

A-125042

ARP 2007

**Philadelphia Gas Works**

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Senior Attorney



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**ORIGINAL**

February 28, 2007

VIA EXPRESS MAIL

James McNulty, Secretary  
Pennsylvania Public Utility Commission  
Commonwealth Keystone Building  
2<sup>nd</sup> Floor, 1 North  
400 North Street  
Harrisburg, PA 17120

**RECEIVED**

FEB 28 2007

PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

ARP 125042

RE: Philadelphia Gas Works Annual Resource Planning Report

Dear Secretary McNulty,

Enclosed for filing is an original and seven (7) copies of Philadelphia Gas Works Annual Resource Planning Report, Forms 1 and 2.

Please contact me if you have any questions regarding this filing at 215-684-6878.

Respectfully submitted,

Gregory J. Stunder  
Senior Attorney

Enclosures

cc: Calvin Birge, Conservation, Economics and Energy Planning (w/enc.)

**DOCUMENT  
FOLDER**

76

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day served a true copy of the foregoing document upon the participants listed below in accordance with the requirements of § 1.54 (relating to service by a participant).

**VIA EXPRESS MAIL**

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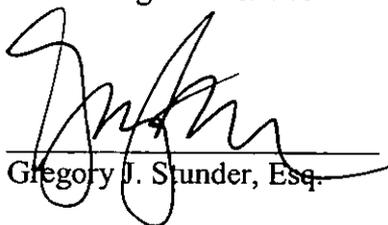
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\_\_\_\_\_  
Gregory J. Stunder, Esq.

Date: February 28, 2007

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SECRETARY'S BUREAU**

# ANNUAL RESOURCE PLANNING REPORT

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**Philadelphia Gas Works**

**Philadelphia, Pennsylvania**

March 2007

Forms 1 & 2

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PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

**BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Philadelphia Gas Works  
800 West Montgomery Avenue  
Philadelphia, Pennsylvania 19122**

**ANNUAL RESOURCE PLANNING REPORT**  
**MARCH 2007**

**Forms 1 & 2**

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**FEB 28 2007**

**PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU**

**Information Submitted in Compliance with and Pursuant to Title 52  
Pennsylvania Code Section 59.81**

# PHILADELPHIA GAS WORKS

## TABLE OF CONTENTS

<u>EXHIBIT NO.</u>	<u>REGULATION</u>	<u>DESCRIPTION</u>
1	59.81	General
2	59.81	Forms IRP-Gas 1A, and 1B Annual and Peak Day Energy Demand
3	59.81	Forms IRP-Gas 2A, 2B, and 2C Annual and Peak Day Energy Resources, And transmission and storage contracts

Section 59.81: **General**

Pursuant to Section 59.81 (a), each major jurisdictional gas utility must file an annual resource planning report (ARPR) on or before June 1, 1996 and June 1 of each succeeding year, except Form 1A/2A which filing date is March 1. One (1) original and seven (7) copies of the report must be submitted to:

Secretary  
Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

One copy should be submitted unbound for ease of duplication.

One courtesy copy should also be submitted to:

Pennsylvania Public Utility Commission  
Conservation, Economics and Energy Planning  
P.O. Box 3265  
Harrisburg, PA 17105-3265  
Attn. Calvin Birge

Also submit one (1) copy to the following:

Office of Consumer Advocate  
555 Walnut Street  
Forum Place, 5<sup>th</sup> Floor  
Harrisburg, PA 17101-1921

Office of Small Business Advocate  
Suite 1102, Commerce Building  
300 N. Second Street  
Harrisburg, PA 17101

**RECEIVED**

FEB 28 2007

**PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU**

Be sure to indicate the name and telephone number of at least one individual at the company who is familiar with the filing and will be available to answer any questions the Commission staff may have. You may also wish to list those individuals who are directly involved in the preparation of the various document components.

Information contained in annual resource planning reports must be utility-specific. The report should follow an outline similar to that which is contained herein, with narrative accompanying the required data. Forms may be modified to accommodate wide columns of numbers and enhance readability, but the general format should be used to maintain consistency.

This information is not generally considered confidential. Utilities are obligated to provide complete information. However, we will treat as confidential those portions of the report designated by the utility as proprietary. If a utility's proprietary claim is challenged, the Commission will direct the utility to file a petition for protective order pursuant to 52 PA Code 5.423.

All questions concerning the reporting requirements for Forms IRP Gas 1A through 9 should be addressed to Pennsylvania Public Utility Commission Bureau of Conservation, Economics and Energy Planning.

Response:

An original, seven (7) copies, and one unbound copy of Forms 1A, 1B, 2A, 2b, and 2C along with a general discussion of the methodologies, data sources, and assumptions are being submitted to meet the requirements of the March 1 filing.

All questions concerning the ARPR should be directed to Mr. Kenneth Dybalski, Director, Gas Planning & Rates at 215-684-6317. The following individual is available to answer questions concerning Forms 1 and 2: Ms. Maria Hogan, Administrator – Gas Planning at (215) 684-6618.

Section 59.81 **Forms IRP-Gas 1A, and 1B – Annual and Peak Day Demand**

The load growth projections shall reflect the effects of price elasticity, market induced conservation, building and appliance efficiency standards, and the effects of the utility's existing and planned conservation and load management activities.

Response: Please see the attached documentation and forms.

**FORM-IRP-GAS-1A: ANNUAL GAS REQUIREMENTS  
REPORTING UTILITY: PHILADELPHIA GAS WORKS  
(VOLUMES IN MMcf)**

Index Year Actual Year	Historical Data		Current Year	Three Year Forecast		
	-2 2004-2005	-1 2005-2006	0 2006-2007	1 2007-2008	2 2008-2009	3 2009-2010
<b>Firm Requirements:</b>						
Retail Residential	41,467	34,083	35,400	38,633	38,362	38,205
Retail Commercial	11,919	10,697	10,135	12,259	12,486	12,717
Retail Industrial	1,050	904	857	1,163	1,244	1,326
Electric Power Generation	-	-	-	-	-	-
Exchanges with Other Utilities	-	-	-	-	-	-
Unaccounted For Gas	1,902	2,290	1,532	1,913	1,916	1,920
Company Use	95	681	643	702	702	702
Other - Prior Period Adjustment	(463)	-	-	-	-	-
<b>Subtotal Firm</b>	<b>55,970</b>	<b>48,654</b>	<b>48,568</b>	<b>54,670</b>	<b>54,730</b>	<b>54,871</b>
<b>Interruptible Requirements:</b>						
Retail	4,464	2,409	2,188	3,270	3,373	3,503
Electric Power Generation	47	17	20	13	10	8
Company's Own Plant	65	62	64	72	72	72
Unaccounted For Gas	185	230	84	115	118	123
<b>Subtotal Interruptible</b>	<b>4,760</b>	<b>2,717</b>	<b>2,355</b>	<b>3,469</b>	<b>3,573</b>	<b>3,706</b>
<b>SUBTOTAL FIRM AND INTERRUPTIBLE</b>	<b>60,730</b>	<b>51,371</b>	<b>50,922</b>	<b>58,139</b>	<b>58,303</b>	<b>58,577</b>
<b>Transportation:</b>						
Firm Residential	-	-	-	-	-	-
Firm Commercial	-	-	363	-	-	-
Firm Industrial	-	-	27	-	-	-
Interruptible Residential	-	-	-	-	-	-
Interruptible Commercial	1,508	1,937	2,900	2,201	2,235	2,208
Interruptible Industrial	1,912	3,244	4,225	3,223	3,583	3,828
Other - Non-Utility Power Producers	8,307	5,681	6,006	8,485	8,464	8,489
<b>Subtotal Transportation</b>	<b>11,727</b>	<b>10,861</b>	<b>13,521</b>	<b>13,909</b>	<b>14,282</b>	<b>14,526</b>
<b>TOTAL GAS REQUIREMENTS</b>	<b>72,457</b>	<b>62,233</b>	<b>64,444</b>	<b>72,048</b>	<b>72,585</b>	<b>73,102</b>
Increase (Decrease)	NA	(10,224)	2,211	7,605	537	517
Percent Change (%)	NA	-14.1%	3.6%	11.8%	0.7%	0.7%

**FORM-IRP-GAS-1B: PEAK DAY REQUIREMENTS**  
**REPORTING UTILITY: PHILADELPHIA GAS WORKS**  
**(VOLUMES IN MMcf)**

Index Year Actual Year	Historical Data		Current Year <sup>(2)</sup>	Three Year Forecast <sup>(1)</sup>		
	-2 2004-2005	-1 2005-2006	0 2006-2007	1 2007-2008	2 2008-2009	3 2009-2010
<b>Firm Requirements:</b>						
Retail Residential	405	323	417	482	479	482
Retail Commercial	116	101	148	133	136	135
Retail Industrial	10	9	13	12	13	12
Electric Power Generation	0	0	0	0	0	0
Exchanges with Other Utilities	0	0	0	0	0	0
Unaccounted For Gas	19	22	0	0	0	0
Company Use	1	6	2	1	1	1
Other	0	0	0	0	0	0
<b>Subtotal Firm</b>	<b>552</b>	<b>461</b>	<b>579</b>	<b>627</b>	<b>629</b>	<b>630</b>
<b>Interruptible Requirements:</b>						
Retail	28	13	27	27	29	31
Electric Power Generation	0	0	0	0	0	0
Company's Own Plant	1	1	0	0	0	0
Unaccounted For Gas	0	0	0	1	1	1
<b>Subtotal Interruptible</b>	<b>29</b>	<b>14</b>	<b>27</b>	<b>28</b>	<b>30</b>	<b>32</b>
<b>SUBTOTAL FIRM AND INTERRUPTIBLE</b>						
	<b>580</b>	<b>475</b>	<b>606</b>	<b>656</b>	<b>659</b>	<b>662</b>
<b>Transportation:</b>						
Firm Residential	0	0	0	0	0	0
Firm Commercial	0	0	4	0	0	0
Firm Industrial	0	0	0	0	0	0
Interruptible Residential	0	0	0	0	0	0
Interruptible Commercial	6	8	0	0	0	0
Interruptible Industrial	5	9	0	0	0	0
Other - Non-Utility Power Producers	35	30	0	0	0	0
<b>Subtotal Transportation</b>	<b>46</b>	<b>47</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL GAS REQUIREMENTS</b>						
	<b>627</b>	<b>522</b>	<b>611</b>	<b>656</b>	<b>659</b>	<b>662</b>
Increase (Decrease)	na	(105)	89	45	3	3
Percent Change (%)	na	-16.80%	17.07%	7.41%	0.46%	0.50%

<sup>(1)</sup> Peak Day is forecasted at a 2 degree temperature.

<sup>(2)</sup> Current Year Peak Day is forecasted at a 5 degree temperature.

Section 59.81

**Forms IRP-Gas 2A, 2B and 2C - Annual and Peak Day Energy Resources, Transmission and Storage Contracts**

The forecast of energy sources shall indicate sources of all presently available and new supplies which the utility estimates will become available, displayed by component parts.

Response:

Please see the attached documentation and forms.

**FORM-IRP-GAS-2A: ANNUAL/PEAK SUPPLY**

**TABLE 1: ANNUAL/PEAK SUPPLY  
REPORTING UTILITY: PHILADELPHIA GAS WORKS  
(Volumes in MMcf)**

Index Year Actual Year	Historical Data				Current Year <sup>(2)</sup>		Three Year Forecast <sup>(1)</sup>					
	-2 2004-2005		-1 2005-2006		0 2006-2007		1 2007-2008		2 2008-2009		3 2009-2010	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
Gas Supply for Sales Service												
TETCO			-	-	-	-	-	-	-	-	-	-
TRANSCO	4,557	53	-	-	-	-	-	-	-	-	-	-
Spot Purchases	59,837	235	52,081	297	56,377	199	58,935	254	59,092	254	59,332	254
Storage Withdrawals	11,116	160	12,745	139	10,838	217	17,242	205	17,242	205	17,242	205
LNG Withdrawal	1,817	135	1,082	40	1,150	195	1,186	202	1,165	205	1,170	209
Company Production	-	-	-	-	-	-	-	-	-	-	-	-
LNG Purchases	382	-	2	-	-	-	-	-	-	-	-	-
Exchanges with other LDCs	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-
<b>Total Gas Supply</b>	<b>77,709</b>	<b>583</b>	<b>65,909</b>	<b>476</b>	<b>68,365</b>	<b>611</b>	<b>77,363</b>	<b>662</b>	<b>77,499</b>	<b>664</b>	<b>77,745</b>	<b>668</b>
<b>Total Transportation Services</b>	<b>11,727</b>	<b>-46</b>	<b>10,861</b>	<b>47</b>	<b>13,521</b>	<b>4</b>	<b>13,909</b>	<b>-</b>	<b>14,282</b>	<b>-</b>	<b>14,526</b>	<b>-</b>
<b>TOTAL GAS SUPPLY AND TRANSPORTATION SERVICE</b>	<b>89,436</b>	<b>630</b>	<b>76,771</b>	<b>523</b>	<b>81,886</b>	<b>615</b>	<b>91,272</b>	<b>662</b>	<b>91,782</b>	<b>664</b>	<b>92,270</b>	<b>668</b>
Deductions												
Underground Storage Injections & Fuels	13,939	-	12,861	-	15,503	4	17,996	4	17,990	4	17,956	4
LNG Liquefactions & Fuels	2,571	3	1,647	1	1,939	0	1,228	2	1,207	1	1,212	2
Sales to other LDC's	470	-	30	-	-	-	-	-	-	-	-	-
<b>Total Deductions</b>	<b>16,979</b>	<b>3</b>	<b>14,538</b>	<b>1</b>	<b>17,442</b>	<b>5</b>	<b>19,224</b>	<b>6</b>	<b>19,197</b>	<b>5</b>	<b>19,168</b>	<b>6</b>
<b>NET GAS SUPPLY</b>	<b>72,457</b>	<b>627</b>	<b>62,233</b>	<b>522</b>	<b>64,444</b>	<b>611</b>	<b>72,048</b>	<b>656</b>	<b>72,585</b>	<b>659</b>	<b>73,102</b>	<b>662</b>
BTU	1.038											

<sup>(1)</sup> Peak Day is forecasted at a 2 degree temperature.

