.1: Labour Cost Increases



Historically, APTPWA's operations costs are split circa 70% labour and circa 30% materials. The following discussion highlights how costs have increased for Western Australian-based resource companies.

Engineers Australia Pty Ltd ("EA") publishes an annual Engineers Salary and Benefits Survey for its clients. GGT has been able to gain access to the last three published surveys. Key findings of these surveys are discussed below:

2005 Survey:

Key findings of this survey[41] relevant to GGT's situation are:

- salaries in the private sector were significantly higher than those in the public sector; and
- salaries in the private sector had increased by 4.8% slightly higher than the CPI increase during the same period.

The shortage of engineers within Australia is being addressed on a number of fronts:

- changes to immigration and visa requirements;
- increasing emphasis on graduate programs; and
- increasing remuneration levels across a range of difficult-to-fill classifications. [42]

2006 Survey:

Key findings of this survey[43] relevant to GGT's situation are:

- professional engineers with four to 15 years experience were the big winners in the past 12 months with salaries increasing by 13%. Their salaries rose most significantly due to the acute skills shortages in that range of experience; and
- skills shortages were experienced by almost all the respondents and they occurred across the board, albeit to varying degrees, with civil, mechanical and electrical engineering being the worst affected. Nearly half of the respondents said they had to pay higher salaries than expected.

The skill shortage problem is being manifested in various ways, some of which are across the board. An inability to recruit the required skill set characterised 82% of organisations, 66% said recruiting took longer than normal, 46% could not recruit at all, 42% could recruit only by paying higher salaries than planned and 18% resorted to hiring a different skill set and retraining the people concerned.[44]

2007 Survey:

Key findings of this survey[45] relevant to GGT's situation are:

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[41] Sourced from 2005 Engineers Australia Salary and Benefits Survey Publication, page v
[42] Op cit., page 7
[43] Sourced from 2006 Engineers Australia Salary and Benefits Survey Publication, page 5
[44] Op cit., page VI
[45] Sourced from 2007 Engineers Australia Salary and Benefits Survey Publication, page 5

- professional engineers in the private sector were the big winners in the past 12 months, due to the continuing skills shortage. Their salaries rose on average by 9% to nearly $106,000. The largest increases were enjoyed by graduates starting their careers (13.3%) and engineers with between four and ten years experience (10.7%). The rises in this latter group directly correlate to the skills shortages reported by the survey respondents, with the biggest shortages experienced in this group; and
- the skills shortage was again one of the biggest human resources issues, with 75% of all respondents being affected by it. 42% of those affected said the shortage had caused major problems including project delays and added costs. Another 40% said it had caused moderate problems.

2008 Survey:

Key findings of this survey[46] relevant to GGT's situation are:

- nearly three quarters of all respondents experienced shortages of professional engineers in 2008, with the disciplines in highest demand being civil, electrical and mechanical engineering; and
- about a third of the respondents experienced major problems including project delays and cost increases as a consequence of their recruiting difficulties, with 43% reporting moderate problems.

Australia is now experiencing a record low of unemployment, a strong economy and booming resources and construction sectors. The downside is the lack of skilled professionals to meet demand. [47]

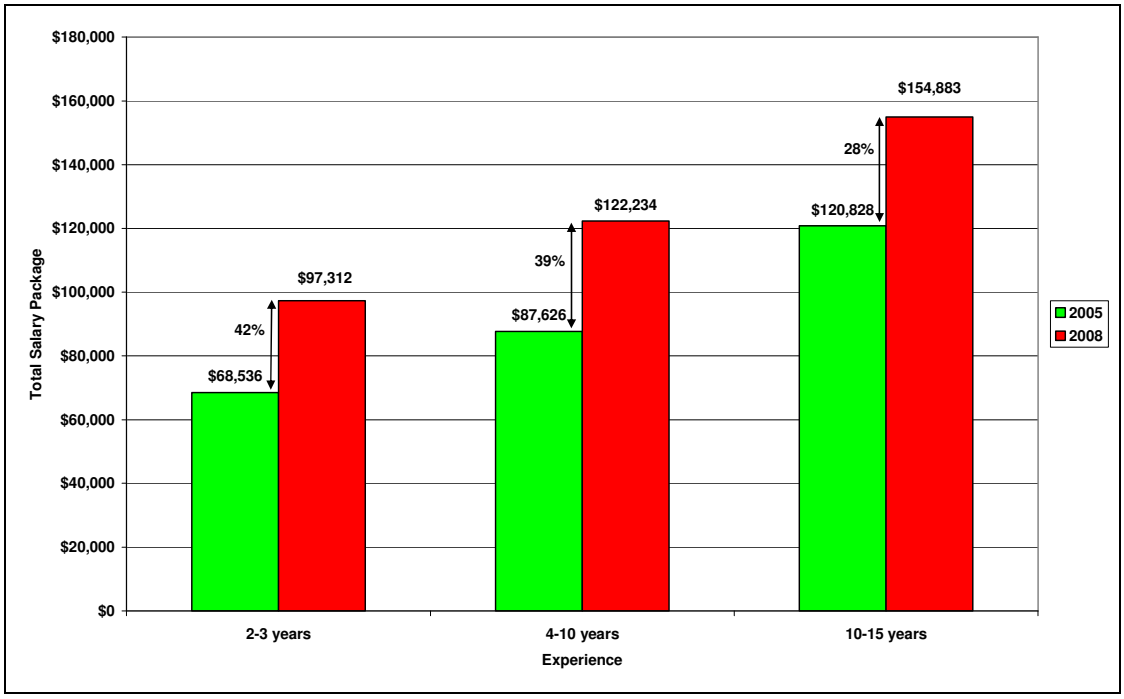
This shortage is fuelled by continued growth in the mining industry, with Western Australia and Queensland leading the way coupled with a growth in construction and infrastructure projects Australia wide. Additionally the Middle East has contributed to a skills drain, with massive construction and infrastructure activity creating opportunities for engineers from Australia and Southeast Asia. There has also been a loss of skills from retiring baby boomer engineers, which has further exasperated the situation. [48]

The most evident trend is an upward push on contract rates and salaries for engineers. This trend commenced mainly with the mining industry and has now impacted on rates and salaries across Australia.[49]

A major proportion of engineers working on the GGP have qualifications in mechanical and electrical engineering. Figures A4.2 and A4.3 illustrate the rises in total salary packages between 2005 and 2008 obtained by electrical engineers and mechanical engineers in the private sector in Western Australia for levels of experience matching the profile working on the GGP.

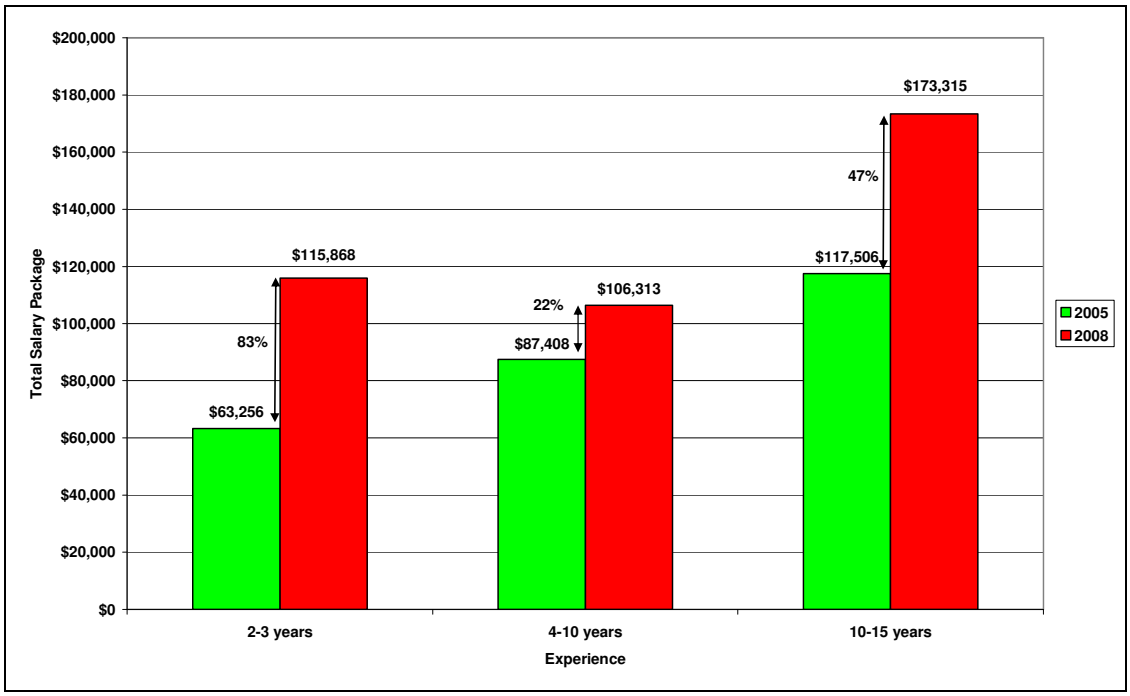
[46] Sourced from 2008 Engineers Australia Salary and Benefits Survey Publication, page 5
[47] Op cit., page IV
[48] Ibid.
[49] Sourced from 2007 Engineers Australia Salary and Benefits Survey Publication, page IV

Figure A4.2: Average Engineers Salaries Private Sector



Source: Engineers Australia – Engineers Salary and Benefits Survey Publications for 2005 and 2008.

Figure A4.3: Electrical Engineers Total Salary Package Private Sector – 2005 versus 2008



Source: Engineers Australia – Engineers Salary and Benefits Survey Publications for 2005 and 2008

There is further evidence that labour costs have increased with:

(i) the Mercer 2008 Market Issues Survey ("Mercer Survey") of over 250 companies claiming that while employers have "tightening their belts" to cope with a slowing economy the skills shortage was forcing them to increase pay.[50] The Mercer Survey indicated that despite concerns of a slowing economy, there was still a robust labour market being driven by hot job sectors as follows:

- the construction and engineering sector continue to lead the charge, experiencing the highest median pay increases over the past 12 months (8%) as a result of continued growth from the resources boom;
- the energy sector has come in close behind, with salaries rising by 7.3 per cent; and
- the demand for skilled labour in the resource-rich states of Queensland (median wage increases of 7.7 per cent) and Western Australia (median wage increases of 7.7 per cent) is driving higher fixed pay increases for non-management roles, as opposed to management roles; an indication that salary movements in these regions reflect the need for additional resources required to get the job done, with employers paying more to attract and retain the skills in demand; [51] and

(ii) an Engineering and Manufacturing Salary Survey 2007/08 undertaken by Michael Page International predicted that average salary increases would be in the 5 – 10% range and go as high as 15% for sought after mining professionals. [52]

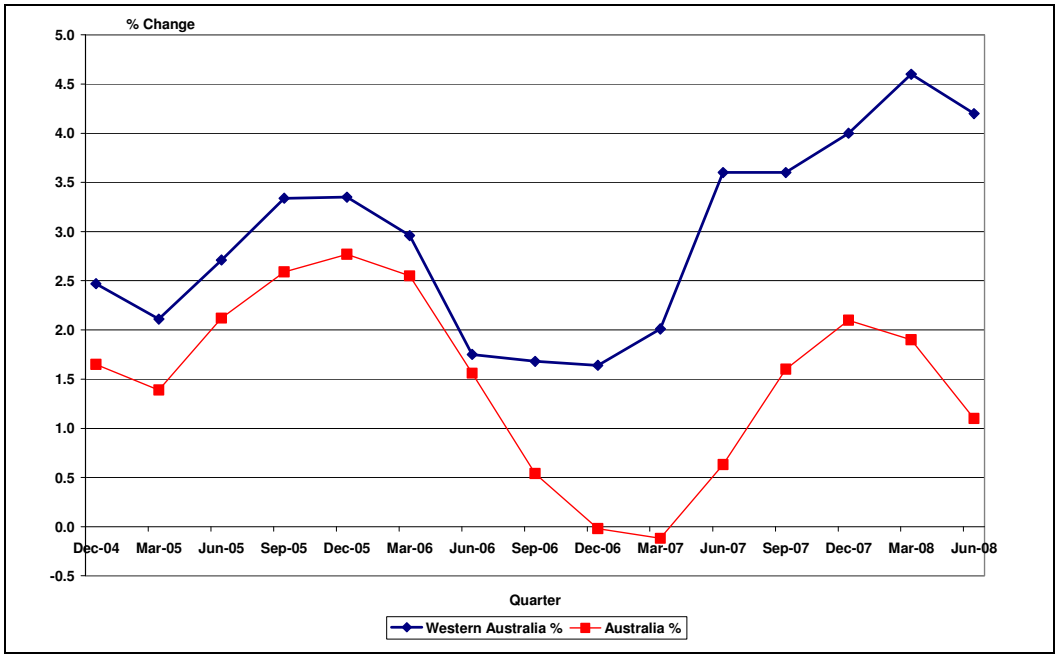
Wages growth has been the main cause of labour cost increases. Figure A4.4 shows wages growth comparing Western Australia against Australia and has come from data published by the Department of Consumer and Employment Protection (Government of WA) Labour Relations Division – Sub Source ABS Cat. 6302.0 and 6401.0.