<sup>(2)</sup> Current Year Peak Day is forecasted at a 5 degree temperature.



FORM-IRP-GAS-2C: NATURAL GAS STORAGE <sup>(1)</sup>  
 REPORTING UTILITY: PHILADELPHIA GAS WORKS  
 (volumes in MMcf)

Index Year Actual year	Historical Data				Current Year		Three Year Forecast					
	-2 2004-2005		-1 2005-2006		0 2006-2007		1 2007-2008		2 2008-2009		3 2009-2010	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
Transcontinental Transmission Corp.	3,723	60	3,723	60	3,723	60	3,723	60	3,723	60	3,723	60
Dominion Transmission Inc.	3,481	32	3,481	32	3,481	32	3,481	32	3,481	32	3,481	32
Transcontinental Transmission Corp.	3,086	36	3,086	36	3,086	36	3,086	36	3,086	36	3,086	36
Texas Eastern Transmission Corp.	2,467	43	2,467	43	2,467	43	2,467	43	2,467	43	2,467	43
Texas Eastern Transmission Corp.	2,219	20	2,219	20	2,219	20	2,219	20	2,219	20	2,219	20
ANR	-	-	-	-	-	-	-	-	-	-	-	-
Transcontinental Transmission Corp.	802	80	1,106	110	1,106	110	1,106	110	1,106	110	1,106	110
Equitrans	507	5	507	5	507	5	507	5	507	5	507	5
Transcontinental Transmission Corp.	453	5	453	5	453	5	453	5	453	5	453	5
<b>Total</b>	<b>16,736</b>	<b>281</b>	<b>17,042</b>	<b>311</b>	<b>17,042</b>	<b>311</b>	<b>17,042</b>	<b>311</b>	<b>17,042</b>	<b>311</b>	<b>17,042</b>	<b>311</b>

<sup>(1)</sup> Rank contracts in order of magnitude for the current year, noting the transportation provided and termination date for each contract reported. Reporting should proceed along rank ordering until 75% of total is accounted for, or until ten contracts have been listed, whichever occurs first.

Conversions at 1030 Btu

	Contract Expiration Date <sup>(2)</sup>
Transcontinental Transmission Corp.	03/31/2013
Dominion Transmission Inc.	03/31/2007
Transcontinental Transmission Corp.	Evergreen
Texas Eastern Transmission Corp.	04/30/2012
Texas Eastern Transmission Corp.	04/30/2012
Transcontinental Transmission Corp.	10/31/2013
Equitrans	03/31/2007
Transcontinental Transmission Corp.	04/15/2007

<sup>(2)</sup> For purposes of this report, all contracts due to expire are assumed renewed for the forecast years.

**BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**PHILADELPHIA GAS WORKS  
800 WEST MONTGOMERY AVENUE  
PHILADELPHIA, PENNSYLVANIA**

**Annual Resource Planning Summary Report**

**Filed: March 2007**

**Information Submitted in Compliance with and Pursuant to Title 52  
Pennsylvania Code Sections 59.81-59.84**

**PHILADELPHIA GAS WORKS**

**2007 Annual Resource Planning Summary Report**

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**INTRODUCTION**

**SECTION I -- PGW's Overall Approach to Integrated Resource Planning**

**SECTION II -- Supply Forecasting Methodology and Assumptions**

**SECTION III -- Demand Forecasting Methodology and Assumptions**

**SECTION IV -- Design Day Forecasting Methodology and Assumptions**

**SECTION V -- PGW Corporate Modeling System**

## Introduction

By Order entered January 11, 1996, the Pennsylvania Public Utility Commission (PUC) adopted final regulations (52 PA Code §§ 59.81 - 59.84) which set forth revised requirements for filing an Annual Resource Planning Report (the Plan). The Plan submitted represents Philadelphia Gas Works' (PGW or the Company) belief that integrated resource planning (IRP) is a workable approach to utility planning.

This plan summary contains historical data and projections for annual, winter and peak day supply to meet projected customer requirements in a least cost manner, while ensuring adequate and reliable service. It is organized into the following 5 sections:

- I. PGW's Overall Approach to Integrated Resource Planning
- II. Supply Forecasting Methodology and Assumptions
- III. Demand Forecasting Methodology and Assumptions
- IV. Design Day Forecasting Methodology and Assumptions
- V. PGW Corporate Modeling System

## **I. PGW's Overall Approach to Integrated Resource Planning**

### **PGW Optimization Standard for Purchasing and Utilizing Gas Supplies**

As reasonably anticipated PGW intends on meeting its contractual obligations to supply all of its current firm customers in its service territory on the coldest day, throughout the heating season and throughout the year. Projected customer requirements for design day and design winter conditions form the basis for capacity commitments for pipeline supply, storage, and transportation contracting.

Natural gas supplies are purchased under a portfolio approach with PGW intending to secure the lowest overall price consistent with the corporate goals of reliability and security of supply. In addition, consideration is given to maintaining a diversity of sources and types of supply, coupled with contractual and operational flexibility on both a daily and seasonal basis. Short term purchases from spot market sources are utilized to the maximum degree that they are more economical, available, and transportable.

Natural gas supplies are utilized so as to minimize gas costs subject to reliability constraints. Supply contract obligations are honored and prudent Gas Control operational requirements are assumed. Storage gas is drawn down so as to always maintain an inventory level sufficient for the remaining winter in the event that design temperature conditions should occur in the remaining segment of the winter season. Within the above parameters, priority is given to utilizing the most economical sources of supply first within the context of preserving the capability of meeting seasonal and annual demands rather than the momentary daily requirements. All facilities and sources of supply - flowing, storage and LNG are available to achieve the intended end, namely, minimizing gas costs subject to reliability constraints.

## II. Supply Forecasting Methodology and Assumptions Basic Assumptions

The PGW Gas Supply Policy Committee comprised of senior corporate management as well as Gas Planning, Gas Control, Gas Supply, and Regulatory departmental management, approved the aforementioned Optimization Standard for Purchasing and Utilizing Gas Supplies (Section I). All natural gas purchases continue to be made in accordance with this standard. Projected sales, revenues and natural gas expenses in this report result from this agreement, particularly in the areas of inventory valuation, priorities of gas selection and interruptible supply availability.

Incorporated into our projections are additional implementation steps involved with developing a cohesive gas supply/demand strategy for the near term and the longer range. These include developing a cost relationship comparison for current resources and a review of current contract terms and alternatives for continuing, extending, modifying or eliminating contracts.

In order to achieve this while maintaining a balance between economics and security of supply, the company uses a portfolio strategy approach. This approach incorporates a menu driven selection of services which allows the company to choose only those specific services necessary to meet its requirements. This is achieved by taking into consideration transportation capacity rights and then sources of supply are contracted to cover the firm transport rights over differing seasonal obligations.

Operating flexibility is sustained by variations in contract stipulations to permit the system to *swing on the most economical gas supplies available while maintaining the ability to supply rapidly fluctuating temperature requirements*. Storage facilities are substituted wherever opportunity affords to reduce annual expense for flowing 365 day pipeline service without reducing design day and design winter season delivery capability. Direct control of all storage is paramount to permit PGW to minimize winter costs by injecting lower priced summer purchases and to cycle storage to balance daily take fluctuations to avoid overrun/balancing charges.

## **II. Supply Forecasting Methodology and Assumptions** **Basic Assumptions (Continued)**

PGW's supply strategy incorporates maintaining full current winter day deliverability with regard to transportation capacity but to convert, where possible, to storage rather than winter flowing contracts to enhance financial and operational flexibility. A variety of longer term supply contracts are necessary to support pipeline transportation capacity because reliance upon best effort spot suppliers to fill wintertime supply requirements to meet firm customers' demands has proven to be an unreliable alternative. As a result longer-term contracts are utilized to support firm transportation capacity. To accomplish this end, the Company purchases winter supply contracts with daily deliverability equal to approximately 62% of the contractual daily transportation entitlements on its two interstate pipelines with direct connections to PGW's service territory. Additionally, these supply contracts match the contractual entitlements of the two pipelines by sourcing supply in a manner consistent with the pipeline's upstream contractual requirements. In this way, PGW not only helps ensure the security of supply by sourcing the gas from geographically diverse supply regions but this diversity also allows PGW to take advantage of the pricing basis differential inherent in these supply locations.

These contracts all contain the ability to fix the price for upcoming months as well as to allow the pricing to default to an agreed upon market index when there is no market advantage in fixing a price before the month begins. PGW uses this fixed price option in conjunction with its Gas Cost Rate (GCR) filing (GCR filing includes pricing based upon the NYMEX and Global Insight) by always attempting to buy under the GCR forecasted prices. Through the matching of the duration supply contracts to a seasonal demand, such as the winter operating season, the firm ratepayers benefit from not paying demand charges year-round.

A second component of PGW's supply portfolio or a volume equal to 28% of pipeline capacity, is purchased gas based on a first-of-the-month index pricing methodology with contracts that allow for daily change in volumetric take. This allows the Company to effectively shut-off higher priced supply replacing such supply with daily cheaper spot priced gases. Under assumed normal winter conditions, PGW utilizes certain storage fields (Eminence and Washington) in a manner similar to third party supply. Specifically, these storage contracts do not contain

II. Supply Forecasting Methodology and Assumptions  
Basic Assumptions (Continued)

transportation to the PGW city gate. Therefore, these storages must flow within PGW's contractual upstream capacity rights on TGPL. Typical daily delivery from these fields utilizes approximately 10% of the daily TETCO and TGPL capacity rights to the Philadelphia city gates. These storage fields also act as a physical fixed price to counter winter price conditions since the WACOG usually reflects a winter/summer pricing differential. PGW's summer purchasing strategy also incorporates a portfolio approach to the purchase of system supply and storage refill. The GCR filing is again used as a yardstick in purchasing supply for both system supply and storage refill. PGW attempts to always purchase a portion of its supply needs below the projected GCR cost estimate with a portion of the portfolio purchased at default, first-of-the-month pricing. These first of the month pricing option contracts, in most instances, allow PGW to evaluate daily spot prices and provide for a turn-off of first-of-the-month index priced supply in favor of the purchase of more advantageous daily spot purchases.

Operating conditions permitting, the Company enters into the FERC approved capacity release market to offset demand charges it pays for its firm transportation and/or the incremental off-systems sales market when it is economically advantageous for the firm ratepayer. In both instances, these opportunities are sought only when firm customer needs are satisfied. Additionally, PGW's bundled storages and LNG can be utilized as a substitute for higher price gas supply based on market pricing conditions and the results of PGW's status report. Effectively, the Gas Supply Group is at all times studying the market for any economic advantage it can bring to the firm ratepayer.

### **III. Demand Forecasting Methodology and Assumptions** **Basic Assumptions**

PGW uses a combination of four basic methods to develop demand projections. They are:

- 1) Historical Data -- data showing long-term demand trends, conservation and utilization patterns by the various classes of customers -- Residential, Commercial, Industrial and Interruptible.
- 2) Customer Survey -- Information as gathered by PGW's Marketing Department and used for annual projections by month and year.
- 3) Relative End Use -- Projections via Marketing methods of customer load sizing by appliance type, maximum input, maximum summer and winter full load hour (FLH) calculations which are used to develop yearly and monthly demand requirements.
- 4) Judgment -- Experienced opinion as applied to the evaluation of the combination of all data to develop the basic demand requirements.