[50] Salaries on high despite the gloom, 17 September, Zsa-Zsa Bowie Wilson, http://www.careerone.com.au/news-advice/salary-centre/salaries-on-high-despite-the-gloom-20080917

[51] Salaries continue to rise despite slowing economy - Mercer remuneration survey finds, 17 September 2008, http://www.mercer.com.au/summary.htm?siteLanguage=1012&idContent=1321740

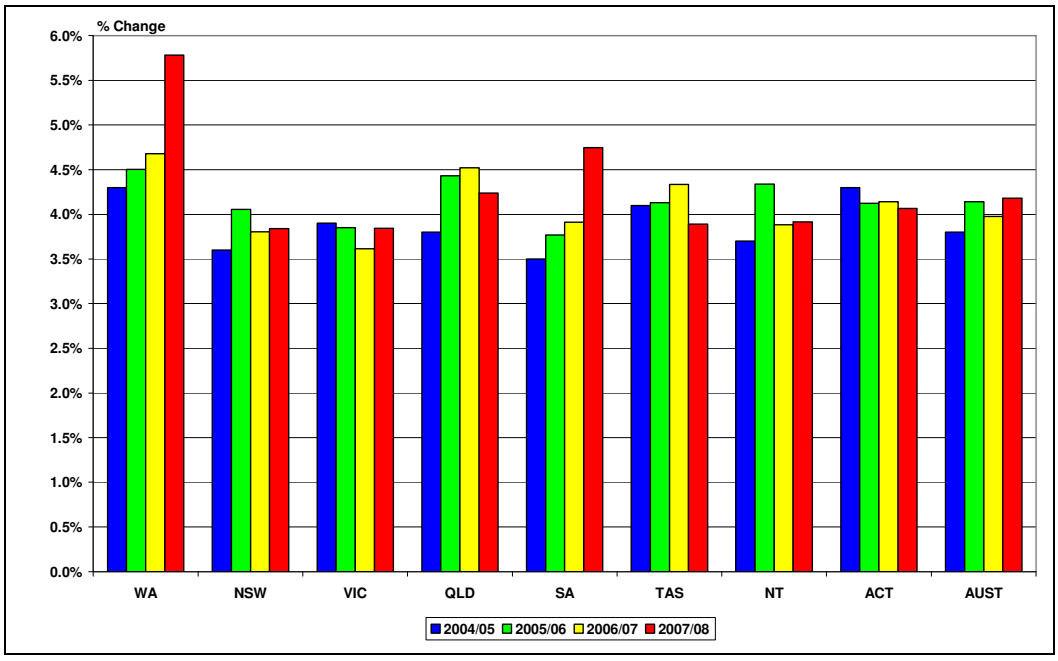
[52] Engineering and Manufacturing Salary Survey 2007/08, page 5

Figure A4.4: Average Annual Real Wages Growth



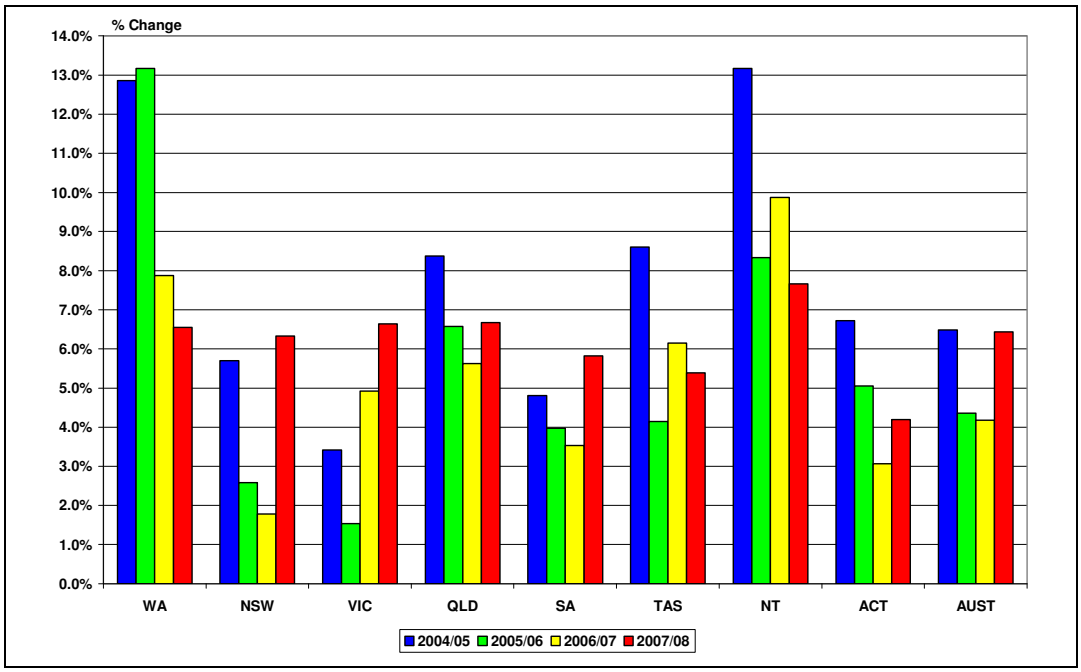
Another methodology to measure labour cost increases is by reviewing movements in the Wage Price Index ("WPI"), which measures total hourly rates of pay. Figure A4.5 below provides a view of movements in the WPI (total hourly rates of pay excluding bonuses) on a financial year basis, sourced from the Australian Bureau of Statistics Publication ABS 6435.0. Clearly, over the period of 2005 to 2008, labour cost increases in Western Australia have far exceeded those in the other states.

Figure A4.5: Wage Price Index % change from previous financial year by state



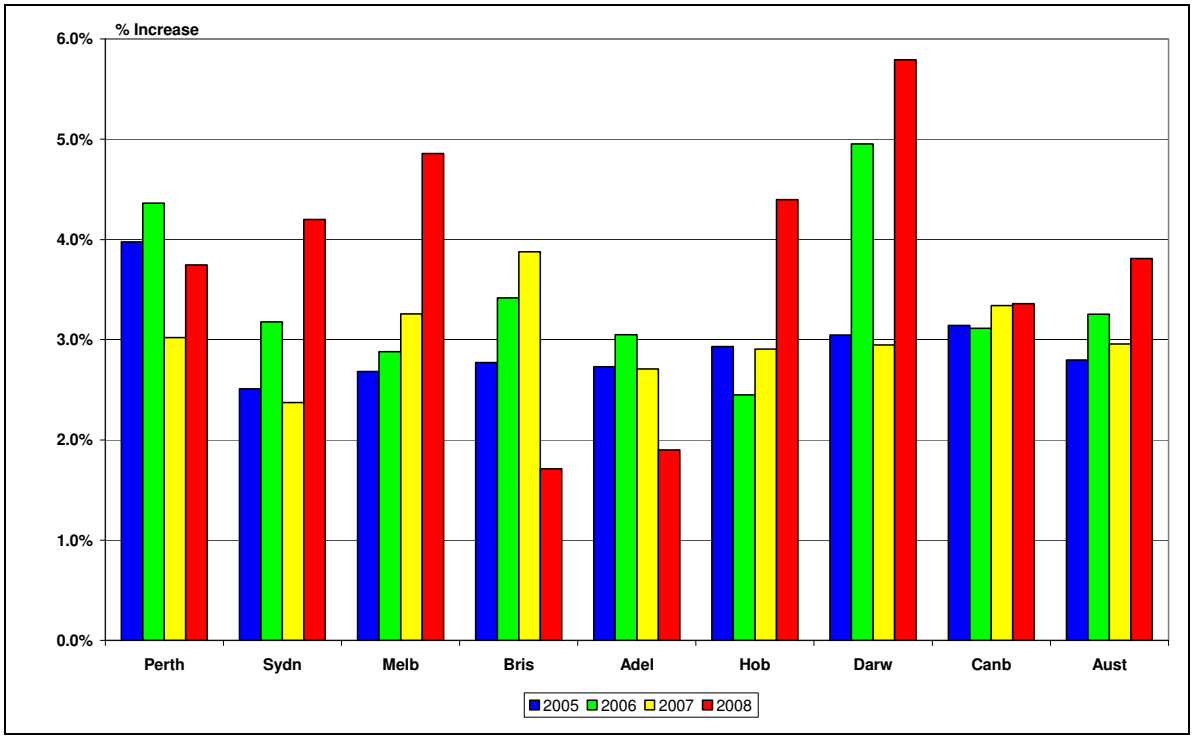
GGT's materials costs have increased and this is supported by growth in general construction costs. Figure A4.6 below provides a view of movements in the General Construction Cost Index ("GCCI") on a financial year basis, sourced from the Australian Bureau of Statistics Publication ABS 6427.0. Clearly, material costs in Western Australia have far exceeded those in the other States with costs increasing by approximately 42% between December 2004 and December 2008 (or by an annual average increase of 10.5%).

Figure A4.6: General Construction Cost Index % change from previous financial year by state



Some of GGT's costs have also increased due to inflation. Figure A4.7 shows the movements in CPI on a calendar year basis, sourced from the Australian Bureau of Statistics Publication ABS 6401.0. Since December 2004, WA CPI has increased by 18.1%, as compared to the Australian average equating to only 15.6%.

Figure A4.7: Consumer Price Index % change from previous calendar year by state



A4.1.1.3 Major Expenditure Jobs (MEJs) - 2005 to 2009

MEJ is work that is generally large in relative cost or is conducted on a less than regular basis. This cost category has been identified as appropriate to the GGP, so as not to distort general O&M expenditures with irregular costs, thus allowing improved management overview of the asset's operational expenditures. The major MEJs on the GGP include:

- Intelligent Pigging – regulatory requirement every five years to inspect and clean the pipeline internally to identify any anomalies.
- DoIR Compliance Audit – regulator's discretionary action to inspect and audit pipeline assets and systems, ensuring implementation of management systems is in accord with written procedures.
- Update Online Operations Manuals – electronic manuals must be updated on a regular cycle to allow for changes in equipment, technology, processes and regulatory requirements.
- Mandatory Competency Qualification – regulatory requirement to assess individual's competencies in operating the pipeline assets, plus identify gaps for additional competency training.
- Hazardous Area Routine Inspections – regulatory requirement to follow on from hazardous area identification and rectification, to ensure rectification actions are appropriately implemented.

- Information Management Systems – non-capital information management expenditures including training module development and review, intranet development, etc. These costs are primarily driven by regulatory changes or recommended improvements.
- Energy Safety Audit – Department of Commerce (Energy Safety Division) audit of GGP facilities to ensure compliance with gas supply regulations.
- Training Module Review and Update – maintain existing modules with amendments necessary for changes to technologies, equipment, processes and systems.
- Compressor Overhauls – the GGP currently operates four compressor stations incorporating six compressor units, with two different compressor types. Overhauls are a major irregular expense with each unit type being overhauled on a different running hour's schedule. The overhaul costs have been calculated based on existing and proposed compression units.
- Generator Overhauls – as with compressor overhauls, this is an irregular event with overhaul cost forecasts calculated based on the scheduled cycle of running hours.
- Easement Maintenance – includes rectification of erosion damage, maintaining line of sight for pipeline marker signs (per regulatory requirements) and crossing maintenance. Erosion rectification will generally follow cyclonic weather conditions with the Pilbara region more likely to suffer damage that the Goldfields area. This cost is impossible to forecast, so forecasts are prepared on historical occurrences. General slashing and clearing to maintain line of sight and crossings is more predictable and less subjective in forecasting.
- Karratha Building Renovations – the Karratha base building has deteriorated over recent years, such that it is in need of significant non-capital repairs, including structural movement rectification, repair of water damage, roof leakage and painting. It is proposed that such repairs be carried out over an extended period.
- Project Equipment Repairs – a forecast allowance for unidentified equipment repairs to rectify failures. In recent years this category would include Wiluna Gas Engine Alternator repairs, Wyloo Scraper Station gas leak rectification and exposed pipe monitoring and rectification.
- Pipeline Security Audit - security of infrastructure assets, as the GGP has been included on the national register of strategic infrastructure assets.
- Earth Testing – regulatory requirement to conduct testing aimed at identifying faults that may lead to personal injury through electrocution, equipment damage and/or failure to supply.
- Earth Grid Rectification – rectification of priority areas identified in earth testing investigation.
- Induce Voltage Study – identification of areas and instances where overhead power lines may induce currents into the pipeline system, providing potential for personal injury, death or equipment failure.