#### **Customer Demand**

The total system-wide demand is a function of the projected gas demand per customer and the anticipated number of customers in each class. In determining customer demand, consideration is given to projecting current customer usage, augmented by significant gains or losses in each of 48 homogeneous groups for the period being projected. The Gas Planning Department attempts to determine for each customer class, the level of demand relating to experienced temperatures and the component of demand that is apparently not affected by changes in temperature. Within each class the most recent summer and winter usage patterns are established from historical records. Summer data provides an insight into each class of customers non-temperature sensitive load requirements or baseload which can be expressed in terms of thousands of cubic feet (Mcf) per day, per customer. Similarly, winter data after removal of the daily baseload level provides the temperature sensitive load requirements for each class of customer.

This usage primarily reflects space heating but also includes such other temperature sensitive needs as water heating attributable to colder ground water inlet temperatures and similar process variations. This overall heating requirement can be expressed in terms of the cubic feet of gas

**III. Demand Forecasting Methodology and Assumptions**  
**Basic Assumptions (Continued)**

utilized per degree of temperature change on a per customer basis for each separate customer classification.

In addition, consideration must be given to the variation of customer utilization patterns for space heating over the year, recognizing the transitional fall start-up of heaters, the deep winter period needs and the tapering off and shut-down which occurs in the spring. These usage patterns taken in conjunction with anticipated customer counts and appropriate temperature patterns form the basis of determining class and total system demands. Due to the inconsistencies of weather and weather forecasting techniques, no attempt is made to predict the specific daily temperatures of the projection period. Instead PGW has developed a normal monthly temperature pattern by analyzing statistical records of actual temperature patterns over a 30-year period. This pattern reflects 4510 degree-days annually distributed in a stylized pattern preserving the monthly range of colder to warmer daily temperatures experienced in the January to May period and warmer to colder daily temperatures in the September to December period.

The term "degree days" quantifies the number of degrees of temperature below a base level of 65 degrees Fahrenheit and is used as a tool to measure space heating requirements, i.e. on a day experiencing an average temperature of 40 degrees F. there would be 25 degree days. The annual 4510 degree days which is composed of the PGW normal monthly temperature patterns, form the basis of the calculation of the temperature sensitive component of demand. The application of the above described baseload, space heating factors and customer counts, when applied to a calendar based daily temperature pattern, produce a daily calculation of total customer requirements identified as sendout. It should be noted that there is a difference between sendout volume and sales volume. Sendout represents those volumes metered at the city gate to supply customers' requirements while sales are those volumes registered on customer meters. The variation between sendout and sales, after adjustments, is that portion which is lost and unaccounted for in the PGW distribution system.

### **III. Demand Forecasting Methodology and Assumptions** **Basic Assumptions (Continued)**

Sales and sendout differ on a monthly basis in the degree day distribution pattern. For efficiency, meter reading and billing efforts are distributed uniformly over the available number of working days in a month and the majority of PGW customers are divided into 20 individual groups or cycles containing residential, commercial and industrial accounts within a specific geographic area. When these cycle customers are billed each month they reflect meter reading usage not for the calendar month being billed, but for the number of days and temperature pattern of degree-days experienced during their specific interval between meter readings. For example, assume the month of January contained 900 calendar degree-days. The customers in cycle 10 being billed for the month of January might have had meter readings taken on December 15 and again on January 17. Sales billed and reported in the company records for these customers would reflect the number of days and degree days between these reading dates rather than the 900 degree days of the month. Similarly, cycle 1 customers that might have had meter readings taken on December 1 and January 2 would reflect principally the month of December temperature experience, whereas, cycle 20 customers with meter readings taken possibly December 28 and January 29 would reflect principally the month of January temperature experience.

An average of the 20 cycles (Average Cycle Degree-Days) is used as the temperature pattern upon which to project the volume of sales in the forecast period. Both projections of sales and sendouts represent the full demand for that period from both firm and interruptible customers.

#### **Methodology Used to Develop Monthly Estimates**

A trial domestic factor is developed by classes of customers from sales reported for the summer months in the previous year. This average factor is then utilized in the sendout formula with the customer counts for the months of July, August and September. A comparison between what the formula calculates and the actual experienced for those three months is ascertained and the trial

### **III. Demand Forecasting Methodology and Assumptions** **Basic Assumptions (Continued)**

domestic (baseload) factors are finalized to replicate the total sendout experienced. The finalized domestic factors (DOMs) are then utilized in conjunction with the actual sales and customer counts for the months of December, January and February to determine the average Mcf per degree day for each of the individual months for the remaining temperature sensitive load. The results are weighted by degree-days to give an average value which is utilized as a trial value for the heating factor.

The finalized domestic factor and the trial heating factor developed, as such, are then applied in the sendout calculations together with customer counts for the months of December, January and February (the peak winter heating period) to project an estimated sendout for each of these months. The projected sendout is then compared with the actual sendout experienced. Any variation between the projected and actual is adjusted to force the replication of the actual *sendout experience thus resulting in the determination of a finalized heating factor.*

To project the number of customers for each individual rate class, each rate class of customers are reviewed and accumulated individually. Current customers are ascertained from the number of billings data available from sales and revenue actually experienced immediately prior to the commencement of a model run. Declines are projected for anticipated losses to electric and other fuels, demolitions and transfers to other rates. Direct transfers from a non-heating to a heating account, as a result of a current customer's conversion to gas heat, moves the domestic load to the new category. Projected additional customers are developed by the Marketing Department where staff dealing with individual classes of customers and having the most direct knowledge of conditions within their expertise, project annual load additions which are translated into customer counts based upon typical customer usage for that individual customer class. The approximate month of turn-on is also developed to permit reflection of the effective portion of the load addition within the fiscal period under study. Interruptible class customers as well as other large special accounts are detailed individually incorporating expected gains and losses as direct contact and experience has indicated.

**III. Demand Forecasting Methodology and Assumptions**  
**Basic Assumptions (Continued)**

The base revenue projections for both firm and interruptible customer groups are derived as the product of the projected sales volumes and the present tariff rate for each individual customer class within each group. The GCR revenue projections are derived as the product of the GCR factor and the projected sales volumes to the firm customers.

#### **IV. Design Day and Design Hour Forecasting Methodology and Assumptions**

Each year a six year estimate of *Design Day* and *Design Hour* requirements anticipated under design day and design hour operating conditions is prepared to ensure that adequate resources are under contract and to further ensure that PGW can fulfill its supply obligation for its firm customer requirements on a design day and design hour.

The projected demands for design day are developed utilizing previous winter periods data for all weekdays where the temperature average for the day is 32 degrees Fahrenheit or below. The total sendout for these days as recorded under actual conditions and is reduced to firm sendout by removal of the interruptible load. A computer generated linear regression procedure is utilized to develop a sendout model from actual daily sendouts and degree days, and the process is repeated in a quadratic regression and a cubic regression procedure. From the predicted sendouts in the regression, which are within a reasonable percent of error to the actual sendout, factors are derived to replicate the actual sendouts. The factors derived from this are used to determine the current load requirements for a 0 degrees F day and from this data, the load for a -5 degrees F hour is calculated. PGW's Marketing Department's load projections for present and future years are then applied to these requirements to develop design day and design hour present and future load requirements. This is achieved by the addition of the projected marketing load growth on an annual basis (by day) to the derived base-year design day requirements.

## **V. PGW Corporate Modeling System**

### **General Description**

The corporate modeling system is a tool used by PGW management to project sales, revenues and expenses, as well as to examine key planning strategies and evaluate their effects on company operations. The system provides the ability to determine the results of alternate plans and scenarios, while at the same-time allowing for responses to "what if" type situations quantifying revenue and expenses. The system combines the power of the computer with the experience of management to develop both short and long range projections based upon experienced historical data for sales and sendout volumes, raw material expenses and sale revenues. The corporate model system is composed of five separate models. Each model operates independently but requires substantial external data inputs as well as data output results from one or more of the other models in the system.

### **Gas Demand Model**

The gas demand model is used to forecast total requirements for gas based upon current customer usage experience with adjustments for projected gains and losses. Input data includes domestic and space heating usage factors, customer counts by rate classifications, temperature patterns and results in projections of sales and sendout volumes. Detail and summary reports include average usage per customer and demands by rate classification. This data is transferred to the supply model.

### **Gas Supply Model**

The supply model is used to dispatch the various supply sources in accordance with contract availability limitations. It develops the necessary balance between supply and demand which reflects plant fuel and storage injection requirements as well as customer demands by identifying the availability of interruptible load balancing sales. Detail and summary reports include daily and monthly load requirements, the volumes taken from each source by pipeline contract, storage balances, LNG requirements, etc. Data is transferred to both the cost model and the revenue model downstream.

## **V. PGW Corporate Modeling System (Continued)**

### **Gas Cost Model**

The gas cost model is used to determine natural gas and other raw material costs dispatched. The model tracks the various cost components of each contract - the demand, capacity, commodity, injection and withdrawal charges - providing monthly and annual details and summary information including inventory valuations and expenses for supplemental LNG supplies. It transfers these expenses to the Gas Cost Rate Model.

### **Gas Cost Rate Model**

The gas cost rate model is used to develop the net natural gas expenses, net applicable GCR expenses and the GCR. It ascribes responsibility for the raw material costs to firm and interruptible classes in accordance with PGW's tariff requirements, assigning cost on an as-used basis to customer classes applicable to such charges, and compensates for natural gas refunds and previous over or under billing of fuel expenses. Detail summary reports include specifics of raw material adjustment, statements of reconciliation, and determination of applicable sales and expenses. It transfers the results to the revenue model.

### **Revenue Model**

The revenue model is used to project billed revenue by rate classification in accordance with PGW's rate tariffs. It prepares the net billed revenue, GCR revenues, senior citizen discounts, and cycle billing information all detailed by rate classification. The detail and summary reports provided by this model are directed to the accounting and financial departments for inclusion in various financial reviews.

### **Summary**

The corporate modeling system allows PGW management to effectively address supply/demand balancing, supply facilities planning, projected sales, cost, revenues, and sendout volumes in a timely manner. Results assist in the development of PGW's annual Operating Budget, setting of the GCR and planning of supply resources.

**V. PGW Corporate Modeling System (Continued)**

The model also provides a Status Report for the evaluation of remaining winter period requirements on both normal and design temperature patterns and the extrapolation of the current year based upon the experience to date and an assumption of temperatures anticipated for the remaining period of the year, this latter acting as a guide for both financial cash flow planning and winter operations.

**Philadelphia Gas Works**

Gregory J. Stunder  
Senior Attorney



800 W. Montgomery Avenue, Philadelphia, PA 19122  
Telephone: (215) 684-6878 - Fax (215) 684-6798  
Email: greg.stunder@pgworks.com

June 12, 2007

VIA OVERNIGHT MAIL

James J. McNulty  
Secretary  
PA Public Utility Commission  
Commonwealth Keystone Building  
400 North Street, 2nd Floor  
Harrisburg, PA 17120

DOCUMENT  
FOLDER

RECEIVED

JUN 12 2007

PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

Re: Philadelphia Gas Works - Annual Resource Planning Report

Dear Secretary McNulty:

ARP 125042

Enclosed for filing please find an original and seven (7) Philadelphia Gas Works' Annual Resource Planning Report, that includes Forms 3-9 and the Summary Report.

If you have any questions regarding this matter, please contact me. Thank you for your assistance with this matter.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gregory J. Stunder".

Gregory J. Stunder

cc: Calvin Birge, Bureau of Conservation, Economics, and Energy Planning

609

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JUN 1 2 2007

PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

# ANNUAL RESOURCE PLANNING REPORT

Forms 3 - 9

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**Philadelphia Gas Works  
Philadelphia, Pennsylvania**

June 2007

**BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Philadelphia Gas Works  
800 West Montgomery Avenue  
Philadelphia, Pennsylvania 19122**

**ANNUAL RESOURCE PLANNING REPORT**

**June 2007**

**RECEIVED**

**JUN 1 2 2007**

**PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU**

**Information Submitted in Compliance with and Pursuant to Title 52  
Pennsylvania Code Section 59.81**

**PHILADELPHIA GAS WORKS  
ANNUAL RESOURCE PLANNING REPORT**

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Section 59.81: General

Pursuant to Section 59.81 (a), each major jurisdictional gas utility must file an annual resource planning report (ARPR) on or before June 1, 1996 and June 1 of each succeeding year, except Form 1A/2A which filing date is March 1. One (1) original and seven (7) copies of the report must be submitted to:

Secretary  
Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

One copy should be submitted unbound for ease of duplication.

One courtesy copy should also be submitted to:

Pennsylvania Public Utility Commission  
Conservation, Economics and Energy Planning  
P.O. Box 3265  
Harrisburg, PA 17105-3265  
Attn. Calvin Birge

Also submit one (1) copy to the following:

Office of Consumer Advocate  
555 Walnut Street  
Forum Place, 5<sup>th</sup> Floor  
Harrisburg, PA 17101-1921

Office of Small Business Advocate  
Suite 1102, Commerce Building  
300 N. Second Street  
Harrisburg, PA 17101

Be sure to indicate the name and telephone number of at least one individual at the company who is familiar with the filing and will be available to answer any questions the Commission staff may have. You may also wish to list those individuals who are directly involved in the preparation of the various document components.

Information contained in annual resource planning reports must be utility-specific. The report should follow an outline similar to that which is contained herein, with narrative accompanying the required data. Forms may be modified to accommodate wide columns of numbers and enhance readability, but the general format should be used to maintain consistency.

This information is not generally considered confidential. Utilities are obligated to provide complete information. However, we will treat as confidential those portions of the report designated by the utility as proprietary. If a utility's proprietary claim is challenged, the Commission will direct the utility to file a petition for protective order pursuant to 52 PA Code 5.423.

All questions concerning the reporting requirements for Forms IRP Gas 1A through 9 should be addressed to Pennsylvania Public Utility Commission Bureau of Conservation, Economics and Energy Planning.

Response:

An original, seven (7) copies, and one unbound copy of Forms 1A, 1B, 2A, 2B, 2C, 3, 4A, 4b, 5, 6, 7, 8 and 9 along with a general discussion of the methodologies, data sources, and assumptions are being submitted to meet the requirements of the June 1 filing. Please note that Forms 1A, 1B, 2A, 2B, 2C were already filed in the company's March 1 filing and included herein, without modification, for completeness.

All questions concerning the ARPR should be directed to Mr. Kenneth Dybalski, Director – Gas Planning & Rates (215) 684-6317. The following individuals will be available to answer questions concerning specific forms:

Ms. Maria Hogan - Forms 3,4 and 6 at (215) 684-6618

Ms. Cristina Coltro – Forms 5,7,8, and 9 at (215) 684-6785

**Section 59.81 Forms IRP-Gas 3 - Historical, Current and Forecast Number of Customers**

Provide the number of year end customers displayed by component parts.

Response: Please see the attached form.

FORM-IRP-GAS-3: NUMBER OF CUSTOMERS <sup>(1)</sup>  
 REPORTING UTILITY: PHILADELPHIA GAS WORKS

	Historical Data		Current Year	Three Year Forecast			
	Index Year Fiscal Year	-2	-1	0	1	2	3
		2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
<b>Firm Customers</b>							-
Retail Residential		486,144	477,336	465,825	464,817	461,184	457,560
Retail Commercial		26,769	26,442	25,703	27,172	27,632	28,089
Retail Industrial		896	852	819	926	992	1,056
Other		-	-	-	-	-	-
Subtotal Sales Service		513,809	504,629	492,347	492,915	489,808	486,705
Electric Power Generation		4	4	4	2	2	2
Interruptible Customers		407	323	251	296	283	273
Transportation Service <sup>(2)</sup>		76	128	213	197	223	245
<b>CUSTOMER TOTAL</b>		514,296	505,084	492,815	493,410	490,315	487,226
Increase ( Decrease)		514,296	(9,212)	(12,269)	595	(3,095)	(3,090)
Percent Change (%)			-1.8%	-2.4%	0.1%	-0.6%	-0.6%

<sup>(1)</sup> Customer Count is based on the average number of billings over the course of the year.

<sup>(2)</sup> The increase in Transportation customers is due to Interruptible customers switching to transportation.

Section 59.81 **Forms IRP-Gas 4A and 4B - Annual and Peak Day Energy Supply and Demand**

Response: Please see the attached forms.

FORM-IRP-GAS-4A: ANNUAL SUPPLY AND REQUIREMENTS SUMMARY  
 REPORTING UTILITY: PHILADELPHIA GAS WORKS  
 (Volumes in MMcf)

Index Year Actual Year	Historical Data		Current Year	Three Year Forecast		
	-2 2004-2005	-1 2005-2006	0 2006-2007	1 2007-2008	2 2008-2009	3 2009-2010
<b>Gas Supply:</b>						
Supply Contracts	64,394	52,081	56,377	58,935	59,092	59,332
Storage Withdrawals	11,116	12,745	10,838	17,242	17,242	17,242
LNG	2,199	1,084	1,150	1,186	1,165	1,170
Subtotal Gas Supply	77,709	65,909	68,365	77,363	77,499	77,745
Transportation	11,727	10,861	13,521	13,909	14,282	14,526
<b>TOTAL GAS SUPPLY</b>	<b>89,436</b>	<b>76,771</b>	<b>81,886</b>	<b>91,272</b>	<b>91,782</b>	<b>92,270</b>
<b>Requirements:</b>						
Firm Requirements	55,970	48,654	48,568	54,670	54,730	54,871
Liquefaction	2,571	1,647	1,939	1,228	1,207	1,212
Interruptible Requirements	4,760	2,717	2,355	3,469	3,573	3,706
Storage Injections	13,939	12,861	15,503	17,996	17,990	17,956
Sales to other LDC's	470	30	-	-	-	-
Subtotal Firm & Interruptible	77,709	65,909	68,365	77,363	77,500	77,745
Transportation	11,727	10,861	13,521	13,909	14,282	14,526
Load Reductions						
<b>TOTAL GAS REQUIREMENTS</b>	<b>89,436</b>	<b>76,771</b>	<b>81,886</b>	<b>91,272</b>	<b>91,782</b>	<b>92,270</b>
Surplus (Deficiency)	0	0	0	0	0	0

FORM-IRP-GAS-4B: PEAK DAY SUPPLY AND REQUIREMENTS SUMMARY <sup>(1)</sup>  
 REPORTING UTILITY: PHILADELPHIA GAS WORKS  
 (Volumes in MMcf)

Index Year Actual Year	Historical Data		Current Year	Three Year Forecast		
	-2 2004-2005	-1 2005-2006	0 2006-2007	1 2007-2008	2 2008-2009	3 2009-2010
Gas Supply:						
Supply Contracts	288	297	199	254	254	254
Storage Withdraws	160	139	217	205	205	205
LNG	135	40	195	202	205	209
Subtotal Gas Supply	583	476	611	662	664	668
Transportation	46	47	4	-	-	-
<b>TOTAL GAS SUPPLY</b>	<b>630</b>	<b>523</b>	<b>615</b>	<b>662</b>	<b>664</b>	<b>668</b>
Requirements:						
Firm Requirements <sup>(2)</sup>	551	461	579	627	629	630
Interruptible Requirements	29	14	27	28	30	32
Storage & LNG Fuels	3	1	5	6	4.8	6
Subtotal Firm & Interruptible	583	476	611	662	664	668
Transportation	46	47	4	-	-	-
Load Reductions	-	-	-	-	-	-
<b>TOTAL GAS REQUIREMENTS</b>	<b>630</b>	<b>522</b>	<b>615</b>	<b>662</b>	<b>664</b>	<b>668</b>
Surplus (Deficiency)	0	0	0	0	0	0

<sup>(1)</sup> Peak Day is forecasted at a 2 degree temperature.

<sup>(2)</sup> Firm requirements for the forecast years include plant use.

Section 59.82 **Forms IRP-Gas 5 - Energy Conservation Report-Program Description**

Response: Please see the attached forms.

## FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Philadelphia Gas Works (PGW)

Program: Conservation Works Program (CWP)

Existing [ X ] Proposed [ ]

Contact Person: Cristina Coltro  
(215) 684-6785

Objective: To reduce energy usage, therefore, making bills more affordable for low-income customers whose usage is average or above average and who are participants in the Customer Responsibility Program.

Details of Activity and Implementation Schedule:

Eligible customers are targeted for program participation. For each participating household, PGW's contractors will perform an energy diagnostic audit, energy education, and conservation treatments such as home repairs, automatic clock thermostat, insulation, etc.

Actual and/or Anticipated Results:

Year	Peak Load Reduction Mcf	Electric Mwh	Energy Savings		Other Results
			Gas Mcf	Oil Gallons	
2003 (1)			13		3417 Homes w/ Treatment
2004 (1)			16		2985 Homes w/ Treatment
2005 (2)			14		2721 Homes w/ Treatment

Monetary and Personal Resources:

Year	Personnel Est. Hrs. (3)	Categorized program Expenses		
		Outside Services	Admin. (PGW Internal)	Total
2003 (1)	37,587	\$1,975,962	\$60,000	\$2,035,962
2004 (1)	32,835	\$2,008,697	\$50,000	\$2,058,697
2005 (1)	29,931	\$2,014,086	\$50,000	\$2,064,086

(1) Actual

(2) Actual number of participants, actual expenditure, estimated energy savings

(3) Personnel hours were estimated by multiplying the number of homes by 11, the average number of hours spent per home.

Section 59.82   **Forms IRP-Gas 6 - Energy Users**

Response:   Please see the attached forms.

FORM-IRP-GAS-6  
ENERGY USERS  
COMPANY: PHILADELPHIA GAS WORKS

Fiscal Year Ending August 31, 2006

	<u>Number of Customers</u>	<u>Sales (Mcf)</u>
<b>Firm:</b>		
Residential:		
Heating	422,386	32,424,377
Non-heating	54,950	1,476,662
Commercial	26,442	10,827,670
Industrial	<u>852</u>	<u>914,609</u>
<b>Sub-total Firm</b>	504,629	45,643,318
<b>Interruptible</b>		
Commercial & Industrial	<u>327</u>	<u>2,425,858</u>
<b>Total Gas Sold</b>	504,956	48,069,176
Unbilled Adjustment	-	(559,921)
Transportation	128	10,727,487
Utility Use	<u>-</u>	<u>680,632</u>
<b>Total</b>	<u>505,084</u>	<u>58,917,374</u>

Section 59.82    **Forms IRP-Gas 7 - Conservation and Load Management Program Cost  
Benefit Analysis Inputs**

Response:    Please see the attached forms.

## FORM-IRP-GAS-7 PROGRAM SUMMARY

Company: Philadelphia Gas Works (PGW)

Program Name	Peak Load Reduction (Mcf)	Energy Use Change (Mcf)	Personnel Est. Hrs (3)	Categorized Program Expenses		
				Outside Services	Adm.	Total
Conservation Works Program (CWP) - 2001 (1)	NA	13	46,475	\$2,352,533	\$60,000	\$2,412,533
Conservation Works Program (CWP) - 2002 (1)	NA	13	34,980	\$1,922,540	\$60,000	\$1,982,540
Conservation Works Program (CWP) - 2003 (1)	NA	13	37,587	\$1,975,962	\$60,000	\$2,035,962
Conservation Works Program (CWP) - 2004 (1)	NA	16	32,835	\$2,008,697	\$50,000	\$2,058,697
Conservation Works Program (CWP) - 2005 (1)	NA	14	29,931	\$2,014,086	\$50,000	\$2,064,086

(1) Actual

(2) Actual figures except for Energy Savings

(3) Personnel hours were estimated by multiplying the number of homes by 1.1, the average number of hours spent per home

Section 59.82 **Forms IRP-Gas 8 - Conservation and Load Management Program Cost  
Benefit Analysis Results**

Response: Please see the attached forms.