- Induced Voltage Rectification - rectification of priority areas identified in the induced voltage study.
- Reciprocating Compressor Valve Replacement – review of compressor valve performance in light of new technologies, and replace valve to reduce fuel gas usage and pulsation.
- FlowTran Modelling – regular updates to FlowTran leak detection model to ensure increased stability of leak detection / tracking model, early warning of metering imbalance reducing unaccounted gas volumes and reduction in number of gas chromatographs.
- Lightning Protection Investigation – review of lightning protection arrangements at all asset points in view of new lightning standard AS1768: 2004.
- Lightning Protection Rectification - rectification of priority areas identified in the lightning protection investigation, as justified by high level of station outages suffered through lightning strike during recent years.
- Ilgarari Vibration – due to high ongoing vibration levels the steel substructure at Ilgarari compressor station requires repairs and reinforcement. Extensive reliability issues suffered by Ilgarari unit 1 are likely to reoccur unless rectification proceeds.
- Pipe Settlement Survey – detailed survey of above ground facilities establishing datum's upon which to observe foundation settlement. Pipeline settlement is the principal cause of pressure equipment overstress.
- CP Reference Cell Replacement – the cathodic protection system is controlled by reference cells, which have deteriorated, and consequently the pipeline is increasingly overprotected. This leads to the disbondment of the protective coating, shielding of the cathodic protection system and potentially to stress corrosion cracking.
- Preventative General Expenditure – a forecast allowance for general preventative maintenance expenditure that cannot reasonably be foreseen as to actual areas of occurrence.
- Solar Battery Replacement – the consumable component of the solar battery array with each battery having an expected life of approximately seven years.
- Emergency Equipment Replenishment – each of the four emergency response trailers contain consumable supplies that have an effective life recommendation. After ten years operation, it is proposed to change-out these consumable items only.
- General Equipment Failure - a forecast allowance for replacement of Non Capital general equipment that cannot reasonably be foreseen as to actual areas of occurrence.

In its Submission dated 23 June 2005, GGT provided a detailed forecast of MEJ costs based on GGT's Programme and Budget for 2004/05 under the following areas:

(i) Technical Regulation and Licensing;

(ii) DoIR Compliance Audit;

(iii) Maintenance (including compressor overhauls);

(iv) Generator Overhauls;

(v) Health, Safety and Environment;

(vi) Efficiency and Improvement;

(vii) Preventative & Refurbishment; and

(viii) General and Replacement.

It must be emphasised that this forecast was formulated in 2004 and would only accurately detail those MEJs that were planned to occur in 2004/05.

Appendix A4.1 shows that that there is a variation between GGT's Actuals and the Authority Approved Forecast for "MEJs" over the period 2005 to 2009. GGT's Actuals of $7.4 million are 24.7% lower than the Authority Approved Forecast of $9.8 million mainly due to:

- in the Authority Approved Forecast, GGT forecast that it would spend $2.690 million on Intelligent Pigging during 2008 and 2009. However, GGT has not incurred any costs for this MEJ in 2008 or expects to incur costs in 2009, as it has been accepted by DoIR that Intelligent Pigging will be carried out in 2013/14. However, it has been agreed with DoIR that GGT will carry out a Direct Current Voltage Gradient ("DCVG") Survey at a forecast cost of $0.5 million during 2009 to check the integrity of the GGP. This MEJ was not included in the Authority Approved Forecast;
- in the Authority Approved Forecast, GGT forecast that it would spend $2.2 million on overhauling compressors, however, this forecast did not take into account that overhauls occur approximately every 3 years depending on operating philosophy and are carried out based on OEM manufacturer's recommended operating hours. Therefore, GGT Actuals of $0.9 million were significantly lower. It should also be pointed out that the overhaul of the compressor at Paraburdoo was not carried out due to the installation of additional compression, which is excluded from the covered pipeline. This overhaul is scheduled to be carried out in 2010;
- a number of MEJs (refer Appendix A4.2) were not carried out, as GGT determined that the GGP and its associated facilities were sound or where GGT had allowed for expenditure under generalised MEJs (e.g., "Project Equipment Repairs" or "Preventative General Expenditure") these funds were employed in carrying out projects under specific MEJs (refer to the following bullet point); and
- a number of MEJs (refer Appendix A4.2) were carried out in the period 2005 to 2008 and are forecast to be carried out in 2009 that were not included in the Authority Approved Forecast.

Appendix A4.2 provides a comparison of the Authority Approved Forecast of MEJs to GGT Actuals of MEJs actually undertaken during 2005 to 2008 and forecast to be undertaken in 2009.

A4.1.1.4 GGT operating costs – 2005 to 2009

Appendix A4.1 shows that that there is a variation between GGT's Authority Approved Forecast for "GGT Operating Costs" when compared to GGT's Actuals over this period. GGT's Actuals actual costs of $15.0 million are 19.9% higher than the Authority Approved Forecast of $12.5 million.

GGT's Actuals varied in comparison to the Authority Approved Forecast mainly due to the following material dollar variations:

- Administration – incorporates costs for the rental of GGT's Perth Office (and parking bays) and GGP licence fee. GGT's Actuals of $3.3 million were higher than Authority Approved Forecast of $2.7 million, as a result of:
  - 2005: Comm Equipment Lease & Maintenance and Insurance costs were no longer included in this cost centre and in 2005 were included under APTG costs and rental of GGT's Perth Office had been included under Administration (Business Services) business unit costs in 2005;
  - 2006: now incorporated the costs for rental of GGT's Perth Office (and parking bays) and GGP licence fee for full year;
  - 2007: rise in costs in 2007 was due to GGT renting additional floor space of circa 400 square metres to accommodate additional engineering personnel;
  - 2008: reduction in costs in 2008, as compared to 2007 was due to reduction in car bays leased and utilised floor space; and
  - 2009: **"[Information Confidential]"**;

- APA Operations Labour Recoverable - GGT's Actuals of -$1.8 million were lower than the Authority Approved Forecast of -$3.5 million due to the following reasons:
  - 2005: Labour Recoverable was directly incorporated under the Operations (Field Services) Business Unit;
  - 2006: First 6 months of 2006 was directly incorporated under the Operations (Field Services) Business Unit; and
  - 2007 and 2008: APTG negotiated lower lease rental for level 8, Australia Place, which reduced the amount of labour recoverable;
- APA Operations Management Fee - GGT's Actuals of $6.3 million were higher than the Authority Approved Forecast of $6.0 million due mainly to the forecast fees payable in 2009, which reflects the higher operating costs that APTPWA is forecast to incur;

- APA Commercial Management Fee - GGT's Actuals of $6.3 million were lower than the Authority Approved Forecast of $6.5 million due to actual costs being reduced by GGT to reflect the fee APTG would obtain for revenue attributable to the covered pipeline, i.e., actual costs have been allocated based on the following formulae (split for clarity purposes):

$$RAPACMF = APACMF \times Y;$$

$$Y = \left(\frac{\sum_{i=1}^{n} CPURC_i \times NOD \times CPUD_i}{\sum_{i=1}^{m} TPURC_i \times NOD \times TPUD_i} \right);$$

where,

RAPACMF: means revised APA Commercial Management Fee;

APACMF: means actual APA Commercial Management Fee;

CPURCi: means the reserved capacity (MDQ) for each covered pipeline User (i);

CPUDi: means the distance (kilometres) for each covered pipeline User (i);

TPURCi: means reserved capacity (MDQ) for each GGP User (i) on the covered pipeline and the non-covered pipeline on an annual basis;

TPUDi: means the distance (kilometres) for each GGP User (i) on the covered pipeline and non-covered pipeline; and

NOD: number of days in each year.

It maybe noted that *"Y"* when calculated is an arithmetic factor or percentage. Table A4.3 shows the calculated percentage for *"Y"*, which is used by GGT to calculate the fee APTG, would obtain for revenue attributable to the covered pipeline.

Table A4.3: Calculated Percentage for *"Y"*

Calendar Year	2005	2006	2007	2008	2009
Calculated Percentage for *"Y"*	96%	96%	94%	87%	80%

- Projects/Operations Contingency - GGT's Actuals of $0.8 million were higher than the Authority Approved Forecast of $0.5 million due to:
  - 2005: GGT incurred costs of $0.3 million to rectify erosion on the GGP easement at KP42 and KP377; and
  - 2009: GGT current forecasts for 2009 of $0.5 million are higher than the Authority Approved Forecast for 2009 of $0.1, as though actuals for 2005 to 2008 only amount to $0.3 million, GGT since 2006 has budgeted $0.5 million for this contingency, as this represents an allowance to cover unbudgeted expenditure such as unanticipated contractual negotiations, easement disputes, work required to be performed by APTPWA beyond the scope of the normal work program, such as response to cyclone activity. The above amount is the escalated budget amount.

A4.1.2 Administration and general – 2005 to 2009

Table A4.1 reveals that there is a variation between GGT's Actuals and the Authority Approved Forecast for "Administration and General" over this period. GGT's Actuals actual costs of $13.7 million are 11.7% lower than the Authority Approved Forecast of $15.5 million.

Table A4.1 provides a detailed view of APA Commercial Operations ("APTG") costs that comprise "Administration and General". APTG costs are divided into the following cost centres:

- Administration;
- Legal;
- Marketing;
- Public Relations;
- Regulatory;
- Commercial Equipment Lease & Maintenance; and
- Insurance.

GGT's Actuals varied in comparison to the Authority Approved Forecast mainly due to the following material dollar variations:

- Administration - GGT's Actuals of $2.9 million were higher than the Authority Approved Forecast of $2.2 million due to:
  - specific projects during the years 2006 to 2007 that were not incorporated in the Authority Approved Forecast such as:
  - GGT Supervisory Control and Data Acquisition (SCADA) security study.

This study was initiated as a result of the Auditor-General's report released in 2005 which specifically identifies security issues associated with SCADA and other process control systems associated with critical infrastructure. This work involved the engagement of an external contractor and internal staff in the preparation of a scoping study, conducting workshops to:

- identify the potential events, actions, etc. (i.e. causes) leading to SCADA security being compromised;
- identify the effects of such causes;
- identify the consequences of such effects;
- assess the impact of such consequences;
- identify measures currently in place to prevent and / or mitigate causes, effects, and consequences; and
- initiate measures for remedial action if and as required.

Upgrade of the GGP SCADA communications bearer.

This work involved the engagement of external contractors, legal practitioner and internal staff in the preparation of tenders and the selection of the provider for the upgrade of the GGP SCADA satellite communications bearer and the negotiation, preparation and issue of the contract to the preferred provider.

- 2009: GGT has forecast an increase in the use of consultants working on issues in regard to the GGP, which are not covered under the "Regulatory" cost centre.
- Regulatory – is comprised of ERA Standing Charges, ERA Service Charges, APTG regulatory costs, APA Group and Babcock regulatory costs. Each is dealt separately below:
  - ERA Standing Charges - GGT's Actuals of $1.0 million were lower than the Authority Approved Forecast of $1.5 million due to the Authority Approved Forecast being originally based on 2004 actuals, which were $0.2 million but increased to $0.3 million per year;
  - ERA Service Charges - - GGT's Actuals of $0.6 million were lower than the Authority Approved Forecast of $1.0 million due to the Authority Approved Forecast being originally based on 2004 actuals, which were $0.3 million;
  - GGT Regulatory Costs - GGT's Actuals of $3.4 million were higher than the Authority Approved Forecast of $1.5 million due to following additional activities that were either not included in 2005 Forecast or had lower forecasted costs:
  - 2005: Preparation of submissions and in response to the Final Decision of the GGP Access Arrangement. Participation in the analysis of the commencement of the initial publications by the Ministerial Council on Energy (MCE) Standing Committee of Officials (SCO) in response to the Productivity Commission's (PC) report on the Review of the Gas Access Regime;
  - 2006: GGT representation on the APIA Regulatory Affairs Committee which was involved in the preparation of responses to various reports including the Expert Panel on Energy Access Pricing -Draft Report to the MCE March 2006, the decision on the MCE Review of the Gas Access Regime May 2006. In addition, the first exposure draft of the National Gas Law (NGL) was released in November 2006;

- 2007: The focus on regulatory activities in 2007 was in response to the release of the NGL and the National Gas Rules (NGR). This included preparation of submissions and meetings with the Department of Industry Tourism and Resources. During 2007, the Authority issued its pre-lodgement consultation guidelines (guidelines) to the WA service providers of regulated pipelines. GGT in consultation with DBP and WA Gas Networks provided feedback to the Authority to finalise the guidelines;
- 2008: Pre-lodgement consultation process commenced during 2008 with the Authority and the WA service providers regarding the interpretation of the NGL and NGR. In addition separate meetings were held with the Authority and GGT to address GGP specific areas. GGT commenced preparation of its Revised Access Arrangement with the Revisions Submission Date being 1 April 2009; and
- 2009: APTG expects to incur in the continuation of the preparation and lodgement of the Revised Access Arrangement and subsequently the Authority's approval process.
- APA Group & BBP Regulatory Costs - GGT's Actuals of $0.2 million were higher than the Authority Approved Forecast, which did not forecast any of these types of costs, as at the time the Authority Approved Forecast were submitted APTG was unaware of the future parent company corporate changes.

- Comm Equipment Lease & Maintenance - GGT's Actuals of $2.1 million were lower than the Authority Approved Forecast of $3.8 million were mainly due to a decrease in the communications charges for APTG, as a result of the New Skies Satellite contract, which finished in December 2004, and from Jan 2005 APTG was able to negotiate reduced charges of approximately $27,000 per quarter as opposed to the original charges of $20,000 per month. At the time of the Authority Approved Forecast, which was prior to this contract being re-negotiated, it was thought by APTG that these costs would have increased in the order of $200,00 per annum to $723,566, as shown in its forecast for the calendar year 2005, which APTG escalated by the CPI for the later years; and
- Insurance - GGT's Actuals of $2.3 million were lower than the Authority Approved Forecast of $4.0 million due to a lower amount of insurance costs allocated from the corporate group.

A4.1.3 Corporate overheads – 2005 to 2009.

Table 5.2 reveals that there is a substantial variation between GGP's actual Corporate Costs (including the 2009 Forecast) and the Authority Approved for "Corporate Overheads" over the period 2005 to 2009. Actuals of $23.8 million are 127.9% higher than the Authority Approved of $10.4 million. The forecasts have understated actuals by between 64% (2005) and 216% (2009).

The forecast for 2005 corporate costs itself underestimated costs by 64%, indicating that there was an initial systemic forecasting problem creating an underestimation of corporate costs from the first year of estimates.

The forecasts did not capture all future corporate costs. This is due to several factors including:

- Forecasting errors at the time the forecast were made. For example not all costs were correctly captured and allocated. This seems to be borne out in the fact that the 2005 forecast underestimates costs by 64%.

  In particular the methodology used in allocating Corporate Costs in the approved Access Arrangement Corporate Cost forecasts did not reflect the methodology used to allocate APA costs in its general accounts, which is the value reflected in the Corporate Costs Actuals figure.

  In the approved Access Arrangement GGT was carrying 10-12% of APA corporate overheads[53]. This allocation is based on an estimate of capital value. However since 2005, if not before, APA has allocated corporate costs on a revenue basis. Allowing for this adjustment largely explains discrepancies in the 2005 forecast

  The value of the approved Access Arrangement Corporate Cost forecasts was based on historic averages for 2001-2004[54] of labour costs (these costs reflected the costs of 14 staff allocated on either an allocation basis (10-12%) or an activity basis) and overheads allocated on an allocation basis (10-12%). Costs incurred in 2001-2004 may not necessarily be a robust basis for determining future costs.

- Incorrect forecasting assumptions. The forecasts were based on the assumption that APA's corporate and operating structure would remain as it was in 2005. This assumption was incorrect.

- Changes in what functions are reflected in Corporate Costs. At the time of the 2005 forecasts the APA Group was a small company which had many functions undertaken by Agility, and to some extent, by AGL For example in 2005 functions such as IT, asset management, operations, accounting and some treasury and regulatory functions were undertaken by Agility and AGL.

  As the relationship between APA and AGL changed, APA took on more corporate functions, such that all corporate functions are now undertaken by APA. In particular this occurred in 2007 and 2008 as AGL and then Alinta exited APA's share registry, and the management agreements between APA and these companies were renegotiated or terminated. This shift in functions to APA contributes to the increases in corporate costs seen in these years.

  As a means of crosschecking this point, the 2005 corporate costs reflect corporate services provided by approximately 15 staff. 2009 APA corporate costs reflect corporate services provided by approximately 60 staff.

[53] See for example Page 14 of Goldfields Gas Pipeline Supporting Information submitted to the ERA on 17 November 2004.
[54] See for example Page 14 of Goldfields Gas Pipeline Supporting Information submitted to the ERA on 17 November 2004.

- Changes in the size of APA. At the time the Corporate Costs were approved in 2005 APA was a small company (e.g., APA had approximately 20 employees). APA is now a much larger company (e.g., APA now has over 1000 employees). This change in size means that
  - more functions and processes are formalised and conducted on a centralised basis (e.g., human resources was originally operated on an ad hoc basis by general management, it is now operated from a dedicated corporate function);
  - some functions and costs have changed in scope and size (e.g., investor relations and treasury functions have changed as APA has become a larger company).
  - new functions are required to be undertaken due to APA's size (e.g., IT integration is required to rationalise disparate IT systems which exist due to APA's growth via acquisitions).
- Changes in the general business environment. As business, financial, regulatory and operating environments become more complex costs have increased. This increasing complexity was not factored into the 2005 approved Corporate Costs.

To the extent that GGP has carried higher corporate costs than those imperfectly forecast in 2005, then this is an issue for GGT rather than the Authority, as these costs have been carried by GGT.

In deriving the Corporate Costs in .

Table 5.2 the Corporate Overheads have been reduced by GGT to reflect the Corporate Overheads that are attributable to the covered pipeline. GGT has used similar formulae to what it used to reduce the "APA Commercial Management Fee", as both costs relate to revenue. Therefore, actual costs have been allocated based on the following formulae (split for clarity purposes):

$$COACP = COATP \times Y;$$

$$Y = \left(\frac{\sum_{i=1}^{n} CPURC_i \times NOD \times CPUD_i}{\sum_{i=1}^{m} TPURC_i \times NOD \times TPUD_i} \right);$$

where,

$COACP$: means Corporate Overheads attributable to covered pipeline;

$COATP$: means Corporate Overheads attributable to Total Pipeline (i.e., covered pipeline plus uncovered pipeline);

C$PURCi$: means the reserved capacity (MDQ) for each covered pipeline User (i);

$CPUDi$: means the distance (kilometres) for each covered pipeline User (i);

TPURCi: means reserved capacity (MDQ) for each GGP User (i) on the covered pipeline and the non-covered pipeline on an annual basis;

TPUDi: means the distance (kilometres) for each GGP User (i) on the covered pipeline and non-covered pipeline; and

NOD: number of days in each year.

It maybe noted that *"Y"* when calculated is an arithmetic factor or percentage. Table A4.4 shows the calculated percentage for *"Y"*, which is used by GGT to calculate the fee APTG, would obtain for revenue attributable to the covered pipeline.

Table A4.4: Calculated Percentage for *"Y"*

Calendar Year	2005	2006	2007	2008	2009
Calculated Percentage for *"Y"*	96%	96%	94%	87%	80%

A4.2 Major expenditure jobs – 2005 to 2009

				Submission 23 June 2005					Actuals 2005 to 2008 and Current Forecast - 2009				
		calendar year ending 31 December		2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
				Authority Approved					Actuals	Actuals	Actuals	Actuals	Forecasts
				($000's)	($000's)	($000's)	($000's)	($000's)	($000's)	($000's)	($000's)	($000's)	($000's)
A	**Technical Regulation & Licensing**												
	1	Intelligent Pigging		751	15		1,570	1,120	660	9	0	0	0
	2	DCVG Dig Ups		63					0	36	5	4	0
	3	DCVG Survey							0	0	0	0	529
			Sub-total	813	15	0	1,570	1,120	660	44	5	4	529
	4	DoIR Compliance Audit		1		60			2	0	0	0	0
	5	Drawing Register Development											
	6	Update Online Operations Manuals			15		15		0	0	0	0	0
	7	Mandatory Competency PreQual		50					31	0	0	0	0
	8	HSE Systems Accreditation		39					23	0	0	39	0
	9	Hazardous Area Routine Inspections			37			50	1	48	46	0	0
	10	Information Mgmt Systems		72	3	25		30	10	20	25	54	94
	11	Energy Safety Audit			40			40	0	0	0	0	0
	12	Training Module Review & Update			77	6			8	39	67	37	41
	13	GGT - Pressure Vessel Rectification							0	0	0	1	0
	14	Review GGT Environmental/Lands Mgmt Sys & Upg AS 14001							0	0	191	0	0
	15	GGT Ops Safety Case							0	4	10	10	0
	16	AS 2885 GAP Analysis							1	0	17	0	0
	17	GGT KP 928 Defect Repairs							0	0	44	9	0
	18	Emergency Training							0	0	0	25	0
	19	Pilbara Pressure Equip Inspections							0	0	0	50	0
	20	GGT Operational Safety Case Review							0	0	0	0	0
	21	Apache Inlet GASPL GGP KPO to KPI							0	0	0	3	12
	22	Detailed Pipeline Right of Way Survey and Alignment Sheet Update							0	0	0	0	129
	23	Location Classification Review							0	0	0	0	82
	24	GGT Public Awareness							0	0	0	0	0
				975	187	91	1,585	1,240	736	155	404	231	888
B	**Maintenance**												
		Compressor Overhauls											
	1		Yaraloola	300	100	100	100	300	45	0	0	0	329
	2		Ilgarari	300	100	100	100	300	37	0	0	222	0
	3		Wiluna		210				0	281	-5	0	0
	4		Paraburdoo				210						
			Sub-total	600	410	200	410	600	83	281	-5	222	329
	5	Generator Overhauls			25		25	100	0	0	0	0	94
	6	Pilbara Easement Maintenance		301		180		180	366	85	6	0	176
	7	Goldfields Easement Maintenance			120		80						
	8	Karratha Building Renovations		28		50		50					
	9	Project Equipment Repairs			75	75	75	75					
	10	Pressure Safety Valves							15	0	0	0	0
	11	GGT - Central Store							0	3	0	0	0
	12	GGT Vehicle Repairs							1	0	0	0	0
	13	Mtce Documentation Review							0	5	13	0	0
	14	Review of Spare Parts Wiluna & Paraburdoo CS Stns							0	0	0	0	0
	15	Spare Aerial JGD/2 Compressor Cylinders							0	0	0	68	0
	16	Yarraloola Header Valves Overhaul							0	0	0	10	0
	17	Ilgarari Header Valves Repairs							0	0	0	0	94
	18	GGT - Pressure Equipment Rectification Items							0	0	0	0	165
	19	Investigate EC & II Issues Wiluna CS							9	0	0	0	0
	20	GEA Fuel Gas Solenoid Replacement							0	23	0	0	0
	21	Service Yarraloola Uninterruptible Power Supply							19	0	0	0	0
	22	Scada Tag Limit Increase&Graphic Editor							17	0	0	0	0
				329	220	305	180	405	427	117	19	78	529
C	**Heath, Safety & Environment**												
	1	Pipeline Security Audit		16	88	40	40	40	6	0	0	0	0
	2	CS Power Fault Protection			27				0	0	0	0	0
	3	Earth Testing		50			45		13	5	0	0	0
	4	Induced Voltage Study		28					5	2	0	0	0
	5	Earth Grid Rectification			100			40					
	6	Induced Voltage Rectification			50								
	7	Noise Survey							0	0	0	4	0
	8	Risk Register Improvements							0	12	6	0	0
	9	GGT - Work Instruction Review							0	0	2	4	0
	10	GIS Analysis							0	0	0	15	0
			Sub-total	94	265	40	85	80	23	19	8	23	0
D	**Efficiency & Improvement**												
	1	Recip Compressor Valve Replacement			81				0	0	0	0	0
	2	Flow Tran Modelling		14		15		18	0	0	15	0	0
	3	Lightening Protection Investigation		21					0	1	0	0	0
	4	Lightening Protection Rectification			120	120			0	0	0	0	0
	5	GGT Interface Design							11	0	0	0	0
	6	SCADA Alarms Rationalisation							18	0	0	0	0
	7	GGT / Parmelia AVT System							5	30	0	9	0
	8	Validation of GGT Billing Data Capture Process							4	0	0	0	0
	9	SCADA Security Risk Assessment							18	7	0	0	0
	10	Investigate Network Performance							1	13	2	0	0
	11	Review of Spare Parts							0	38	0	0	0
	12	GGT Control Room Intergration							0	107	0	0	0
	13	GGT Synergee Flow Modelling Software							0	15	2	0	0
	14	GC Data Changes							0	0	14	4	0
	15	Metering - 24 Hour Daily Totals PLC Reprogramming							0	0	0	0	217
	16	Wiluna GEA Jacket Water Heaters							13	11	0	0	0
	17	Yarraloola Ilgarari ESD System - Phase 2							0	0	0	0	0
	18	Heating Fuel Gas at Ilgarari CS / Upgrade							0	3	95	0	0
	19	Allow Remote Control of CP Outputs							0	0	2	0	0
	20	CPU Synchroniser Upgrade							0	0	1	0	0
	21	Upgrade CPU Interrupter Modules to Relay Switch Mechanism							0	0	0	0	0
	22	Yarraloola & Ilgarari Fire & Gas Upgrade							0	0	0	0	0
	23	Agility Data Link A/R							0	0	1	0	0
			Sub-total	35	201	135	0	18	70	224	132	12	217