Company Name:  
FORM-IRP-GAS-8

Philadelphia Gas Works (PGW)  
Cost-Benefit Analysis Input

PROGRAM:

Conservation Works Program

t	Year	Energy Savings (E) Mcf	Average Energy Cost (ACE) \$ per Mcf	Avoided Energy Cost (MCE) \$ per Mcf	Participant Demand Savings (D) Mcf	Utility Capacity Savings (G) Mcf	Average Demand Costs (ACD) \$/Mcf	Avoided Demand Costs (MCD) \$/Mcf	Participant Costs (PC) \$
1	2005	37,829	\$ 14.90	\$ 9.08130	N/A	N/A	N/A	\$	-
2	2006	37,829	\$ 19.01	\$ 12.32550	N/A	N/A	N/A	\$	-
3	2007	37,829	\$ 17.39	\$ 10.43380	N/A	N/A	N/A	\$	-
4	2008	37,829	\$ 16.72	\$ 10.18120	N/A	N/A	N/A	\$	-
5	2009	37,829	\$ 17.29	\$ 10.75585	N/A	N/A	N/A	\$	-
6	2010	37,829	\$ 16.79	\$ 10.25004	N/A	N/A	N/A	\$	-
7	2011	37,829	\$ 16.63	\$ 10.09489	N/A	N/A	N/A	\$	-
8	2012	37,829	\$ 16.40	\$ 9.86531	N/A	N/A	N/A	\$	-
9	2013	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
10	2014	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
11	2015	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
12	2016	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
13	2017	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
14	2018	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
15	2019	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
16	2020	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
17	2021	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
18	2022	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
19	2023	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
20	2024	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
21	2025	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
22	2026	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
23	2027	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
24	2028	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-
25	2029	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A	\$	-

PROGRAM:

Conservation Works Program

		Discount Rates							
t	Year	Incentive Cost (l) \$	Utility Costs (UC) \$	Participant (d) %	Non-Participant (d) %	Utility (1) (d) %	Escalation Rate (e) %	System Sales or Demand (S) Mcf	Sales or Demand Ratio (f) %
1	2005	\$ -	\$2,014,086	5.9	5.9	5.9	\$ -	58,319,743	0.0071
2	2006	\$ -	\$ -	5.9	5.9	5.9	\$ -	48,669,373	0.0085
3	2007	\$ -	\$ -	5.9	5.9	5.9	\$ -	48,486,536	0.0085
4	2008	\$ -	\$ -	5.9	5.9	5.9	\$ -	55,937,140	0.0074
5	2009	\$ -	\$ -	5.9	5.9	5.9	\$ -	56,095,484	0.0074
6	2010	\$ -	\$ -	5.9	5.9	5.9	\$ -	56,359,849	0.0074
7	2011	\$ -	\$ -	5.9	5.9	5.9	\$ -	56,643,598	0.0073
8	2012	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
9	2013	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
10	2014	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
11	2015	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
12	2016	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
13	2017	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
14	2018	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
15	2019	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
16	2020	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
17	2021	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
18	2022	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
19	2023	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
20	2024	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
21	2025	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
22	2026	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
23	2027	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
24	2028	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
25	2029	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076

(1) The Participant, Non-Participant and Utility discount rates are based on PGW's long-term debt and AFUDC (Allowance for Funds Used During Construction).

Section 59.81 **Forms IRP-Gas 9 - 2000 Annual Resource Summary Planning Report**

Response: The Summary Report is included as a separate document.

Company Name:  
FORM-IRP-GAS-9

**Philadelphia Gas Works (PGW)  
Cost-Benefit Analysis Input**

Program:

**Conservation Works Program (CWP)**

Period of Analysis		Total Utility Benefits (Bu) \$	Total Utility Costs (Cu) \$	Revenue Reduction Cost (Cr) \$	Participant Revenue Requirement (Rp) \$	Total participant Benefits (Bp) \$	Total Participant Costs (Cp) \$
Beginning Year	Ending Year						
2005	2029	\$ 4,549,061	\$ 2,014,086	\$ 7,480,464	\$ 29,431	\$ 7,480,464	\$ 29,431

Discounted Payback Period Yrs.	NET PRESENT VALUE			BENEFIT COST RATE			Rate Impact Non-Part (RIMnp) \$/Mcf
	Participant (NPVp) \$	Non-Part (NPVnp) \$	Utility (NPVu) \$	Participant (BCRp)	Non-Part (BCRnp)	Utility (BCRu)	
25	\$ 7,451,033	\$(4,910,335.60)	\$ 2,534,974.89	254.17	0.48	2.26	\$ 0.04

# ANNUAL RESOURCE PLANNING REPORT

**Summary Report**

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**Philadelphia Gas Works  
Philadelphia, Pennsylvania**

**June 2007**

**BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**Philadelphia Gas Works  
800 West Montgomery Avenue  
Philadelphia, Pennsylvania 19122**

**ANNUAL RESOURCE PLANNING REPORT**

**June 2007**

**Information Submitted in Compliance with and Pursuant to Title 52  
Pennsylvania Code Section 59.81**

**PHILADELPHIA GAS WORKS  
ANNUAL RESOURCE PLANNING REPORT**

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Section V PGW Corporate Modeling System

Section VI Summary Tables

Exhibit No.	Regulation	Description
1	59.81	Forms IRP-Gas 1A, and 1B Annual and Peak Day Energy Demand (Originally Submitted March 1)
2	59.81	Forms IRP-Gas 2A, 2B, and 2C Annual and Peak Day Energy Resources, And transmission and storage contracts (Originally Submitted March 1)
3	59.81	Form IRP-Gas 3 Historical, Current and Forecast Number Of Customers
4	59.81	Forms IRP-Gas 4A and 4B Annual and Peak Day Energy Supply and Demand

## Table of Contents (Continued)

5	59.82	Form IRP-Gas 5 Energy Conservation Report-Program Description
6	59.82	Form IRP-Gas 6 Energy Users 6
7	59.82	Form IRP-GAS 7 Conservation and Load Management Program Summary
8	59.82	Form IRP-Gas 8 Conservation and Load Management Program Cost Benefit Analysis Inputs
9	59.82	Form IRP-Gas 9 Conservation and Load Management Program Cost Benefit Analysis Results

Section 59.81: General

Pursuant to Section 59.81 (a), each major jurisdictional gas utility must file an annual resource planning report (ARPR) on or before June 1, 1996 and June 1 of each succeeding year, except Form 1A/2A which filing date is March 1. One (1) original and seven (7) copies of the report must be submitted to:

Secretary  
Pennsylvania Public Utility Commission  
P.O. Box 3265  
Harrisburg, PA 17105-3265

One copy should be submitted unbound for ease of duplication.

One courtesy copy should also be submitted to:

Pennsylvania Public Utility Commission  
Conservation, Economics and Energy Planning  
P.O. Box 3265  
Harrisburg, PA 17105-3265  
Attn. Calvin Birge

Also submit one (1) copy to the following:

Office of Consumer Advocate  
555 Walnut Street  
Forum Place, 5<sup>th</sup> Floor  
Harrisburg, PA 17101-1921

Office of Small Business Advocate  
Suite 1102, Commerce Building  
300 N. Second Street  
Harrisburg, PA 17101

Be sure to indicate the name and telephone number of at least one individual at the company who is familiar with the filing and will be available to answer any questions the Commission staff may have. You may also wish to list those individuals who are directly involved in the preparation of the various document components.

Information contained in annual resource planning reports must be utility-specific. The report should follow an outline similar to that which is contained herein, with narrative accompanying the required data. Forms may be modified to accommodate wide columns of numbers and enhance readability, but the general format should be used to maintain consistency.

This information is not generally considered confidential. Utilities are obligated to provide complete information. However, we will treat as confidential those portions of the report designated by the utility as proprietary. If a utility's proprietary claim is challenged, the Commission will direct the utility to file a petition for protective order pursuant to 52 PA Code 5.423.

All questions concerning the reporting requirements for Forms IRP Gas 1A through 9 should be addressed to Pennsylvania Public Utility Commission Bureau of Conservation, Economics and Energy Planning.

Response:

An original, seven (7) copies, and one unbound copy of Forms 1A, 1B, 2A, 2B, 2C, 3, 4A, 4b, 5, 6, 7, 8 and 9 along with a general discussion of the methodologies, data sources, and assumptions are being submitted to meet the requirements of the June 1 filing. Please note that Forms 1A, 1B, 2A, 2B, 2C were already filed in the company's March 1 filing and included herein, without modification, for completeness.

All questions concerning the ARPR should be directed to Mr. Kenneth Dybalski, Director – Gas Planning & Rates (215) 684-6317. The following individuals will be available to answer questions concerning specific forms:

Ms. Maria Hogan - Forms 1,2,3,4 and 6 at (215) 684-6618  
Ms. Cristina Coltro -- Forms 5,7,8, and 9 at (215) 684-6785

## **Introduction**

By Order entered January 11, 1996, the Pennsylvania Public Utility Commission (PUC) adopted final regulations (52 PA Code §§ 59.81 - 59.84) which set forth revised requirements for filing an Annual Resource Planning Report (the Plan). The Plan submitted represents Philadelphia Gas Works' (PGW or the Company) belief that integrated resource planning (IRP) is a workable approach to utility planning.

This plan summary contains historical data and projections for annual, winter and peak day supply to meet projected customer requirements in a least cost manner, while ensuring adequate and reliable service. It is organized into the following 5 sections:

- I. PGW's Overall Approach to Integrated Resource Planning
- II. Supply Forecasting Methodology and Assumptions
- III. Demand Forecasting Methodology and Assumptions
- IV. Design Day Forecasting Methodology and Assumptions
- V. PGW Corporate Modeling System

## **I. PGW's Overall Approach to Integrated Resource Planning**

### **PGW Optimization Standard for Purchasing and Utilizing Gas Supplies**

As reasonably anticipated PGW intends on meeting its contractual obligations to supply all of its current firm customers in its service territory on the coldest day, throughout the heating season and throughout the year. Projected customer requirements for design day and design winter conditions form the basis for capacity commitments for pipeline supply, storage, and transportation contracting.

Natural gas supplies are purchased under a portfolio approach with PGW intending to secure the lowest overall price consistent with the corporate goals of reliability and security of supply. In addition, consideration is given to maintaining a diversity of sources and types of supply, coupled with contractual and operational flexibility on both a daily and seasonal basis. Short term purchases from spot market sources are utilized to the maximum degree that they are more economical, available, and transportable.

Natural gas supplies are utilized so as to minimize gas costs subject to reliability constraints. Supply contract obligations are honored and prudent Gas Control operational requirements are assumed. Storage gas is drawn down so as to always maintain an inventory level sufficient for the remaining winter in the event that design temperature conditions should occur in the remaining segment of the winter season. Within the above parameters, priority is given to utilizing the most economical sources of supply first within the context of preserving the capability of meeting seasonal and annual demands rather than the momentary daily requirements. All facilities and sources of supply - flowing, storage and LNG are available to achieve the intended end, namely, minimizing gas costs subject to reliability constraints.

## II. Supply Forecasting Methodology and Assumptions Basic Assumptions

The PGW Gas Supply Policy Committee comprised of senior corporate management as well as Gas Planning, Gas Control, Gas Supply, and Regulatory departmental management, approved the aforementioned Optimization Standard for Purchasing and Utilizing Gas Supplies (Section I). All natural gas purchases continue to be made in accordance with this standard. Projected sales, revenues and natural gas expenses in this report result from this agreement, particularly in the areas of inventory valuation, priorities of gas selection and interruptible supply availability.

Incorporated into our projections are additional implementation steps involved with developing a cohesive gas supply/demand strategy for the near term and the longer range. These include developing a cost relationship comparison for current resources and a review of current contract terms and alternatives for continuing, extending, modifying or eliminating contracts.

In order to achieve this while maintaining a balance between economics and security of supply, the company uses a portfolio strategy approach. This approach incorporates a menu driven selection of services which allows the company to choose only those specific services necessary to meet its requirements. This is achieved by taking into consideration transportation capacity rights and then sources of supply are contracted to cover the firm transport rights over differing seasonal obligations.

Operating flexibility is sustained by variations in contract stipulations to permit the system to swing on the most economical gas supplies available while maintaining the ability to supply rapidly fluctuating temperature requirements. Storage facilities are substituted wherever opportunity affords to reduce annual expense for flowing 365 day pipeline service without reducing design day and design winter season delivery capability. Direct control of all storage is paramount to permit PGW to minimize winter costs by injecting lower priced summer purchases and to cycle storage to balance daily take fluctuations to avoid overrun/balancing charges.

## II. Supply Forecasting Methodology and Assumptions Basic Assumptions (Continued)

PGW's supply strategy incorporates maintaining full current winter day deliverability with regard to transportation capacity but to convert, where possible, to storage rather than winter flowing contracts to enhance financial and operational flexibility. A variety of longer term supply contracts are necessary to support pipeline transportation capacity because reliance upon best effort spot suppliers to fill wintertime supply requirements to meet firm customers' demands has proven to be an unreliable alternative. As a result longer-term contracts are utilized to support firm transportation capacity. To accomplish this end, the Company purchases winter supply contracts with daily deliverability equal to approximately 62% of the contractual daily transportation entitlements on its two interstate pipelines with direct connections to PGW's service territory. Additionally, these supply contracts match the contractual entitlements of the two pipelines by sourcing supply in a manner consistent with the pipeline's upstream contractual requirements. In this way, PGW not only helps ensure the security of supply by sourcing the gas from geographically diverse supply regions but this diversity also allows PGW to take advantage of the pricing basis differential inherent in these supply locations.

These contracts all contain the ability to fix the price for upcoming months as well as to allow the pricing to default to an agreed upon market index when there is no market advantage in fixing a price before the month begins. PGW uses this fixed price option in conjunction with its Gas Cost Rate (GCR) filing (GCR filing includes pricing based upon the NYMEX and Global Insight) by always attempting to buy under the GCR forecasted prices. Through the matching of the duration supply contracts to a seasonal demand, such as the winter operating season, the firm ratepayers benefit from not paying demand charges year-round.