				Submission 23 June 2005						Actuals 2005 to 2008 and Current Forecast - 2009				
		calendar year ending 31 December		2005	2006	2007	2008	2009		2005	2006	2007	2008	2009
				Authority Approved						Actuals	Actuals	Actuals	Actuals	Forecasts
				($000's)	($000's)	($000's)	($000's)	($000's)		($000's)	($000's)	($000's)	($000's)	($000's)
E		**Prevention & Refurbishment**												
	1	Ilgarari Vibration		122	98					200	3	0	0	0
	2	Pipe Settlement Survey		8	40					0	0	0	0	0
	3	CP Reference Cell Replacement			18	9				0	0	33	0	0
	4	Preventative General Expenditure			100	100	100	100		0	0	0	0	0
	5	GGT Addl. Comp. Spring Survey								5	5	0	0	0
	6	Yarraloola Above Ground Coating Repaint								0	0	30	0	0
	7	Small Bore Plug Valve Replacement - Yarraloola								0	0	1	0	0
	8	Pipe Support Linings at GGT Facilities								0	0	68	0	0
	9	Protection Relay Testing & Thermographic Survey								0	0	41	0	0
	10	Yarraloola Compressor One Engine Crankshaft Failure								0	427	47	0	0
	11	Ilgarari Compressor Station PLC Upgrade								0	0	60	0	0
	12	Leinster Receiver Closure Repair								0	0	0	4	0
	13	Kalgoorlie Maintenance Base Repairs								0	0	0	0	35
	14	Leinster Maintenance Base Repairs								0	0	0	0	18
	15	Yarraloola Compressor Driver Radiator Fan Conversion								0	0	18	0	0
	16	Station UPS Replacement								0	0	20	0	0
	17	Ilgarari CS - Electric Fan								0	0	28	0	0
	18	Yarraloola Fuel Gas Upgrade								0	93	8	0	0
	19	Yarraloola & Ilgarari LV Hut TRU Replacement								0	0	4	3	0
	20	Torsional Vibration Dampner Monitoring								0	0	1	0	0
			Sub-total	130	256	109	100	100		206	528	360	7	53
F		**General & Replacement**												
	1	Solar Battery Replacement		69										
	2	Emergency Equipment Replenishment		25										
	3	Fire Suppressment System - Gas Changeout		63										
	4	UPS Battery Replacement - Wiluna					20			0	0	0	0	0
	5	General Equipment Failure			40	50	60	70		6	0	59	36	0
	6	Moisture Analyser Replacement								0	1	66	0	0
	7	Spare Wakeusha Crankshaft								0	0	113	0	0
	8	Replace Failed CP Resistance Probe								0	0	7	0	0
	9	Yarraloola Piping Drawings & P & ID Update								0	0	0	37	0
	10	Yarraloola/Apache Gas Quality - Out of Spec: Gas								0	0	0	89	0
	11	Wiluna GEA PLC Upgrade								0	0	0	16	0
	12	Wiluna Dual Trip Alarm & Tristation Version Upgrade								0	0	0	54	0
	13	Compressor Prosoft Card Upgrade Paraburdoo								0	0	3	58	0
	14	Ilgarari PLC & Macroview Upgrade								0	0	0	11	0
	15	DBNGP Interconnect - Yarraloola Flow Control Modifications								0	30	13	0	0
	16	Upgrade Facility Equip Leinster & Wiluna								0	0	0	9	0
	17	Yarraloola / DBP Interconnect Ops Estab.								0	0	0	1	0
	18	Satellite Communications Transfer								7	0	0	0	0
	19	Scada Software Intergrade Upgrade								0	4	0	0	0
	20	FEED- GGT Comms U/grade (data control rm)								0	8	159	48	0
	21	WA Control Room Intergration + FEED								0	0	2	0	0
	22	WA Control Room Intergration + FEED								0	0	0	0	0
	23	FEED- GGT Manufacturing Exec. System								0	8	0	0	0
	24	FEED- GGT Vehicle Mounted Voice Comms								0	38	17	1	0
	25	Leinster Comms Replacement Purchase								0	12	0	0	0
	26	PLC Upgrade & DBP Tie In								0	0	22	0	0
	27	SCADA Server Replacement								0	0	10	0	0
	28	Bigpond Broadband & 2 Ways Satellite for Regionals								0	0	0	0	0
	29	GGT Personal Earth Stn Inverter Invest								0	0	0	8	0
	30	GDU Preliminary Project Costs								0	0	28	7	0
	31	Initial Design Work - Thunderbox								0	0	0	0	0
			Sub-total	157	40	50	80	70		13	100	499	377	0
		Escalation	4%	92	93	63	37	97						
			Total	**2,320**	**1,579**	**930**	**2,440**	**2,513**		**1,558**	**1,424**	**1,417**	**950**	**2,016**
		Note: Total does not include Escalation by 4%												

A4.3 Forecast labour cost increases - 2010 to 2014

In seeking to gain an insight into the predicted movement of wages growth over the period 2010 to 2014, GGT has considered a variety of factors, as described below, which will have a bearing on this likely growth pattern.

In the September quarter 2008, the Australian Bureau of Statistics reported that Western Australia continued to record strong wages growth relative to National Outcomes. The wage price index ("WPI") for all sectors in Western Australia was 1.3% for the quarter and 5.1% in the year to September 2008. By comparison the national WPI was 1.2% and 4.1% for the year to September 2008.

A report released by global consulting, outsourcing and investments firm, Mercer warns that the global financial crisis could mask the risk of long term demographic trends. The report entitled "Workplace 2012: beyond the Global Financial Crisis" ("Mercer Report") dated 16 December 2008 includes modelling of Australia's workforce in 2012 that confirms relief for employers from an going skills shortage and ageing population will be short lived.

Key findings in the Mercer Report show that the number of individuals in Australia's labour force aged 55 plus will increase by 15.4%, while the number of workers aged 25-54 will only increase by 6.3%. This will place increased demand on labour costs. Other findings in the Mercer Report show that:

- the number of women aged 55 plus in the labour workforce will increase by 17%;
- the number of women aged 25-54 will increase by only 9%;
- men aged 55 plus will increase by 14%;
- men aged 25-54 will increase marginally by 4%;
- greater demand for flexible work arrangements; and
- increased talent demand pressures.

The Mercer Report also advised that:

- as supply and demand pressures continue to create upward pressure on wages it comes as no surprise that the highest pay movements within industry sectors over the past 12 months have been in construction (7%) and energy (7%);
- job families experiencing wage increases above the national same incumbent movement of 4.7% are the engineering (6.8%), construction (6.6%), insurance (5.4%) and technical roles (5.3%);
- across the nation Western Australia continuers to remain the current power house of economic growth for Australia with overall fixed pay movements rising well above the national average at 5.7%; and
- employers in Western Australia have experienced a slight decline in remuneration spend since 2007 (6.4%) suggesting that they are looking for alternative ways of attracting talent or that the economic slowdown in WA is beginning to emerge.

It is unclear what changes may be initiated by Federal Governments between 2010 to 2014 and with the current state of the world economic crisis this challenges anyone to be able to successfully make predictions and forecasts as far out as 2014 regards to wages growth. Additionally we are unable to gauge what restrictions or increased demands may be placed on employers by Governments which may have a bearing on overall costs. Currently the Australian Federal Government has tabled for discussion items such as compulsory maternity leave which will undoubtedly create costs to employers who don't have these schemes in place.

As stated above it is hard to find any industry body willing to now make forecasts on wages as far out as 2014. Groups such as Mercer, Hays and the Australian Institute of Management have no long term forecast models out to 2014.

A4.3.1 National forecasts – 2010 to 2014

Econtech Pty Ltd have developed a labour cost model ("LCM") that provides for labour costs by national, state and industry over the period 2006/07 to 2015/16, it is this that GGT now refers to gain an understanding of what likely increases there may be in coming years.

Table A4.5 provides a summary of the key forecast macroeconomic variables from the LCM. It should be noted that the LCM was developed prior to the Global Financial Crisis.

TableA4.5: Econtech Forecast Key Macroeconomic Variables (%)

Forecasts	Real GDP Growth	Unemployment Rate	Employment Growth	CPI Inflation	Wage Growth National
2008/09	2.7	4.3	2.0	2.9	4.9
2009/10	3.1	4.3	1.4	3.0	5.3
2010/11	3.6	4.5	1.0	2.5	5.2
2011/12	3.6	4.6	1.0	2.2	5.1
2012/13	3.0	4.7	0.7	2.3	5.0
2013/14	2.5	5.0	0.3	2.3	4.5

Since this report we are now aware that the unemployment growth rate will increase at higher levels than predicted with an expectation of 5.2% unemployment by mid 2009.

Table A4.6 provides a view on forecast wages growth by Econtech and also BIS Shrapnel.

Table A4.6: Wages Growth Forecasts: Econtech versus BIS Shrapnel at National Level (%)

Forecasts	Econtech	BIS Shrapnel
2008/09	4.9	4.4
2009/10	5.3	5.3
2010/11	5.2	5.6
2011/12	5.1	5.4
2012/13	5.0	4.8
2013/14	4.5	4.8

Table 4.7 shows the forecast average wages growth for the Utility Sector on a National basis by various industry sources.

Table A4.7: Forecast Average Wages Growth for Utility Sector, National Level (%)

Forecasts	Econtech	BIS Shrapnel	Access Economics
2008/09 – 2013/14	6.3	5.5	4.3

Table A4.8 provides Econtech view of forecast labour cost growth rates for selected industries on a National basis.

Table A4.8: Econtech Forecast Key Macroeconomic Variables (%)

Forecasts	Mining	Electricity, Gas & Water	Construction	All Industries
2008/09	3.3	5.7	4.0	4.9
2009/10	3.7	7.6	4.8	5.3
2010/11	3.5	7.0	4.9	5.2
2011/12	3.6	6.3	4.9	5.1
2012/13	4.0	6.0	4.9	5.0
2013/14	3.8	5.6	4.4	4.5

A4.3.2 Forecasted Prediction WA GGT wages growth - 2010 to 2014

"[Information Confidential]"

Table A4.9: "[Information Confidential]"

It is known from past statistics that wages growth in Western Australia has outstripped national growth and GGT considers that this trend will continue for the foreseeable future.

Given the known EBA increases combined with the information of National wages growth from forecasted information and current knowledge of WA wages growth, which as shown in Figure A4.4 in Appendix A4.1.1.2 is currently 1.5% above the national average, GGT is able to predict annual rate of wages growth in Western Australia for the period 2010 - 2014 taking into account a slowing economic situation and softening growth.

The estimated growth for WA during this period has been forecasted by GGT to be the forecasted Australian average, which is based on Econtech LCM plus 0.75%, all increases would be as at the 1 July of each year, as shown in Table A4.10 below.

Table A4.10: GGT's Wages Growth Forecast – 2010 to 2014 (%)

Forecasts	Australian	Western Australia
2008/09	4.90	5.65
2009/10	5.30	6.05
2010/11	5.20	5.95
2011/12	5.10	5.85
2012/13	5.00	5.75
2013/14	4.50	5.25

A4.4 Forecast material cost increases - 2010 to 2014

GGT's materials costs have increased and this is supported by growth in general construction costs. Figure A4.6 in Appendix A4.1.1.2shows that material costs in Western Australia have far exceeded those in the other states with costs increasing by approximately 42% between December 2004 and December 2008. GGT forecasts that its material costs will continue to grow but at a lower level due to the Global Financial Crisis.

The underlying assumption, as noted by Rider Levett Bucknall ("RLB") (international property and construction consultants) is that major construction companies currently with full order books will become increasingly keen to secure work in late 2009 and some lower (materials and labour) costs should start to flow through by then.[55]

RLB indicate that additional federal commitment to spending on large infrastructure works will help to stimulate domestic economic activity, as money feeds through the layers of the economy but will take time to build momentum.[56] In private sector

[55] International Construction Cost Commentary, January 2009, Rider Levett Bucknall, page 17
[56] Op cit, page 5

building much depends upon a return of consumer and developer confidence, which has taken a battering with the combined effects of falling exchange rates, share market reverses and talk of recession.[57]

It is interesting to note that RLB indicate that in its "International Tender Price Relativity Matrix", Perth costs are still rising with a 2.3% increase between July 2008 and January 2009 and of the 35 cities evaluated in this review only 11 (including Perth) saw a rise in the cost of works.[58] RLB Tender Price Index for Perth is expected to fall to 6.5 in 2009, down from 9.0 in 2008.[59]

However, RLB says that though the Western Australian economy is better placed than most States in Australia to weather the current Global Financial Crisis the extent to which China slows or slips into stagnant growth (or even into recession) has the potential to initiate a further deterioration. But material costs are anticipated to continue to rise.[60]

Table A4.11 provides GGT's conservative forecasts of material cost increases over the period 2009 to 2014, which is based on Australian Bureau of Statistics publication: 6427.0 Tables 15 and 16; Economic Briefing; Western Australian Local Government Association, December 2008 and GGT's assumptions. This forecast does not consider implications of the Carbon Pollution Reduction Scheme planned to be implemented during 2010.

Table A4.11: GGT's Materials Cost Growth Forecasts – 2010 to 2014 (%)

Forecasts	% Increase
2008/09	4.2
2009/10	4.0
2010/11	4.0
2011/12	4.0
2012/13	4.0
2013/14	4.0
2014/15	4.0

A4.5 Forecast cost escalator – 2010 to 2014

As mentioned in Appendix A4.1.1.2, a majority of GGT's operations and maintenance costs rise due to a rise in labour and materials costs. Historically, APTPWA's operations costs are split circa 70% labour and circa 30% materials.

[57] ibid
[58] Op cit, page 8
[59] ibid
[60] Op cit, page 17

Table A4.12 shows the weighted average of forecast rises in labour and materials costs over the period 2010 to 2014 based on the forecasts provided in Table A4.10 and Table A4.11.

Table A4.12: GGT's Forecast Cost Escalator – 2010 to 2014 (%)

Forecasts	% Increase
2008/09	5.22
2009/10	5.44
2010/11	5.37
2011/12	5.30
2012/13	5.23
2013/14	4.88
2014/15	4.70

GGT has also used this cost escalator when escalating forecast capital expenditure post 1 January 2009, as most of GGT's capital expenditure post this date is "Stay-in-Business" capital expenditure where cost breakdown is in the same proportion, as abovementioned split for operating costs. It should be noted that the major capital expenditure in 2009, that is, the Accommodation Project is based on a fixed price not subject to escalation.

A4.6 Forecast CPI increases - 2010 to 2014

As mentioned in Appendix A4.1.1.2, some of GGT's costs are forecast to rise due to inflation. GGT has reviewed forecasts provided by Econtech and other financial institutions and considers the following forecasts in Table A4.13 to be more recent and realistic.

These forecasts have been provided by Synergies Economic Consulting Pty Ltd ("Synergies"). More detail on the forecasts are provided in Attachment 1.

Synergies note that until relatively recently most Australian regulators based their inflation estimates on the inflation value implied by the difference between ten year nominal and indexed bond yields.[61] However the Government's decision to cease the issuing indexed bonds has had a significant impact on the depth and liquidity in this market.

Furthermore, it is now generally recognised that a bias exists in indexed bond yields, with the significant reduction in supply relative to demand putting upward pressure on prices, and hence downward pressure on yields.

[61] This approach used the Fisher equation which specifies the following relationship: (1 + nominal rate) = (1 + real rate)(1+ inflation)

Consequently regulators have sought other forecasting approaches.

In its recent SP AusNet decision, the AER gave explicit consideration to inflation forecasts and concluded that the Reserve Bank of Australia's ("RBA's") forecasts should be given the most weight. The AER determined to estimate a long-term average based on the RBA's forecasts for the first two years, and then assuming 2.5%, being the mid-point of the RBA's target band for inflation, after that.

GGT believe that the approach adopted by the AER is appropriate. Consequently GGT is using an inflation forecast estimate based on the RBA's forecasts for the next two years and the mid-point of the target range for inflation after that.

In this analysis it should be noted that a ten year time frame is used as the analysis is replacing the previous approach which used an implicit ten year time frame as it used ten year bond rates is used. The AER used a ten year analysis in the SP Ausnet decision referred to above.[62]

The inflation forecasts (based on the RBA's 6 February 2009 Statement of Monetary Policy and above Commonwealth Government statement) are shown in the following Table A4.13.

Table A4.13: Inflation Forecast (%)

June 2009	June 2010	June 2011	June 2012	June 2013	June 2014	June 2015	June 2016	June 2017	June 2018	Average
1.75	2.75	2.0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	**2.4**

Based on a simple average, the resulting forecast for inflation is 2.4% and GGT's forecast for inflation is shown in Table A2.14 below.

Table A4.14: GGT's CPI Forecasts – FY2009 to FY2015 (%)

Forecasts	% Increase
2008/09	2.4
2009/10	2.4
2010/11	2.4
2011/12	2.4
2012/13	2.4
2013/14	2.4
2014/15	2.4

[62] See for example the discussion in AER, 2008, Final decision, SP AusNet transmission determination 2008-9 -2013- 14, January 2008, p102-104.

A4.7 Non Capital Costs – 2010 to 2014

Table A4.15 contains GGT's Non Capital Costs for the period 2010 to 2014 ("Current Forecasts"), which totals $147.8 million, which can be recalculated as an average annual cost of $29.6 million. This average annual cost is 16.0% higher than GGT's 2009 Forecasts for Non Capital Costs of $25.5 million.

The major reasons for GGT's Current Forecasts being higher than what would normally be expected due to inflationary increases are that GGT:

(i) is scheduled to undertake an intelligent pigging program in 2013 and 2014, as agreed with the DoIR;

(ii) has made an allowed for Self Insurance;

(iii) **"[Information Confidential]"**; and

(iv) has made an allowance for Asymmetric Risk.

It should also be noted that GGT's Non Capital Costs mainly escalate due to rises in labour and material costs, which are forecast to rise at rates higher than GGT's forecast for inflation (as detailed in Appendix 1).

A more detailed view of Table A4.15 is shown in Appendix A4.9.

Table A4.15: GGT's Non Capital Costs – 2010 to 2014 ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Operations and Maintenance	16.8	17.6	18.4	21.2	22.1
Administration and General	3.2	2.7	2.8	3.7	4.6
Corporate Overheads	6.3	6.4	6.5	6.5	6.5
Asymmetric Risk	0.5	0.5	0.5	0.5	0.6
Total	**26.8**	**27.2**	**28.2**	**31.9**	**33.7**

GGT has developed this Current Forecasts based on its December 2008 Forecast and its view of future increase in labour costs, materials costs and CPI.

A4.7.1 Operations and maintenance – 2010 to 2014

GGT's Current Forecasts for "Operations and Maintenance Costs" of $96.1 million during the period of 2010 to 2014, which can be recalculated as an average annual cost of $19.2 million. This average annual cost is 19.8% higher than GGT's 2009 Forecasts for "Operations and Maintenance Costs" of $16.0 million.

The major reasons for GGT's Current Forecasts being higher than what would normally be expected due to inflationary increases are:

- GGT's Operational and Maintenance Costs are forecast to rise at rates higher than inflation (refer to Appendix A4.3 to A4.5); and
- GGT is scheduled to carry out an intelligent pigging program in 2013 and 2014 (refer Appendix A4.7.1.2).

Appendix 4 shows that "Operations and Maintenance Costs" are comprised of:

- APA Operations Costs (Agility);
- Major Expenditure Jobs ("MEJs"); and
- GGT Operating Costs.

GGT's Current Forecasts for Operations and Maintenance Costs have been established based on GGT's organisational structure and FTE establishment, as at December 2008. The Current Forecasts exclude any additional staff that maybe required operating and maintaining the new compressor stations at Ned's Creek and Wyloo West, as these facilities are not part of the covered pipeline.

Each of the abovementioned businesses and/or cost areas will be discussed separately below.

A4.7.1.1 APA operations costs – 2010 to 2014

In managing its operational responsibilities, APTPWA maintains the GGP assets with due regard to:

(i) obligations under the Operating Agreement to ensuring expenditures on the pipeline assets are efficient, prudent and cost effective;

(ii) ensure the safe and reliable operation of the GGP and ensure that GGT meets all technical regulatory and environmental requirements;

(iii) accepted pipeline practice,

(iv) in accord with the requirements of the Australian Standard AS2885 Pipelines, Gas, Liquid and Petroleum – Design, Construction and Operation;

(v) in accord with the minimum requirements of the applicable regulators, DoIR and Department of Commerce (Energy Safety Division); and

(vi) in accord with equipment manufacturers recommendations as appropriate to the GGP.

GGT's Current Forecasts for "APA Operations Costs" of $58.9 million during the period of 2010 to 2014, which can be recalculated as an average annual cost of $11.8 million. This average annual cost is 15.5% higher than GGT's 2009 Forecasts for "APA Operations Costs" of $10.2 million. This variation reflects GGT's forecast that a majority of "APA Operations Costs" will rise due to a combination of rises in labour and material costs.

Appendix A4.9 provides a detailed view of GGT's Current Forecasts for APA Operations Costs. APA Operations Costs are comprised of the following business units:

- Administration (Business Services);
- Engineering (Engineering & Projects); and
- Operations (Field Services).

To determine the Current Forecast, GGT has escalated the December 2008 Forecasts for each business unit by its cost driver. Table A4.16 shows the cost driver for each business unit.

Table A4.16: APA Operations Costs Cost Drivers

Business Unit	Cost Driver	Reference
Administration (Business Services)	Labour	Table A4.10
Engineering (Engineering & Projects)	Labour / Materials	Table A4.12
Operations (Field Services)	Labour / Materials	Table A4.12

As per the period 2005 to 2009 (refer Appendix A4.1.1.1), GGT within the Current Forecasts for Operations (Field Services) business unit has removed the additional costs (circa $0.5 million for period 2010 to 2014) of operating the second compressor at Paraburdoo.

A4.7.1.2 Major Expenditure Jobs – 2010 to 2014

MEJ is work that is generally large in relative cost or is conducted on a less than regular basis. This cost category has been identified as appropriate to the GGP, so as not to contaminate general O&M expenditures with irregular costs, thus allowing improved management overview of the asset's operational expenditures. The major MEJs on the GGP include:

- Intelligent Pigging – regulatory requirement every five years to inspect and clean the pipeline.
- DoIR Compliance Audit – regulator's discretionary action to inspect and audit pipeline assets and systems, ensuring implementation of management systems is in accord with written procedures.
- Update Online Operations Manuals – electronic manuals must be updated on a regular cycle to allow for changes in equipment, technology, processes and regulatory requirements.
- Mandatory Competency Qualification – regulatory requirement to assess individual's competencies in operating the pipeline assets, plus identify gaps for additional competency training.
- Hazardous Area Routine Inspections – regulatory requirement to follow on from hazardous area identification and rectification, to ensure rectification actions are appropriately implemented.

- Information Management Systems – Non Capital information management expenditures including training module development and review, intranet development, etc. These costs are primarily driven by regulatory changes or recommended improvements.
- Energy Safety Audit – DOCEP (Energy Safety Division) audit of GGP facilities to ensure compliance with gas supply regulations.
- Training Module Review and Update – maintain existing modules with amendments necessary for changes to technologies, equipment, processes and systems.
- Compressor Overhauls – the GGP currently operates four compressor stations incorporating six compressor units, with two different compressor types. Overhauls are a major irregular expense with each unit type being overhauled on a different running hour's schedule. The overhaul costs have been calculated based on existing and proposed compression units.
- Generator Overhauls – as with compressor overhauls, this is an irregular event with overhaul cost forecasts calculated based on the scheduled cycle of running hours.
- Easement Maintenance – includes rectification of erosion damage, maintaining line of sight for pipeline marker signs (per regulatory requirements) and crossing maintenance. Erosion rectification will generally follow cyclonic weather conditions with the Pilbara region more likely to suffer damage that the Goldfields area. This cost is impossible to forecast, so forecasts are prepared on historical occurrences. General slashing and clearing to maintain line of sight and crossings is more predictable and less subjective in forecasting.
- Karratha Building Renovations – the Karratha base building has deteriorated over recent years, such that it is in need of significant non-capital repairs, including structural movement rectification, repair of water damage, roof leakage and painting. It is proposed that such repairs be carried out over an extended period.
- Project Equipment Repairs – a forecast allowance for unidentified equipment repairs to rectify failures.
- Pipeline Security Audit - security of infrastructure assets, as the GGP has been included on the national register of strategic infrastructure assets.
- Earth Testing – regulatory requirement to conduct testing aimed at identifying faults that may lead to personal injury through electrocution, equipment damage and/or failure to supply.
- Earth Grid Rectification – rectification of priority areas identified in earth testing investigation.
- Induce Voltage Study – identification of areas and instances where overhead power lines may induce currents into the pipeline system, providing potential for personal injury, death or equipment failure.