A second component of PGW's supply portfolio or a volume equal to 28% of pipeline capacity, is purchased gas based on a first-of-the-month index pricing methodology with contracts that allow for daily change in volumetric take. This allows the Company to effectively shut-off higher priced supply replacing such supply with daily cheaper spot priced gases. Under assumed normal winter conditions, PGW utilizes certain storage fields (Eminence and Washington) in a manner similar to third party supply. Specifically, these storage contracts do not contain

## **II. Supply Forecasting Methodology and Assumptions** **Basic Assumptions (Continued)**

transportation to the PGW city gate. Therefore, these storages must flow within PGW's contractual upstream capacity rights on TGPL. Typical daily delivery from these fields utilizes approximately 10% of the daily TETCO and TGPL capacity rights to the Philadelphia city gates. These storage fields also act as a physical fixed price to counter winter price conditions since the WACOG usually reflects a winter/summer pricing differential. PGW's summer purchasing strategy also incorporates a portfolio approach to the purchase of system supply and storage refill. The GCR filing is again used as a yardstick in purchasing supply for both system supply and storage refill. PGW attempts to always purchase a portion of its supply needs below the projected GCR cost estimate with a portion of the portfolio purchased at default, first-of-the-month pricing. These first of the month pricing option contracts, in most instances, allow PGW to evaluate daily spot prices and provide for a turn-off of first-of-the-month index priced supply in favor of the purchase of more advantageous daily spot purchases.

Operating conditions permitting, the Company enters into the FERC approved capacity release market to offset demand charges it pays for its firm transportation and/or the incremental off-systems sales market when it is economically advantageous for the firm ratepayer. In both instances, these opportunities are sought only when firm customer needs are satisfied. Additionally, PGW's bundled storages and LNG can be utilized as a substitute for higher price gas supply based on market pricing conditions and the results of PGW's status report. Effectively, the Gas Supply Group is at all times studying the market for any economic advantage it can bring to the firm ratepayer.

### **III. Demand Forecasting Methodology and Assumptions** **Basic Assumptions**

PGW uses a combination of four basic methods to develop demand projections. They are:

- 1) Historical Data -- data showing long-term demand trends, conservation and utilization patterns by the various classes of customers -- Residential, Commercial, Industrial and Interruptible.
- 2) Customer Survey -- Information as gathered by PGW's Marketing Department and used for annual projections by month and year.
- 3) Relative End Use -- Projections via Marketing methods of customer load sizing by appliance type, maximum input, maximum summer and winter full load hour (FLH) calculations which are used to develop yearly and monthly demand requirements.
- 4) Judgment -- Experienced opinion as applied to the evaluation of the combination of all data to develop the basic demand requirements.

#### **Customer Demand**

The total system-wide demand is a function of the projected gas demand per customer and the anticipated number of customers in each class. In determining customer demand, consideration is given to projecting current customer usage, augmented by significant gains or losses in each of 48 homogeneous groups for the period being projected. The Gas Planning Department attempts to determine for each customer class, the level of demand relating to experienced temperatures and the component of demand that is apparently not affected by changes in temperature. Within each class the most recent summer and winter usage patterns are established from historical records. Summer data provides an insight into each class of customers non-temperature sensitive load requirements or baseload which can be expressed in terms of thousands of cubic feet (Mcf) per day, per customer. Similarly, winter data after removal of the daily baseload level provides the temperature sensitive load requirements for each class of customer.

*This usage primarily reflects space heating but also includes such other temperature sensitive needs as water heating attributable to colder ground water inlet temperatures and similar process variations. This overall heating requirement can be expressed in terms of the cubic feet of gas*

### **III. Demand Forecasting Methodology and Assumptions** **Basic Assumptions (Continued)**

utilized per degree of temperature change on a per customer basis for each separate customer classification.

In addition, consideration must be given to the variation of customer utilization patterns for space heating over the year, recognizing the transitional fall start-up of heaters, the deep winter period needs and the tapering off and shut-down which occurs in the spring. These usage patterns taken in conjunction with anticipated customer counts and appropriate temperature patterns form the basis of determining class and total system demands. Due to the inconsistencies of weather and weather forecasting techniques, no attempt is made to predict the specific daily temperatures of the projection period. Instead PGW has developed a normal monthly temperature pattern by analyzing statistical records of actual temperature patterns over a 30-year period. This pattern reflects 4510 degree-days annually distributed in a stylized pattern preserving the monthly range of colder to warmer daily temperatures experienced in the January to May period and warmer to colder daily temperatures in the September to December period.

The term "degree days" quantifies the number of degrees of temperature below a base level of 65 degrees Fahrenheit and is used as a tool to measure space heating requirements, i.e. on a day experiencing an average temperature of 40 degrees F. there would be 25 degree days. The annual 4510 degree days which is composed of the PGW normal monthly temperature patterns, form the basis of the calculation of the temperature sensitive component of demand. The application of the above described baseload, space heating factors and customer counts, when applied to a calendar based daily temperature pattern, produce a daily calculation of total customer requirements identified as sendout. It should be noted that there is a difference between sendout volume and sales volume. Sendout represents those volumes metered at the city gate to supply customers' requirements while sales are those volumes registered on customer meters. The variation between sendout and sales, after adjustments, is that portion which is lost and unaccounted for in the PGW distribution system.

### **III. Demand Forecasting Methodology and Assumptions** **Basic Assumptions (Continued)**

Sales and sendout differ on a monthly basis in the degree day distribution pattern. For efficiency, meter reading and billing efforts are distributed uniformly over the available number of working days in a month and the majority of PGW customers are divided into 20 individual groups or cycles containing residential, commercial and industrial accounts within a specific geographic area. When these cycle customers are billed each month they reflect meter reading usage not for the calendar month being billed, but for the number of days and temperature pattern of degree-days experienced during their specific interval between meter readings. For example, assume the month of January contained 900 calendar degree-days. The customers in cycle 10 being billed for the month of January might have had meter readings taken on December 15 and again on January 17. Sales billed and reported in the company records for these customers would reflect the number of days and degree days between these reading dates rather than the 900 degree days of the month. Similarly, cycle 1 customers that might have had meter readings taken on December 1 and January 2 would reflect principally the month of December temperature experience, whereas, cycle 20 customers with meter readings taken possibly December 28 and January 29 would reflect principally the month of January temperature experience.

An average of the 20 cycles (Average Cycle Degree-Days) is used as the temperature pattern upon which to project the volume of sales in the forecast period. Both projections of sales and sendouts represent the full demand for that period from both firm and interruptible customers.

#### **Methodology Used to Develop Monthly Estimates**

A trial domestic factor is developed by classes of customers from sales reported for the summer months in the previous year. This average factor is then utilized in the sendout formula with the customer counts for the months of July, August and September. A comparison between what the formula calculates and the actual experienced for those three months is ascertained and the trial

### **III. Demand Forecasting Methodology and Assumptions** **Basic Assumptions (Continued)**

domestic (baseload) factors are finalized to replicate the total sendout experienced. The finalized domestic factors (DOMs) are then utilized in conjunction with the actual sales and customer counts for the months of December, January and February to determine the average Mcf per degree day for each of the individual months *for the remaining* temperature sensitive load. The results are weighted by degree-days to give an average value which is utilized as a trial value for the heating factor.

The finalized domestic factor and the trial heating factor developed, as such, are then applied in the sendout calculations together with customer counts for the months of December, January and February (the peak winter heating period) to project an estimated sendout for each of these months. The projected sendout is then compared with the actual sendout experienced. Any variation between the projected and actual is adjusted to force the replication of the actual sendout experience thus resulting in the determination of a finalized heating factor.

To project the number of customers for each individual rate class, each rate class of customers are reviewed and accumulated individually. Current customers are ascertained from the number of billings data available from sales and revenue actually experienced immediately prior to the commencement of a model run. Declines are projected for anticipated losses to electric and other fuels, demolitions and transfers to other rates. Direct transfers from a non-heating to a heating account, as a result of a current customer's conversion to gas heat, moves the domestic load to the new category. Projected additional customers are developed by the Marketing Department where staff dealing with individual classes of customers and having the most direct knowledge of conditions within their expertise, project annual load additions which are translated into customer counts based upon typical customer usage for that individual customer class. The approximate month of turn-on is also developed to permit reflection of the effective portion of the load addition within the fiscal period under study. Interruptible class customers as well as other large special accounts are detailed individually incorporating expected gains and losses as direct contact and experience has indicated.

**III. Demand Forecasting Methodology and Assumptions**  
**Basic Assumptions (Continued)**

The base revenue projections for both firm and interruptible customer groups are derived as the product of the projected sales volumes and the present tariff rate for each individual customer class within each group. The GCR revenue projections are derived as the product of the GCR factor and the projected sales volumes to the firm customers.

#### **IV. Design Day and Design Hour Forecasting Methodology and Assumptions**

Each year a six year estimate of Design Day and Design Hour requirements anticipated under design day and design hour operating conditions is prepared to ensure that adequate resources are under contract and to further ensure that PGW can fulfill its supply obligation for its firm customer requirements on a design day and design hour.

The projected demands for design day are developed utilizing previous winter periods data for all weekdays where the temperature average for the day is 32 degrees Fahrenheit or below. The total sendout for these days as recorded under actual conditions and is reduced to firm sendout by removal of the interruptible load. A computer generated linear regression procedure is utilized to develop a sendout model from actual daily sendouts and degree days, and the process is repeated in a quadratic regression and a cubic regression procedure. From the predicted sendouts in the regression, which are within a reasonable percent of error to the actual sendout, factors are derived to replicate the actual sendouts. The factors derived from this are used to determine the current load requirements for a 0 degrees F day and from this data, the load for a -5 degrees F hour is calculated. PGW's Marketing Department's load projections for present and future years are then applied to these requirements to develop design day and design hour present and future load requirements. This is achieved by the addition of the projected marketing load growth on an annual basis (by day) to the derived base-year design day requirements.

## **V. PGW Corporate Modeling System**

### **General Description**

The corporate modeling system is a tool used by PGW management to project sales, revenues and expenses, as well as to examine key planning strategies and evaluate their effects on company operations. The system provides the ability to determine the results of alternate plans and scenarios, while at the same time allowing for responses to "what if" type situations quantifying revenue and expenses. The system combines the power of the computer with the experience of management to develop both short and long range projections based upon experienced historical data for sales and sendout volumes, raw material expenses and sale revenues. The corporate model system is composed of five separate models. Each model operates independently but requires substantial external data inputs as well as data output results from one or more of the other models in the system.

### **Gas Demand Model**

The gas demand model is used to forecast total requirements for gas based upon current customer usage experience with adjustments for projected gains and losses. Input data includes domestic and space heating usage factors, customer counts by rate classifications, temperature patterns and results in projections of sales and sendout volumes. Detail and summary reports include average usage per customer and demands by rate classification. This data is transferred to the supply model.

### **Gas Supply Model**

The supply model is used to dispatch the various supply sources in accordance with contract availability limitations. It develops the necessary balance between supply and demand which reflects plant fuel and storage injection requirements as well as customer demands by identifying the availability of interruptible load balancing sales. Detail and summary reports include daily and monthly load requirements, the volumes taken from each source by pipeline contract, storage balances, LNG requirements, etc. Data is transferred to both the cost model and the revenue model downstream.

## **V. PGW Corporate Modeling System (Continued)**

### **Gas Cost Model**

The gas cost model is used to determine natural gas and other raw material costs dispatched. The model tracks the various cost components of each contract - the demand, capacity, commodity, injection and withdrawal charges - providing monthly and annual details and summary information including inventory valuations and expenses for supplemental LNG supplies. It transfers these expenses to the Gas Cost Rate Model.

### **Gas Cost Rate Model**

The gas cost rate model is used to develop the net natural gas expenses, net applicable GCR expenses and the GCR. It ascribes responsibility for the raw material costs to firm and interruptible classes in accordance with PGW's tariff requirements, assigning cost on an as-used basis to customer classes applicable to such charges, and compensates for natural gas refunds and previous over or under billing of fuel expenses. Detail summary reports include specifics of raw material adjustment, statements of reconciliation, and determination of applicable sales and expenses. It transfers the results to the revenue model.

### **Revenue Model**

The revenue model is used to project billed revenue by rate classification in accordance with PGW's rate tariffs. It prepares the net billed revenue, GCR revenues, senior citizen discounts, and cycle billing information all detailed by rate classification. The detail and summary reports provided by this model are directed to the accounting and financial departments for inclusion in various financial reviews.

### **Summary**

The corporate modeling system allows PGW management to effectively address supply/demand balancing, supply facilities planning, projected sales, cost, revenues, and sendout volumes in a timely manner. Results assist in the development of PGW's annual Operating Budget, setting of the GCR and planning of supply resources.