- Induced Voltage Rectification - rectification of priority areas identified in the induced voltage study.
- Reciprocating Compressor Valve Replacement – review of compressor valve performance in light of new technologies, and replace valve to reduce fuel gas usage and pulsation.
- FlowTran Modelling – regular updates to FlowTran leak detection model to ensure increased stability of leak detection / tracking model, early warning of metering imbalance reducing unaccounted gas volumes and reduction in number of gas chromatographs.
- Lightning Protection Investigation – review of lightning protection arrangements at all asset points in view of new lightning standard AS1768: 2004.
- Lightning Protection Rectification - rectification of priority areas identified in the lightning protection investigation, as justified by high level of station outages suffered through lightning strike during recent years.
- Ilgarari Vibration – due to high ongoing vibration levels the steel substructure at Ilgarari compressor station requires repairs and reinforcement. Extensive reliability issues suffered by Ilgarari unit 1 are likely to reoccur unless rectification proceeds.
- Pipe Settlement Survey – detailed survey of above ground facilities establishing datum's upon which to observe foundation settlement. Pipeline settlement is the principal cause of pressure equipment overstress.
- CP Reference Cell Replacement – the cathodic protection system is controlled by reference cells, which have deteriorated, and consequently the pipeline is increasingly overprotected. This leads to the disbondment of the protective coating, shielding of the cathodic protection system and potentially to stress corrosion cracking.
- Preventative General Expenditure – a forecast allowance for general preventative maintenance expenditure that cannot reasonably be foreseen as to actual areas of occurrence.
- Solar Battery Replacement – the consumable component of the solar battery array with each battery having an expected life of approximately seven years.
- Emergency Equipment Replenishment – each of the four emergency response trailers contain consumable supplies that have an effective life recommendation. After ten years operation, it is proposed to change-out these consumable items only.
- General Equipment Failure - a forecast allowance for replacement of Non Capital general equipment that cannot reasonably be foreseen as to actual areas of occurrence.

GGT's Current Forecasts are based on its December 2008 Forecasts for 2009 and escalated by the "Cost Escalator", discussed in Appendix A4.5. GGT has however, incorporated in 2013 and 2014 the costs for completing an intelligent pigging program at a cost of $3 million (December $2008), as required by DoIR.

GGT's Current Forecasts for MEJs of $15.7 million during the period of 2010 to 2014, which can be recalculated as an average annual cost of $3.1 million. This average annual cost is 55.8% higher than GGT's 2009 Forecasts for MEJs of $2.0 million.

The major reasons for GGT's Current Forecasts being higher than what would normally be expected due to inflationary increases are:

- GGT's MEJs are forecast to rise at rates higher than inflation and specifically are forecast to rise due to a combination of rises in labour and material costs; and
- GGT is scheduled to carry out an intelligent pigging program in 2013 and 2014.

A4.7.1.3 GGT operating costs – 2010 to 2014

As described in Appendix A1.1 above, GGT, as manager of the GGTJV, is responsible for the efficient and successful operation of the business of the GGP.

GGT's Current Forecasts for "GGT Operating Costs" of $21.5 million during the period of 2010 to 2014, which can be recalculated as an average annual cost of $4.3 million. This average annual cost is 12.3% higher than GGT's 2009 Forecasts for GGT Operating Costs of $3.8 million.

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- Appendix A4.9 provides a detailed view of GGT's Current Forecasts for GGT Operating Costs. GGT Operating Costs are comprised of the following cost centres:
- Administration;
- APA Operations Labour Recoverable;
- APA Operations Management Fee;
- APA Commercial Management Fee;
- Marketing;
- Newman;
- Projects/Operations Contingency;
- Public Relations; and
- Technical Regulatory.

To determine the Current Forecast, GGT has escalated the December 2008 Forecasts for each business unit by its cost driver. Table A4.17 shows the cost driver for each cost centre.

Table A4.17: GGT Operating Costs Cost Drivers

Cost Centre	Cost Driver	Reference
Administration	CPI	Table A4.14
APA Operations Labour Recoverable	CPI	Table A4.14
APA Operations Management Fee	CPI	Table A4.14
APA Commercial Management Fee	CPI	Table A4.14
Marketing	CPI	Table A4.14
Newman	CPI	Table A4.14
Projects/Operations Contingency	CPI	Table A4.14
Public Relations	CPI	Table A4.14
Technical Regulatory	CPI	Table A4.14

As per the period 2005 to 2009 (refer Appendix A4.1.1.4), GGT within the Current Forecasts for GGT Operating Costs has reduced forecast APA Commercial Management Fee for the Total Pipeline to reflect the fee APTG would obtain for revenue attributable to the covered pipeline, i.e., actual costs have been allocated based on the following formulae (split for clarity purposes):

$$APACMFCP = APACMFTP \times Y;$$

$$Y = \left(\frac{\sum_{i=1}^{n} CPURC_i \times NOD \times CPUD_i}{\sum_{i=1}^{m} TPURC_i \times NOD \times TPUD_i} \right);$$

where,

$APACMFCP$: means forecast APA Commercial Management Fee for the covered pipeline;

$APACMFTP$: means forecast APA Commercial Management Fee for the Total Pipeline;

$CPURCi$: means the reserved capacity (MDQ) for each covered pipeline User (i);

$CPUDi$: means the distance (kilometres) for each covered pipeline User (i);

$TPURCi$: means reserved capacity (MDQ) for each GGP User (i) on the covered pipeline and the non-covered pipeline on an annual basis;

$TPUDi$: means the distance (kilometres) for each GGP User (i) on the covered pipeline and non-covered pipeline; and

NOD: number of days in each year.

It maybe noted that *"Y"* when calculated is an arithmetic factor or percentage. Table A4.18 shows the calculated percentage for *"Y"*, which is used by GGT to calculate the fee APTG, would obtain for revenue attributable to the covered pipeline.

Table A4.18: Calculated Percentage for *"Y"*

Calendar Year	2010	2011	2012	2013	2014
Calculated Percentage for *"Y"*	80%	80%	80%	80%	80%

A4.7.2 Administration and general – 2010 to 2014

GGT's Current Forecasts for "Administration and General" of $16.9 million during the period of 2010 to 2014, which can be recalculated as an average annual cost of $3.4 million. This average annual cost is 12.6% lower than GGT's 2009 Forecasts for "Administration and General" of $3.9 million.

The major reason for GGT's Current Forecasts being substantially lower than what would normally be expected if the 2009 Forecasts were escalated by inflation is that the 2009 Forecasts incorporate high "Regulatory" costs of $1.9 million due to GGT's high costs with the continued preparation and lodgement of the Revised Access Arrangement and subsequently the Authority's approval process. Whilst GGT's Current Forecasts reflect the lower "Regulatory" costs that GGT has forecast to incur during the period of 2010 to 2013.

It should be noted that GGT's Current Forecasts for "Administration and General" during the period of 2010 to 2014 also includes an allowance for Self Insurance of $1.0 million, which is not incorporated in the 2009 Forecasts.

Appendix A4.9 provides a detailed view of GGT's Current Forecasts for "Administration and General", i.e., APA Commercial Operations costs. APA Commercial Operations costs are divided into the following cost centres:

- Administration;
- Legal;
- Marketing;
- Public Relations;
- Regulatory;
- Commercial Equipment Lease & Maintenance;
- Insurance;
- GGT has made an allowance for "Self Insurance", which is discussed separately in Appendix A4.7.3 below; and
- Other Charges – is discussed separately in Appendix A4.7.4 below.

To determine the Current Forecast, GGT has escalated the December 2008 Forecasts for each business unit by its cost driver. Table A4.19 shows the cost driver for each business unit.

Table A4.19: APA Commercial Operations Costs Cost Drivers

Cost Centre	Cost Driver	Reference
Administration	Labour	Table A4.10
Legal	CPI	Table A4.14
Marketing	Labour	Table A4.10
Public Relations	Labour	Table A4.10
Regulatory	CPI	Table A4.14
Commercial Equipment Lease & Maintenance	CPI	Table A4.14
Insurance	CPI	Table A4.14
Self Insurance	CPI	Table A4.14
Reference Service - Other Charges	CPI	Table A4.14

A4.7.3 Self insurance

Self-insured risk can be related to an approach where the risk of a negative event is carried entirely by the company, and it may also refer to the residual risk carried by a company before/after an insurance policy's excess, deductible or limit takes effect. Deductibles require the insured to pay the first portion of any claim. They are generally included in policies to encourage better risk management and to reduce an insurer's exposure to small claims (an administrative burden relative to claim size).

The occurrence of a self insured risk would result in a loss on GGT returns when it would not be covered by the company's insurance policies due to limit and exclusions or insufficient funds set aside for self-insurance purposes. This would result in GGT receiving a lower than intended regulatory return because the annualised financial impact (when negative events occur) represents a real cost to GGT.

In some cases GGT would be able to obtain insurance for these risks. However, this may not always be feasible or efficient. Valid reasons for limiting the level of insurance purchased from private insurers or reinsurers include:

- GGT believes the quoted insurance premium is excessive given the underlying risk level;
- the required insurance is not readily available;
- GGT has sufficient resources to withstand the risks in question (for example, risks within the insurance 'deductible');

- GGT has accepted an attractive premium on a 'standard' insurance policy which includes a range of exclusions, and the cost of 'writing back' the exclusions exceeds GGT's perceived value of the excluded risks; or
- the insurer requires GGT to bear a share of each claim to provide an incentive for GGT to manage its risks more effectively.

The efficiency of decisions taken around self-insurance by utility businesses has been generally recognised and accepted in Australian regulatory decisions.

While GGT has insurance cover for many risks (e.g. public liability and material loss of assets) there remains a range of risks for which GGT is not currently explicitly insured, for reasons such as those listed. All efforts to mitigate risk internally are taken, but some residual risk is present, leading to costs borne by the company should a negative event occur. This is of particular concern for those events which have a low probability of occurrence – and thus are not specifically forecast to occur – but represent a very high (negative) impact on the business and/or customers should they occur.

For the purposes of proposing these revisions to the GGP Access Arrangement, GGT has relied on the AER-approved expert analysis undertaken for the GasNet 2008 Access Arrangement. The Non Capital Costs and more specifically under the "Administration and General" cost area also includes the cost of self insurance as shown in Table A4.20 below:

Table A4.20: GGT's Self Insurance Costs – 2010 to 2014 ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Self Insurance	0.2	0.2	0.2	0.2	0.2

GGT has escalated the allowance for self insurance by the forecast CPI (refer Table A4.14).

In considering self insured risk it should be noted that this risk is different to asymmetric risk discussed in Appendix A4.7.6. Asymmetric risk fundamentally refers to the asymmetry of risk and returns arising from the existence of regulation, whereas the self insured risk is a broader concept relating to risk in general. The risk being allowed for in the self insured risk allowance differs from the risk allowed for in the asymmetric risk allowance..

A4.7.4 Other charges

The current approved Access Arrangement includes a Sixth Schedule: Statement of Tariffs and Charges comprising:

- Transportation Tariffs;
- Used Gas Charge;
- Other Charges;
- Supplementary Quantity Option Charge; and
- Quantity Variation Charges.

The "Other Charges" are payable by a Prospective User over and above the Transportation tariffs. The "Other Charges" comprise:

- Connection Charge;
- Account Establishment Charge; and
- Annual Account Management Charge.

In the Revised Access Arrangement, GGT has included the "Account Establishment Charge" and "Annual Account Management Charge" (being "Other Charges") in the determination of the Reference Service Tariff rather than, as separate charges.

GGT has escalated the current approved "Account Establishment Charge" and "Annual Account Management Charge" by the actual CPI as required by the existing Access Arrangement and forecast CPI (refer Table A4.14).

Table A4.21 shows the "Reference Service - Other Charges" included in Non Capital Costs.

Table A4.21: GGT's Other Charges – 2010 to 2014 ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Reference Service - Other Charges	0.004	0.002	0.002	0.002	0.002

A4.7.5 Corporate overheads – 2010 to 2014

A4.7.5.1 Overview

Section 8.38 of the Code requires the Service Provider to design Reference Tariffs to collect revenues equal the costs of providing the Reference Service, where the cost of providing the Reference Service is derived through a reasonable allocation of costs. This requires a reasonable allocation of shared costs, including corporate costs and owner's costs

In instances such as the GGP, where the owners and operators of the pipeline also own and / or operate other assets, the joint and shared costs incurred need to be allocated between all assets in a reasonable manner.

Once these costs have been allocated to the regulated portion of the GGP they may then be further allocated to the Reference Service and Tariff as outlined in Section 6.3.

The GGP corporate costs are based on the following steps and assumptions. (It should be recognised that much of this methodology is based on APA 2008-9 budgets and may be able to be updated when APA finalises 2009-10 budgets in the next three months).

A4.7.5.2 APA Corporate Cost Budget

Firstly, the corporate costs are based on APA Group approved 2008-9 budget adjusted for known major variances. These costs are based on a comprehensive planning and review process. The APA Board approved budget represents a reasonable basis for estimating the future corporate costs of the APA Group. Note that these costs do not include insurance costs or the costs of any future mergers, acquisitions, divestments or similar corporate projects.

The total Corporate Cost is built up from the costs of various corporate functions. These functions are:

- Chief Executive Officer function;
- Company Secretary function – including annual reporting, general meetings, risk management, compliance management, directors costs and general administrative costs;
- Corporate Finance function – including, treasury, tax, budgeting, general financial and management accounting;
- Corporate Commercial function – including corporate legal, investor relations, strategic planning and general commercial functions;
- Operations – including general oversight of the operations functions of all assets;
- Human Resources – including health safety and environment, employee communications, payroll, recruiting;
- Financial Services Centre (e.g., accounts payable processing);
- IT; and
- Technical services – including asset management, engineering services and project management.

Note that regulatory costs are excluded from the commercial costs.

A4.7.5.3 APA Corporate Cost Forecasts

The costs for the functions above are then projected forward by financial years to 2014-15 based on known and reasonably expected corporate projects.

These costs include operating costs for current separate IT and Finance transformation projects in the earlier years which reduce in the later years. These projects involve consolidation and rationalisation of IT and finance applications across the APA group to allow greater efficiencies moving forward. For example, APA currently has three separate major finance systems, three works management systems, four GISs, four incident management systems and four intranets being

used. APA is currently rationalising and replacing IT systems, processes and applications, including systems and applications used to support the GGT. The non-capital costs for these projects are based on internal estimates as follows:

- 2009-10 and 2010-11 – $**"[Information Confidential]"**million per annum for both the finance and the IT transformation project;
- 2011-12 and 2012-13 - $**"[Information Confidential]"** million for the finance transformation project and $**"[Information Confidential]"** million for the IT transformation project; and
- 2013-14 and 2014-15 – no costs.

The costs of updating and integrating business processes and systems are not insubstantial. By recognising these costs the Authority is then in a position to potentially recognise subsequent efficiencies. Such efficiencies will only be fully realised following the completion of the project.

While synergies are expected to result in time, at this stage it is impossible to accurately quantify these synergies. Given this, the synergies resulting from the project should first be realised and quantified and then, via the application of a benefit sharing mechanism, be returned in future Access Arrangement periods.

Note that the forecast corporate costs are in financial years as APA does its budgeting in financial years. These costs are shown below in total:

Table A4.22: APA Forecast Total Corporate Costs ($m, real 2008-9)

Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
APA Corporate Costs	**"[Information Confidential]"**					

A4.7.5.4 Allocation of APA Corporate Costs to GGP and Incorporation of Minority Owner Costs

Thirdly, these costs are then allocated to the APA owned portion of the GGP for each year up to 2014-15 based on allocators based on APA's individual assets budgeted revenues. In previous regulatory processes this revenue based methodology of allocating costs has been accepted by the ACCC/ AER.

In 2008-9 APA's budgeted revenue is $**"[Information Confidential]"** million and the APA owned share of GGP including the uncovered section is budgeted to earn $**"[Information Confidential]"** million. Thus the general allocator is 18.3%. This allocator is adjusted for several corporate functions as outlined below:

Allocator	Cost categories to which the allocator is applied	Rationale
18.3%	CEO, Company secretary, Finance, Commercial, Operations, HR:	The allocator is directly based on the budget revenues from the GGT as a percentage of the budget revenues of the APA group.
21.8%	Financial Services Centre	These allocators are directly based on the budget revenues from the GGT as a percentage of the budget revenues of the APA group, which have then been adjusted to exclude business units which do not use the Financial Services Centre or Technical Services functions. (Hence the allocators are slightly higher than the general allocator above)
21.6%	Technical services	
11.2%	IT	One asset area of APA (not GGP) uses substantially more IT than other assets. This asset has its IT costs calculated and allocated to it and the remaining IT costs are then allocated between the remaining assets on a revenue basis. The allocator is lower as the total IT costs include the costs of the IT for the APA asset which uses substantially more IT than other asset areas.

It should be recognised that these allocators are those used within the business for general budgeting and cost allocation – they have not been derived for regulatory purposes.

Following this the APA corporate costs attributable to the GGP have been derived. These are shown in Table A4.23 below.

Fourthly, the APA corporate costs for the GGP are then adjusted to take account of the fact that the 12% shareholder, Babcock and Brown Power (BBP) also incur costs. This adjustment is based on a cost figure of provided by BBP.

Following this the corporate costs and owners costs for the GGP as a whole have been derived.

Table A4.23: Forecast Corporate Costs Allocated to total GGP ($m, real 2008-9)

Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
APA Corporate Costs	**"[Information Confidential]"**					
BBP Owners Costs	**"[Information Confidential]"**					
Total	**6.89**	**6.89**	**6.78**	**6.78**	**6.45**	**6.45**

A4.7.5.5 Allocation of GGP Corporate and Owner Costs to the covered pipeline

The corporate and owners costs for the whole of the GGP are then adjusted to take account of the fact that not all of the GGP is covered. In doing this GGP has used similar formulae to what it used to reduce the "APA Commercial Management Fee", as both costs relate to revenue. Therefore, forecast costs have been allocated based on the following formulae (split for clarity purposes):

$$COACP = COATP \times Y;$$

$$Y = \left(\frac{\sum_{i=1}^{n} CPURC_i \times NOD \times CPUD_i}{\sum_{i=1}^{m} TPURC_i \times NOD \times TPUD_i} \right);$$

where,

$COACP$: means Corporate Overheads attributable to covered pipeline;
$COATP$: means Corporate Overheads attributable to Total Pipeline (i.e., covered pipeline plus uncovered pipeline);
$CPURC_i$: means the reserved capacity (MDQ) for each covered pipeline User (i);
$CPUDi$: means the distance (kilometres) for each covered pipeline User (i);
$TPURC_i$: means reserved capacity (MDQ) for each GGP User (i) on the covered pipeline and the non-covered pipeline on an annual basis;
$TPUDi$: means the distance (kilometres) for each GGP User (i) on the covered pipeline and non-covered pipeline; and
NOD: number of days in each year.

The Calculated Percentage for "Y" is 80% in all relevant years.

Following this the real corporate costs and real owner's costs for the regulated portion of the GGP as a whole have been derived. The numbers derived are in financial years as the APA Group budget is in financial years.

Table A4.24: Forecast Corporate Costs Allocated - covered pipeline ($m, real 2008-9)

Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Covered Portion Of GGP Owners and Corporate Costs	5.5	5.5	5.4	5.4	5.2	5.2

A4.7.5.6 "[Information Confidential]"

Table A4.25: Additional "[Information Confidential]" Costs allocated to the Covered GGP ($m, real 2008-9)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
"[Information Confidential]"						

The corporate costs and **"[Information Confidential]"** costs are then added in Table A4.26.

Table A4.26: Total Corporate and "[Information Confidential]" Costs Allocated to Covered Pipeline ($m, real 2008-9)

	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Covered Portion Of GGP Owners and Corporate Costs	5.5	5.5	5.4	5.4	5.2	5.2
"[Information Confidential]"						
Total	**6.1**	**6.0**	**5.9**	**5.9**	**5.7**	**5.7**

These costs are then adjusted to take account of:

- Calendar years – this occurs as the costs for GGP Access arrangement are in calendar years not financial years. This adjustment is a simple halving and re-addition of the various costs. The fact that these costs are forecasts means that any greater precision is unlikely to be beneficial.
- Inflation – the costs are then escalated by inflation of 2.4% per annum.

Giving the final corporate costs in Table A4.27, as shown in the AAI:

Table A4.27: Total Corporate and "[Information Confidential]" Costs Allocated to the covered GGP ($m, nominal)

	2010	2011	2012	2013	2014
Total Corporate Costs	6.3	6.4	6.5	6.5	6.5

Given the above GGT corporate costs are based on 2008-9 figures GGT can update these figures following finalisation of the APA Group 2009-10 budget. This will allow more recent cost forecasts to be reflected in the final tariffs.

A4.7.6 Asymmetric risk – 2010 to 2014

Investors need to be compensated for the risk of their investments. While WACC compensates for systematic and symmetric risks it does not compensate for non-systematic risks or asymmetric risks. These risks need to be compensated for in cash flows, via allowances for insurance, self insurance or asymmetric risk.

Asymmetric risks are risks generally arise due to the existence of regulation. They are not recognised in the assessment of insured risk, self insured risk or the assessment of an appropriate equity beta for the GGP.[63] The risk is not reflected in beta as beta only reflects symmetric or systematic risks rather than asymmetric risks.

Consequently GGT has incorporated an allowance for "Asymmetric Risk" into its Non Capital cost cash flows. These costs have been based on a report prepared by Synergies. The report is attached at Attachment 5. The attachment contains a comprehensive and detailed discussion of both the theoretical underpinnings of asymmetric risk and the methodology used to quantify asymmetric risk.

A major issue with infrastructure asset regulation is ensuring that the asymmetric risks associated with the existence of this of regulation are not ignored. The existence of these risks has previously been recognised by regulators.[64]

[63] The risk cannot be correctly reflected in beta as beta reflects symmetric risks rather than asymmetric risks.
[64] See for example, ACCC, 1998, GasNet 1998 Final Decision, 6 October 1998, pp 59- 60

Regulated entities face a specific set of risks which are asymmetric, as the distribution of expected regulated returns are skewed downward or truncated at the upper end. These skewed or truncated returns arise as a consequence of regulation. Under the regulatory framework returns are generally not allowed to exceed the regulated rate of return (ie the asset is not allowed to "over-perform"), however the asset remains exposed to possible under-performance. In this way regulation limits the upside of risk to the owners while leaving the owners exposed to the downside of risk. The regulated asset requires compensation for bearing these risks that it cannot avoid or mitigate.

Applying a WACC in this environment without some additional form of adjustment or compensation is flawed.

GGT believes that compensation for the identified and quantified asymmetric risk should be via a cash flow adjustment. The difficultly is being able to quantify the asymmetric risk. Quantifying the risk is not exact or precise. Nevertheless, just because the methodology or approach is not exact does not mean they should be disregarded.

In Attachment 5, Synergies have used a probabilistic approach to quantify an estimate of the asymmetric risk applying to the regulated capacity of the GGP. This approach provides a framework for assessing and quantifying asymmetric risk. The outcome of this approach is a reasonable estimate of asymmetric risk.

The estimate from the Synergies approach is $0.490 million per annum.

GGT should be allowed an allowance of $0.490 million per annum in its cash flows to compensate it for asymmetric risks.

GGT has escalated the allowance for Asymmetric Risk by the forecast CPI (refer Table A4:14). Table A4.28 shows the allowance for Asymmetric Risk that GGT has included in Non Capital Costs.

Table A4.28: GGT's Asymmetric Risk – 2010 to 2014 ($m, nominal)

Calendar Year	2010	2011	2012	2013	2014
Asymmetric Risk	0.5	0.5	0.5	0.5	0.6

A4.8 Corporate overheads – 2010 to 2014

"[Information Confidential]"

A4.9 Non Capital costs by categories – 2010 to 2014

"[Information Confidential]"

A5 Appendix 5 Capacity available to reference service

quarter ending	31-Mar-10	30-Jun-10	30-Sep-10	31-Dec-10	31-Mar-11	30-Jun-11	30-Sep-11	31-Dec-11	31-Mar-12	30-Jun-12	30-Sep-12	31-Dec-12	31-Mar-13	30-Jun-13	30-Sep-13	31-Dec-13	31-Mar-14	30-Jun-14	30-Sep-14	31-Dec-14
	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d	TJ/d
Total	102.82	103.33	103.73	103.16	103.02	103.56	103.81	103.23	102.95	103.52	103.73	103.11	103.34	103.93	104.04	103.39	103.24	103.91	104.08	103.42
	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00	108.00
	5.18	4.67	4.27	4.84	4.98	4.44	4.19	4.77	5.05	4.48	4.27	4.89	4.66	4.07	3.96	4.61	4.76	4.09	3.92	4.58
Capacity Available	**4.12**																			

Attachments

Attachment 1: Proposed Inflation Forecast. Synergies Economic Consulting Pty Ltd, March 2009

Attachment 2: Proposed Cost of Debt. Synergies Economic Consulting Pty Ltd, March 2009

Attachment 3: Ongoing Debt and Equity Raising Costs. Synergies Economic Consulting Pty Ltd, March 2009

Attachment 4: Equity Beta Analysis. Synergies Economic Consulting Pty Ltd, March 2009

Attachment 5: Asymmetric risk - The importance of recognition and compensation. Synergies Economic Consulting Pty Ltd, March 2009

Attachment 1: Proposed Inflation Forecast. Synergies Economic Consulting Pty Ltd, March 2009

Refer to attached document.

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Refer to attached document.

Attachment 5: Asymmetric risk - The importance of recognition and compensation. Synergies Economic Consulting Pty Ltd, March 2009

Refer to attached document.