V. **PGW Corporate Modeling System (Continued)**

The model also provides a Status Report for the evaluation of remaining winter period requirements on both normal and design temperature patterns and the extrapolation of the current year based upon the experience to date and an assumption of temperatures anticipated for the remaining period of the year, this latter acting as a guide for both financial cash flow planning and winter operations.

Section 59.81 **Forms IRP-Gas 1A, and 1B – Annual and Peak Day Demand**

The load growth projections shall reflect the effects of price elasticity, market induced conservation, building and appliance efficiency standards, and the effects of the utility's existing and planned conservation and load management activities.

Response: Please see the attached documentation and forms.

**FORM-IRP-GAS-1A: ANNUAL GAS REQUIREMENTS  
REPORTING UTILITY: PHILADELPHIA GAS WORKS  
(VOLUMES IN MMcf)**

Index Year Actual Year	Historical Data		Current Year	Three Year Forecast		
	-2 2004-2005	-1 2005-2006	0 2006-2007	1 2007-2008	2 2008-2009	3 2009-2010
<b>Firm Requirements:</b>						
Retail Residential	41,467	34,083	35,400	38,633	38,382	38,205
Retail Commercial	11,919	10,697	10,135	12,259	12,486	12,717
Retail Industrial	1,050	904	857	1,163	1,244	1,326
Electric Power Generation	-	-	-	-	-	-
Exchanges with Other Utilities	-	-	-	-	-	-
Unaccounted For Gas	1,902	2,290	1,532	1,913	1,916	1,920
Company Use	95	681	643	702	702	702
Other - Prior Period Adjustment	(463)	-	-	-	-	-
Subtotal Firm	55,970	48,654	48,568	54,670	54,730	54,871
<b>Interruptible Requirements:</b>						
Retail	4,464	2,409	2,188	3,270	3,373	3,503
Electric Power Generation	47	17	20	13	10	8
Company's Own Plant	65	62	64	72	72	72
Unaccounted For Gas	185	230	84	115	118	123
Subtotal Interruptible	4,760	2,717	2,355	3,469	3,573	3,706
<b>SUBTOTAL FIRM AND INTERRUPTIBLE</b>	<b>60,730</b>	<b>51,371</b>	<b>50,922</b>	<b>58,139</b>	<b>58,303</b>	<b>58,577</b>
<b>Transportation:</b>						
Firm Residential	-	-	-	-	-	-
Firm Commercial	-	-	363	-	-	-
Firm Industrial	-	-	27	-	-	-
Interruptible Residential	-	-	-	-	-	-
Interruptible Commercial	1,508	1,937	2,900	2,201	2,235	2,208
Interruptible Industrial	1,912	3,244	4,225	3,223	3,583	3,828
Other - Non-Utility Power Producers	8,307	5,681	6,006	8,485	8,464	8,489
Subtotal Transportation	11,727	10,861	13,521	13,909	14,282	14,526
<b>TOTAL GAS REQUIREMENTS</b>	<b>72,457</b>	<b>62,233</b>	<b>64,444</b>	<b>72,048</b>	<b>72,585</b>	<b>73,102</b>
Increase (Decrease)	NA	(10,224)	2,211	7,605	537	517
Percent Change (%)	NA	-14.1%	3.6%	11.8%	0.7%	0.7%

**FORM-IRP-GAS-1B:PEAK DAY REQUIREMENTS**  
**REPORTING UTILITY: PHILADELPHIA GAS WORKS**  
**(VOLUMES IN MMcf)**

Index Year Actual Year	Historical Data		Current Year <sup>(2)</sup>	Three Year Forecast <sup>(1)</sup>		
	-2 2004-2005	-1 2005-2006	0 2006-2007	1 2007-2008	2 2008-2009	3 2009-2010
<b>Firm Requirements:</b>						
Retail Residential	405	323	417	482	479	482
Retail Commercial	116	101	148	133	136	135
Retail Industrial	10	9	13	12	13	12
Electric Power Generation	0	0	0	0	0	0
Exchanges with Other Utilities	0	0	0	0	0	0
Unaccounted For Gas	19	22	0	0	0	0
Company Use	1	6	2	1	1	1
Other	0	0	0	0	0	0
Subtotal Firm	552	461	579	627	629	630
<b>Interruptible Requirements:</b>						
Retail	28	13	27	27	29	31
Electric Power Generation	0	0	0	0	0	0
Company's Own Plant	1	1	0	0	0	0
Unaccounted For Gas	0	0	0	1	1	1
Subtotal Interruptible	29	14	27	28	30	32
<b>SUBTOTAL FIRM AND INTERRUPTIBLE</b>						
	580	475	606	656	659	662
<b>Transportation:</b>						
Firm Residential	0	0	0	0	0	0
Firm Commercial	0	0	4	0	0	0
Firm Industrial	0	0	0	0	0	0
Interruptible Residential	0	0	0	0	0	0
Interruptible Commercial	6	8	0	0	0	0
Interruptible Industrial	5	9	0	0	0	0
Other - Non-Utility Power Producers	35	30	0	0	0	0
Subtotal Transportation	46	47	4	0	0	0
<b>TOTAL GAS REQUIREMENTS</b>						
	627	522	611	656	659	662
Increase (Decrease)	na	(105)	89	45	3	3
Percent Change (%)	na	-16.80%	17.07%	7.41%	0.46%	0.50%

<sup>(1)</sup> Peak Day is forecasted at a 2 degree temperature.

<sup>(2)</sup> Current Year Peak Day is forecasted at a 5 degree temperature.

Section 59.81

**Forms IRP-Gas 2A, 2B and 2C - Annual and Peak Day Energy Resources, Transmission and Storage Contracts**

The forecast of energy sources shall indicate sources of all presently available and new supplies which the utility estimates will become available, displayed by component parts.

Response:

Please see the attached documentation and forms.

FORM-IRP-GAS-2A: ANNUAL/PEAK SUPPLY

TABLE 1: ANNUAL/PEAK SUPPLY

REPORTING UTILITY: PHILADELPHIA GAS WORKS

(Volumes in MMcf)

Index Year Actual Year	Historical Data				Current Year <sup>(2)</sup>		Three Year Forecast <sup>(1)</sup>					
	-2 2004-2005		-1 2005-2006		0 2006-2007		1 2007-2008		2 2008-2009		3 2009-2010	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
Gas Supply for Sales Service												
TETCO			-	-	-	-	-	-	-	-	-	-
TRANSCO	4,557	53	-	-	-	-	-	-	-	-	-	-
Spot Purchases	59,837	235	52,081	297	56,377	199	58,935	254	59,092	254	59,332	254
Storage Withdrawals	11,116	160	12,745	139	10,838	217	17,242	205	17,242	205	17,242	205
LNG Withdrawal	1,817	135	1,082	40	1,150	195	1,186	202	1,165	205	1,170	209
Company Production	-	-	-	-	-	-	-	-	-	-	-	-
LNG Purchases	382	-	2	-	-	-	-	-	-	-	-	-
Exchanges with other LDCs	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-
Total Gas Supply	77,709	583	65,909	476	68,365	611	77,363	662	77,499	664	77,745	668
Total Transportation Services	11,727	46	10,861	47	13,521	4	13,909	-	14,282	-	14,526	-
TOTAL GAS SUPPLY AND TRANSPORTATION SERVICE	89,436	630	76,771	523	81,886	615	91,272	662	91,782	664	92,270	668
Deductions												
Underground Storage Injections & Fuels	13,939	-	12,861	-	15,503	4	17,996	4	17,990	4	17,956	4
LNG Liquefactions & Fuels	2,571	3	1,647	1	1,939	0	1,228	2	1,207	1	1,212	2
Sales to other LDC's	470	-	30	-	-	-	-	-	-	-	-	-
Total Deductions	16,979	3	14,538	1	17,442	5	19,224	6	19,197	5	19,168	6
NET GAS SUPPLY	72,457	627	62,233	522	64,444	611	72,048	656	72,585	659	73,102	662
BTU	1.038											

<sup>(1)</sup> Peak Day is forecasted at a 2 degree temperature.

<sup>(2)</sup> Current Year Peak Day is forecasted at a 5 degree temperature.



FORM-IRP-GAS-2C: NATURAL GAS STORAGE <sup>(1)</sup>  
 REPORTING UTILITY: PHILADELPHIA GAS WORKS  
 (volumes in MMcf)

Index Year Actual year	Historical Data				Current Year		Three Year Forecast					
	-2 2004-2005		-1 2005-2006		0 2006-2007		1 2007-2008		2 2008-2009		3 2009-2010	
	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak	Annual	Peak
Transcontinental Transmission Corp.	3,723	60	3,723	60	3,723	60	3,723	60	3,723	60	3,723	60
Dominion Transmission Inc.	3,481	32	3,481	32	3,481	32	3,481	32	3,481	32	3,481	32
Transcontinental Transmission Corp.	3,086	36	3,086	36	3,086	36	3,086	36	3,086	36	3,086	36
Texas Eastern Transmission Corp.	2,467	43	2,467	43	2,467	43	2,467	43	2,467	43	2,467	43
Texas Eastern Transmission Corp.	2,219	20	2,219	20	2,219	20	2,219	20	2,219	20	2,219	20
ANR	-	-	-	-	-	-	-	-	-	-	-	-
Transcontinental Transmission Corp.	802	80	1,106	110	1,106	110	1,106	110	1,106	110	1,106	110
Equitrans	507	5	507	5	507	5	507	5	507	5	507	5
Transcontinental Transmission Corp.	453	5	453	5	453	5	453	5	453	5	453	5
<b>Total</b>	<b>16,738</b>	<b>281</b>	<b>17,042</b>	<b>311</b>	<b>17,042</b>	<b>311</b>	<b>17,042</b>	<b>311</b>	<b>17,042</b>	<b>311</b>	<b>17,042</b>	<b>311</b>

<sup>(1)</sup> Rank contracts in order of magnitude for the current year, noting the transportation provided and termination date for each contract reported. Reporting should proceed along rank ordering until 75% of total is accounted for, or until ten contracts have been listed, whichever occurs first.

Conversions at 1030 Btu

	Contract Expiration Date <sup>(2)</sup>
Transcontinental Transmission Corp.	03/31/2013
Dominion Transmission Inc.	03/31/2007
Transcontinental Transmission Corp.	Evergreen
Texas Eastern Transmission Corp.	04/30/2012
Texas Eastern Transmission Corp.	04/30/2012
Transcontinental Transmission Corp.	10/31/2013
Equitrans	03/31/2007
Transcontinental Transmission Corp.	04/15/2007

<sup>(2)</sup> For purposes of this report, all contracts due to expire are assumed renewed for the forecast years.

**Section 59.81 Forms IRP-Gas 3 - Historical, Current and Forecast Number of Customers**

Provide the number of year end customers displayed by component parts.

Response: Please see the attached form.

FORM-IRP-GAS-3: NUMBER OF CUSTOMERS <sup>(1)</sup>  
 REPORTING UTILITY: PHILADELPHIA GAS WORKS

	Historical Data		Current Year	Three Year Forecast			
	Index Year Fiscal Year	-2	-1	0	1	2	3
		2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
<b>Firm Customers</b>							-
Retail Residential		486,144	477,336	465,825	464,817	461,184	457,560
Retail Commercial		26,769	26,442	25,703	27,172	27,632	28,089
Retail Industrial		896	852	819	926	992	1,056
Other		-	-	-	-	-	-
Subtotal Sales Service		513,809	504,629	492,347	492,915	489,808	486,705
Electric Power Generation		4	4	4	2	2	2
Interruptible Customers		407	323	251	296	283	273
Transportation Service <sup>(2)</sup>		76	128	213	197	223	245
<b>CUSTOMER TOTAL</b>		514,296	505,084	492,815	493,410	490,315	487,226
Increase ( Decrease)		514,296	(9,212)	(12,269)	595	(3,095)	(3,090)
Percent Change (%)			-1.8%	-2.4%	0.1%	-0.6%	-0.6%

<sup>(1)</sup> Customer Count is based on the average number of billings over the course of the year.

<sup>(2)</sup> The increase in Transportation customers is due to Interruptible customers switching to transportation.

Section 59.81 **Forms IRP-Gas 4A and 4B - Annual and Peak Day Energy Supply and Demand**

Response: Please see the attached forms.

FORM-IRP-GAS-4A: ANNUAL SUPPLY AND REQUIREMENTS SUMMARY  
 REPORTING UTILITY: PHILADELPHIA GAS WORKS  
 (Volumes in MMcf)

Index Year Actual Year	Historical Data		Current Year	Three Year Forecast		
	-2 2004-2005	-1 2005-2006	0 2006-2007	1 2007-2008	2 2008-2009	3 2009-2010
<b>Gas Supply:</b>						
Supply Contracts	64,394	52,081	56,377	58,935	59,092	59,332
Storage Withdrawals	11,116	12,745	10,838	17,242	17,242	17,242
LNG	2,199	1,084	1,150	1,186	1,165	1,170
Subtotal Gas Supply	77,709	65,909	68,365	77,363	77,499	77,745
Transportation	11,727	10,861	13,521	13,909	14,282	14,526
<b>TOTAL GAS SUPPLY</b>	<b>89,436</b>	<b>76,771</b>	<b>81,886</b>	<b>91,272</b>	<b>91,782</b>	<b>92,270</b>
<b>Requirements:</b>						
Firm Requirements	55,970	48,654	48,568	54,670	54,730	54,871
Liquefaction	2,571	1,647	1,939	1,228	1,207	1,212
Interruptible Requirements	4,760	2,717	2,355	3,469	3,573	3,706
Storage Injections	13,939	12,861	15,503	17,996	17,990	17,956
Sales to other LDC's	470	30	-	-	-	-
Subtotal Firm & Interruptible	77,709	65,909	68,365	77,363	77,500	77,745
Transportation	11,727	10,861	13,521	13,909	14,282	14,526
Load Reductions						
<b>TOTAL GAS REQUIREMENTS</b>	<b>89,436</b>	<b>76,771</b>	<b>81,886</b>	<b>91,272</b>	<b>91,782</b>	<b>92,270</b>
Surplus (Deficiency)	0	0	0	0	0	0

FORM-IRP-GAS-4B: PEAK DAY SUPPLY AND REQUIREMENTS SUMMARY <sup>(1)</sup>  
 REPORTING UTILITY: PHILADELPHIA GAS WORKS  
 (Volumes in MMcf)

Index Year Actual Year	Historical Data		Current Year	Three Year Forecast		
	-2 2004-2005	-1 2005-2006	0 2006-2007	1 2007-2008	2 2008-2009	3 2009-2010
<b>Gas Supply:</b>						
Supply Contracts	288	297	199	254	254	254
Storage Withdraws	160	139	217	205	205	205
LNG	135	40	195	202	205	209
Subtotal Gas Supply	583	476	611	662	664	668
Transportation	46	47	4	-	-	-
<b>TOTAL GAS SUPPLY</b>	<b>630</b>	<b>523</b>	<b>615</b>	<b>662</b>	<b>664</b>	<b>668</b>
<b>Requirements:</b>						
Firm Requirements <sup>(2)</sup>	551	461	579	627	629	630
Interruptible Requirements	29	14	27	28	30	32
Storage & LNG Fuels	3	1	5	6	4.8	6
Subtotal Firm & Interruptible	583	476	611	662	664	668
Transportation	46	47	4	-	-	-
Load Reductions	-	-	-	-	-	-
<b>TOTAL GAS REQUIREMENTS</b>	<b>630</b>	<b>522</b>	<b>615</b>	<b>662</b>	<b>664</b>	<b>668</b>
Surplus (Deficiency)	0	0	0	0	0	0

<sup>(1)</sup> Peak Day is forecasted at a 2 degree temperature.

<sup>(2)</sup> Firm requirements for the forecast years include plant use.

Section 59.82 **Forms IRP-Gas 5 - Energy Conservation Report-Program Description**

Response: Please see the attached forms.

## FORM-IRP-GAS-5 PROGRAM DESCRIPTION

Company: Philadelphia Gas Works (PGW)

Program: Conservation Works Program (CWP)

Existing [ X ] Proposed [ ]

Contact Person: Cristina Coltro  
(215) 684-6785

Objective: To reduce energy usage, therefore, making bills more affordable for low-income customers whose usage is average or above average and who are participants in the Customer Responsibility Program.

Details of Activity and Implementation Schedule:

Eligible customers are targeted for program participation. For each participating household, PGW's contractors will perform an energy diagnostic audit, energy education, and conservation treatments such as home repairs, automatic clock thermostat, insulation, etc.

Actual and/or Anticipated Results:

Year	Peak Load Reduction Mcf	Electric Mwh	Energy Savings		Other Results
			Gas Mcf	Oil Gallons	
2003 (1)			13		3417 Homes w/ Treatment
2004 (1)			16		2985 Homes w/ Treatment
2005 (2)			14		2721 Homes w/ Treatment

Monetary and Personal Resources:

Year	Categorized program Expenses			
	Personnel Est. Hrs. (3)	Outside Services	Admin. (PGW Internal)	Total
2003 (1)	37,587	\$1,975,962	\$60,000	\$2,035,962
2004 (1)	32,835	\$2,008,697	\$50,000	\$2,058,697
2005 (1)	29,931	\$2,014,086	\$50,000	\$2,064,086

(1) Actual

(2) Actual number of participants, actual expenditure, estimated energy savings

(3) Personnel hours were estimated by multiplying the number of homes by 11, the average number of hours spent per home.

Section 59.82 **Forms IRP-Gas 6 - Energy Users**

Response: Please see the attached forms.

FORM-IRP-GAS-6  
ENERGY USERS  
COMPANY: PHILADELPHIA GAS WORKS

Fiscal Year Ending August 31, 2006

	<u>Number of Customers</u>	<u>Sales (Mcf)</u>
<b>Firm:</b>		
<b>Residential:</b>		
Heating	422,386	32,424,377
Non-heating	54,950	1,476,662
Commercial	26,442	10,827,670
Industrial	<u>852</u>	<u>914,609</u>
<b>Sub-total Firm</b>	504,629	45,643,318
 <b>Interruptible</b>		
Commercial & Industrial	<u>327</u>	<u>2,425,858</u>
<b>Total Gas Sold</b>	504,956	48,069,176
 Unbilled Adjustment		
	-	(559,921)
Transportation	128	10,727,487
Utility Use	<u>-</u>	<u>680,632</u>
<b>Total</b>	<u>505,084</u>	<u>58,917,374</u>

Section 59.82 **Forms IRP-Gas 7 - Conservation and Load Management Program Cost  
Benefit Analysis Inputs**

Response: Please see the attached forms.

## FORM-IRP-GAS-7 PROGRAM SUMMARY

Company: Philadelphia Gas Works (PGW)

Program Name	Peak Load Reduction (Mcf)	Energy Use Change (Mcf)	Personnel Est. Hrs (3)	Categorized Program Expenses		
				Outside Services	Adm.	Total
Conservation Works Program (CWP) - 2001 (1)	NA	13	46,475	\$2,352,533	\$60,000	\$2,412,533
Conservation Works Program (CWP) - 2002 (1)	NA	13	34,980	\$1,922,540	\$60,000	\$1,982,540
Conservation Works Program (CWP) - 2003 (1)	NA	13	37,587	\$1,975,962	\$60,000	\$2,035,962
Conservation Works Program (CWP) - 2004 (1)	NA	16	32,835	\$2,008,697	\$50,000	\$2,058,697
Conservation Works Program (CWP) - 2005 (1)	NA	14	29,931	\$2,014,086	\$50,000	\$2,064,086

(1) Actual

(2) Actual figures except for Energy Savings

(3) Personnel hours were estimated by multiplying the number of homes by 11, the average number of hours spent per home

Section 59.82 **Forms IRP-Gas 8 - Conservation and Load Management Program Cost  
Benefit Analysis Results**

Response: Please see the attached forms.

Company Name:  
FORM-IRP-GAS-8

Philadelphia Gas Works (PGW)  
Cost-Benefit Analysis Input

PROGRAM:

Conservation Works Program

t	Year	Energy Savings (E) Mcf	Average Energy Cost (ACE) \$ per Mcf	Avoided Energy Cost (MCE) \$ per Mcf	Participant Demand Savings (D) Mcf	Utility Capacity Savings (G) Mcf	Average Demand Costs (ACD) \$/Mcf	Avoided Demand Costs (MCD) \$/Mcf	Participant Costs (PC) \$
1	2005	37,829	\$ 14.90	\$ 9.08130	N/A	N/A	N/A		\$ -
2	2006	37,829	\$ 19.01	\$ 12.32550	N/A	N/A	N/A		\$ -
3	2007	37,829	\$ 17.39	\$ 10.43380	N/A	N/A	N/A		\$ -
4	2008	37,829	\$ 16.72	\$ 10.18120	N/A	N/A	N/A		\$ -
5	2009	37,829	\$ 17.29	\$ 10.75585	N/A	N/A	N/A		\$ -
6	2010	37,829	\$ 16.79	\$ 10.25004	N/A	N/A	N/A		\$ -
7	2011	37,829	\$ 16.63	\$ 10.09489	N/A	N/A	N/A		\$ -
8	2012	37,829	\$ 16.40	\$ 9.86531	N/A	N/A	N/A		\$ -
9	2013	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
10	2014	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
11	2015	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
12	2016	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
13	2017	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
14	2018	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
15	2019	37,829	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
16	2020	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
17	2021	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
18	2022	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
19	2023	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
20	2024	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
21	2025	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
22	2026	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
23	2027	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
24	2028	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -
25	2029	17,470	\$ 16.32	\$ 9.77964	N/A	N/A	N/A		\$ -

Company Name:  
FORM-IRP-GAS-8

Philadelphia Gas Works (PGW)  
Cost-Benefit Analysis Input

PROGRAM:

Conservation Works Program

		Discount Rates							
t	Year	Incentive Cost (I) \$	Utility Costs (UC) \$	Participant (d) %	Non-Participant (d) %	Utility (1) (d) %	Escalation Rate (e) %	System Sales or Demand (S) Mcf	Sales or Demand Ratio (f) %
1	2005	\$ -	\$2,014,086	5.9	5.9	5.9	\$ -	58,319,743	0.0071
2	2006	\$ -	\$ -	5.9	5.9	5.9	\$ -	48,669,373	0.0085
3	2007	\$ -	\$ -	5.9	5.9	5.9	\$ -	48,486,536	0.0085
4	2008	\$ -	\$ -	5.9	5.9	5.9	\$ -	55,937,140	0.0074
5	2009	\$ -	\$ -	5.9	5.9	5.9	\$ -	56,095,484	0.0074
6	2010	\$ -	\$ -	5.9	5.9	5.9	\$ -	56,359,849	0.0074
7	2011	\$ -	\$ -	5.9	5.9	5.9	\$ -	56,643,598	0.0073
8	2012	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
9	2013	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
10	2014	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
11	2015	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
12	2016	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
13	2017	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
14	2018	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
15	2019	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0073
16	2020	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
17	2021	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
18	2022	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
19	2023	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
20	2024	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
21	2025	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
22	2026	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
23	2027	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
24	2028	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076
25	2029	\$ -	\$ -	5.9	5.9	5.9	\$ -	57,027,120	0.0076

(1) The Participant, Non-Participant and Utility discount rates are based on PGW's long-term debt and AFUDC (Allowance for Funds Used During Construction).

Section 59.81 **Forms IRP-Gas 9 - 2000 Annual Resource Summary Planning Report**

Response: The Summary Report is included as a separate document.

Company Name:  
FORM-IRP-GAS-9

**Philadelphia Gas Works (PGW)**  
**Cost-Benefit Analysis Input**

Program:

**Conservation Works Program (CWP)**

Period of Analysis		Total Utility Benefits (Bu) \$	Total Utility Costs (Cu) \$	Revenue Reduction Cost (Cr) \$	Participant Revenue Requirement (Rp) \$	Total participant Benefits (Bp) \$	Total Participant Costs (Cp) \$
Beginning Year	Ending Year						
2005	2029	\$ 4,549,061	\$ 2,014,086	\$ 7,480,464	\$ 29,431	\$ 7,480,464	\$ 29,431

Discounted Payback Period Yrs.	NET PRESENT VALUE			BENEFIT COST RATE			Rate Impact Non-Part (RIMnp) \$/Mcf
	Participant (NPVp) \$	Non-Part (NPVnp) \$	Utility (NPVu) \$	Participant (BCRp)	Non-Part (BCRnp)	Utility (BCRu)	
25	\$ 7,451,033	\$(4,910,335.60)	\$ 2,534,974.89	254.17	0.48	2.26	\$ 0.04

**CERTIFICATE OF SERVICE**

I hereby certify that I have this day served a true copy of the foregoing document upon the participants listed below in accordance with the requirements of § 1.54 (relating to service by a participant).

**VIA FIRST CLASS MAIL**

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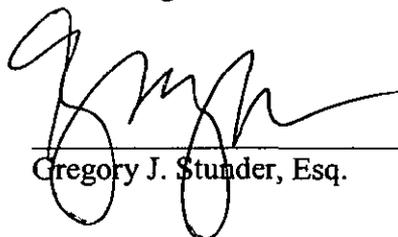
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Date: June 12, 2007

**RECEIVED**

JUN 12 2007

**PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU**