Matthew M. Weissman
General Regulatory Counsel - Rates

Law Department
PSEG Services Corporation
80 Park Plaza – T5, Newark, New Jersey 07102-4194
tel : 973-430-7052 fax: 973-430-5983
email: matthew.weissman@pseg.com

July 27, 2017

In the Matter of the Petition of
Public Service Electric and Gas Company
for Approval of the Next Phase of the
Gas System Modernization Program and
Associated Cost Recovery Mechanism
("GSMP II")

BPU Docket No. ___________________

VIA E-FILING & OVERNIGHT MAIL

Irene K. Asbury, Secretary
Board of Public Utilities
44 South Clinton Avenue, 9th Floor
Post Office Box 350
Trenton, New Jersey 08625-0350

Dear Secretary Asbury:

Enclosed please find an original and two copies of Public Service Electric and Gas Company's (PSE&G, the Company) filing in the above-referenced matter.

Please be advised that workpapers are being provided via electronic version only.

Very truly yours,

Matthew Weissman

C Attached service list (via e-mail)

BPU
William Agee Esq.
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-1616
william.agee@bpu.nj.gov

BPU
Irene Kim Asbury
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-1599
Irene.Asbury@bpu.nj.gov

BPU
Mark Beyer
Board of Public Utilities
44 South Clinton Avenue,
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-2637
mark.beyer@bpu.nj.gov

BPU
Joe Costa
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 984-4558
joe.costa@bpu.nj.gov

BPU
Cynthia Covie
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-1482
cynthia.covie@bpu.nj.gov

BPU
Paul Flanagan
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-2836
paul.flanagan@bpu.nj.gov

BPU
Son Lin Lai
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-2098
son-lin.lai@bpu.nj.gov

BPU
Christine Lin
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-2956
christine.lin@bpu.nj.gov

BPU
Megan Lupo
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
megan.lupo@bpu.nj.gov

BPU
Jacqueline O'Grady
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-2947
jackie.ogrady@bpu.nj.gov

BPU
Stacy Peterson
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-4517
stacy.peterson@bpu.nj.gov

BPU
Henry Rich
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 341-5760
henry.rich@bpu.nj.gov

BPU
Bethany Rocque-Romaine Esq.
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-1496
bethany.rocque-romaine@bpu.nj.gov

BPU
Michael Stonack
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 777-0192
michael.stonack@bpu.nj.gov

BPU
Scott Sumliner
Board of Public Utilities
44 South Clinton Avenue
3rd Floor, Suite 314
P.O. Box 350
Trenton NJ 08625-0350
(609) 292-4519
scott.sumliner@bpu.nj.gov

DAG
Geoffrey Gersten
NJ Dept. of Law & Public Safety
Division of Law
124 Halsey Street, 5th Flr.
P.O. Box 45029
Newark NJ 07101
(973) 648-3510
geoffrey.gersten@dol.lps.state.nj.us

DAG
Angela Hickson
Department of Law & Public Safety
Division of Law
124 Halsey Street, 5th Flr.
P.O. Box 45029
Newark NJ 07102
Angela.Hickson@dol.lps.state.nj.us

DAG
Jenique Jones
NJ Dept. of Law & Public Safety
Division of Law
124 Halsey Street, 5th Flr.
P.O. Box 45029
Newark NJ 07101
jenique.jones@dol.lps.state.nj.us

DAG
Alex Moreau DAG
NJ Dept. of Law & Public Safety
Division of Law
124 Halsey Street, 5th Flr.
P.O. Box 45029
Newark NJ 07101
(973) 648-3762
Alex.Moreau@dol.lps.state.nj.us

DAG
Caroline Vachier DAG
NJ Dept. of Law & Public Safety
Division of Law
124 Halsey Street, 5th Flr.
P.O. Box 45029
Newark NJ 07101
(973) 648-3709
caroline.vachier@dol.lps.state.nj.us

PSE&G
Joseph F. Accardo, Jr.
PSEG Services Corporation
80 Park Plaza, T5G
P.O. Box 570
Newark NJ 07102
(973) 430-5811
joseph.accardojr@pseg.com

PSE&G
Michele Falcao
PSEG Services Corporation
80 Park Plaza, T5
P.O. Box 570
Newark NJ 07102
(973) 430-6119
michele.falcao@pseg.com

PSE&G
Bernard Smalls
PSEG Services Corporation
80 Park Plaza-T5
Newark NJ 07102-4194
(973) 430-5930
bernard.smalls@pseg.com

PSE&G
Matthew M. Weissman Esq.
PSEG Services Corporation
80 Park Plaza, T5
P.O. Box 570
Newark NJ 07102
(973) 430-7052
matthew.weissman@pseg.com

PSE&G
Caitlyn White
PSEG Services Corporation
80 Park Plaza, T-5
P.O. Box 570
Newark NJ 07102
(973)-430-5659
caitlyn.white@pseg.com

Rate Counsel
Stefanie A. Brand
Division of Rate Counsel
140 East Front Street, 4th Flr.
P.O. Box 003
Trenton NJ 08625
(609) 984-1460
sbrand@rpa.state.nj.us

Rate Counsel
Maura Caroselli Esq.
Division of Rate Counsel
140 East Front Street
4th Floor
Trenton NJ 08625
mcaroselli@rpa.state.nj.us

Rate Counsel
James Glassen
Division of Rate Counsel
140 East Front Street, 4th Flr.
P.O. Box 003
Trenton NJ 08625
(609) 984-1460
jglassen@rpa.state.nj.us

Rate Counsel
Kurt Lewandowski Esq.
Division of Rate Counsel
140 East Front Street, 4th Flr.
P.O. Box 003
Trenton NJ 08625
(609) 984-1460
klewando@rpa.state.nj.us

Rate Counsel
Brian O. Lipman
Division of Rate Counsel
140 East Front Street, 4th Flr.
P.O. Box 003
Trenton NJ 08625
(609) 984-1460
blipman@rpa.state.nj.us

Rate Counsel
Shelly Massey
Division of Rate Counsel
140 East Front Street, 4th Flr.
P.O. Box 003
Trenton NJ 08625
(609) 984-1460
smassey@rpa.state.nj.us

Rate Counsel
Henry M. Ogden Esq.
Division of Rate Counsel
140 East Front Street, 4th Flr.
P.O. Box 003
Trenton NJ 08625
(609) 984-1460
hogden@rpa.state.nj.us

Rate Counsel
Sarah Steindel
Division of Rate Counsel
140 East Front Street, 4th Flr.
P.O. Box 003
Trenton NJ 08625
(609) 984-1460
ssteinde@rpa.state.nj.us

Rate Counsel
Felicia Thomas-Friel
Division of Rate Counsel
140 East Front Street, 4th Flr.
P.O. Box 003
Trenton NJ 08625
(609) 984-1460
fthomas@rpa.state.nj.us

Rate Counsel Consultant
Robert Henkes
Henkes Consulting
7 Sunset Road
Old Greenwich CT 06870
(203) 698-1989
rhenkes@optonline.net

STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

In the Matter of the Petition of Public Service Electric and Gas Company for Approval of the Next Phase of the Gas System Modernization Program and Associated Cost Recovery Mechanism ("GSMP II")	BPU DOCKET NO. __________________

VERIFIED PETITION

Public Service Electric and Gas Company (PSE&G, the Company, Petitioner), a corporation of the State of New Jersey, having its principal offices at 80 Park Plaza, Newark, New Jersey, respectfully petitions the New Jersey Board of Public Utilities (Board or BPU) pursuant to N.J.S.A. 48: 2-21, or any other statute the Board deems applicable, as follows:

INTRODUCTION AND OVERVIEW OF THE FILING

1. Petitioner is a public utility engaged in the distribution of electricity and the provision of electric Basic Generation Service (BGS), and distribution of gas and the provision of Basic Gas Supply Service (BGSS), for residential, commercial and industrial purposes within the State of New Jersey. PSE&G provides service to approximately 2.2 million electric and 1.8 million gas customers in an area having a population in excess of 6.2 million persons and which extends from the Hudson River opposite New York City, southwest to the Delaware River at Trenton and south to Camden, New Jersey.

2. Petitioner is subject to regulation by the Board for the purposes of setting its retail distribution rates and to assure safe, adequate and reliable electric distribution and natural gas distribution service pursuant to N.J.S.A. 48:2-21 *et seq*.

3. PSE&G is filing this Petition seeking Board approval of the next phase of its Gas System Modernization Program and associated cost recovery mechanism (GSMP II or Program) for a five-year period. The Program is an extension of PSE&G's current Gas System Modernization Program (GSMP), which was approved by the Board pursuant to an Order dated November 16, 2015. PSE&G anticipates that GSMP II will be conducted over the five-year period 2019 through 2023, as further described herein, and will commence on January 1, 2019, following Board approval.

4. The GSMP II program is comprised of gas utility projects designed to replace cast iron (CI) mains and unprotected steel (US) mains and services; address the abandonment of district regulators associated with this cast iron and unprotected steel plant; rehabilitate large diameter elevated pressure cast iron; upgrade utilization pressure (UP) portions of the system to elevated pressure (EP); replace limited amounts of protected steel and plastic mains; and relocate inside meter sets.[1]

5. The proposed Program would result in the replacement of approximately 250 miles of main per year, with estimated investment of approximately $2.68 billion for the full five years, or approximately $536 million per year.[2] At this time, the Company anticipates these expenditures will result in the replacement of approximately 870 miles of UPCI main (of PSE&G's current inventory of 3,294 miles), 130 miles of EPCI main, 200 miles of unprotected/bare steel main, 50 miles of UP cathodically protected steel and plastic main, and reinforcement of approximately 4,000 EPCI bell joints. This main replacement will result in

[1] For purposes of this petition, "unprotected steel" is steel that is not cathodically protected and includes both bare steel and coated steel.

[2] Work required to complete the Program will continue into the first six months of a sixth year of this Program, i.e., through June 30, 2024. The $2.68 billion cost of this Program includes this work.

approximately 266 abandoned district regulators, replacement of approximately 99,200 unprotected steel services, and the relocation of approximately 70,900 inside meter sets to the outside. Where appropriate, services will have excess flow valves installed for improved safety.

6. PSE&G is in the second year of a program that would take 30 years to address all cast iron main and unprotected steel in the distribution system. The Company has demonstrated that it has the capacity to increase the mileage replaced safely and cost-effectively. With this GSMP II filing, PSE&G proposes to accelerate the pace of replacement to 20 years. As discussed in the accompanying testimony, this is the optimal time to accelerate this work given low gas prices, the availability of labor and the corresponding economic stimulus of a continued and expanded program, and the more rapid reduction of greenhouse gas emissions by eliminating leak-prone materials from the system.

7. GSMP II targets all UPCI main diameters, and work prioritization will be based on grid hazard index calculations. UPCI systems will be replaced with EP systems that have improved reliability. EPCI mains will be prioritized by break or leak history, condition, diameter, pressure, and vintage, as well as consideration of EPCI main replacement associated with UPCI and unprotected steel projects. Unprotected steel mains will be prioritized by age, diameter, pressure, and leak history. EPCI joint reinforcement will target large diameter cast iron mains that are not prone to breaks and are not currently planned for replacement but are prone to joint leaks. The reinforcements will reduce the possibility of future joint leaks and reduce potential methane emissions.

8. GSMP II is designed to run for five years, as further described herein, and focuses on modernization of the gas distribution system. These investments will enable the Company to

focus on enhancing the reliability and safety of its gas distribution system in a cost effective manner, and to continue to provide economic stimulus currently being provided by the GSMP program. Although not part of the request in this Petition, the Company anticipates that additional gas distribution system modernization will need to be undertaken beyond this five year Program. The Company anticipates returning to the BPU prior to the expiration of this Program to address continued action of this nature.

9. PSE&G currently performs well with regard to addressing leaks in its system. When compared to companies that operate over 1,000 miles of cast iron, PSE&G is the best in terms of having the least number of main leaks per mile. (PHMSA report data: 2016 F7100.1-1). PSE&G responds to over 80,000 gas emergency calls on an annual basis at a rate of 99.9% within one hour. This ranks within the top decile of peer companies. Since 2014, PSE&G has reduced methane emissions 2.9% annually or a total of 65,000 metric tons of CO_2 equivalent (calculated using EPA Greenhouse Gas Reporting Program: Subpart W – Petroleum and Natural Gas Systems methodology (EPA Subpart W)).

10. Replacement of cast iron and unprotected steel as proposed in this Program builds upon the NJBPU's longstanding proactive approach to addressing aging infrastructure for PSE&G and other utilities. Systematic, long-term replacement allows for greater economies of scale, less municipal disruption, and more efficient execution. Methane emission reduction from this Program is estimated at approximately 199,000 metric tons of CO_2 equivalent per year as of the completion of the Program (calculated using EPA Subpart W), which would be equivalent to removing approximately 42,000 vehicles from the road.

11. The Program includes upgrading of low pressure systems to elevated pressure, which enables the installation of smaller size material, the installation of excess flow valve safety devices, and the use of high efficiency and other appliances by customers. The efficiencies of cost effective construction to replace cast iron mains, unprotected steel mains, and services in this proposed Program and the increased long-term reliability and safety that will result will benefit PSE&G ratepayers and the State for several decades. Proceeding with this Program will also continue PSE&G's support of economic development and enhanced employment opportunities in New Jersey.

12. It is reasonable and prudent to provide for the modernization of the PSE&G gas distribution system to advance the long-term reliability and safety of that system through the Program proposed herein. Accordingly, PSE&G requests that the Board approve this Program, to provide an investment of up to $2.68 billion.

BACKGROUND – ESTABLISHMENT, IMPLEMENTATION AND STATUS OF GAS CAPITAL INFRASTRUCTURE PROGRAMS (CIP I AND CIP II), THE GAS INFRASTRUCTURE PORTION OF ENERGY STRONG, AND GSMP

13. A Capital Infrastructure Program (CIP I) for PSE&G was established in April 2009, with the cooperation and assistance of the Board Staff, the New Jersey Division of Rate Counsel (Rate Counsel), and the Board. The program helped mitigate the negative impacts of poor economic conditions and stimulate the State's economy through investment in additional capital projects, creating new employment opportunities in the state while enhancing service and reliability throughout PSE&G's electric and gas service territories.

14. In CIP I PSE&G proposed to undertake, and the BPU subsequently approved, a program to spend $694 million in capital infrastructure investments, of which $273 million was for

gas infrastructure to be invested over a 24 month period. The results of the accelerated investment in CIP I resulted in the replacement of 200 miles of cast iron and unprotected steel mains and achieved the Board's and PSE&G's job creation and economic growth goals.

15. In July 2011 the Board approved PSE&G's request for an extension of CIP I, to enable the Company to continue that construction program and enhance the reliability of its gas distribution system under a program generally referred to as CIP II. A similar request to extend the electric portion of CIP I was reviewed in parallel with the gas extension. CIP II resulted in the replacement of 47 miles of cast iron and unprotected steel mains.

16. In February 2013, Public Service petitioned the Board for approval of a program (Energy Strong) and for the recovery of costs to harden its electric and gas infrastructure to make them less susceptible to damage from wind, flying debris and water damage in anticipation of future Major Storm Events, and to increase the resiliency of PSE&G's electric delivery system. In an Order issued in May 2014, the Board approved a Stipulation to authorize the Energy Strong Program, which includes an investment level of up to $400 million of investment in gas infrastructure designed to harden gas infrastructure to protect it from future storms. The Energy Strong Program also includes $820 million of electric infrastructure investment.

17. Up to $350 million of the gas portion of the Energy Strong program is for a sub-program for PSE&G to replace an estimated 250 miles of utilization pressure cast iron main and associated services with a higher operating pressure system utilizing plastic or cathodically protected steel mains and services in specified areas. The investment in this gas Utilization Pressure Cast Iron subprogram of Energy Strong was completed in July 2016.

18. In November 2015 the Board approved GSMP, which provided for $650 million in total spend, plus $85 million per year in stipulated base investment that would not be recovered through the GSMP cost recovery mechanism. Up to 400 miles of main were to be installed to replace UPCI and unprotected steel mains. The stipulated base investment would include the replacement of cast iron (UP and EP) and unprotected steel mains and associated services, as well as the costs required to uprate the UPCI systems if applicable (including the uprating of associated protected steel and plastic mains and services) to higher pressures and the elimination, where applicable, of district regulators, the installation of excess flow valves associated with the stipulated base investment, and the additional costs associated with the relocation of inside meter sets that is associated with the stipulated base as well as the program main replacements. During the three years 2016 – 2018, the Company would install no less than 110 miles of main to replace cast iron and unprotected steel mains and associated services under the stipulated base.

19. Under GSMP, as of June 2017 YTD, the Company has replaced approximately 157 miles of main and replaced approximately 11,820 services, or an average of 75 services per mile of main replaced. The Company has also abandoned 16 district regulators associated with the replacement areas. Cost to date is approximately $266 million, or approximately $1.7 million per mile.

20. The cost recovery mechanism and rate of return proposed by PSE&G in this GSMP II Petition and supporting materials are aligned with the Board's recently issued Infrastructure Investment Program regulations described below, and otherwise consistent with the 2015 GSMP order.

<u>FEDERAL AND STATE POLICY SUPPORTING THIS GAS MODERNIZATION INVESTMENT</u>

21. In 2011, the Secretary of the Department of Transportation (DOT), and the Pipeline and Hazardous Materials Safety Administration (PHMSA) issued a "Call to Action," which seeks more aggressive actions on the part of pipeline operators to repair and replace infrastructure that is considered high risk. The PHMSA specifically characterizes cast iron and unprotected steel pipe as categories of pipeline infrastructure that require repair, rehabilitation and replacement. The "Call to Action" was followed by an advisory bulletin issued by PHMSA on March 23, 2012, to owners and operators of natural gas cast iron distribution pipelines and state pipeline safety representatives. The bulletin urges operators of natural gas distribution systems to accelerate replacement of aging infrastructure in order to enhance safety and requests state agencies to consider enhancements to cast iron replacement plans and programs. PSE&G's proposed Program, with a focus on gas projects designed to replace cast iron mains, unprotected steel mains and services, and regulators associated with this cast iron and unprotected steel plant, will provide substantial progress in addressing the goals of the "Call to Action", as described in the attached testimony of Wade E. Miller.

22. The most recent update to the State's Energy Master Plan (EMP)[3] emphasizes continued and increased reliance on natural gas and thus investment in natural gas infrastructure overall as a means of lowering energy costs, decreasing carbon emissions, and enhancing energy security. Specifically, the report states that New Jersey has benefitted from the enhancement and expansion of its natural gas distribution system, which "will help further lower the cost of energy to

---

[3] See http://nj.gov/emp/docs/pdf/New_Jersey_Energy_Master_Plan_Update.pdf

New Jersey's homeowners and businesses and reduce emissions." The EMP continues to encourage increased use of natural gas for residential and commercial applications, "including the use of high-efficiency natural gas appliances such as replacing distillate oil appliances with natural gas furnaces and hot water heaters." The most recent EMP update specifically notes that "[the] BPU has approved almost $1 billion for natural gas utility infrastructure upgrades and mitigation projects," and that "[a]n additional $280 million in proposed projects is pending." Finally, the report states that New Jersey "will continue to develop policies that remove barriers and expand the use of the entire array of alternative fuel vehicles," including vehicles powered by Compressed Natural Gas (CNG). PSE&G's proposed investment in gas infrastructure modernization is consistent with these EMP policies.

23. On June 30, 2017, the Board announced a proposed set of regulations (Infrastructure Investment and Recovery (Proposed New Subchapter: N.J.A.C. 14:3-2A, BPU Docket Number: AX17050469), encouraging utilities to implement Infrastructure Investment Programs (IIPs). Specifically, this regulation has been proposed by the BPU to "allow a utility to construct, install, or remediate utility plant and facilities related to reliability, resiliency, and/or safety to provide safe and adequate service. The IIP is a regulatory initiative intended to create a financial incentive for utilities to accelerate the level of investment needed to promote the timely rehabilitation and replacement of certain non-revenue producing components that enhance reliability, resiliency, and/or safety." This filing has been designed to be consistent with the Board's proposed regulations. Appendix 1 attached to this Petition sets forth the location in this filing of all requirements per the Board's proposed regulations.

BENEFITS TO CUSTOMERS AND THE NEW JERSEY ECONOMY

24. This proposed Program, like the prior PSE&G Capital Infrastructure Programs and Energy Strong and the current GSMP, will produce many benefits for customers, for PSE&G's gas distribution system, and for the environment. Customers will benefit from a safer, more modern system that accommodates newer technologies and appliances. The replacement of mains and services will enhance the safety and reliability of the system through the use of more modern materials and construction. An additional benefit of GSMP II is an accelerated reduction of greenhouse gas emissions from legacy facilities. The long term 20 year elimination strategy is equivalent to removing approximately 127,000 vehicles from the road.

25. Providing for this Program over multiple years will enable PSE&G to plan to construct these facilities in a cost effective manner, and allow PSE&G to coordinate with municipalities in planning construction.

26. Proceeding with this Program will also continue PSE&G's support of economic development and enhanced employment opportunities in New Jersey. This Program will support additional skilled jobs. Proceeding on a multi-year basis will provide stability and permanence in the jobs the Program creates and supports.

COST RECOVERY

27. PSE&G is proposing a cost recovery mechanism for GSMP II that is consistent with the recently proposed BPU Infrastructure Investment and Recovery (IIR) regulations (Proposed New Subchapter: N.J.A.C. 14:3-2A, BPU Docket Number: AX17050469) and the existing Gas System Modernization Program (GSMP I) where applicable. As detailed in the attached Direct Testimony of Stephen Swetz, the cost recovery method will involve semi-annual base rate roll-in

filings, consistent with the proposed IIP regulations and the same approach used for PSE&G's Energy Strong program (for electric investments).

28. Consistent with the IIP proposal, PSE&G proposes to limit each base rate roll-in to a minimum investment level of 10 percent of the total program investment. Therefore, based on the proposed capital expenditure forecast, the first base rate roll-in filing will not occur until December 31, 2019, for rates effective June 1, 2020. Following that initial filing in December 2019, filings will be made at the end of June and December of each year, for rate changes related to plant in-service August 31 of the same year and February 28 (or 29) of the subsequent year, respectively. Those filings would be updated through a second filing that would be due September 15 and March 15, respectively, and that would provide actual data through August 31 and February 28 (or 29), respectively. Under this proposal, the rate adjustment following the June filing would be implemented on the first of December, and the rate adjustment following the December filing would be implemented on the first of June.

29. The main replacement work for GSMP II is scheduled to be complete December 31, 2023. However, close out work such as final paving must wait 3 to 6 months following main installation to allow ground to settle. In addition, trailing charges from contractors may lag into 2024. Without a firm date for completion of this close out work, the Company is proposing a rate filing no later than July 15, 2024 with all actual data for rates effective October 1, 2024.

30. Consistent with the Energy Strong program and GSMP, PSE&G proposes that the costs to be included in rates will include: depreciation/amortization expense providing for the recovery of the invested capital over its useful book life; return on the net investment, where net

investment is the capital expenditures less accumulated depreciation/amortization, less associated accumulated deferred income taxes; and the impact of any tax adjustments applicable to the Program. The return on net investment will be based upon a weighted average cost of capital (WACC). The Company's initial WACC for the Program will be based on the ROE, long-term debt rate and capital structure approved in PSE&G's Solar 4 All Extension II filing in Docket No. EO16050412, which was the latest new program approved for the Company by the Board on November 30, 2016. Any change in the WACC authorized by the Board in a subsequent base rate case will be reflected in the subsequent monthly revenue requirement calculations.

31. BPU Staff and Rate Counsel will have an opportunity to review each roll-in filing to ensure that the revenue requirements and proposed rates are being calculated in accordance with the BPU Order approving the Program. The changes to base rates made through these roll-in filings would be subject to refund based solely upon a Board finding that PSE&G imprudently incurred capital expenditures. The actual prudence of the Company's expenditures in GSMP II will be reviewed as part of PSE&G's subsequent base rate case(s) following the roll-ins. Again, this is identical to the approach under the Energy Strong program and GSMP. Following the base rate case to be filed no later than November 1, 2017, the Company proposes that it will file its next base rate case no later than five years after the commencement of work for GSMP II, anticipated to be December 31, 2023.

32. In addition to limiting the base rate roll-ins to a minimum investment level of 10 percent of the total program investment, PSE&G is also proposing to limit the amount of investment to be included in the rate base roll-ins by an earnings test. Consistent with the IIP, if the Company exceeds the allowed ROE from the utility's last base rate case by fifty (50) basis

points or more for the most recent twelve (12) moth period, the pending base rate roll-in shall not be allowed for the applicable filing period. Details regarding application of the earnings test are set forth in the direct testimony of Stephen Swetz, submitted herewith.

33. This Petition does not propose any rate increase and, for that reason, no public comment hearings are required. Nevertheless, PSE&G proposes public comment hearings similar to those that are held when rate increases are proposed. Thus, a proposed form of public notice of filing and public hearings, including the proposed rates and bill impacts attributable to the proposed implementation of the Program, is attached to the testimony of Stephen Swetz as Schedule SS-GSMPII-7. PSE&G proposes that this Form of Notice will be placed in newspapers having a circulation within the Company's gas service territory upon receipt, scheduling and publication of public hearing dates. As with petitions that propose rate increases, PSE&G proposes that public hearings will be held in each geographic area within the Company's service territory, i.e., Northern, Central, and Southern. A Notice will be served on the County Executives and Clerks of all municipalities within the Company's gas service territories upon receipt, scheduling and publication of public hearing dates.

ATTACHED DIRECT TESTIMONY AND PROPOSED PROCEDURAL SCHEDULE

34. The attached Direct Testimonies of Wade E. Miller and Stephen Swetz provide support for the forgoing and the requests herein.

35. Given the expiration of the Energy Strong main replacement program in July 2016, the anticipated expiration of the GSMP main replacement work in 2018, and the importance of maintaining the support for jobs through PSE&G infrastructure programs and continuity in those programs, it is important for PSE&G to receive Board approval in the first quarter of 2018 to begin

planning for, designing and making the capital investments described herein. Therefore, the Company respectfully requests that the Board retain this matter and utilize a schedule similar to the following procedural schedule:

• Petition and Direct Testimony filed	July 27, 2017
• Prehearing Conference	Week of August 21, 2017
• Discovery on PSE&G Filing	July-September, 2017
• Non-Petitioner Direct Testimony Due	October 15, 2017
• Discovery Requests on Non-Petitioner Testimony	October 16 – November 30, 2017
• Rebuttal Testimony – All Parties	November 20, 2017
• Discovery Requests on Rebuttal Testimony	November 21- December 5, 2017
• Settlement Conferences	Week of December 11, 2017
• Hearings	December 18-22, 2017
• Initial Briefs	January 15, 2018
• Reply Briefs	January 29, 2018
• BPU Decision and Order	1st Quarter 2018

<u>COMMUNICATIONS</u>

36. Communications and correspondence related to the Petition should be sent as follows:

Joseph F. Accardo, Esq.
Deputy General Counsel
PSEG Services Corporation
80 Park Plaza, T5
P. O. Box 570
Newark, New Jersey 07102
Phone: (973) 430-5811
joseph.accardojr@pseg.com

Matthew M. Weissman, Esq.
General Regulatory Counsel-Rates
PSEG Services Corporation
80 Park Plaza, T5
P. O. Box 570
Newark, New Jersey 07102
Phone: (973) 430-7052
matthew.weissman@pseg.com

Michele Falcao
Regulatory Filings Supervisor
PSEG Services Corporation
80 Park Plaza, T5
P.O. Box 570
Newark, New Jersey 07102
Phone: (973) 430-6119
michele.falcao@pseg.com

Caitlyn White
Regulatory Case Coordinator
PSEG Services Corporation
80 Park Plaza, T5
P.O. Box 570
Newark, New Jersey 07102
Phone: (973) 430-5659
caitlyn.white@pseg.com

<u>CONCLUSION AND REQUESTS FOR APPROVAL</u>

For all the foregoing reasons, PSE&G respectfully requests that the Board issue an Order approving this Petition no later than the first quarter of 2018 and specifically finding that:

1. The Gas System Modernization Program Extension is in the public interest;

2. The Gas System Modernization Program Extension as described herein is reasonable and prudent;

3. PSE&G is authorized to implement and administer the Program under the terms set forth in this Petition and accompanying Attachments;

4. The cost recovery proposal and mechanism set forth in this Petition will provide for implementation of just and reasonable rates and is approved; and

5. PSE&G may recover all prudently-incurred Program costs, on a full and timely basis, under the cost recovery mechanism set forth herein.

Respectfully submitted,

PUBLIC SERVICE ELECTRIC
AND GAS COMPANY

Matthew Weissman

Matthew M. Weissman, Esq.
General Regulatory Counsel - Rates
Public Service Electric and Gas Company
80 Park Plaza, T-5
P. O. Box 570
Newark, New Jersey 07101
Phone (973) 430-7052
Fax (973) 430-5983

DATED: July 27, 2017

STATE OF NEW JERSEY)
:
COUNTY OF ESSEX)

Wade E. Miller of full age, being duly sworn according to law, on his oath deposes and says:

1. I am the Director – Gas Transmission and Distribution Engineering Gas Company, the Petitioner in the foregoing Petition.

2. I have read the annexed Petition, and the matters and things contained therein are true to the best of my knowledge and belief.

Wade E. Miller

Sworn and subscribed to)
before me this 27th day)
of July, 2017)

MICHELE D. FALCAO
Notary Public, State of New Jersey
My Commission Expires
November 14, 2021

PUBLIC SERVICE ELECTRIC AND GAS Minimum Filing Requirements – Gas System Modernization Program II	
Minimum Filing Requirement	**Location in Filing**
14:3-2A.2 Project eligibility	
a) Eligible projects within an Infrastructure Investment Program shall be: 1. Related to safety, reliability, and/or resiliency; 2. Non-revenue producing; 3. Specifically identified by the utility within its petition in support of an Infrastructure Investment Program; and 4. Approved by the Board for inclusion in an Infrastructure Investment Program, in response to the utility's petition.	See Attachment 1, Direct Testimony of Wade E. Miller
b) Projects within an Infrastructure Investment Program may include: 5. The replacement of gas Utilization Pressure Cast Iron mains with elevated pressure mains and associated services; 6. The replacement of mains and services that are identified as high risk in a gas utility's Distribution Integrity Management Plan; 7. The installation of gas Excess Flow Valves where existing gas service line replacements require them, excluding Excess Flow Valves installed upon customer request pursuant to 49 CFR 192.383; 8. Electric distribution automation investments, including, but not limited to, Supervisory Control and Data Acquisition equipment, cybersecurity investments, relays, reclosers, Voltage and Reactive Power Control, communications networks, and Distribution Management System Integration; 9. The installation of break-predictive water sensors and wastewater sensors to curtail combined sewer overflows; and 10. Other projects deemed appropriate by the Board	See Attachment 1, Direct Testimony of Wade E. Miller
c) A utility shall maintain its capital expenditures on projects similar to those proposed within the utility's Infrastructure Investment Program. These capital expenditures shall amount to at least ten (10) percent of any approved Infrastructure Investment Program. These capital expenditures shall be made in the normal course of business and recovered in a base rate proceeding, and shall not be subject to the recovery mechanism set forth in N.J.A.C. 14:3-2A.6.	See Attachment 1, Schedule WEM-GSMPII-2, of the Direct Testimony of Wade E. Miller

14:3-2A.3 Annual baseline spending levels	
a) A utility seeking to establish an Infrastructure Investment Program shall, within its petition, propose annual baseline spending levels to be maintained by the utility throughout the length of the proposed Infrastructure Investment Program. These expenditures shall be recovered by the utility in the normal course within the utility's next base rate case.	See Attachment 1, Schedule WEM-GSMPII-2, of the Direct Testimony of Wade E. Miller
b) In proposing annual baseline spending levels, the utility shall provide appropriate data to justify the proposed annual baseline spending levels, which may include historical capital expenditure budgets, projected capital expenditure budgets, depreciation expenses, and/or any other data relevant to the utility's proposed baseline spending level	See Attachment 1, Schedule WEM-GSMPII-2, of the Direct Testimony of Wade E. Miller
14:3-2A.4 Infrastructure Investment Program length and limitations	
a) Allowance for Funds Used During Construction (AFUDC) shall be permitted under an Infrastructure Investment Program, but a utility shall not utilize AFUDC once Infrastructure Investment Program facilities are placed in service.	See Attachment 2, Direct Testimony of Stephen Swetz
14:3-2A.5 Infrastructure Investment Program minimum filing and reporting requirements	
1) Projected annual capital expenditure budgets for a five (5) year period, identified by major categories of expenditures	See Attachment 1, Schedule WEM-GSMPII-3, of the Direct Testimony of Wade E. Miller
2) Actual annual capital expenditures for the previous five (5) years, identified by major categories of expenditures	See Attachment 1, Schedule WEM-GSMPII-3, of the Direct Testimony of Wade E. Miller
3) An engineering evaluation and report identifying the specific projects to be included in the proposed Infrastructure Investment Program, with descriptions of project objectives, detailed cost estimates, in-service dates, and any applicable cost-benefit analysis for each project	See Attachment 1, Direct Testimony of Wade E. Miller
4) An Infrastructure Investment Program budget setting forth annual budget expenditures	See Attachment 1, Schedule WEM-GSMPII-4, of the Direct Testimony of Wade E. Miller
5) A proposal addressing when the utility intends to file its next base rate case, consistent with N.J.A.C. 14:3-2A.6(f)	See Attachment 2, Direct Testimony of Stephen Swetz
6) Proposed annual baseline spending levels, consistent with N.J.A.C. 14:3-2A.3(a) and (b)	See Attachment 1, Schedule WEM-GSMPII-

	2, of the Direct Testimony of Wade E. Miller
7) The maximum dollar amount, in aggregate, the utility seeks to recover through the Infrastructure Investment Program; and	See Attachment 1, Schedule WEM-GSMPII-4, of the Direct Testimony of Wade E. Miller
8) The estimated rate impact of the proposed Infrastructure Investment Program on customers	See Attachment 2, Schedule SS-GSMPII-6, of the Direct testimony of Stephen Swetz
Following the Board's approval of a utility's petition in support of an Infrastructure Investment Program, the utility shall file supportive semi-annual status reports with the Board and the Division of Rate Counsel for project management and oversight purposes that, at a minimum, contain the following:	See Below
1) Forecasted and actual costs of the Infrastructure Investment Program for the applicable reporting period, and for the Program to date, where Program projects are identified by major category;	See Attachment 1, Direct Testimony of Wade E. Miller
2) The estimated total quantity of work completed under the Program identified by major category. In the event that the work cannot be quantified, major tasks completed shall be provided;	See Attachment 1, Direct Testimony of Wade E. Miller
3) Estimated completion dates for the Infrastructure Investment Program as a whole, and estimated completion dates for each major Program category;	See Attachment 1, Direct Testimony of Wade E. Miller
4) Anticipated changes to Infrastructure Investment Program projects, if any;	See Attachment 1, Direct Testimony of Wade E. Miller
5) Actual capital expenditures made by the utility in the normal course of business on similar projects, identified by major category; and	See Attachment 1, Direct Testimony of Wade E. Miller
6) Any other performance metrics concerning the Infrastructure Investment Program required by the Board.	See Attachment 1, Direct Testimony of Wade E. Miller
14:3-2A.6 Infrastructure Investment Program Recovery	
a) Each filing made by a utility seeking accelerated recovery under an Infrastructure Investment Program shall seek recovery, at a minimum, of at least ten (10) percent of overall Infrastructure Investment Program expenditures.	See Attachment 2, the Direct testimony of Stephen Swetz
b) A utility's expenditures made prior to the Board's approval of an Infrastructure Investment Program shall not be eligible for accelerated recovery.	N/A
c) Rates approved by the Board for recovery of expenditures under an Infrastructure Investment Program shall be	See Attachment 2, the Direct testimony of

	accelerated, and recovered through a separate clause of the utility's Board-approved tariff.	Stephen Swetz
d)	Rates approved by the Board for recovery of expenditures under an Infrastructure Investment Program shall be provisional, subject to refund and interest. Prudence of Infrastructure Investment Program expenditures shall be determined in the utility's next base rate case.	See Attachment 2, the Direct testimony of Stephen Swetz
e)	A utility shall file its next base rate case not later than five (5) years after the Board's approval of the Infrastructure Investment Program, although the Board, in its discretion, may require a utility to file its next base rate case within a shorter period	See Attachment 2, the Direct testimony of Stephen Swetz
f)	An earnings test shall be required, where Return on Equity (ROE) shall be determined based on the actual net income of the utility for the most recent twelve (12) month period divided by the average of the beginning and ending common equity balances for the corresponding period.	See Attachment 2, the Direct testimony of Stephen Swetz
g)	For any Infrastructure Investment Program approved by the Board, if the calculated ROE exceeds the allowed ROE from the utility's last base rate case by fifty (50) basis points or more, accelerated recovery shall not be allowed for the applicable filing period.	See Attachment 2, the Direct testimony of Stephen Swetz

STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

**IN THE MATTER OF THE PETITION OF
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
FOR APPROVAL OF THE NEXT PHASE OF
THE GAS SYSTEM MODERNIZATION PROGRAM AND
ASSOCIATED COST RECOVERY MECHANISM
("GSMP II")**

BPU Docket No. __________

**PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DIRECT TESTIMONY
OF
WADE E. MILLER
DIRECTOR – GAS TRANSMISSION AND DISTRIBUTION
ENGINEERING**

July 27, 2017

INTRODUCTION

Q. Please state your name, affiliation and business address.

A. My name is Wade E. Miller, and I am Director, Gas Transmission and Distribution (T&D) Engineering of Public Service Electric and Gas Company (PSE&G, or the Company), the Petitioner in this matter.

Q. Please describe your responsibilities as Director of Gas Transmission and Distribution Engineering.

A. As the Director of Gas T&D Engineering, I have the responsibility and accountability for three core functions of PSE&G's gas business. The first core function is delivering the natural gas. This includes gas control and system reliability to over 1.8 million customers. This also includes the operation and maintenance of 48 city gate stations, one Liquefied Natural Gas (LNG) plant, three Liquid Propane Air (LPA) plants, and one Liquid Propane (LP) storage facility. The second core function is gas asset management. This includes the safe and efficient engineering and design of PSE&G's gas transmission and distribution assets, capacity planning, corrosion control, replacement facility identification and prioritization, transmission pipeline maintenance, and the management of the Transmission and Distribution Integrity Management Programs. The third core function is business support and technical services. This includes the development of operating standards and procedures, material evaluation and specification, operator qualification and our research & development programs.

Q. Please describe your educational and professional background and qualifications.

A. This information is provided in Schedule WEM-GSMPII-I, which is attached hereto.

Q. What is the purpose of your testimony in this proceeding?

A. My testimony discusses the prudence and timeliness of PSE&G's proposed Gas System Modernization Program extension (GSMP II, or Program). I describe the Program and its focus solely on gas projects designed to replace cast iron mains, unprotected steel mains and services, abandonment of district regulators associated with this cast iron and unprotected steel plant, reinforcement of large diameter elevated pressure cast iron, and relocation of inside meter sets. I also describe the underlying reasons for the Program, including the need for a forward-looking, efficient, long-term replacement plan for aging gas infrastructure. Further, I describe the time-frame for the Program and the estimated costs of the Program.

Q. How is the remainder of your testimony organized?

A. My testimony is organized into several sections following this introduction:

EXECUTIVE SUMMARY

Q. Please provide a brief summary of the GSMP.

A. PSE&G's Gas System Modernization Program (GSMP) is an accelerated replacement program for low/utilization pressure cast iron mains (UPCI), elevated pressure cast iron (EPCI), and unprotected steel mains and services. GSMP II has been filed with the New Jersey Board of Public Utilities (BPU or the Board) as a 5 year program extension as part of a long-term 20 year elimination strategy. GSMP started when the BPU approved GSMP I, and GSMP II continues this effort. GSMP II targets the replacement of legacy systems on a "map grid" basis, compared to the segment by segment approach of typical annual base plan main replacement. This allows for a systematic replacement strategy that still focuses on risk, while maximizing construction efficiency and cost-effectiveness. The program continues to support a regulatory focus on replacing the highest risk, most leak prone facilities, as identified in the Company's Distribution Integrity Management Plan.

The proposed program would be for 5 years at 250 miles per year, with estimated investment of approximately $536 million per year, or $2.68 billion for the full five years. The Company's experience executing GSMP I and ability to go beyond its requirements demonstrates that the Company can execute a larger scale and longer program. In addition, the work completed under GSMP I was performed with an excellent safety record while maintaining high customer satisfaction. As noted, a longer term program will prove to be more cost effective. The proposed Program will accelerate O&M savings and emissions reductions, and the timing is right given the relatively low cost of gas commodity for residential customers.

Q. Please describe the proposed program extension.

A. The proposed GSMP II would replace 870 miles of UPCI (of PSE&G's current inventory of 3,294 miles), 130 miles of EPCI, 200 miles of unprotected/bare steel mains, 50 miles of cathodically-protected steel and plastic main, and reinforcement of approximately 4,000 EPCI, large diameter bell joints. Main replacement will result in approximately 266 abandoned district regulators, replacement of approximately 99,200 unprotected steel services, and the relocation of approximately 70,900 inside meter sets to the outside. Where appropriate, services will have excess flow valves installed for improved safety. GSMP II targets all UPCI main diameters, and work prioritization will be based on grid hazard index calculations. UPCI systems will be replaced with EP systems that have improved reliability. EPCI mains will be prioritized by break history, as well as consideration of EPCI main replacement associated with UPCI and unprotected steel jobs. Unprotected steel mains will be prioritized by age, diameter, pressure, and leak history. EPCI joint reinforcement will target large diameter cast iron mains that are not prone to breaks and are not due for replacement but are prone to joint leaks. The reinforcements will reduce the possibility of future joint leaks and reduce potential methane emissions.

Q. Please describe the Program's benefits.

A. The Program will produce many benefits for customers, for PSE&G's gas distribution system, and for the environment. Customers will benefit from a safer, more modern system that accommodates newer technologies and appliances. The replacement of mains and services will enhance the safety and reliability of the system through the use of more modern materials and construction. An additional benefit from GSMP is an accelerated reduction of greenhouse gas emissions from legacy facilities. The long term 20 year elimination strategy is equivalent to removing approximately 127,000 vehicles from the road every year.

Reasons for the Filing

Q. Please summarize your reason for filing.

A. Aging cast iron and unprotected steel pipe serving PSE&G customers exhibits significantly greater leak rates than newer plastic and cathodically protected steel pipe and will eventually require replacement or rehabilitation. The proposed GSMP II and associated cost recovery mechanism represent a prudent response to PSE&G's long- term system needs and the Department Of Transportation's "Call to Action" to facilitate the replacement of aging gas infrastructure. The GSMP II Program is also consistent with the Board's proposed new regulations (New Subchapter N.J.A.C. 14:3-2A), regarding Infrastructure Investment Programs ("IIPs"). The safety-related, customer, economic and other benefits attributable to the five-year Program extension, as presented in my testimony, are compelling.

Q. Is it appropriate for PSE&G to move forward with a long-term approach to gas infrastructure replacement?

A. Yes. PSE&G's prior replacement levels supported safe and adequate service but the current GSMP program and this proposed extension will expedite the replacement, making the system safer, more reliable, and less leak prone. This will result in O&M savings and emissions reductions, all at "the right time", while construction labor is available and customers' gas rates remain low. While there is no immediate risk posed by PSE&G's current system and operating practices, the distribution system is aging; and while

PSE&G manages the risks posed by its legacy system, all cast iron and unprotected steel will eventually require replacement or rehabilitation. Moreover, the costs associated with the ongoing management of the legacy systems will increase as the system continues to age.

If significant failures occur, a potential response may be to develop a reactive accelerated replacement program. Such a reactive approach could present costly and difficult management issues, as opposed to the more orderly and proactive planned approach through the GSMP Program.

"Call to Action"

Q. Please describe the "Call to Action" in greater detail.

A. In 2011, under the direction of the then Department of Transportation (DOT) Secretary Ray LaHood, the DOT and Pipeline and Hazardous Materials Safety Administration (PHMSA) called for readdressing the fitness for service of the nation's natural gas system, including the replacement of aging facilities. This is the DOT's "Call to Action", which seeks more aggressive actions on the part of pipeline operators to repair and replace infrastructure that is considered high risk. PHMSA specifically includes cast iron and unprotected steel pipe as categories of pipeline infrastructure that require repair, rehabilitation and replacement. The "Call to Action" was followed by an advisory bulletin issued by PHMSA on March 23, 2012 to owners and operators of natural gas cast iron distribution pipelines and state pipeline safety representatives. The bulletin urges operators of natural gas distribution systems to accelerate replacement of aging infrastructure in order to enhance safety, and requests state agencies to consider enhancements to cast iron replacement plans and programs. The focused attention on cast iron pipelines was based upon the agency's assessment of circumstances that may have contributed to recent deadly explosions in Pennsylvania. Secretary LaHood called for an evaluation of the fitness for service of the aging aspects of natural gas infrastructure and for actions to be taken to address safety risks. The plan seeks to involve operators such as Local Distribution Companies (LDCs), utility regulators, safety regulators and other interested stakeholders in the development of a strategy for addressing aging natural gas infrastructure. The "Call to Action" proposes that pipeline owners and operators, such as PSE&G, take an aggressive approach to repairing and replacing pipeline facilities that are more hazardous. The "Call to Action" specifically identifies the benefits of investing in infrastructure to enhance public safety and to provide for the future integrity of the pipeline system through the use of Smart Modernization.

Q. Can you define what Smart Modernization is?

A. The concept of Smart Modernization arises from the "Call to Action" issued by Secretary LaHood, following incidents on the United States natural gas delivery system. The intention behind Smart Modernization is to balance customer needs with risk and is not an overly aggressive approach to system risk management. In essence it is part of the implementation of the Company's Distribution Integrity Management Plan ("DIMP") program and recognizes that the risks inherent in the system cannot be eliminated without due consideration of cost and impact on customers and the community. Smart Modernization includes the replacement and upgrading of existing mains, services, and equipment by following a methodological approach that considers:

- current and future demand needs;
- prioritization of selected facilities for safety and reliability, based on the DIMP;
- the latest technologies for system design and materials;
- environmentally favorable construction (e.g., trenchless construction where applicable);
- impact to customers;
- system pressure upgrades for increased capacity;
- leveraging existing embedded system components that are not being replaced, e.g., uprating existing plastic systems and eliminating district regulators;
- right-sizing new facilities for cost effectiveness;
- inclusion of related gate station upgrades to latest technology;
- maximizing the retire/install ratio; and
- coordinating work with other programs, e.g., replacement of unprotected steel services under
- BPU requirements with water company projects, and with municipal paving projects, where applicable.

Q. Please describe the appropriate course of action under the circumstances.

A. An appropriate and operationally prudent course of action is the proposed Program for the replacement of PSE&G's cast iron and unprotected steel infrastructure. I believe that the Program being proposed represents an opportunity to achieve, in a timely manner, a substantial risk reduction and other benefits through a reduction of the inventory of pipe prone to leakage. The approach proposed by the Company will allow PSE&G to achieve efficiencies; and cost savings through large scale replacements. PSE&G's proposed Program to address its inventory of these facilities is clearly consistent with the "Call to Action" and the PHMSA advisory bulletin.

Infrastructure Investment Program Proposal

Q. What is the Infrastructure Investment Program proposal?

A. It is a regulation proposed by the BPU "to allow a utility to construct, install, or remediate utility plant and facilities related to reliability, resiliency, and/or safety to provide safe and adequate service. The IIP is a regulatory initiative intended to create a financial incentive for utilities to accelerate the level of investment needed to promote the timely rehabilitation and replacement of certain non-revenue producing components that enhance reliability, resiliency, and/or safety."

Q. Are the projects in the GSMP II Program eligible under the IIP proposal?

A. Yes. The IIP proposal covers projects that are related to safety, reliability and/or resiliency and that are non-revenue producing. The GSMP II projects are consistent with this requirement. Further, the IIP proposal even specifies replacement of utilization pressure cast iron main with elevated pressure, the removal of high risk mains according to a Company's Distribution Integrity Management Plan, and the installation of excess flow valves as examples of projects eligible for the IIP.

Q. Are there requirements to seek accelerated recovery of infrastructure investments under the IIP proposal?

A. Yes. The location of all requirements under the IIP proposal in the GSMP II filing is provided in Appendix 1 to the Petition. I will address the requirements related to program eligibility, capital expenditures, selection criteria, and reporting. Mr. Swetz will address requirements associated with cost recovery.

Q. Is the Company proposing to maintain base capital expenditures on similar projects as proposed for the GSMP II Program?

A. Yes. The Company commits to spending at least 10 percent above the capital expenditures proposed for the GSMP II Program to be recovered in a base rate proceeding. See Schedule WEM-GSMPII-2 for the annual breakdown.

Q. Is the Company proposing annual baseline spending levels over the life of the Program?

A. Yes. Please see Schedule WEM-GSMPII-2 for the annual baseline spending levels over the GSMP II period.

Q. What is the justification for the annual baseline budget spending levels?

A. The annual baseline spending levels proposed in Schedule WEM-GSMPII-2 are the Company's projected capital budget, which is based on projected annual depreciation expenses. Further, within the baseline spending limit, the Company commits to maintaining 10 percent of the Program capital expenditures specific to projects similar to GSMP II.

Q. Is the Company proposing any limit to variations in annual spending?

A. Yes. Consistent with the proposed IIP regulations, the Company proposes that it be allowed annual variations in its capital expenditures up to 10 percent so long as the expenditures do not exceed the overall approved budget for the Program. The Company will seek Board approval for any year-to-year variances that are expected to be greater than 10 percent.

Q. Have you included the Company's actual capital expenditures over the past five years and projected capital expenditures over the next five years by major category?

A. Yes. Please see Schedule WEM-GSMPII-3 for the actual and projected capital expenditures by major category from 2012 through 2021.

Q. Has an engineering evaluation been done to determine the projects, in-service dates, costs and benefits of the proposed Program?

A. Yes. My testimony below details the projects proposed for the Program, how and why they were selected, the monthly forecasted capital expenditures, the cost estimate, including how those cost estimates were developed, and the benefits of the Program.

Q. Have you developed an annual budget for the GSMP II Program?

A. Yes. Please see Schedule WEM-GSMPII-4 for the monthly and annual capital expenditures for the Program. As shown in Schedule WEM-GSMPII-4, the maximum capital expenditure dollar amount the Company seeks to recover through the Program is $2.7 billion.

Q. Is the Company proposing any reporting requirements associated with GSMP II?

A. Yes. Consistent with the IIP, the Company is proposing semi-annual status reports on the Program. The reporting requirements are detailed later in my testimony.

PSE&G Inventory and System Profile

Q. Describe the development of PSE&G's gas distribution system.

A. PSE&G was formed in 1903 by amalgamating more than 400 gas, electric and transportation companies in New Jersey. PSE&G's oldest predecessor, the Paterson Gas Light Company, began actual operations in 1847. The pioneering history of a manufactured gas system, creating gas from coal and supplying it predominantly for lighting, has resulted in PSE&G's remaining legacy low-pressure gas distribution system. Some of the older cast-iron pipes in the Company's system date back to the late 1800s.

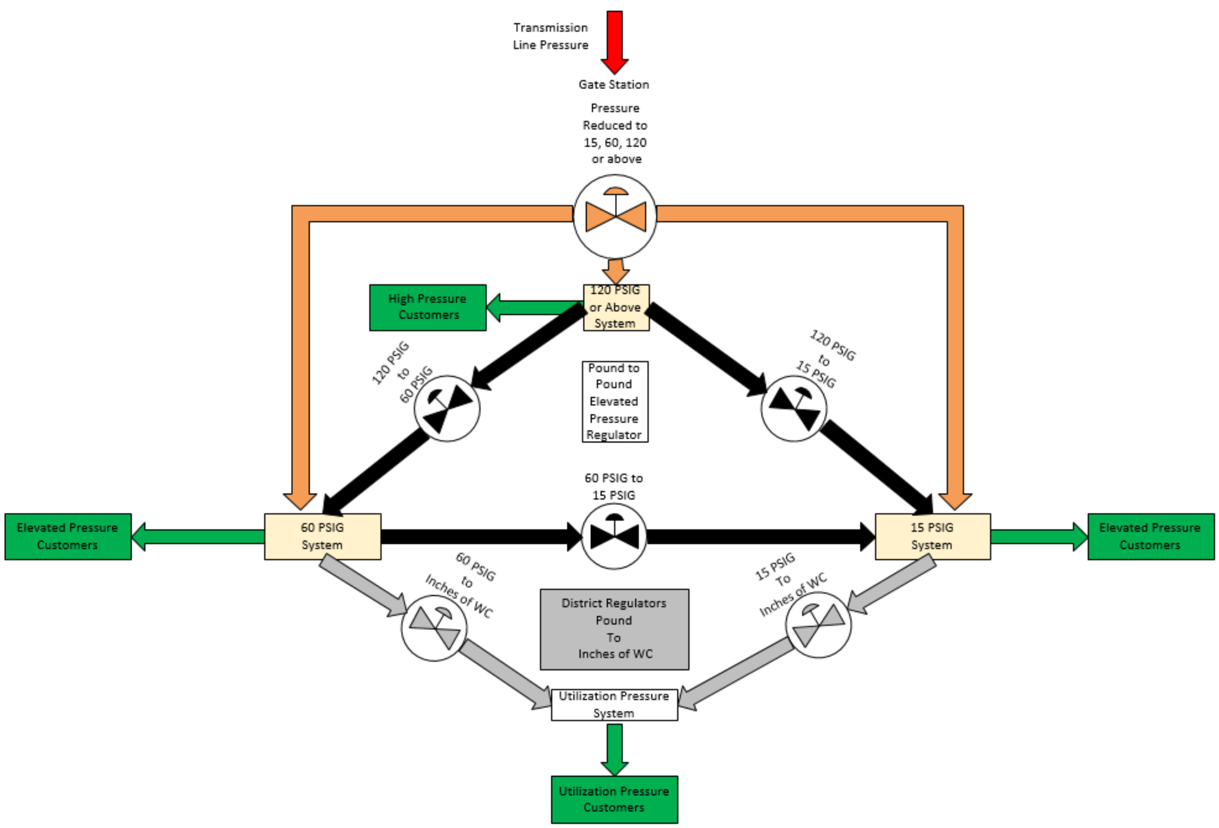
The Company's distribution system mains and services reflect the material types that were considered state-of-the-art over the years as the system grew to serve new customers. The system design has large diameter trunk mains supplied from a source (initially a manufactured gas plant; subsequently a city gate station) transporting gas to a connected network of smaller diameter mains that ultimately supply gas to customers through single service lines. In the first half of the 20^{th} century the primary material used for distribution main pipe was cast iron, and the primary material used for services was unprotected steel pipe. In the 1950s, there was a transition to steel materials for mains. Cathodic protection of steel pipe became widespread in the 1960s. From the 1970s to the present, plastic materials for new mains and services were installed in lieu of steel except for certain large diameter installations. As a result of the foregoing, the Company's current distribution system includes a mix of cast iron, steel, and plastic mains, steel and plastic services, and a very small percentage of copper services.

Q. Please describe the current distribution system infrastructure that PSE&G maintains and operates, and the physical characteristics and materials that make up PSE&G's current distribution system.

A. PSE&G serves approximately 1.8 million gas customers in a service area of almost 2400 square miles. PSE&G operates a gas distribution system network of approximately 35,000 miles of mains and services in pipe sizes ranging from ½" to 42" in diameter and composed of plastic, steel, and cast iron materials. PSE&G receives odorized gas from 48 city gate stations, where gas volumes are measured and the pressure is reduced to distribution pressure. PSE&G operates an integrated gas distribution network comprised of four pressure systems: utilization pressure (UP) and elevated pressures (EP) (15 psig, 60 psig, and 120 psig and above). Exhibit 1.1 illustrates the major components of PSE&G's distribution network.

Exhibit 1.1

Illustrations of Distribution System Pressure Components



As summarized in Exhibit 1.2 the 4,332 mile, 0.25 psig utilization pressure system is approximately 24 percent of the distribution network; the 4,606 mile 15 psig system is approximately 26 percent; the 8,783 mile 60 psig system is approximately 49 percent; and the 130 mile 120 psig and above system is approximately 1 percent.

Exhibit 1.2

Gas Distribution Network Pressure Systems (miles at end of 2016)

Mains					
MILES	**UP**	**15 PSIG**	**60 PSIG**	**120 PSIG**	**> 120 PSIG**
Cast Iron	3294	438	57		
Steel	494	1683	3532	128	12
Plastic	542	2454	5178	2	
Other	2	31	16		
Total	4332	4606	8783	130	12

The reduction in pressure from either the 60 psig or 15 psig pressures to utilization pressure occurs at district regulator stations. The utilization pressure system is supplied by approximately 1,300 district regulator stations fed by either 15 or 60 psig pressure. In addition, PSE&G utilizes 36 pounds to pounds regulators to transfer gas from the 120 psig or above and 60 psig systems to a lower pressure system. Main lines transport gas from the regulator vaults to individual elevated and utilization pressure customers via individual service lines. In all, PSE&G operates and maintains approximately 17,863 miles of various pressure gas distribution main, and 1,256,333 services totaling approximately 17,125 miles of service lines. PSE&G's services feed over 1.8 million meters serving utilization pressure, 15 psig, 60 psig and 120 psig customers. Approximately 720,000 meters serve customers connected to utilization pressure, while the remaining 1,080,000 meters provide gas service to elevated pressure customers. Approximately 65,000 of PSE&G's elevated pressure services have excess flow valves. Exhibit 1.3 shows the various materials that makeup PSE&G's distribution system. Approximately 27 percent of the main system is cast iron and unprotected steel and 13 percent of the service lines are unprotected steel. This data was gathered from the Company's latest report to the

PHMSA, which contains system data for year-ending 2016.

Exhibit 1.3

Material Makeup of PSE&G Distribution System

	STEEL							
	UNPROTECTED	CATHODICALLY PROTECTED	PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	TOTAL
	BARE	COATED						
MILES OF MAIN	995	4,854	8,218	3,789	0	1	6	17,863
NO. OF SERVICES	166,459	238,019	819,489	0	0	32,367	0	1,256,333

	STEEL							
	UNPROTECTED	CATHODICALLY PROTECTED	PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	TOTAL
	BARE	COATED						
% OF MAIN	5.57%	27.17%	46.01%	21.21%	0.00%	0.00%	0.03%	100%
% OFSERVICES	13.25%	18.95%	65.23%	0.00%	0.00%	2.58%	0.00%	100%

2016 Form PHMSA F7100.1-1

Q. Are the materials that make up PSE&G's distribution system the types of materials you would anticipate in a system with its legacy and vintage?

A. Yes. A large portion of PSE&G's system was put in place in the first half of the 20th century when the primary material used for distribution main pipe was cast iron, and the primary material used for services was unprotected steel. There was a transition to unprotected steel materials for main in the 1950's. Cathodic protection of steel mains became widespread in the 1960's. In the 1970's there was a transition from steel to plastic materials for mains and services except for large diameter and elevated pressure installations that continued to rely on protected steel. PSE&G's system has the highest inventory of cast iron and the eighth highest inventory of unprotected steel in the US. Other factors that contribute to the system's uniqueness is the fact that the system originated in the manufactured gas era; contains a large variety of pipe materials and sizes; is subject to weather extremes; and is located in a densely populated area.

Q. Based on these distinguishing system factors, do you have any concerns with the age, materials, weather extremes and population density that impact PSE&G's distribution system?

A. New Jersey is located in the Northeastern, and part of the Middle Atlantic, regions of the United States. As a result, the climate and geography could adversely affect pipe integrity. Relevant factors include poorly drained soils, large temperature variations, and conditions favorable for frost heave, which is when soil expands and contracts due to freezing and thawing.

PSE&G currently serves nearly three quarters of New Jersey's population in a service area consisting of a 2,400-square-mile diagonal corridor across the state from Bergen to Gloucester Counties. PSE&G is New Jersey's largest provider of gas service, serving 1.8 million customers in more than 300 urban, suburban, and rural communities, including New Jersey's three largest cities. New Jersey is the fourth-smallest state, but is the 11th-most populous and the most densely populated of the 50 United States.

PSE&G cannot control the weather or population density in its franchise area, and pipe age alone is not a primary factor for concern. Rather my concern is with the material types that were installed prior to 1960. PSE&G's analysis has shown that cast iron and unprotected steel typically exhibit higher leakage rates than post-1960 construction materials. I note that PSE&G has managed pipe replacement through various means, including targeted replacement, under the Capital Infrastructure Investment Programs(CIP I and CIP II), Energy Strong, and GSMP I, which has resulted in removal of approximately 41% of the cast iron and unprotected steel main in PSE&G's system.

Q. Can you comment on the age of facilities that are presently in service?

A. Yes. Exhibit 1.4 provides a profile of the age of PSE&G's distribution mains and services as of December 31, 2016.

Exhibit 1.4

Age Profile of PSE&G Gas Mains and Services				
	MAINS		**SERVICES**	
VINTAGE	**MILES**	**PERCENT**	**COUNT**	**PERCENT**
PRE-1940	2,523	14%	141,775	11%
1940-1949	314	2%	20,071	2%
1950- 1959	1,651	9%	88,662	7%
1960- 1969	3,030	17%	194,676	15%
1970- 1979	1,570	9%	120,248	10%
1980- 1989	3,113	17%	206,227	16%
1990- 1999	2,835	16%	189,355	15%
2000- 2009	1,947	11%	158,887	13%
2010- 2019	881	5%	136,433	11%
TOTAL	17,863	100%	1,256,333	100%

Source: 2016 Form PHMSA F7100.1-1

Q. Are there any concerns with a gas system distribution inventory with this age profile?

A. Yes. As discussed in my testimony, generally, the greatest concerns are associated with facilities installed prior to 1960. Pre-1960 materials constitute 25% of PSE&G's mains and 20% of its services, yet account for approximately 65% of the distribution system leaks, excluding leaks caused by third-party damage.

PSE&G operates 3,789 miles of cast iron main, almost 1,000 miles of unprotected steel main, and approximately 167,000 unprotected steel services. Continued corrosion is likely to increase the leak rates for older materials due to the time function of the corrosion process. The primary problems presented by cast iron and unprotected steel are summarized below.

Cast Iron Pipe – There are two primary problems with cast iron systems.

First, cast iron pipe has little inherent flexibility and is susceptible to breakage due to ground movement, which is most frequently caused by frost heave. Ground movement creates an excessive bending stress in the pipe which may cause it to fail in a circumferential break and lead to a relatively large gas leak at the point of failure. Cast iron pipe sizes 12 inches and below are particularly susceptible to unpredictable breaks.

Second, when originally installed in rigid 12 or 18 foot lengths, sections were joined either with bell and spigot type connections or mechanical joints. The annular space in bell and spigot connections was packed with jute fiber followed by lead or cement to form a gas tight joint, while mechanical joints resulted in a bolted connection with a gasket seal. Time, ground movement and/or drying action of the gas can cause a joint to leak. Remedial action in the form of external clamps or internal seals then becomes necessary. The occurrence of cast iron joint leaks is 4 to 5 times greater than cast-iron breaks. Larger size cast-iron pipes are more susceptible to joint leaks than breaks.

Unprotected Steel Pipe - The primary problem encountered with unprotected steel pipe is corrosion that will develop leaks over time. Specifically, steel pipe deteriorates due to contact with moisture present in the soil. The rate of corrosion varies depending on a number of characteristics of the soil, including moisture and pH. Uncontrolled corrosion will ultimately result in numerous, relatively small gas leaks.

Initially, a leak from an unprotected steel pipe starts as a pinhole leak. Over- time metal loss will increase in size and location, allowing more gas to escape; and eventually resulting in numerous relatively small gas leaks. Eventually, these small leaks multiply and can grow to the point where they threaten the integrity of the pipe. In general the deterioration of unprotected steel accelerates as it ages.

Q. How does PSE&G's inventory of cast iron and unprotected steel compare to other gas distribution systems in the United States?

A. PSE&G's distribution system contains a large inventory of cast iron and unprotected steel. Exhibit 1.5 shows that the Company has 3,789 miles of cast iron pipe comprising 21% of its main system at year end 2016. When compared to other distribution companies that have significant amounts of cast iron in their distribution pipe inventory, PSE&G has the distinction of being ranked number one based on total miles of cast iron main.

Exhibit 1.5

Ten Largest Cast Iron Gas Distribution Systems

Name	Total Miles of Main	Miles of Cast Iron Main	CI % of Total Main
PUBLIC SERVICE ELECTRIC & GAS CO	17,863	3,789	21%
DTE GAS COMPANY	19,368	2,272	12%
BOSTON GAS CO	6,360	1,834	29%
KEYSPAN ENERGY DELIVERY - NY CITY	4,118	1,413	34%
PHILADELPHIA GAS WORKS	3,031	1,409	47%
PEOPLES GAS LIGHT & COKE CO	4,351	1,245	29%
BALTIMORE GAS & ELECTRIC CO	7,306	1,216	17%
CONSOLIDATED EDISON CO OF NEW YORK	4,329	1,072	25%
NIAGARA MOHAWK POWER CORP	3,193	754	24%
PECO ENERGY CO	6,853	660	10%

Source: Pipeline and Hazardous Materials Safety Administration
2016 Annual Report for Gas Distribution System Form F7100.1-1

PSE&G also has a significant amount of unprotected steel. Exhibit 1.6 shows that when PSE&G's total miles of unprotected steel mains and the total miles of unprotected services are combined they amount to 3,265 miles, which comprises 9% of the Company's distribution system. When compared to the other distribution companies that have significant amounts of unprotected steel in their distribution system inventory, PSE&G is ranked in the top ten in terms of miles of unprotected steel mains and services as a percent of its total system.

Exhibit 1.6

Ten Largest Unprotected Steel Main and Services Gas Distribution Systems

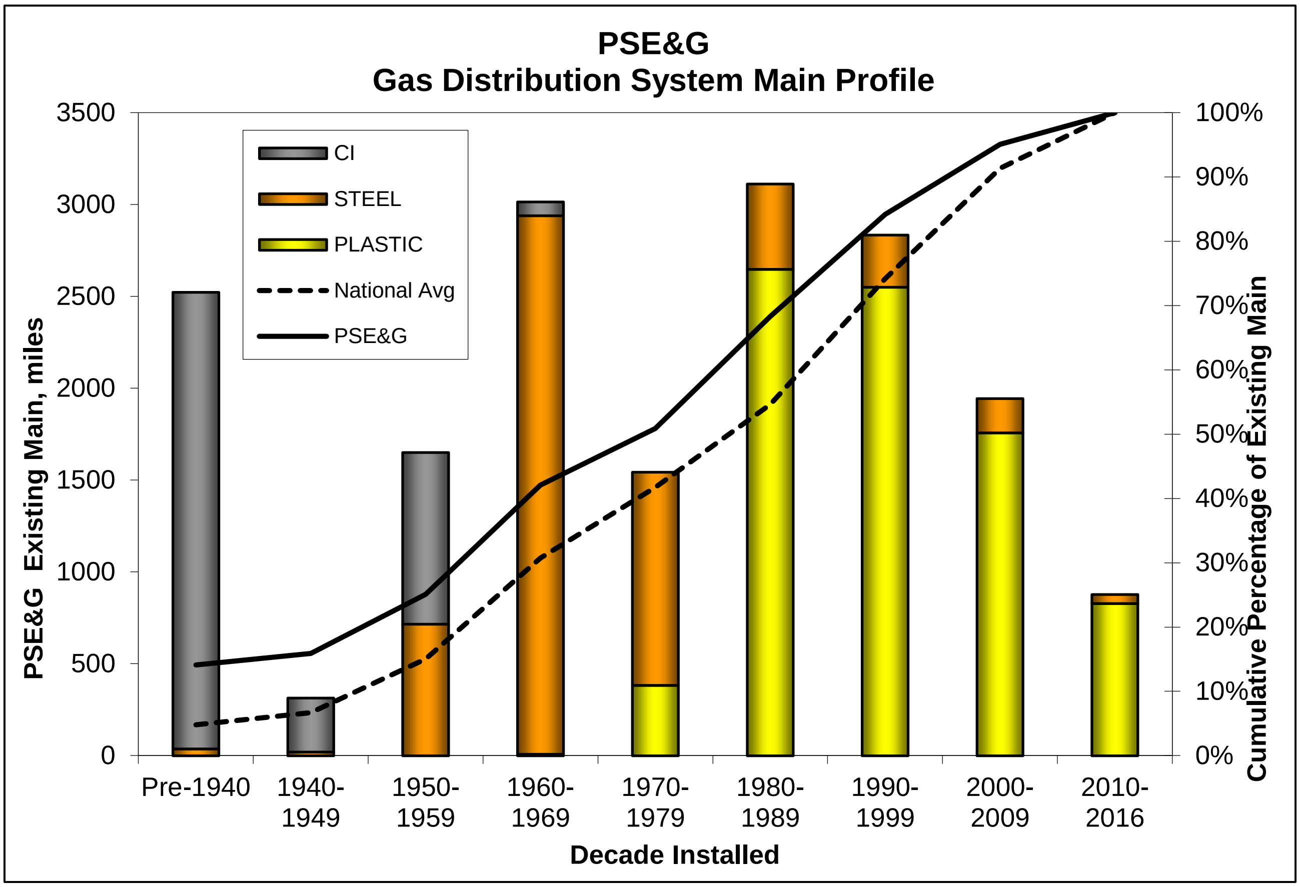
Name	Total Miles of Main and Services	Miles of Unprotected Steel Main and Services	Unprotected Steel % of Total Main and Services
SOUTHERN CALIFORNIA GAS CO	99,872	17,490	18%
ATMOS ENERGY CORPORATION - MID-TEX	42,459	8,577	20%
DOMINION EAST OHIO	31,034	4,864	16%
DTE GAS COMPANY	39,650	4,476	11%
KEYSPAN ENERGY DELIVERY - LONG ISLAND	14,812	4,111	28%
COLUMBIA GAS OF OHIO INC	41,683	3,771	9%
PEOPLES NATURAL GAS COMPANY LLC	16,153	3,332	21%
PUBLIC SERVICE ELECTRIC & GAS CO	34,995	3,265	9%
BOSTON GAS CO	10,784	2,057	19%
NIAGARA MOHAWK POWER CORP	16,508	1,995	12%

Source: Pipeline and Hazardous Materials Safety Administration
2016 Annual Report for Gas Distribution System Form F7100.1-1

Q. How does the age of pipe in PSE&G's gas system compare to other gas operators in the United States?

A. The pipe in PSE&G's distribution system is significantly older than the national average. Exhibit1.7 describes PSE&G's gas distribution main profile as compared to the national average. Our service territory was built out in the 1950s, prior to most other utilities, resulting in an older system comprised of the materials used at that time. The vertical bars represent the amount of pipe installed by the Company in the decades between pre-1940 and 2016. The solid line shows the cumulative percentage of pipe installed by PSE&G between pre-1940 and 2016, while the dashed line shows the national average percentage over the same time span. The Company's distribution system is significantly older than the national average. This chart also visually conveys that a significant portion, 4,488 miles or 25.1 percent of PSE&G's distribution system, was installed prior to 1960, when cast iron and unprotected steel were considered state-of-the art construction materials.

Exhibit 1.7



Source: Pipeline and Hazardous Materials Safety Administration
2016 Annual Report for Gas Distribution System Form F7100.1-1

Q. Based on comparison with the other United States and New Jersey gas utilities; do you have any concerns about the amount of cast-iron and unprotected steel that make up PSE&G's distribution system?

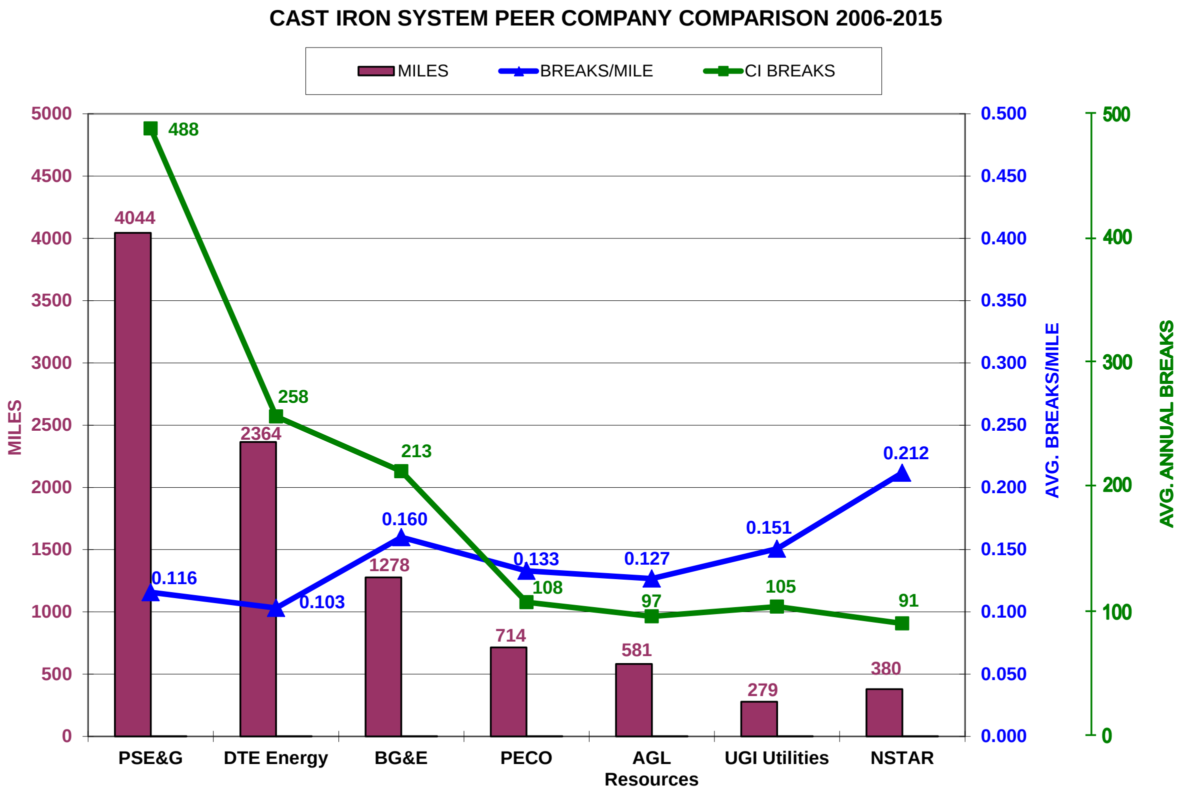
A. Yes. The sheer magnitude of the cast iron and unprotected steel in the Company's network is a concern. PSE&G has more cast-iron in its system than any other utility in the United States; and is ranked eighth nationally for the amount of unprotected steel in its distribution system inventory. When compared to the other New Jersey utilities, the amount of cast-iron and unprotected steel is even more striking. To illustrate, using end of 2016 PHMSA data, if the total main systems of the other three New Jersey gas utilities were combined, they would almost equal the size of PSE&G's system (16,911 miles versus 17,863 miles). However, if the amount of cast-iron in the other three Jersey utility networks was combined, the magnitude of cast iron pipe in PSE&G's distribution system would be more than six times greater (3,789 miles versus 580 miles). The same analogy could be made for the total amount of unprotected steel. If the total main and service systems of the other three gas utilities were combined they too would almost equal the size of PSE&G's system (33,115 miles versus 34,995 miles); however the amount of unprotected steel in PSE&G's distribution network would be over 2 times greater (3,265 miles versus 1,251 miles).

Q. How does the performance of PSE&G's cast iron system compare to other gas companies?

A. Exhibit 1.8 compares PSE&G's cast iron performance to six other gas companies for the 10 year period 2006-15 (these are the companies that consistently reported cast iron system data over the 10 year period to PSE&G's Peer Panel). Miles of cast iron main are plotted against the average annual break per mile rate and the average annual number of breaks. PSE&G has the second lowest average annual break rate at 0.116 breaks per mile. It can be seen that the key benefit of inventory reduction is not necessarily a reduction in the break rate but a reduction in the total number of breaks. There is an inherent risk of a cast iron main break and the large volume of escaping gas leading to a catastrophic incident.

Reducing this risk exposure requires a sustained, significant replacement program.

Exhibit 1.8



Q. Are other natural gas utilities faced with similar infrastructure challenges?

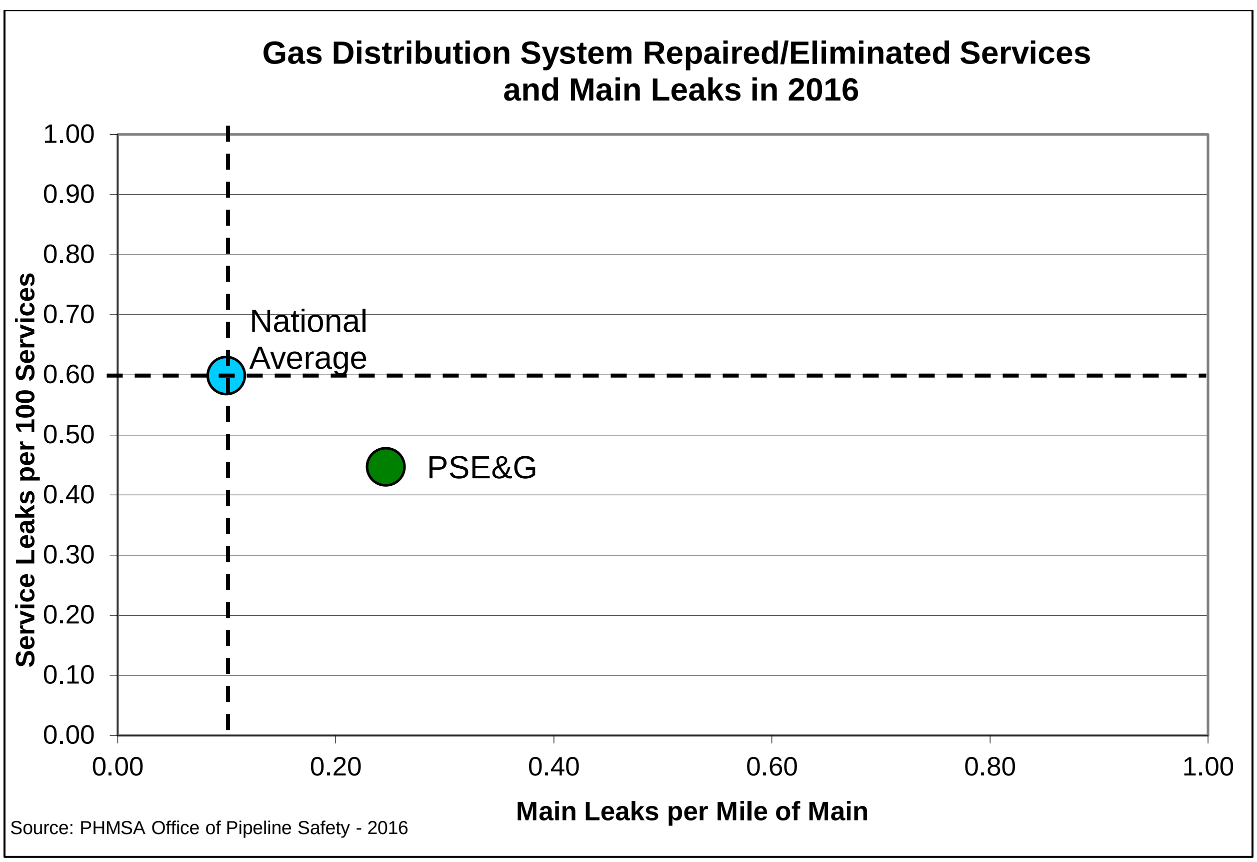
A. Yes. Natural gas utilities across the United States that have cast iron and unprotected steel infrastructure face many of the same challenges as PSE&G, even though the situation for each gas distribution company is specific and unique to its system. The presence of aging cast iron and unprotected steel pipe in the natural gas infrastructure has received considerable national attention due to environmental concerns over greenhouse gas (GHG) emissions and safety concerns associated with aging infrastructure. While utilities have long focused on managing the integrity of these elements of their infrastructure, recent incidents have greatly heightened the emphasis that industry members, safety regulators and other stakeholders are placing on addressing potential risks associated with aging infrastructure.

Q. Does PSE&G currently operate and manage a system that can be deemed safe by industry standards?

A. Yes. In my opinion PSE&G's operation and management of its distribution system currently provides a level of safety and of leak management that compares well to industry standards, including other utilities with large amounts of Cast Iron/Unprotected Steel (CI/US) in their systems. This leak comparison is presented in Exhibit 1.9.

Exhibit 1.9

Comparison of PSE&G's Leak Rates to National Average



As shown in Exhibit 1.9, PSE&G's leak rate for services is 0.45 leaks per 100 services, which is below (i.e., better than) the national average of 0.60 leaks per 100 services. PSE&G's leak rate for mains of 0.25 leaks per mile is higher (i.e., worse than) the national average of 0.10 main leaks per mile. In fact the Company's main leak rate is more than double the national average. The explanation for the lower national average leak rate reflects the reliability of the newer materials that make up the national network. To see how PSE&G compares to distribution networks that have large amounts of cast iron and unprotected steel, please refer to Exhibit 1.10, a table showing leak rates among utilities with the most cast iron and unprotected steel. The data is displayed by Main Leaks per Mile of Main rate from lowest to highest. There is significant variation between main leak rates and service leak rates. In general, companies with higher percentages of cast iron main have higher main leak rates and companies with higher percentage of unprotected steel main and service have higher service leak rates. PSE&G results are better than the average of all companies in both main leak rates and service leak rates.

Exhibit 1.10

Leak Rates among Utilities with the Most Cast Iron and Unprotected Steel

Names	Total Miles of Main	Total Services	Total Main Leaks	Total Service Leaks	Main Leaks per Mile of Main	Service Leaks per 100 Services	CI Rank	UP ST Rank
SOUTHERN CALIFORNIA GAS CO	50,356	4,431,302	2962	38384	0.06	0.87	15	1
ATMOS ENERGY CORPORATION - MID-TEX	31,853	1,435,914	3120	8296	0.10	0.58	8	2
ALABAMA GAS CORPORATION	11,040	548,355	1580	4544	0.14	0.83	7	14
KEYSPAN ENERGY DELIVERY - LONG ISLAND	8,113	544,174	1299	1950	0.16	0.36	10	4
COLUMBIA GAS OF OHIO INC	20,000	1,379,390	3222	11946	0.16	0.87	11	6
DOMINION EAST OHIO	19,720	1,194,694	3361	7950	0.17	0.67	14	3
NATIONAL FUEL GAS DISTRIBUTION CORP NY	9,699	457,704	2235	1011	0.23	0.22	9	8
PUBLIC SERVICE ELECTRIC & GAS CO	17,863	1,256,333	4391	5618	0.25	0.45	1	13
COLUMBIA GAS OF PENNSYLVANIA	7,501	425,038	2232	1770	0.30	0.42	12	10
PEOPLES NATURAL GAS COMPANY LLC	10,369	610,803	3186	3767	0.31	0.62	13	5
DTE GAS COMPANY	19,368	1,200,937	6176	4792	0.32	0.40	2	9
MOUNTAINEER GAS CO	5,855	220,292	2417	982	0.41	0.45	16	7
BOSTON GAS CO	6,360	504,389	4456	2621	0.70	0.52	3	11
KEYSPAN ENERGY DELIVERY - NY CITY	4,118	568,043	3174	1282	0.77	0.23	4	16
PHILADELPHIA GAS WORKS	3,031	478,267	2948	3022	0.97	0.63	5	15
CONSOLIDATED EDISON CO OF NEW YORK	4,329	370,924	8241	4232	1.90	1.14	6	12
Source: Pipeline and Hazardous Materials Safety Administration 2016 Annual Report for Gas Distribution System Form F7100.1-1				AVERAGE	0.43	0.58		

Q. How does PSE&G's gas system compare to other gas operators within the state of New Jersey?

A. There are numerous differences between the gas systems of the respective utilities serving New Jersey. My response will specifically focus on the amount of cast iron and unprotected steel each of the respective utilities has in their distribution system inventory.

Referring to Exhibit 1.11, PSE&G's 3,789 miles of cast iron is more than six times greater than the cast iron in the networks of the other three New Jersey gas distribution companies combined. In addition, cast iron constitutes 21 percent of PSE&G's 17,863 mile main system, while the next largest cast iron system in a New Jersey utility is 16 percent of a much smaller 3,190 mile main system. The other two gas utilities have between them 76 miles of cast iron in their distribution network.

Exhibit 1.11

New Jersey Utilities Cast Iron Gas Distribution Systems

Name	Total Miles of Main	Miles of Cast Iron Main	CI % of Total Main
PUBLIC SERVICE ELECTRIC & GAS CO	17,863	3,789	21%
ELIZABETHTOWN GAS CO	3,190	504	16%
SOUTH JERSEY GAS CO	6,592	76	1%
NEW JERSEY NATURAL GAS CO	7,129	-	0%

Source: Pipeline and Hazardous Materials Safety Administration 2016 Annual Report for Gas Distribution System Form F7100.1-1

Referring to Exhibit 1.12, PSE&G's 3,265 miles of unprotected steel is over 4 times greater than the amount of unprotected steel in the system of the next highest ranking New Jersey gas distribution company.

Exhibit 1.12

New Jersey Utilities Unprotected Steel Main and Services Gas Distribution Systems

Name	Total Miles of Mains and Services	Miles of Unprotected Steel Main and Services	Unprotected Steel % of Total Main and Services
PUBLIC SERVICE ELECTRIC & GAS CO	34,995	3,265	9%
ELIZABETHTOWN GAS CO	12,830	710	6%
NEW JERSEY NATURAL GAS CO	14,874	477	3%
SOUTH JERSEY GAS CO	5,411	64	1%

Source: Pipeline and Hazardous Materials Safety Administration 2016 Annual Report for Gas Distribution System Form F7100.1-1

Proposed Program

Work to be Done

Q. Please describe the proposed Program.

A. The Program is a systematic cast iron and unprotected steel pipe replacement and rehabilitation program that will increase public safety, operational efficiencies, and environmental protection. It is a five-year program and approximately 250 miles of mains will be replaced each year. The foundation and summary of the Program is illustrated in Exhibit 1.13.

Exhibit 1.13

Program Scope Summary[1]

5 YEAR PROGRAM	**Total**	2019	2020	2021	2022	2023
Description						
EP Cast Iron Main (Miles)	130	25	28	26	26	26
UP Cast Iron Main (Miles)	870	165	187	174	172	172
Unprotected Steel Main (Miles)	200	38	43	40	40	40
Cathodically Protected Steel and Plastic Main (Miles)	50	10	11	10	10	10
EPCI Joint Reinforcements	4,000	760	858	800	792	791
District Regulators Abandoned	266	51	57	53	53	53
Unprotected Steel Services	99,200	17,877	22,764	19,809	19,414	19,344
Relocate Inside Meter Set	70,900	13,471	15,201	14,180	14,038	14,013
Total Miles	**1,250**	**238**	**268**	**250**	**248**	**247**

[1] Annual amounts may not tie to total due to annual scaling factor.

Cast Iron and Unprotected Steel Main Replacement

Q. Under the proposed replacement program, what materials would PSE&G use to replace the cast iron and unprotected steel in its distribution system, and what are the strengths of these materials?

A. Polyethylene pipe material and coated, cathodically protected steel, which currently represent state-of-the-art gas main and service materials, will be used. Polyethylene (PE) pipe is the current state-of-the-art material for natural gas distribution systems due to its non-corrosive properties. When additional capacity is sought, or design conditions require, companies use coated and cathodically protected steel pipe.

Plastic systems have fewer joint connections susceptible to leakage, can withstand ground movement caused by frost and will not corrode. PE pipe also enables companies to more readily isolate and shutoff smaller areas because it can be "squeezed off," which is a technique that uses a tool that compresses the pipe to stop escaping gas, thus minimizing the impact on customers.

On large diameter replacements PSE&G designs call for construction using coated, cathodically protected steel. Cathodically protected steel is highly resistant to the effects of corrosion due to the two levels of protection provided by both the coating and the cathodic protection system. The pipe is significantly more resistant to the effects of ground stresses due to its ductile nature and is more resistant to outside damage due to the strength of the steel.

EPCI Replacement

Q. Explain the proposed EPCI replacement in more detail.

A. The Company would target EPCI that is at a higher risk of failure relative to other

EPCI segments. EPCI mains would be prioritized by hazard index, size –(from smaller to larger diameter), pressure (from higher to lower pressure), pipe condition (if known), vintage (post 1946 pipe would receive a higher priority), and logistics. The program would eliminate approximately 96% of all 12" and smaller EPCI, 19% of 16" EPCI, and 7% of 20" and larger EPCI.

Elevating Pressure

Q. Besides the replacement of legacy materials, what other improvements will be made to the system?

A. The utilization pressure portions of the system will be upgraded to higher pressure mains and services. The new elevated pressure will vary depending upon its location. An elevated pressure system has many benefits that will be discussed further in the testimony.

Q. Will the new system involve any foregone functionality?

A. Eliminating the utilization pressure system and high-risk pipe will not result in any foregone system functionality. Replacing the UPCI and unprotected steel with PE pipe can reduce operating and maintenance cost. PSE&G delivers and has delivered natural gas to over 60% of its customers at elevated pressure for many years.

Cathodically Protected Steel and Plastic Main Replacement

Q. Will any protected steel or plastic main be replaced in this program?

A. Yes. Our experiences in GSMP I have shown that certain segments of cathodically protected steel and PE main that are in the UP system are required to be replaced as part of a large grid based system conversion for economic and logistical reasons. This is approximately 6% of the overall program.

EPCI Joint Reinforcement

Q. Why is EPCI joint reinforcement being including in the proposed program?

A. PSE&G tracks and reports to the BPU annually the leak rate per mile of elevated pressure cast iron main versus an upper performance limit of 0.866 leaks per mile. PSE&G has a regulatory commitment to meet this upper performance standard and if it is exceeded for two consecutive years, must submit a justification and a corrective action plan to comply with the standard within one year.

PSE&G's inventory of elevated pressure cast iron main at the end of 2016 was 494 miles. Although these mains, particularly the larger diameters (larger than 24") rarely experience a break due to their heavy wall thickness and high beam strength, they are nevertheless impacted by the ground stresses and earth movement associated with severe frost conditions that can lead to a joint leak. In the severe winter of 2014, the elevated cast iron system was subjected to significant stresses and the leak rate for the year exceeded the target (0.960). Leaks associated with joints account for approximately 80% of elevated pressure cast iron main leaks.

PSE&G proposes a rehabilitation program to proactively reinforce bell joints on large diameter elevated pressure cast iron mains in an effort to control the annual leak rate below the upper performance standard and avoid the extremely aggressive one year compliance requirement. The program would target 800 joints per year for reinforcement. Reinforcing a cast iron joint imparts rigidity to the joint that results in the expansion/contraction loads being transferred to the nearby unreinforced joints since the reinforced joints have effectively "locked" in movement. A transfer of stress along the pipe can ultimately lead to leakage of adjacent joints. For this reason, PSE&G would prioritize mains that have had recent joint leak reinforcements and main sizes and pressures that have shown higher leak rates, and would select sections of pipe between natural transition points (changes in pipe type, size, or direction) for these projects.

Q. Explain in more detail the issue with EP CI joint leaks.

A. The elevated pressure cast iron system has approximately 175,000 joints (avg. 15 foot segments). At PSE&G's current inventory of 494 miles, the upper performance target of 0.866 equates to 428 leaks per year. Approximately 342 (80%) of these leaks can be expected to be joint related or one leak for every 512 joints. The joint leak rate is expected to slowly escalate over time due to conditional factors associated with the age of the pipe such as drying out of a caulked joint, gaskets on the Innertite and mechanical joints that dry out, corrosion of the steel bolts/set screws on Innertite joints, mechanical joints and thrust restraint devices. When combined with the additional ground stress induced by severe frost conditions, the overall leak rate can exceed the upper performance standard. It will be extremely challenging to complete enough work within one year to ensure the elevated pressure cast iron leak rate remains below the upper performance standard.

As an illustration of this, if PSE&G's elevated pressure cast iron leak rate was 0.900 for two consecutive years, the target would be exceeded by 0.034 leaks per mile each year or 17 leaks per year. If main replacement was the chosen means of lowering the leak rate, the data indicates that 19 miles of mains were associated with 17 leaks (17/0.900). If joint reinforcement was chosen, again the data indicates that 8700 joints were associated with 17 leaks (17 x 512). However, since the leaks can occur at any time of year, more than the calculated total of replacement main or joint reinforcements would need to be completed to have confidence that 17 leaks would be prevented and ensure the target was achieved. Assuming an average in-service period of 6 months would require approximately 38 miles of main replacement or 17,400 joint reinforcements would need to be completed in the year at a cost of approximately $275 - $300 million (38 miles x $7.9 M/Mile or 17,400 joints x $16,000/joint) to have confidence that 17 leaks would be prevented and the target achieved. Even completing this amount of work still does not *guarantee* that the leak rate would be below the upper performance standard for the year. EPCI replacement and rehabilitation work is a critical component of the Program.

Moving Inside Meter Sets

Q. Explain in more detail the benefits of moving inside meter sets to the outside.

A. Outside meter sets have numerous benefits. Having meters outside provides easy access for shut off in the event of an emergency, for both Company and emergency response personnel. Moving meter sets to the outside also improve access for meter inspection and leak surveys, as well as meter readers. It reduces the potential for gas leaks within buildings. It also reduces the potential theft of gas due to visibility of the meter location.

Selection Criteria

DIMP

Q. Please describe what the term DIMP means in relation to the operation of Local Distribution Company (LDC) facilities.

A. Distribution integrity management is a formal systematic process of identifying, evaluating and addressing direct or potential threats to the safe operation of a gas distribution system. On December 4, 2009, the PHMSA amended Federal Pipeline Safety Regulations requiring gas distribution operators to develop and implement integrity management programs by August 2, 2011. The regulations set forth an overall approach by an operator to ensure the integrity of its distribution system, including a DIMP. A DIMP is a written explanation of the mechanisms the operator uses to implement its integrity management program. The purpose of the program is to enhance safety by identifying and reducing pipeline risks.

Q. Please explain the essential requirements of a DIMP and its relationship to the GSMP II Program.

A. The purpose of the DIMP is to enhance safety by identifying and reducing system risks. At a minimum, each distribution pipeline operator must have a written integrity management plan that contains procedures for developing and implementing seven major elements defined by PHMSA 49 CFR Part 192 Subpart P. These elements are:

1) Knowledge: Knowledge entails the documentation of information to demonstrate an understanding of the gas distribution system developed from reasonably available data. PSE&G's DIMP references data pertaining to system design, materials, operating characteristics, and environmental factors contained in the Company's geographic information system, main and service records, and leak management and corrosion control records.

2) Identify threats: Threat identification requires consideration of broad issues that may affect the safe operation of the distribution system. PHMSA identifies potential threats according to the following eight categories: corrosion, natural forces, excavation, other outside force damage, material or welds, equipment, operations, and other.

3) Evaluate and rank risks: Through the process of evaluating and ranking risks, the company determines the relative importance of all identified risks. The Company takes into consideration both the likelihood of occurrence and the consequences of occurrence. PSE&G relies primarily on analysis of leak repair data and internal subject matter experts (SMEs) to evaluate and rank risks.

4) Identify and implement measures to address risks: This element of DIMP documents actions the company takes to reduce risk of failure. Programs at PSE&G that address risks include the leak management, damage prevention, corrosion control, public awareness and operator qualification programs. Specific actions include prevention, detection, mitigation and/or replacement and upgrade.

5) Measure performance, monitor results, and evaluate effectiveness: PSE&G uses monitoring and measurement to evaluate the effectiveness of actions implemented in order to address risks. PSE&G measures performance from a variety of information based on completed work, including the collection of data on leak causes, leak classification, and leaks repaired or eliminated. The data is reported and communicated within PSE&G for evaluation and analysis and to provide input for future planning.

6) Periodic evaluation and improvement: Periodic evaluation establishes a definitive feedback loop for the overall integrity management process. The DIMP is evaluated on a periodic basis through a number of actions that take place on an established schedule. Additionally, as knowledge concerning the distribution system or potential threats is gained, the elements of the DIMP or required actions may be revised to take into account the impact of the new information.

7) Report results: Reporting on integrity management actions and results provides information to PSE&G's internal management and satisfies federal and state mandated reporting requirements. Annually, PSE&G reports data to regulators concerning the facilities in service by vintage and material, as well as leaks and associated causes. PSE&G's DIMP comprehensively documents the Company's risk-based approach to distribution integrity management according to the required elements. PSE&G's risk-based selection process and criteria, employed to manage cast-iron risk, are incorporated into the DIMP. PSE&G's proposed GSMP II aims to fulfill the purpose of integrity management by directing resources at reducing system risks in a comprehensive and conscientious manner, at the most hazardous

assets that the DIMP itself outlines. It is also aimed at preventing or mitigating threats to the integrity of these distribution system assets, while managing discrete cast-iron and unprotected steel risk as it has in the past.

Q. What performance metrics are associated with PSE&G's distribution integrity management activities?

A. PSE&G utilizes various performance metrics to verify the effectiveness of its DIMP. These include but are not limited to: EPCI leaks per mile, UPCI leaks per mile, UPCI breaks per mile, unprotected steel main leaks per mile, number of leak repairs on steel services, and number of leaks by cause. Performance metric analysis allows the Company to evaluate system condition and the effectiveness of leak mitigation methods that are relevant to the characteristics of the Company's infrastructure.

Q. Please describe PSE&G's operational goals and objectives pertaining to the management of its gas infrastructure system.

A. The safe and reliable operation of PSE&G's gas distribution system is the Company's primary operational goal. Such operation is essential to the health and well-being of the customers, residents and businesses in the communities the Company serves, and of the employees who are responsible for operating the system. Moreover, the Company seeks to achieve the safe and reliable operation of its system in a cost- effective and efficient manner. There are a variety of operational requirements associated with achieving this goal, including the ongoing repair and maintenance of existing facilities, the engineering, planning and construction of new facilities to provide for growth and increased operating flexibility, and the need to rehabilitate or replace existing facilities to meet enhanced safety mandates or to address aging infrastructure concerns. In all aspects of PSE&G's operations, the Company's objective is to continuously improve and maintain top decile performance in the industry on a national basis for leak response rate and top quartile performance in system leak reports per mile for similar gas systems.

Q. Could you please comment on the resources required by the Company to carry out its distribution integrity management functions?

A. PSE&G requires considerable capital and staffing resources to manage the integrity of its distribution system, reflecting both the importance of and challenges associated with its commitment to safety. In terms of staffing, the Gas Delivery business unit includes more than 2,200 PSE&G employees who perform all the operational activities and a majority of the planned construction activities throughout PSE&G's New Jersey service territory. Gas Delivery employees are supported by field offices located throughout the service territory, as well as the Company's investment in vehicles and equipment necessary to address all needs and operating circumstances. Additionally, a portion of the Asset Management and Centralized Services staff is directly responsible for the DIMP and provides important management, engineering, construction, and financial oversight for the business unit.

Q. What is entailed in operating and maintaining a distribution system like PSE&G's?

A. Although the federal and state pipeline safety regulations establish minimum safety standards, operating and maintaining the integrity of assets such as cast iron and unprotected steel pipe necessitates the effective implementation of a robust operating and maintenance (O&M) plan of policies, processes and procedures. The breadth and depth of PSE&G's plan is expansive because of the diversity of pipe materials (cast iron, bare steel, coated unprotected steel, protected steel, polyethylene and copper) and operating pressures (utilization, 15 psig, 60 psig and 120 psig and above). The prevention and mitigation activities in the plan include, but are not limited to:

- Instrument surveys for leaks and corrosion;
- Patrolling for excavation activities;
- Inspection of exposed pipe and other facilities;
- Preventative maintenance;
- Repair, rehabilitation or replacement;
- Inside safety inspections;
- Public awareness programs;
- Damage prevention programs; and
- Emergency response.

The frequency of PSE&G's scheduled surveys, inspections, patrols and maintenance range from daily to once every 10 years. Exhibit 1.14 describes the various inspections and their frequency.

Exhibit 1.14

Frequency of Surveys and Inspections

Description	**Inspection Frequency**
Construction Inspection	Daily as needed
Corrosion Control – Rectifiers	2 months
Corrosion Control - Regular Structures	1 year
Corrosion Control - Separately Protected Services	10 years
Corrosion control - Short Structures	10 years
Leaks - Grade 2 Leak Re-checks	6 months
Leaks - Grade 3 Leak Re-checks	15 months
Mains - Exposed Main Inspection	1 year after install, every 3 years after
Mains - High Pressure/Transmission Patrol	2 per month
Mains - Leak Survey – Leakmobile	1 year
Mains - Leak Survey - Manhole/Business	1 year
Mains - Leak Survey - Winter Patrol	Annually as needed
Meter Set Inspection	3 years
Public Building Inspect	3 years
District Regulators	1 year
Services - Walking Survey	3 years
Valves – Distribution	1 year after installation
Valves - Line Valves	1 year
Valves - Separation Valves	1 year

Q. How does PSE&G perform in addressing leaks in its current system?

A. PSE&G currently performs well with regard to addressing leaks in its system. When compared to companies that operate over 1,000 miles of cast iron, PSE&G is the best in terms of having the least number of main leaks per mile. (PHMSA report data: 2016 F7100.1-1). PSE&G responds to over 80,000 gas emergency calls on an annual basis at a rate of 99.9% within one hour. This ranks within the top decile of peer companies. Since 2014, PSE&G has reduced methane emissions 2.9% annually or a total of 65,000 metric tons of CO_2 equivalent (calculated using EPA Greenhouse Gas Reporting Program: Subpart W – Petroleum and Natural Gas Systems methodology).

Q. Please describe PSE&G's current approach to gas distribution pipe replacement.

A. The overall approach of PSE&G's distribution replacement is to minimize risk to the public and employees by effectively understanding the condition of the assets and their rates of failure. This enables the Company to manage replacement of assets to avoid sudden widespread failure within any asset class. Replacement of significant asset classes is as follows:

- Elevated Pressure Cast Iron, Utilization Pressure Cast Iron, and Unprotected Steel are replaced or rehabilitated at a rate consistent with managing the leak/mile rate for each respective asset class to stay within the established upper performance limit for each material; and
- Coated and Protected Steel Main is subjected to ongoing monitoring and remedial action under the requirements of 49 CFR Part 192 Subpart I. There is no significant leakage of PSE&G's coated cathodically protected steel main system relative to unprotected steel main, and to date there is no replacement program for this asset class.

Similarly, there is no significant leakage of PSE&G's plastic main system; therefore there is no current replacement plan for this asset class.

Q. Please describe the work prioritization process you are proposing for GSMP II.

A. For elevated pressure cast iron, Utilization Pressure Cast Iron, and Unprotected Steel, individual main segments are identified for replacement through a PSE&G prioritization ranking methodology for main segments referred to as the Hazard Index. The Hazard Index is based on a predictive model that integrates leak history with a variety of characteristics referred to as "environmental conditions", while also taking into account asset information (e.g., pipe diameter and operating pressure).

Q. Has PSE&G been considering the prioritization of replacement work for some time?

A. Yes. Over the years various internal studies have been conducted to determine if specific approaches needed to be developed to target the replacement of PSE&G's riskiest gas assets. Specifically, programs were designed to replace the following assets:

- 8" and smaller - 15 psig and 60 psig cast iron mains;
- 10" and 12" - 60 psig cast iron mains; and
- 3" UP cast iron

PSE&G will replace unprotected steel services when any of the following conditions are met: after they reach their point of failure by exhibiting a leak; if more than 20% of the unprotected services in a defined area have ever leaked, then all of the services in the defined area are replaced (as required by the New Jersey Administrative Code Section 14:7-1.20); in conjunction with the replacement main program; ahead of road reconstruction projects; and other reasons determined by the PSE&G Asset Management Group.

Q. Please discuss the approaches that gas distribution operators utilize to manage cast iron and unprotected steel pipe systems.

A. One method that gas distribution companies use to manage aging cast iron and unprotected steel pipe is to repair leaks. While this is an effective short-term approach, it is not a long-term solution that provides a proactive, systematic improvement, such as can be achieved by replacing cast iron and unprotected steel pipe with modern pipe materials.

The preferred method of managing cast iron and unprotected steel pipe is to replace these materials using a combination of three replacement approaches: targeted replacement, work in conjunction with the replacement of other utilities, and program replacement:

Targeted Replacement -The targeted or condition approach for identification and retirement of cast iron and unprotected steel is based on an evaluation of several factors such as: maintenance history, soil conditions, and risks inherent in the pipe segments' characteristics and locations.

Work in Conjunction with Replacement of Other Utilities - This approach entails the removal or replacement of pipes in conjunction with other utility, government or municipal agency work to accommodate work projects such as road improvements and water infrastructure projects. It is beneficial to all parties involved if the removal and replacement of pipes can be done in conjunction with other projects, especially to minimize public inconvenience and to avoid the duplication of efforts and cost.

Program Replacement - In terms of planned replacement strategies, several gas distribution operators have approached their state regulators and obtained funding approval to systematically replace all of the cast-iron or unprotected steel and other higher risk materials in their system on an accelerated basis. Program Replacement provides for a long-term, proactive, systematic improvement of a company's distribution network, continuous removal of risk from unpredictable failure and the reduction of greenhouse gases.

Q. Even though PSE&G has managed the integrity of its distribution system over the years, do you believe that there are challenges in the near future?

A. Yes. As discussed above, PSE&G's distribution system contains a large inventory of cast iron and unprotected steel that generates approximately 65% of the number of leaks on an annual basis. Annual replacement of this inventory is one of the primary methods in the leak management process to reduce risk and to control leak rates. However, an increase in pipe deterioration rates may be of a magnitude that requires substantial, additional resources and extended time to address.

Main Selection Methodology

Q. What method will be used to execute the Program?

A. For GSMP II, grid replacement would be the chosen method to replace UPCI mains and convert the UP system to elevated pressure (the majority of the Program); and targeted replacement would be used to replace the elevated pressure cast iron and unprotected steel with plastic and cathodically protected steel (a much smaller part of the Program). This will reduce the risks of CI/US pipe and take advantage of economic efficiencies to reduce construction costs. This approach ensures that high-risk segments will continue to be replaced, while gaining the efficiencies and benefits of larger zone replacements such as economic opportunities in mobilization, material, and labor negotiations.

Q. How will the grids be selected to make up the main replacement program?

A. A grid ranking process has been developed based on the Company's Hazard Risk Index Model. The approach is similar to the hazard ranking method used in GSMP I. PSE&G targets the replacement of its riskiest gas assets through the use of a ranking methodology that prioritizes main segments with the highest risk, through the use of the Hazard Index. The Hazard Index is based on a predictive model constructed from leak history "environmental factors" that include: building setback, number of underground utilities, demographic area (urban, suburban, rural), building types (industrial, commercial, or residential), and asset information (pipe diameter, operating pressure). Through the "weighted leak history" factor, past main breaks are considered and weighted based on how recently they occurred. Each map grid is evaluated by adding the hazard indexes for the individual utilization pressure segments within the grid and dividing them by the total miles of utilization pressure cast iron in the grid, arriving at a hazard index per mile for each map grid. Consistent with the hazard index per mile results, grids are ranked by highest to lowest and then placed into A, B, C and D priority grids categories.

In GSMP I, PSE&G collaborated with the Environmental Defense Fund to conduct a study on methane emissions in grids that were selected for the first 3 years of the program. PSE&G's valuable experience with this effort has resulted in a new sub-prioritization that takes into account leak history on joints and services. This sub-prioritization will be used for grids of similar hazard in the GSMP II extension.

Q. What does a typical grid look like and how will the replacement main and service work proceed?

A. PSE&G's gas distribution system is mapped into grids and each grid measures about one square mile. There are more than 500 grids that contain between one and 21 miles of cast iron pipe along with other types of pipe. Exhibit 1.15 was prepared to illustrate the types of projects that might present themselves in a grid. This sample is meant to show what might be encountered as projects are created within the grid. This particular grid sample contains:

- Utilization pressure cast iron and unprotected steel to be replaced;
- Utilization pressure cast iron to be abandoned;

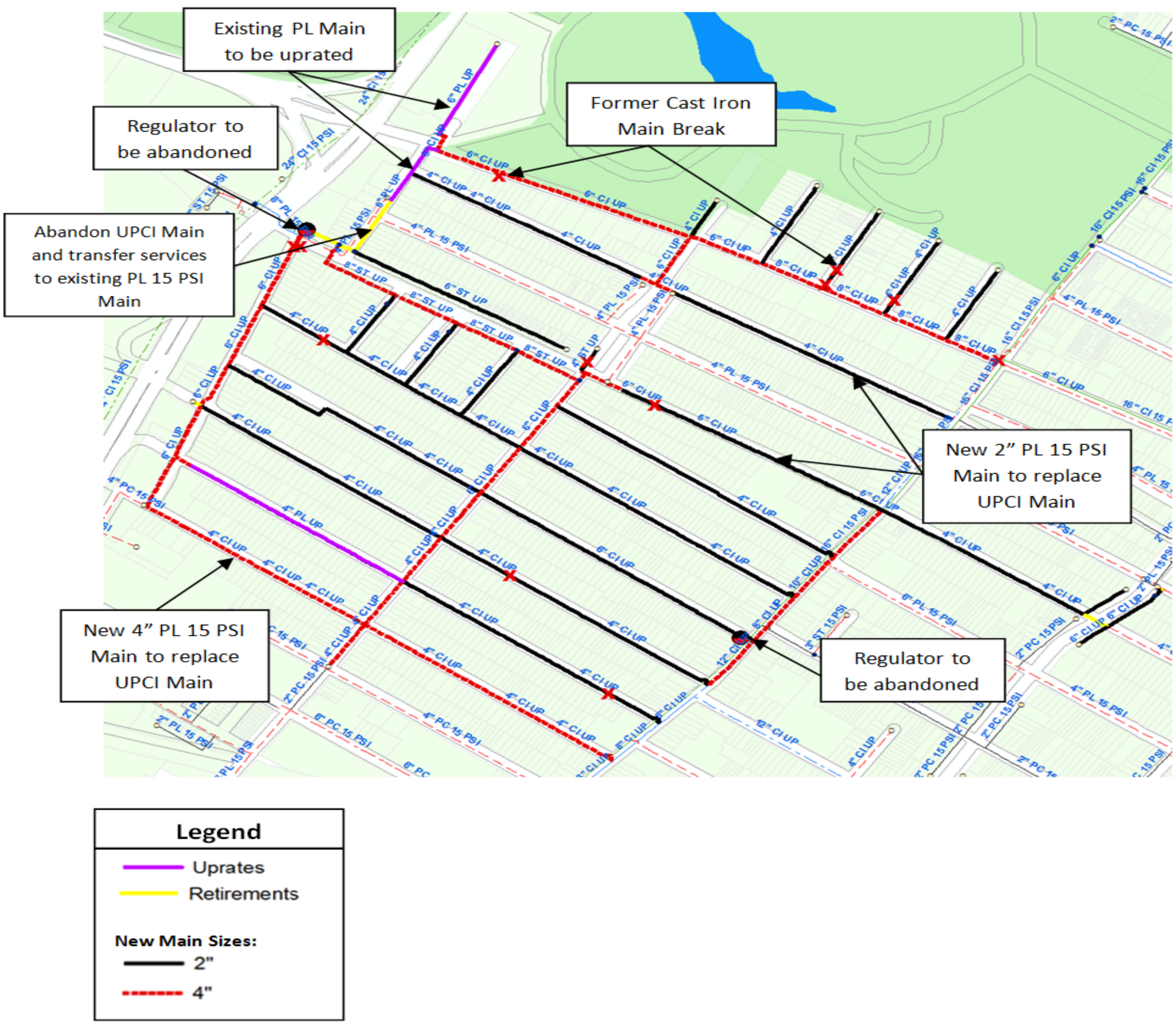
• Utilization pressure plastic to be uprated;

• District regulators to be abandoned; and

• Breaks that have already occurred on cast-iron pipe are designated with an “X”.

Exhibit 1.15

Sample Projects within a Grid



In order to approach the work in this grid, a series of work activities need to be undertaken. New plastic main is installed in locations where cast iron and unprotected steel mains are identified for replacement. These new mains are pressure tested, connected to the existing 15 psig system, and put into service. Service lines are replaced where identified as unprotected steel, and all service lines get transferred over to the new mains. Once this is complete, the existing mains can be abandoned. In locations where there are uprate activities, existing service lines will be replaced if necessary and a service regulator will be installed. A 15 psig main will be connected to the existing plastic main and pressure will be elevated in stages until complete. Where a cast iron main is identified for straight abandonment, the existing services will be replaced if necessary and transferred to the existing pressure main. At the completion of the main and service work, the district regulators can be abandoned. The execution concept is to completely replace the entire UP CI/US pipe in a grid at one time. Employing this approach will help minimize disruption and improve work efficiency.

Q. What technical and non-technical factors need to be considered in determining the quantity and timing of replacement grids?

A. There are a number of technical and non-technical factors that need to be considered in determining the quantity and timing of replacement grids, including:

- As projects are created based on grids designated as Priority A, situations could develop where multiple Priority A grids are adjacent to each other. Where this occurs the full block of grids will be reviewed to determine the most effective approach for sizing and staging of the installation and abandonment work within the entire area;

- Projects will be encountered where UP CI/US mains will not end at the grid line. Consequently, it will be necessary to decide, as the strategy for working a grid is developed, whether the crossover main should be worked with the current Priority A grid or held over until the neighboring grid is worked. This decision would be based on system reliability, effectiveness, and efficiency;
- While the majority of gas main replacement work will not lead to new business connections, incidental requests may occur on occasion. When this occurs, facilities will be designed in accordance with PSE&G's Gas Design Manual and facility costs will be treated consistent with PSE&G's approved Gas Tariff.
- Any unforeseen permitting issues, issues regarding cooperation from municipalities, and coordination with other construction activities will need to be taken into consideration when executing the work. Similarly, unforeseen construction issues (e.g., unanticipated buried utilities, physical obstructions) will also need to be taken into consideration as the work is executed.

Changes from GSMP I

Q. Have you made any adjustments to your prioritization model based on your GSMP I experience?

A. Yes. Additional consideration will be given to historical joint and service leak rates not included in the hazard index. The top 10 Priority A grids will be ranked based strictly on hazard value. The remaining Priority A grids are a similar hazard value and will be prioritized by joint and service leak history. All subsequent grids within a priority level (B, C, and D) will be ranked based on joint and leak history. In other words, all Priority B grids are of a similar hazard and will be ranked based on joint and service leak history. The same ranking will apply for Priority C grids and so forth.

Q. Is there any proposed work that is part of GSMP II that was not part of GSMP I?

A. Yes. PSE&G believes strongly that the additional elements should be included in the Program for the purpose of reducing system risk. These elements include:

- Proposed in GSMP I, not included in the approved, accelerated cost-recovery program
  - EP CI replacement - Prone to the same risks and threats as UP CI.
  - Meter set relocations – An integral part of the low pressure to high pressure upgrades and system modernization.
- New additions for GSMP II
  - Cathodically protected steel and plastic replacement - Our experiences in GSMP I have shown that certain segments of these types of main are required to be replaced as part of a large grid based system conversion. These include very short segments of existing pipe not cost effective to tie into, certain early vintage plastics and steel mains with connections that are prone to leakage. This is approximately 6% of the overall GSMP II program.
  - EP CI joint reinforcements – These are life extending measures for large diameter EP CI mains that are not prone to breaks but whose joints may present leakage issues in the future. The reinforcements improve the integrity of the main without requiring replacement.

Duration – Proposal for 5 year program

Q. How was the basis for the proposed replacement period determined?

A. The initial three year GSMP program established the momentum for the overall long term program. PSEG's strategic vision to enhance efficiency and effectiveness of its replacement program and to accelerate benefits led to the proposed program extension duration. In addition, the duration helps to maintain the momentum of work in terms of staffing levels, contractor resources, and municipality coordination.

Q. You suggested that the Company would like to implement a plan that involves steady, long-term modernization that could last many years. Can you explain then why the proposed Program is only for five years?

A. Given the age and make-up of the Company's gas infrastructure, the continuation of the program to modernize the gas distribution system would take approximately thirty years at the current GSMP rate, and twenty (20) years, assuming a modernization plan consistent with the Program being proposed in my testimony for GSMP II. However, rather than proposing a long-term, 20-year plan, the Company is recommending this five-year GSMP extension. Under the proposed Program, we estimate that the Company's inventory of high risk infrastructure will be decreased by approximately 37 percent. A five-year program will enable the Board and Company to periodically review and evaluate the Program. Prior to the expiration of the Program, the Company anticipates working with the Board to further develop and refine a plan that would continue to appropriately address the modernization needs based upon program experience to date, and technologies, techniques, and circumstances at that time. In addition, the proposed period is consistent with the infrastructure investment period proposed by the BPU in the regulations issued in May 2017.

Q. How would the Company proceed if the Program ended in five years; in other words, without extending the Program for additional years?

A. If this Program is not extended beyond the initial five years proposed herein or is not extended on a time-frame that would allow continuation of work, this Program would involve an additional six months of a variety of work to close out the Program. Such work would continue into the first six months of a sixth year, i.e., assuming a January 2019 start, through June 30, 2024. If the Program is continued in a timely manner, we assume this work would become part of the approved Program extension along with additional work, rather than part of the Program proposed in this proceeding.

Cost

Q. Please provide a description of the estimated cost of the proposed Program.

A. PSE&G estimates the infrastructure investment for the Program to be approximately $2.68 billion. The estimated amount is comprised of approximately $1.95 billion for the replacement of mains, $555 million for the replacement of associated unprotected steel services, $9 million for the abandonment of district regulators associated with the main replacements, $101 million for inside meter set relocations, not including the cost of the meters, and $69 million for EPCI Joint Reinforcements. These estimates are based on the Company’s cost experience over the last three or more years, adjusted for inflation and modified to account for the overall average pipe size. Please see Schedule WEM-GSMPII-4 for the proposed monthly cash flow for the Program.

The Company commits to maintaining base capital expenditures on projects similar to those proposed within the Program. These capital expenditures are provided in Schedule WEM-GSMPII-2 and are at least 10 percent of the overall Program capital expenditures. The spending we are proposing through this Program is incremental to that base capital spending.

Q. Why is this an advantageous time economically to extend and accelerate PSE&G's gas system modernization efforts?

A. PSE&G has an important opportunity to extend this Program now. At this unique time there is a plentiful supply of natural gas and commodity prices are low. Since January 2009, PSE&G has reduced the annual gas bill for the typical residential gas heat customer by 51%, or $855, based on current rates as of July 10, 2017. In addition, this affords the opportunity for additional job creation and economic stimulus, as well as more rapid reduction of greenhouse gas emissions. As a result, now is the time to invest in this required replacement program.

Q. What is the least cost approach?

A. The least cost option results from a combination of an effectively run system modernization plan that is initiated and carried out without interruption and accumulates incidental O&M savings as the CI and US pipe is replaced or rehabilitated. If the System Modernization Plan is ramped-up and ramped-down after each program extension, those delays can result in significant, and unnecessary, cost increases in the total system modernization cost. These costs result from the following factors:

- Contractors are unable to plan into future with regards to labor and equipment and will reflect this risk with a higher unit price bid;

- The Company will be required to recruit, hire and train new employees to accommodate expanded workload, which will result in additional labor costs;
- The Company will be required to perform engineering, obtain permits, procure materials, and execute contracts on an expedited basis that may result in inefficiencies and reduced program management effectiveness;
- The ability to effectively and efficiently ramp-up may be delayed based on reduced contractor labor and equipment availability due to other utility main and service replacement programs, resulting in scheduling delays;
- Contractors are required to provide operator qualified and certified labor resources and have to invest in these resources. Ramp-up and down situations may result in the loss of these resources, resulting in a loss of experience;
- Contracts with shorter time horizons reduce the opportunities for overall cost savings;
- Conflicts with municipal and other utilities due to scheduling and work moratoriums, causing delays and overall increased costs; and
- Incurring higher overall costs to re-staff and train employees

Q. Is it correct that PSE&G is proposing a cost recovery mechanism for the Program?

A. Yes. Mr. Swetz's testimony explains the cost recovery mechanism proposed by the Company. The cost recovery mechanism is an essential component of the Program. As explained in Mr. Swetz's testimony, the cost recovery mechanism facilitates the Company's investments in this important program by enabling the Company to raise necessary capital in an efficient manner.

Q. How were PSE&G's estimates of capital cost developed?

A. The estimates of capital cost were developed by the Company and include the Company's experience with stimulus-related programs recently completed such as CIP I and CIP II, Energy Strong, and GSMP I. The Company believes that the proposed five year program is within its execution capability, using internal and contract field operation forces. The Company has been involved in these programs continuously since 2009 and has proven its ability to complete the work in a timely fashion.

The foundation and summary of the Program is illustrated in Exhibit 1.13. These unit costs were applied to the estimated quantities of main, services and other replacements envisioned in the program. Certain classes of pipe were further disaggregated to compute unit level cost differences. For example, EP CI/US (60 psig) was estimated on the basis of 12", 16" and 20"+ pipe size along with related services and associated meter set relocates. UPCI was estimated based on a different distribution of pipe sizes for main, associated services, district regulators to be abandoned, uprates, and meter set relocates. Unprotected steel was estimated on the basis of mains, associated services and meter set relocates. The unit costs per mile of main were then computed to include the costs of the associated services, abandoned district regulators and relocated meter sets. These unit costs for main replacement by class were applied to expected lengths of main replacement per year for the program and escalated to 2018 dollars. The costs estimated for the Program are summarized in Exhibit 1.16.

Exhibit 1.16

Estimated Program Capital Costs[2]

Program Length	**5 YEARS**	
Program Cost ($M)	**2,682**	
Program Miles	**1,250**	
Average Cost $M/Mile	**2.1**	
EP Cast Iron Main Miles	**130**	
UP Cast Iron Main Miles	**870**	
Unprotected Steel Main Miles	**200**	
UP CP Steel and Plastic Main (Miles)	**50**	
EPCI Joint Reinforcements	**4,000**	
Abandoned Regulators	**266**	
Unprotected Steel Services	**99,200**	
Relocate Inside Meter Sets	**70,900**	
ANNUAL CASH FLOW & MILES	**$M**	**Miles**
2019	**361**	**238**
2020	**541**	**268**
2021	**542**	**250**
2022	**542**	**248**
2023	**553**	**247**
2024	**142**	**0**
TOTAL	**2,682**	**1,250**

Q. What factors have you considered in this analysis?

A. The factors considered in the cost analysis include first and foremost PSE&G's estimate of its capability to undertake a level of replacement amounting to approximately 250 miles per year of CI/US main and associated services, regulators and meter set relocates. The asset factors considered include primarily CI/US mains and unprotected steel services. Since the program philosophy is to replace and upgrade pressure from UP to

[2] Annual amounts may not tie to total due to annual scaling factor.

EP, a corresponding number of district regulator assets will no longer be needed and will be abandoned. Finally, inside meter sets will be relocated outside where possible.

The cost model is based on a continuous program. The model assumes that 20% of the cash flow each year will spill over into the following year, including the year following the fifth year. The model assumes that a subsequent program will be approved prior to the conclusion of the five year period to permit continuous work efforts to eliminate the maximum amount of CI/US main and US services.

Capital cost estimates are PSE&G system-wide and are not based on specifically identified physical assets. The five year program identifies the major capital elements that are part of the Program and develops unit and extended cost information based on the recent experience noted earlier. The estimates are developed in 2018 dollars and the program costs are escalated using an average escalation rate of 2.5%. This escalation factor was developed based on a mix of economic and engineering estimating factors. Capital cost estimates that were developed for recent major programs, including CIP I and CIP II, ES, and GSMP I indicate that PSE&G has developed supportable estimates that reasonably reflect expected program costs.

Q. Are these capital costs to be considered a final construction cost?

A. No, although we consider the estimate to be typical for purposes of budget, authorization or control. The development of the five year GSMP II Program has advanced from the conceptual to the feasibility state. PSE&G developed its estimate for each component project cost using a mix of fixed values, such as cost per mile of main replaced, and statistical estimating methods, such as leak rates. Currently, the Program cost is based on gross units of work and unit cost representative of general construction throughout PSE&G's service area. As previously noted, the Program cost is based on unit-cost averages for similar work recently completed in Energy Strong. The estimate is reasonable for this stage of Program development based on PSE&G prior construction cost experience. Exhibit 1.17 below shows the cost per foot and cost per service comparison between GSMP I and II.

Exhibit 1.17

Cost Per Unit Comparison

	(2016-2018) GSMP I	(2019-2023) GSMP II	(2017-2021) 4-Yr CAGR*	CAGR Explanation
$/Foot (Main) Normalized	$ 257	$ 270	1.2%	GSMP II work normalized to GSMP I work
		$ 30		Increase to total $/foot due to elevated pressure component of GSMP II
$/Foot (Main) Effective	**$ 257**	**$ 300**	**3.9%**	**GSMP II Elevated Pressure Component 10% of total footage) vs. 0% in GSMP I**
$/Service Replaced	**$ 5,100**	**$ 5,634**	**2.5%**	**Inflation**

*Compound Annual Growth Rate

Q. How will the continuation of a multi-year modernization program affect the deployment of capital?

A. The adoption of a multi-year modernization program will allow PSE&G to address larger segments of pipe replacement within individual construction projects, leading to lower average replacement costs per mile as fixed aspects of the planning, engineering, and construction mobilization efforts and tie-ins are spread over a larger project. Additionally, the program will reduce, over time, the occurrence of emergency replacements that have substantially higher costs than planned replacements. Emergent work of this nature can cost 50% or greater when compared to planned, systematic modernization that includes elevating pressure and excess flow valve installations. In addition to the replacement activity, costs associated with leak investigation and monitoring also increase the overall costs associated with resolving emergent replacement projects.

Ability to Do the Work

Experience with Programs

Q. Has the Company made investments to upgrade and modernize its system?

A. Yes. Over the past 46 years, PSE&G has replaced approximately 41% of its of cast iron and unprotected steel mains and approximately 63% of its unprotected steel services. This is over 3,300 miles of main replacement and 285,000 service replacements.

Q. Could you briefly discuss the Company's experience with implementing infrastructure replacement programs of a size similar to the proposed GSMP?

A. The Company has completed extensive amounts of facilities replacement of nearly 250 miles through Capital Infrastructure Investment Programs I and II (CIP I and CIP II) from 2009 through 2012. Also, the Company has replaced 240 miles of cast iron mains under the Energy Strong Program in the 2014-2016 timeframe. Finally, PSE&G is currently replacing 275 miles of cast iron mains and 85 miles of unprotected steel mains under GSMP I and at least 110 miles associated with base investment committed to under the GSMP settlement.

In preparation for planning under the gas main replacement component of GSMP I, the Company increased its resources in engineering to appropriately identify and model areas and facilities selected for replacement. This process strengthened the link between the Engineering group and Field Planning group, which is responsible for finalizing the plans for each construction project. Our Engineering and Field Planning groups have been and currently are working together to sequence our GSMP I related installations, uprates and abandonments to ensure continued system reliability through the entire construction process, as well as evaluate the best technology for constructing each project. While this is a substantial undertaking, it is an essential part of successfully implementing a large-scale replacement project and the Company continues to successfully execute the GSMP I Program.

Additionally, GSMP I clearly demonstrates the Company's ability to construct facilities at an increased rate. To address the increase in replacement facilities associated with GSMP I, the PSE&G Gas Construction group hired additional internal resources and also engaged additional New Jersey contractors. To address the high levels of work in our Northern area, we have shifted employees to the area of work through remote reporting and cascading of crews and technicians between districts. Our contractors have also met the challenge in stride by hiring and qualifying their people. They also produced the necessary equipment and expertise to support GSMP I. The Company is well positioned to leverage its GSMP I related efforts and experienced staffing, training and qualifying resources to implement this proposed Program.

For 2016, results indicate that 209 miles were replaced under PSE&G's infrastructure programs including base spending, GSMP I, and Energy Strong. For 2017, the Company forecasts the completion of 240 miles of gas main replacement. With these previous levels in mind, scaling to approximately 250 miles/year in the Program, plus associated gas main work in PSE&G's base capital program, while maintaining safety, customer satisfaction, and cost effectiveness, is manageable.

Details on Workforce

Q. Please elaborate on the labor and other resources required to successfully complete this program.

A. The Company will need to maintain staffing for engineering, construction, construction management, and records management in order to continue the level of gas infrastructure upgrade and replacement proposed. The amount of staffing required will be based on the approved levels of work in the program. PSE&G anticipates continuing to utilize contractors for a majority of the planned replacement work under the Program. These independent contractors will need to maintain staff and equipment to complete the work to the extent that was needed in GSMP I. Material manufacturers and their suppliers will also need to maintain or increase production to support continuation of the Program.

Using the methodology from the Board's IIP proposal for job creation in New Jersey, the proposed program would create almost 3,000 full time jobs per year for the duration of the program. This is an increase of approximately 1,200 full time jobs per year over GSMP I.

Q. Can you give us an indication of your capacity to replace aging infrastructure?

A. The following exhibit provides a summary of replacement levels for the past several years for various programs along with base replacement:

Exhibit 1.18

Historical Main Replacement Miles

Program	2012	2013	2014	2015	2016	2017*
Base Replace Miles (RF & ER)	29	7	9	29	14	82
Stipulated Base	-	-	-	-	71	40
GSMP Replace Miles	-	-	-	-	118	118
Energy Strong Replace Miles	-	-	98	136	6	-
CIP II Replace Miles	27	1	-	-	-	-
Total	56	8	107	165	209	240

*Estimated

While large scale infrastructure programs require considerable resources, PSE&G has consistently provided the necessary resources and commitment to complete recent short term infrastructure replacement programs. In terms of staffing, PSE&G is currently staffed at approximately 2,220 full time PSE&G employees who perform all operational and construction activities. As part of the Gas Delivery reorganization, we have created a dedicated construction group to focus purely on replacement facilities and large scale or complex projects. This group currently consists of almost 300 full time PSE&G employees with a fully implemented plan of almost 390 full time employees. Our dedicated Construction group includes 24 mobile crews committed to our project work. The construction group also maintains planning for all of gas distribution.

Our Field Operations group is focused on regulatory compliance, customer driven work and system reliability, but is still deeply involved in supporting our project work. Having the ability to supplement our mobile workforce with Field Operations personnel when necessary provides maximum flexibility to support even greater infrastructure replacement programs. PSE&G plans to keep this flexibility in place through the term of any program to address aging facilities.

In addition to our dedicated construction work force and our Field Operations work force, PSE&G Gas Delivery engages outside contractors to assist in our replacement facilities programs in a number of different focus areas. Contractors perform a large portion of our main installation and service replacements with direct PSE&G oversight. We have also increased our use of engineering contractors and consultants to assist with permitting (environmental pre-planning, planning and oversight services) and process management. PSE&G also uses subcontractors to complete the bulk of street, sidewalk and lawn restoration including all of the milling and paving associated with our program work.

Q. What is the impact of multi-year program planning and approval on outside contractors?

A. The implementation of a multi-year program is important because it allows contractors to make commitments to invest in additional employees and equipment with greater certainty than a program of short duration. Approval of the Company's five-year proposed Program will allow PSE&G to make a longer commitment to contractor services, enabling contractors to spread the fixed costs of the additional staff and equipment over a longer period, translating into lower costs for PSE&G.

Communicating with Customers

Q. Can you comment on the communication programs that you have implemented to make customers and public officials aware of GSMP I, which will assist the Company in implementing GSMP II?

A. We are using many of our existing processes including face-to-face meetings with municipalities, newspaper ads, and preconstruction/construction signage. The Company also implemented several new processes including, multi-lingual door hangers explaining upcoming work, dedicated GSMP public phone lines, social media communication, and a dedicated GSMP web site that shows where work is planned and its progress throughout construction.

The Company has seen the need to expand the use of social media. Customers can visit PSE&G at pseg.com or on Facebook, Twitter, LinkedIn and our blog at PSEG blog Energize, and we proactively send out Facebook messages by zip code where our work is scheduled. With the links to our website and other media, we have developed multiple avenues for customers to “find” PSE&G and understand our work along with our commitment to keeping them informed.

PSE&G recently created a video that is available on the Company website to help our customers understand our infrastructure replacement program. The video highlights the program details, the work process, and the ultimate benefits.

PSE&G is using radio to promote our programs and provide important information about the necessary work. We also use the Varolii outbound phone call system. Where customers have provided a phone number, we will send outbound calls with a specific message related to projects impacting those specific customers. We have also set up dedicated phone lines to receive customer inquiries concerning our construction work. While other forms of media are growing in use, many of our customers seem more comfortable leaving a message and getting a call back from a PSE&G representative familiar with our work.

On the more traditional side, we continue to notify our customers through a preconstruction letter campaign and during construction through the use of door hangers. Our letters are published in multiple languages to assure that our message is received by as many customers as possible. Our door hangers also provide a wealth of information about the construction and restoration process.

Where appropriate, we have increased the use of signage on our construction sites. Signs are used prior to starting work and during construction where deemed useful and helpful. The Company has furnished our employees with comprehensive program information and trained our employees on positive customer interaction.

Program Benefits and Savings

Q. What are the benefits associated with this Program?

A. There are a number of well-known benefits associated with the proposed GSMP II:

- Improved long term safety and reliability of the system;
- Outside access to service shut-off valves at meter sets;
- Greater application of service line excess flow valves;

- Reduced greenhouse gas emissions; and Increased ability to use higher-efficiency and other appliances.

As an integral part of a conversion from utilization pressure to elevated pressure, PSE&G would, where possible, relocate meters from inside to the outside of buildings. The five year Program involves relocation of approximately 70,000 meters. There are approximately 1,000,000 inside meters in PSE&G's distribution system. Moving meters to the outside of buildings facilitates easy access for shut off in the event of an emergency, potential reduction of gas leaks within buildings, improved access for safety inspections and meter reading, and reduction of potential theft of gas due to visibility of the meter location. Details of the qualitative and quantitative benefits of the Program are described below.

Benefits of Modernized System

Q. Please summarize some of the benefits that will be realized from the installation of newer materials for mains and services.

A. In addition to enhanced public safety and the benefits I discussed above, the Program will reduce the Company's leak management costs. The Program will also result in the reduction of high cost emergency replacements and repairs as a greater amount of cast iron and unprotected steel pipe is replaced. An additional benefit is the reduction of methane emissions. Additional considerations that will enhance safety include

- Improved Records: for new facilities the Program will provide updated main and service records. Utilizing more precise, as-built drawings will result in more accurate mark-outs, and reduced third-party damage. More modern construction standards will ensure:

- Tracer Wire: for new installations of PE pipe, which will also facilitate locating the pipe for mark-outs and work; and
- Warning Tape: is installed above new facilities; warns an excavator there is a buried pipe below.

Proper Bedding: using current backfill techniques and materials will improve the conditions of the pipe environment and reducing chance of future issues

Elimination of Service Stubs: Another safety improvement associated with the replacement program is the opportunity to eliminate hard-to-locate service stubs and thus reducing the potential of leakage or damage from future construction activity.

Q. Are there any benefits inherent in a utilization pressure gas distribution system such as the one that would be replaced under the proposed program?

A. The utilization pressure system is a legacy system from the period when gas was manufactured from coal. When natural gas became available, the existing system was converted to a utilization pressure natural gas distribution system. No new US gas distribution provider would consider constructing a utilization pressure distribution system today. In my opinion, a utilization pressure system is in some sense obsolete and provides no compelling benefits.

Q. Are there benefits inherent in an elevated pressure gas distribution system such as the one that would be installed under the proposed program? How do those benefits compare to the existing cast iron and unprotected utilization pressure system?

A. An elevated pressure natural gas distribution system has many benefits. A large portion of an elevated pressure system can be constructed from PE pipe. Further, it is less costly to construct because natural gas is compressible and the higher operating pressure allows a smaller diameter replacement pipe to be installed, as opposed to utilization pressure, which requires the same size for the new pipe. This is particularly valuable for service line insertion. This feature allows for less costly construction techniques such as pipe insertion using the existing pipe as a conduit. From an operating and maintenance perspective, the proposed elevated pressure system would have fewer joint leaks because of the installation techniques available for modern materials. Additional considerations underlying the GSMP II Program that will enhance safety include:

Excess Flow Valves - Replacing the low-pressure system through GSMP II will enable PSE&G to install excess flow valves on residential, multi residential, and small commercial customer service lines. An excess flow valve is a device installed on the service line at the point where the service line is connected to the main. In the event that the service is cut, the sudden pressure drop and increased flow rate cause the device to be activated, slowing down the escape of gas. Excess flow valves cannot be installed on low-pressure systems because the pressure difference between the pressure in the gas main and atmospheric pressure is insufficient for the devices to function. PSE&G installs EFVs, where operationally permissible, on new services, and when older services are replaced. To date, PSE&G has installed EFVs on over 65,000 services.

District Regulators - The elimination of the CI/US low-pressure system will enable PSE&G to simplify its operating and maintenance plan. For example, the need for low pressure district pressure regulators will be significantly reduced.

Outage Restoration - Eliminating the CI/US low-pressure system will reduce the number of customers impacted by, and the duration of, unplanned gas outages. Outages caused by water infiltration will be virtually eliminated. The use of polyethylene (PE) main will enable PSE&G crews to isolate gas leaks quickly for repair by either closing an existing valve or squeezing the pipe off upstream and downstream of the leak. An elevated pressure system also generates fewer calls from customers with appliance problems caused by insufficient gas pressure.

High Efficiency Appliances – The elevated pressure systems will allow for the expanded use of high efficiency appliances that require inlet pressures higher than the UP system can provide. The increased ability to use these appliances will improve customer satisfaction, reduce customer's energy bills, and reduce GHG emissions through improved efficiency.

Benefits to Customers

Q. How will the new infrastructure system synergies and efficiencies translate into benefits for the customers?

A. Benefits to the customer of the elevated pressure system would include incidental services made possible by the elevated pressure system's ability to accommodate technologies and appliances not available to be served by the current low-pressure system, including access to many high-efficiency appliances. The lack of an elevated pressure system would cause customers in New Jersey to forego consumer options or require more expensive special orders. In addition, an elevated pressure system will allow customers to install higher efficiency appliances. The following higher efficiency appliances require inlet pressures that in many cases would require either a customer-installed pressure booster or PSE&G's provision of an elevated pressure system:

• Tankless water heaters;

• Fan assisted heaters;

• Natural gas whole-house generators; and

• Commercial-grade cooking appliances.

The benefits for commercial applications would also increase. Current commercial kitchen equipment requires a minimum of approximately 6 inches of water column as do current rooftop heating systems, which are standard for commercial use. Therefore, in many areas customers must install electric-driven gas boosters to raise the gas pressure, and back-up power supplies for the pressure boosters as a safeguard against electrical power outages. There would be additional savings for customers who have backup generators but would no longer need the booster systems.

The State of New Jersey Administrative Code (NJAC 8:43G-24.13(l)) requires critical facilities such as hospitals to have alternate emergency power supply such as a backup generator. While the State practice is not to specify the fuel to be used, natural gas-fired generator equipment requires elevated-pressure or additional booster and back-up expenses if connected to the utilization pressure system.

In addition to the system safety advantages of replacing the low-pressure system described above, there are other benefits related to natural gas-fired generators. Because natural gas-powered back-up generators require elevated-pressure, the alternative is the less environmentally-friendly gasoline- or diesel-powered versions. The use of gasoline- or diesel-powered emergency generators is less safe than a permanently connected natural gas-fueled generator, primarily due to the risks involved in gasoline or diesel fuel storage and transfer, especially in residential applications. Natural gas generators are also more reliable in the case of a gasoline or diesel shortage, as was experienced during Superstorm Sandy.

Environmental Benefits

Q. Will the upgraded system provide any environmental benefits?

A. Yes. There is potential for a significant reduction in greenhouse gas emissions (GHG). We estimated the GHG reduction based on the Title 40 CFR 98 – Mandatory Greenhouse Gas Reporting, Subpart W – Petroleum and Natural Gas System. Our estimate considered the following sources of methane emissions for the gas distribution system using the default emission factors from the Code of Federal Regulations.

- Below Ground M&R Stations (operating pressure < 100 psia);
- Gas Distribution Mains – Unprotected Steel, Protected Steel, Plastic and Cast Iron; and
- Gas Service Lines – Unprotected Steel, Protected Steel, Plastic, and Copper.

The emission reduction was estimated using a baseline scenario in which the five year GSMP II Program begins immediately after January 1, 2019. Emission reductions were credited in the year following completion of the work. For the continued five year Program, the emission reduction would amount to approximately 199,000 metric tons of CO_2 equivalent emissions. Another way of looking at this reduction is to consider that the average vehicle over a year of driving has tailpipe CO_2 emissions of about 4.7 metric tons; removing 199,000 metric tons of CO_2 equivalent emissions, would represent removing approximately 42,000 vehicles from the roads for one year.

In 2017, PSE&G reported greenhouse gas emissions amounting to 699,487 metric tons of CO2 equivalent. The annual cumulative reduction of methane emissions, at completion of all CI and US replacement/rehabilitation, is approximately 599,000 metric tons of CO2 equivalent emissions. This represents a reduction of nearly 86% of the 2017 reported emissions and is equivalent to removing approximately 127,000 vehicles from the road every year.

Cost Efficiency

Q. What are the quantitative benefits associated with the Program that are applied to the entire PSE&G system?

A. There are quantitative benefits from this approach to modernization, which we have estimated based on the assumptions in our analysis and estimates of certain key parameters. For example, the O&M costs associated with CI/US is significantly higher than the O&M costs associated with the replacement materials. This benefit is described as “avoided O&M costs.”

Unprotected Steel services normally would not be repaired but would be replaced at a higher unit cost than the anticipated cost under a planned program. For example, PSE&G calculates that over the last several years, the cost of replacement due to individual leakage is approximately $2,000 more compared to the cost of service replacement as part of a planned program. The calculated individual leakage replacement cost is viewed as an “avoided capital cost” and represents a benefit under the modernization plan applied to the entire PSE&G system. Other “avoided capital costs” include the cost of CI bell joint encapsulations due to individual joint leakage.

The results of this analysis of the Program show that it has quantifiable benefits to the Company and its customers, summarized in Exhibit 1.19

Exhibit 1.19

Five Year Estimated Quantifiable Benefits

5 YEAR Avoided Costs ($M)	O&M	Capital
Leak Repairs	3.2	52.3
Leak Rechecks	0.5	
Regulator Station Inspection and Maintenance	0.6	
Total Savings	4.3	52.3
	$M	
Annual Avoided Costs	O&M	CAPITAL
2020	0.3	3.1
2021	0.6	6.9
2022	0.9	10.5
2023	1.2	14.1
2024	1.5	17.7
TOTAL	4.3	52.3

Q. Are there also quantitative benefits associated with the reduced emissions?

A. Yes, based on the value in the report issued by the Interagency Working Group on Social Cost of Greenhouse Gases (August 2016), the value of avoided emissions associated with the Program is approximately $9 million.

Benefits of Longer Duration

Q. How does a continuous multi-year program, such as the GSMP, affect the work effort required to replace aging infrastructure?

A. Significant benefits of a multi-year approach include better workforce management and reduction in procurement and construction mobilization/de-mobilization associated with completing larger projects. These programs also create long term employment opportunities.

These benefits are consistent with the BPU's proposed infrastructure regulation released on June 30, 2017 and are discussed in more detail in the testimony.

Q. What is the impact of program reductions on the quantifiable benefits from the Gas System Modernization Plan?

A. Program reductions reduce the quantifiable benefits that accompany system modernization. We have estimated the quantifiable benefits of the program in terms of avoided cost in Exhibit 1.20. Exhibit 1.20 illustrates the quantifiable benefits of the baseline program along with programs with 25% and 50% reductions relative to the baseline program.

• Baseline Scenario: The five year Program begins January 1, 2019 and continues through June 30, 2024;

• Scenario 1: Same as Baseline Scenario, except there is a 25% reduction in funding;

• Scenario 2: Same as Baseline Scenario, except there is a 50% reduction in funding;

Exhibit 1.20

5 Year Avoided Costs (2020-2024) ($M)	O&M	Capital
Scenario 0- Baseline Funding	4.3	52.3
Scenario 1 - 25% Reduction in Funding	3.2	39.2
Scenario 2 - 50% Reduction in Funding	2.2	26.1

GSMP I Status Update

Q. Can you summarize the program that you enacted under GSMP I?

A. In the GSMP I Order, the Board approved $650 million in total spend not including $85 million per in year in Stipulated Base. No more than 400 miles of main were to be installed to replace UPCI and unprotected steel mains. Stipulated base would include the replacement of cast iron (UP and EP) and unprotected steel mains and associated services, as well as the costs required to uprate the UPCI systems if applicable (including the uprating of associated protected steel and plastic mains and services) to higher pressures and the elimination, where applicable, of district regulators, the installation of excess flow valves associated with the Stipulated Base, and the additional costs associated with the relocation of inside meter sets that is associated with the Stipulated Base as well as the Program main replacements. During the three years 2016 – 2018, the Company would install no less than 110 miles of main to replace cast iron and unprotected steel mains and associated services under this Stipulated Base.

Q. Please comment on the work that has been completed to date on GSMP I.

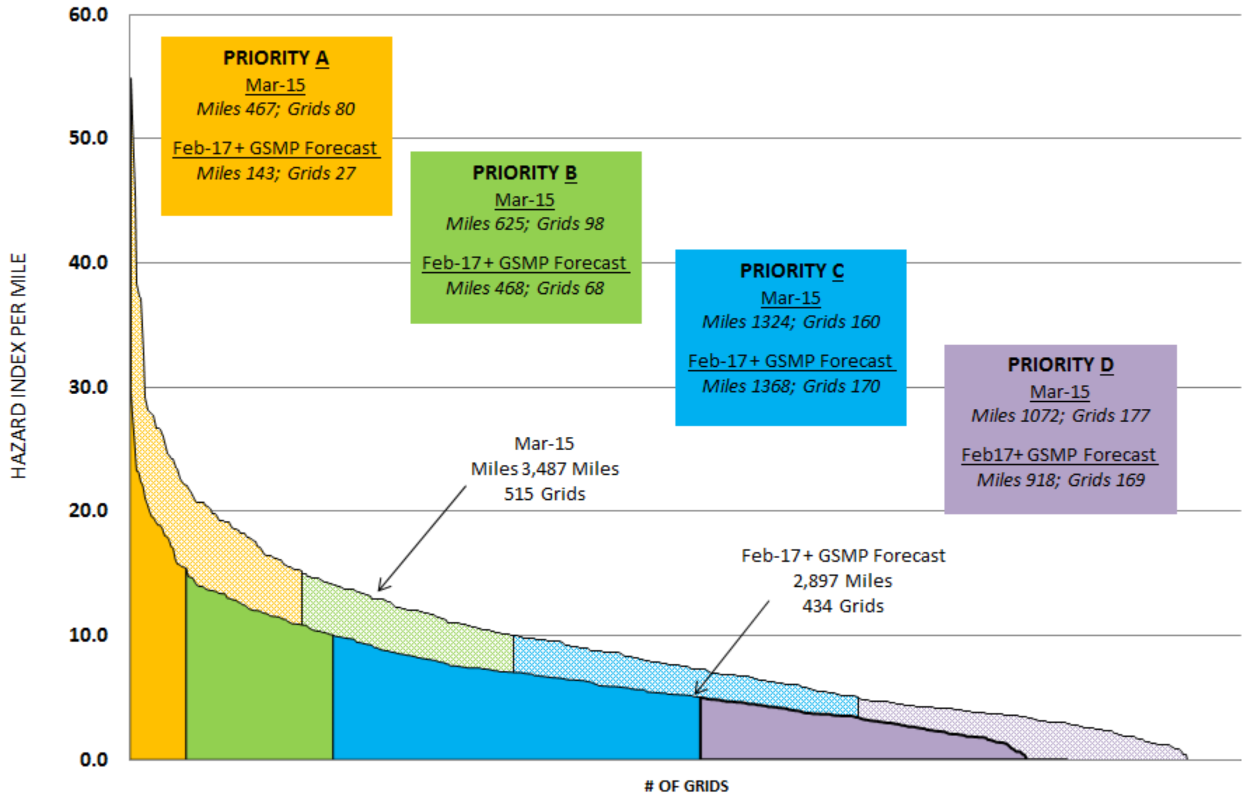
A. As of June 2017 YTD, the Company has replaced approximately 157 miles of main and replaced approximately 11,820 services, or an average of 75 services per mile of main replaced. The Company has also abandoned 16 district regulators associated with the replacement areas. Cost to date is approximately $266 million, or approximately $1.7 million per mile. Average pipe size installed is 3.4”. Please see Schedule WEM-GSMPII-5 for the GSMP quarterly report as of June 30, 2017. The June 2017 quarterly report provides actual results through June 2017 and a forecast for the remainder of the second year of the program.

Q. How do the hazard results from GSMP I compare to GSMP II?

A. Exhibit 1.21 below is a graph that shows the grid hazard prioritization for the proposed GSMP II. The lighter shaded areas in the graph represent the grid hazard prioritization prior to the start of GSMP I.

Exhibit 1.21

Hazard Index/Mile Comparison between 2014 and 2016 Hazard Results



As shown in the graph above, Priority A hazard will be reduced by 2/3 upon completion of GSMP I and combination of Priority A and B will be reduced by over ½ upon completion of GSMP I. GSMP II will be focused on remaining Priority A and B.

GSMP I Lessons Learned

Q. What have you learned from Energy Strong and GSMP I about customer satisfaction?

A. JD Power (JDP) Residential and Business survey results have shown that overall customer satisfaction has been positive throughout GSMP I through the application of strong processes and tools previously discussed in the testimony. We use the JDP survey results to understand our general customer perception. While JDP surveys customers who may or may not have had a recent interaction with PSE&G, the results are very helpful to understand overall customer expectations. We continue to proactively address potential customer concerns that are impacted by construction and that can improve our overall perception. In 2016 JD Power Overall Customer Satisfaction Index showed an increase to 705 vs 668 in 2015.

Q. What have you learned from Energy Strong and GSMP I about working with municipalities?

A. The Company's experience with Energy Strong and GSMP I has shown that proper communication with municipalities and the individual communities within those municipalities is critical to the efficient execution of the program. While many of our initiatives overlap between municipal governance, community and individual customer impact, pre-planned municipal meetings are designed to give officials an advanced understanding of our projects and an opportunity to address potential constituent concerns prior to project approval and construction. At these meetings, we discuss our intentions concerning customer and resident outreach, preliminary schedules, restoration, and plans to minimize overall impact to the community. This includes potential traffic issues and detours, work times around schools and public buildings, and any impact to local businesses. We provide a standardized outreach package that includes all the communication materials to be distributed to the customers. We also discuss the benefits of the facility upgrades. The initial meeting is followed up by a pre-construction meeting that takes place prior to construction and serves to finalize details of the construction schedule, traffic concerns, and customer communication plan. Municipal outreach meetings are held where project impacts to a community are moderate to significant and where we see a need for additional outreach.

Q. What have you learned from GSMP I on construction?

A. The Company has implemented a project management organization within our Gas Construction Organization to address the project components not covered in our work management system or current construction practices. We have also enlisted the use of project management software to assist with scheduling and forecasting. We have additionally added support to that group for project controls and we have expanded our Layout and Planning group to support more proficient project management.

On the topic of permitting, there are additional lessons learned. Based on experience from Energy Strong, Gas Delivery made many improvements obtaining soil sediment erosion control plans and retaining licensed soil remediation professionals for linear construction projects. For GSMP, we continued the blanket type permitting with the Soil Conservation Districts (SCDs), but further consolidated work into projects for submission, thus reducing the amount of paperwork and time to submit. We also took the project submission approach to linear construction projects, greatly reducing lead times and paperwork to manage compliance with the regulations.

On the subject of moving insider meter sets to outside, there are additional lessons learned. The success rate of moving meter sets to the outside is significantly lower than anticipated at the outset of GSMP I. The lower success rate was due to customer’s resistance to moving the meter outside, primarily for aesthetic reasons. The Company implemented specific policies for conditions where leaving the meter inside is acceptable. These exceptions include limited suitable space to accommodate piping and required protection measures, insufficient clearance of the equipment with regard to safety considerations, or local requirements such as historic districts. The policy specifies that customers may object to moving the meter inside, however, if in the sole judgement of the Company there is a suitable location outside, the meter set shall be relocated outside.

Q. What have you learned from GSMP I on coordination of work?

A. We continue to make progress in coordinating work with municipal, state, and county paving programs as well as with other local construction activities. This has enabled us to minimize delays to established paving and reconstruction schedules by others and in some cases not have to complete final restoration because of this coordination.

In addition, when dealing with large numbers of main outages in tandem, there are challenges in coordination and logistics to ensure there is no impact to system reliability. As a result, a weekly statewide system call was implemented to address coordination of these outages. These calls help to coordinate system outages and ensure reliability.

Program Reporting

Q. Does the Company intend to provide regular reporting on its progress?

A. Yes. Consistent with the IPP proposal, the Company proposes to submit semi-annual status reports to Board Staff and the Division of Rate Counsel that contain the following information:

1. Forecasted and actual costs of the Infrastructure Investment Program for the applicable reporting period, and for the Program to date, where Program projects are identified by major category;
2. The estimated total quantity of work completed under the Program identified by major category. In the event that the work cannot be quantified, major tasks completed shall be provided;
3. Estimated completion dates for the Infrastructure Investment Program as a whole, and estimated completion dates for each major Program category;
4. Anticipated changes to Infrastructure Investment Program projects, if any; and
5. Actual capital expenditures made by the utility in the normal course of business on similar projects, identified by major category

Q. Will the Company commit to leak reduction?

A. The Company commits to reducing the open leak inventory by 80% over the five years following the date of Board approval and a minimum of 20% each year in the first two years except if extraordinary circumstances such as extreme weather, acts of war or terrorism, or other *force majeure* extraordinary circumstances prevent the achievement of the annual reduction. This commitment is irrespective of incremental, new, post-approval leaks which will not be counted in such metric.

Conclusion

Q. Please summarize your recommendation.

A. Aging cast iron and unprotected steel pipe serving PSE&G customers exhibits significantly greater leak rates than newer plastic and cathodically protected steel pipe and will eventually require replacement or rehabilitation. The proposed GSMP and associated cost recovery mechanism represent a prudent response to PSE&G's long- term system needs and the DOT's "Call to Action" to facilitate the replacement of aging gas infrastructure. The safety-related, customer, economic and other benefits attributable to the five-year Program extension, as presented in my testimony, are compelling. The Company has a proven track record to show our ability to execute the proposed program in a safe and customer conscious manner. Therefore, I request that the proposed program be approved.

Q. Does this conclude your testimony?

A. Yes, it does.

SCHEDULE INDEX

CREDENTIALS
OF
WADE E. MILLER
DIRECTOR – GAS TRANSMISSION &
DISTRIBUTION ENGINEERING

I received a Bachelor of Science Degree in Mechanical Engineering from The College of New Jersey in 2000. I also received my Engineer-In-Training certification in 2000. I became licensed as a Professional Engineer with the State of New Jersey in 2006. I also received my certification as a Project Management Professional with the Project Management Institute in 2006. In 2007, I earned the designation of Registered Gas Distribution Professional from the Gas Technology Institute.

I was employed by PSE&G in June 2000 as an Associate Engineer in the Trenton Gas Distribution District where I began my training program and was mentored under a senior engineer. In 2001, I was relocated from Trenton District to Burlington District where I acted as the sole engineer. In 2003, I was promoted to the position of Lead Engineer. During my first four years, I provided engineering and managerial support for all phases of planning, design, construction, and maintenance of the gas distribution system while adhering to the established capital and O&M budgets.

In 2004, I was promoted to the position of Supervising Engineer in the Asset Management department and given the responsibility for the approval of all engineering designs associated with new and replacement main requisitions, district and pound to pound regulator installations, large volume meter sets, higher than normal delivery pressure requests, gas load increase submittals, and written gas out procedures covering six of the twelve gas districts. In addition, I was also responsible for developing the replacement main plans for these same six districts including identification and prioritization.

In 2007, I was promoted to the position of Planning & Design Manager in the Asset Management department overseeing a team of engineers and given the responsibility for developing and maintaining Company design standards for the Gas system, maintaining system integrity, and providing technical support to gas field operations. I was also responsible for developing the annual replacement main, regulator, and system reinforcement programs for the Company.

In April 2014, I assumed my current position, which involves overall responsibility for system planning and reliability as well as the safe and efficient engineering, design, and operating procedures of PSE&G's gas transmission and distribution assets. I am also responsible for the management of the Transmission and Distribution Integrity Management Programs, operation and maintenance of 48 city gate stations, four gas plants, and gas control to over 1.8 million customers.

I am the Committee sponsor for PSE&G's Gas Engineering Committee which is responsible for approval of action items due to regulatory changes and changes to Company technical manuals, the Operator Qualification program, Integrity Management programs, and new technology and materials.

I am a member of the Operations Safety Regulatory Action committee and the Engineering committee of the American Gas Association.

PSE&G Gas System Modernization Program II
Baseline Spending Level Calculation
in $000

Attachment 1
Schedule WEM-GSMPII-2

Proposed Baseline Spending Level [1]

	2019	2020	2021	2022	2023
Proposed Baseline Spending Level	**139,400**	**142,000**	**145,100**	**145,100**	**145,100**

Base Capital Similar to GSMP II

	2019	2020	2021	2022	2023
Replace Facilities - Main/Service Replacement & Meter Relocations	29,780	29,790	30,700	30,700	30,700
Environmental/BPU Requirements - Replacement Services	13,000	13,000	13,000	13,000	13,000
Environmental/BPU Requirements - CI/ST Main & Svcs Replacements	1,729	1,729	1,729	1,729	1,729
Syst Reinf Large Diameter Bell Joints	10,348	10,607	10,872	10,872	10,872
Total Base Capital Similar to GSMP II	**54,857**	**55,126**	**56,301**	**56,301**	**56,301**
GSMPII Program	361,275	541,298	542,312	541,946	553,339
Base Work Percentage	15%	10%	10%	10%	10%

[1] Proposed budget based on depreciation expense

PSE&G Gas System Modernization Program II
Gas Delivery Capital Summary (2012 - 2021)

ATTACHMENT 1
Schedule WEM-GSMPII-3

Capital Category	2012 Full Year Actual	2013 Full Year Actual	2014 Full Year Actual	2015 Full Year Actual	2016 Full Year Actual	2017 Full Year Plan	2018 Full Year Plan	2019 Full Year Plan	2020 Full Year Plan	2021 Full Year Plan
New Business Total $	$ 52.0	$ 67.9	$ 63.1	$ 73.3	$ 79.2	$ 76.8	$ 78.7	$ 80.7	$ 82.7	$ 84.7
Base Total $	**$ 145.0**	**$ 116.6**	**$ 138.2**	**$ 173.5**	**$ 210.0**	**$ 391.5**	**$ 253.2**	**$ 139.4**	**$ 142.0**	**$ 145.1**
Stipulated Base Total $					$ 94.8	$ 85.0	$ 85.0			
GSMP I Total $					$ 159.0	$ 221.3	$ 227.6	$ 48.3		
Energy Strong Total $			$ 95.1	$ 225.2	$ 70.3	$ 2.5				
GSMP II Total $								$ 361.3	$ 541.3	$ 542.3
CIP II Total $	$ 54.3	$ 4.9								
Total Capital $	**$ 251.3**	**$ 189.4**	**$ 296.5**	**$ 472.0**	**$ 613.3**	**$ 777.2**	**$ 644.5**	**$ 629.7**	**$ 766.0**	**$ 772.1**

Base Breakdown by Major Category

Replace Facilities	$ 62.8	$ 41.5	$ 44.3	$ 72.3	$ 77.0	$ 189.3	$ 101.7	$ 32.3	$ 32.3	$ 33.2
System Reinforcement	$ 28.2	$ 30.5	$ 48.2	$ 51.4	$ 60.4	$ 80.8	$ 46.8	$ 32.2	$ 33.3	$ 34.0
Environmental Regulatory	$ 22.8	$ 26.1	$ 27.6	$ 25.9	$ 27.2	$ 40.8	$ 33.9	$ 30.0	$ 30.0	$ 30.0
Replace Meters	$ 26.6	$ 15.0	$ 14.0	$ 19.2	$ 36.7	$ 62.3	$ 62.4	$ 40.9	$ 42.4	$ 43.9
Support Facilities	$ 4.6	$ 3.4	$ 4.0	$ 4.7	$ 8.7	$ 18.3	$ 8.4	$ 4.0	$ 4.0	$ 4.0
Base Total $	**$ 145.0**	**$ 116.6**	**$ 138.2**	**$ 173.5**	**$ 210.0**	**$ 391.5**	**$ 253.2**	**$ 139.4**	**$ 142.0**	**$ 145.1**

PSE&G Gas System Modernization Program II
Gas Delivery GSMP II Cash Flows w/COR

ATTACHMENT 1
Schedule WEM-GSMPII-4

Cash Flows ($000s)	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total
5 Year Program ($000s)													
GSMP II (2019)	**$ 1,279**	**$ 2,557**	**$ 5,114**	**$ 12,786**	**$ 30,687**	**$ 33,244**	**$ 36,591**	**$ 46,922**	**$ 45,353**	**$ 54,456**	**$ 44,455**	**$ 47,831**	**$ 361,275**
GSMP II (2019) COR	$ 90	$ 179	$ 358	$ 895	$ 2,148	$ 2,327	$ 2,561	$ 3,285	$ 3,175	$ 3,812	$ 3,112	$ 3,348	$ 25,289
GSMP II (2019) Net Plant	$ 1,189	$ 2,378	$ 4,756	$ 11,891	$ 28,539	$ 30,917	$ 34,030	$ 43,638	$ 42,178	$ 50,644	$ 41,343	$ 44,483	$ 335,986
GSMP II (2020)	**$ 15,833**	**$ 12,304**	**$ 18,822**	**$ 31,280**	**$ 55,241**	**$ 52,472**	**$ 56,566**	**$ 58,655**	**$ 55,796**	**$ 68,072**	**$ 54,674**	**$ 61,585**	**$ 541,298**
GSMP II (2020) COR	$ 1,108	$ 861	$ 1,318	$ 2,190	$ 3,867	$ 3,673	$ 3,960	$ 4,106	$ 3,906	$ 4,765	$ 3,827	$ 4,311	$ 37,891
GSMP II (2020) Net Plant	$ 14,725	$ 11,442	$ 17,504	$ 29,090	$ 51,374	$ 48,799	$ 52,607	$ 54,549	$ 51,890	$ 63,307	$ 50,847	$ 57,274	$ 503,407
GSMP II (2021)	**$ 15,862**	**$ 12,327**	**$ 18,857**	**$ 31,338**	**$ 55,344**	**$ 52,571**	**$ 56,672**	**$ 58,764**	**$ 55,900**	**$ 68,199**	**$ 54,776**	**$ 61,700**	**$ 542,312**
GSMP II (2021) COR	$ 1,110	$ 863	$ 1,320	$ 2,194	$ 3,874	$ 3,680	$ 3,967	$ 4,114	$ 3,913	$ 4,774	$ 3,834	$ 4,319	$ 37,962
GSMP II (2021) Net Plant	$ 14,752	$ 11,464	$ 17,537	$ 29,145	$ 51,470	$ 48,891	$ 52,705	$ 54,651	$ 51,987	$ 63,425	$ 50,942	$ 57,381	$ 504,350
GSMP II (2022)	**$ 15,852**	**$ 12,318**	**$ 18,844**	**$ 31,317**	**$ 55,307**	**$ 52,535**	**$ 56,634**	**$ 58,725**	**$ 55,862**	**$ 68,153**	**$ 54,739**	**$ 61,659**	**$ 541,946**
GSMP II (2022) COR	$ 1,110	$ 862	$ 1,319	$ 2,192	$ 3,871	$ 3,677	$ 3,964	$ 4,111	$ 3,910	$ 4,771	$ 3,832	$ 4,316	$ 37,936
GSMP II (2022) Net Plant	$ 14,742	$ 11,456	$ 17,525	$ 29,125	$ 51,435	$ 48,858	$ 52,670	$ 54,614	$ 51,952	$ 63,383	$ 50,907	$ 57,343	$ 504,009
GSMP II (2023)	**$ 16,185**	**$ 12,577**	**$ 19,240**	**$ 31,976**	**$ 56,469**	**$ 53,640**	**$ 57,825**	**$ 59,959**	**$ 57,037**	**$ 69,586**	**$ 55,890**	**$ 62,955**	**$ 553,339**
GSMP II (2023) COR	$ 1,133	$ 880	$ 1,347	$ 2,238	$ 3,953	$ 3,755	$ 4,048	$ 4,197	$ 3,993	$ 4,871	$ 3,912	$ 4,407	$ 38,734
GSMP II (2023) Net Plant	$ 15,052	$ 11,697	$ 17,894	$ 29,737	$ 52,517	$ 49,885	$ 53,777	$ 55,762	$ 53,044	$ 64,715	$ 51,978	$ 58,548	$ 514,606
GSMP II (2024)	**$ 18,425**	**$ 15,590**	**$ 21,259**	**$ 31,180**	**$ 29,763**	**$ 25,511**							**$ 141,729**
GSMP II (2024) COR	$ 1,290	$ 1,091	$ 1,488	$ 2,183	$ 2,083	$ 1,786							$ 9,921
GSMP II (2024) Net Plant	$ 17,135	$ 14,499	$ 19,771	$ 28,998	$ 27,680	$ 23,725							$ 131,808
Total													**$ 2,681,899**

ROTHFELDER STERN, L.L.C.

Attorneys at Law

Martin C. Rothfelder, Esq.
(Admitted in NJ, NY, NH, PA, MO)

407 Greenwood Ave., Unit #301
Trenton, NJ 08609-2158
Tel: (609) 394-1000
mrothfelder@rothfelderstern.com

Bradford M Stern, Esq.
(Admitted in NJ, PA)

22 Lakeview Hollow
Cherry Hill, NJ 08003
Tel: 856-520-6806
Fax: 856-375-2151
bstern@rothfelderstern.com

Please reply to Trenton

July 19, 2017

VIA E-MAIL AND FIRST CLASS MAIL

Irene Kim Asbury, Secretary
New Jersey Board of Public Utilities
44 South Clinton Avenue, 3rd Fl., Suite 314
P.O. Box 350
Trenton, New Jersey 08625

Re: PSE&G GAS SYSTEM MODERNIZATION PROGRAM (GSMP)
Monthly Report – June 2017, and
Quarterly Report on Activity Related to Department of Energy's Quadrennial Energy Review ("QER")

Dear Secretary Asbury:

Enclosed for filing are ten copies of this letter and its enclosures of Public Service Electric & Gas Company (PSE&G) to provide the monthly report for June, 2017 on the Gas System Modernization Program (GSMP).

The GSMP was approved by a Board Order dated November 16, 2015 in BPU Docket No. GR15030272. That Order adopted a Stipulation pursuant to which PSE&G is operating the Program. This report is filed pursuant to paragraph 25 of that Stipulation and is designed to address the first four items on Attachment C to that Stipulation.

The first three items are addressed in the attached materials. With regard to item 4, there were no funds or credits received from the United States government, the State of New Jersey, a county or a municipality, for work related to any of the Program projects.

In addition, paragraph 26 of the Stipulation states that:

> The Company will monitor progress of the Department of Energy's Quadrennial Energy Review ("QER") initiative, and engage in communications with relevant stakeholders regarding potential funding made available to New Jersey ratepayers for gas main replacement. The Company will interact with the relevant stakeholders to support a position that promotes funding for New Jersey

ratepayers. The Company agrees to provide quarterly updates to Board Staff and Rate Counsel of any QER developments of which it becomes aware.

The PSE&G report on the QER for the second quarter of 2017 is as follows. During 2016, both houses of Congress passed different version of a major energy bill (S. 2012), but no version of the bill passed both houses. That legislation died in early January 2017 at the end of the 114th Congress. During the second quarter of 2017, to the extent possible, PSE&G continued to pursue discussions of the QER recommendation to provide federal funds toward replacement of gas infrastructure with stakeholders and staff on Capitol Hill but, at this time, there is no active consideration of this matter.

Sincerely,

Martin C. Rothfelder

Martin C. Rothfelder

cc: Stefanie Brand (2 hard copies and e-mail)
Paul Flanagan (e-mail only)
Lisa Gurkas (e-mail only)
Brian Lipman (e-mail only)
Thomas Walker (e-mail only)
Alex Moreau (e-mail only)
Stacy Peterson (e-mail only)
Bethany Rocque-Romaine (e-mail only)
Felicia Thomas-Friel (e-mail only)
Caroline Vachier (e-mail only)

PSE&G - GAS SYSTEM MODERNIZATION PROGRAM
ATTACHMENT C - MONTHLY REPORT

1) PSE&G's overall approved Program and Stipulated Base capital budget broken down by major categories, both budgeted and actual amounts.

GSMP Major Project Categories	Overall Approved Program
Replacement Main $	$ 487,800,000
Replacement Service $	$ 159,300,000
Regulator Elimination $	$ 2,900,000
Total	$ 650,000,000

2017 June PTD Budget	2017 June PTD Actual
$160,112,289	$202,263,846
$ 71,547,460	$ 63,284,814
$ 666,456	$ 616,959
$232,326,205	$266,165,619

Stipulated Base Major Project Categories	Overall Approved Program
Replacement Main $	$ 160,400,000
Replacement Service $	$ 35,000,000
Stipulated Meter Reconstruction $	$ 9,700,000
GSMP Meter Reconstruction $	$ 49,900,000
Total	$ 255,000,000

2017 June PTD Budget	2017 June PTD Actual
$ 97,230,233	$131,377,806
$ 14,606,772	$ 26,740,592
$ 642,942	$ 1,981,875
$ 3,214,717	$ 2,806,243
$115,694,664	$162,906,515

PSE&G - GAS SYSTEM MODERNIZATION PROGRAM
ATTACHMENT C - MONTHLY REPORT

2) b. Expenditures incurred to date and amounts transferred to plant in-service, by project.

Expenditures Incurred To Date GSMP Projects	June PTD Actual Material $	June PTD Actual Other $	June PTD Actual Total $	Amount to Plant In-Service
Replacement Main	$ 13,992,136	$188,271,710	$202,263,846	$197,715,176
Replacement Service	$ 1,567,298	$ 61,717,516	$ 63,284,814	$ 63,237,890
Regulator Elimination	$ 38,918	$ 578,041	$ 616,959	$ 480,145
Total	$ 15,598,352	$250,567,267	$266,165,619	$261,433,210

Expenditures Incurred To Date Stipulated Base Projects	June PTD Actual Material $	June PTD Actual Other $	June PTD Actual Total $	Amount to Plant In-Service
Replacement Main	$ 16,921,605	$114,456,201	$131,377,806	$126,941,478
Replacement Service	$ 803,186	$ 25,937,406	$ 26,740,592	$ 26,720,603
Stipulated Meter Reconstruction	$ 95,799	$ 1,886,076	$ 1,981,875	$ 1,981,875
GSMP Meter Reconstruction	$ 84,516	$ 2,721,727	$ 2,806,243	$ 2,806,243
Total	$ 17,905,105	$145,001,410	$162,906,515	$158,450,199

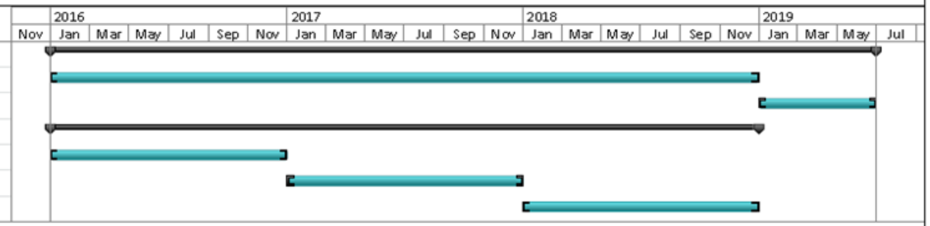
PSE&G - GAS SYSTEM MODERNIZATION PROGRAM
ATTACHMENT C - MONTHLY REPORT

REPORT DATE: JUNE 2017
2a - Description of projects
2c - Projected and actual miles of main installed
2d - Projected and actual number of services installed

	Project	Sub-Project	Project Completion Date	Units	Size Installed	Material Installed	2016 Quantity Completed	Projected Quantity Jan 2017	Actual Quantity Jan 2017	Projected Quantity Feb 2017	Actual Quantity Feb 2017	Projected Quantity Mar 2017	Actual Quantity Mar 2017	Projected Quantity Apr 2017	Actual Quantity Apr 2017	Projected Quantity May 2017	Actual Quantity May 2017	Projected Quantity Jun 2017	Actual Quantity Jun 2017	2017 Estimated Quantity	Quantity Completed 2017 Year To Date	Total Program Quantity Completed To Date
GAS SYSTEM MODERNIZATION PROGRAM	Replace Facilities Blanket	Replacement Main	Dec-18	Feet of Main	2"	Plastic	361,739	-	12,816	-	3,479	4,000	3,196	4,000	13,083	28,119	42,238	37,115	49,573	313,149	124,385	486,124
					4"	Plastic	182,371	-	2,044	-	2,249	4,341	1,231	4,341	3,299	14,653	9,042	14,653	15,389	119,957	33,254	215,625
					6"	Plastic	60,016	-	2,446	-	2,690	4,088	1,027	4,088	3,729	5,023	4,695	6,494	4,538	57,972	19,125	79,141
					8"	Plastic	13,461	-	835	-	466	2,334	5,389	2,334	3,561	1,799	3,616	1,799	308	15,862	14,175	27,636
					12"	Plastic	-	-	-	-	-	1,077	-	1,077	-	1,006	-	1,000	-	4,160	-	-
					12"	Steel	7,324	-	-	-	213	-	5,428	-	5,293	2,200	2,688	2,300	-	16,898	13,622	20,946
					16"	Steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Replace Facilities Blanket	**Replacement Main**	**N/A**	**Feet of Main**	**N/A**	**N/A**	**624,911**	**-**	**18,141**	**-**	**9,097**	**15,840**	**16,271**	**15,840**	**28,965**	**52,800**	**62,279**	**63,360**	**69,808**	**527,998**	**204,561**	**829,472**
	Replace Facilities Blanket	Replacement Service	Dec-18	Services Replaced	≤ 2"	Plastic	6,804	367	1,113	301	787	411	576	617	757	993	803	942	972	10,000	5,008	11,812
					>2"	Plastic	4	-	2	-	-	-	1	-	-	-	1	-	-	-	4	8
	Replace Facilities Blanket	**Replacement Service**	**N/A**	**Services Replaced**	**N/A**	**N/A**	**6,808**	**367**	**1,115**	**301**	**787**	**411**	**577**	**617**	**757**	**993**	**804**	**942**	**972**	**10,000**	**5,012**	**11,820**
	Abandon Facilities Blanket	Abandon Regulator	Dec-18	Regulators Abandoned	N/A	N/A	5		-		1		2		-		2		6		11	16
	Abandon Facilities Blanket	**Abandon Regulator**	**N/A**	**Regulators Abandoned**	**N/A**	**N/A**	**5**		**-**		**1**		**2**		**-**		**2**		**6**		**11**	**16**
STIPULATED BASE	Replace Facilities Blanket	Replacement Main	Dec-18	Feet of Main	2"	Plastic	155,411	-	3,739	-	1,364	2,500	3,830	5,000	6,867	6,277	4,603	4,628	2,475	41,249	22,878	178,289
					4"	Plastic	95,033	-	3,166	-	1,807	1,000	5,132	4,000	2,996	6,049	1,782	4,671	2,682	36,741	17,565	112,598
					6"	Plastic	34,296	-	2,320	-	1,132	252	1,492	2,672	76	2,719	232	1,719	97	16,881	5,349	39,645
					8"	Plastic	16,633	-	-	-	38	-	944	-	14	1,580	14	1,580	-	9,177	1,010	17,643
					8"	Steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
					12"	Plastic	-	-	-	-	-	-	-	-	-	414	-	413	-	2,892	-	-
					12"	Steel	63,212	-	4,937	-	2,304	-	3,444	-	1,430	2,500	1,591	6,528	3,304	30,348	17,010	80,222
					16"	Steel	10,331	-	3,147	-	4,744	1,000	8,420	1,000	9,509	4,223	6,206	4,222	7,765	21,112	39,791	50,122
					20"	Steel	111	-	-	-	-	-	-	-	-	-		-	-	-	-	111
	Replace Facilities Blanket	**Replacement Main**	**N/A**	**Feet of Main**	**N/A**	**N/A**	**375,027**	**-**	**17,309**	**-**	**11,389**	**4,752**	**23,262**	**12,672**	**20,892**	**23,760**	**14,428**	**23,760**	**16,323**	**158,399**	**103,603**	**478,630**
	Replace Facilities Blanket	Replacement Service	Dec-18	Services Replaced	≤ 2"	Plastic	3,153	81	530	68	554	85	407	125	168	196	235	186	75	2,000	1,969	5,122
					>2"	Plastic	3	-	-	-	-	-	-	-	-	-	-	-	2	-	2	5
	Replace Facilities Blanket	**Replacement Service**	**N/A**	**Services Replaced**	**N/A**	**N/A**	**3,156**	**81**	**530**	**68**	**554**	**85**	**407**	**125**	**168**	**196**	**235**	**186**	**77**	**2,000**	**1,971**	**5,127**
	Abandon Facilities Blanket	Abandon Regulator	Dec-18	Regulators Abandoned	N/A	N/A	-		-		-		-		-		-		-		-	-
	Abandon Facilities Blanket	**Abandon Regulator**	**N/A**	**Regulators Abandoned**	**N/A**	**N/A**	**-**		**-**		**-**		**-**		**-**		**-**		**-**		**-**	**-**

GSMP/ Stip Base Timeline

ID	Task Name	Duration	Start	Finish
1	**GSMP**	**911 days**	**Fri 1/1/16**	**Sun 6/30/19**
2	GSMP Work	782 days	Fri 1/1/16	Mon 12/31/18
3	GSMP Completion and Restoration Work	130 days	Tue 1/1/19	Sun 6/30/19
4	**Stip Base**	**782 days**	**Fri 1/1/16**	**Mon 12/31/18**
5	Stip Base Year 1	262 days	Fri 1/1/16	Sat 12/31/16
6	Stip Base Year 2	262 days	Sun 1/1/17	Sun 12/31/17
7	Stip Base Year 3	261 days	Mon 1/1/18	Mon 12/31/18



Project: GSMP Timeline
Date: Wed 5/11/16

Task | Milestone | Summary | Project Summary

ATTACHMENT 2

STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES

IN THE MATTER OF THE PETITION OF
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
FOR APPROVAL OF THE NEXT PHASE OF
THE GAS SYSTEM MODERNIZATION PROGRAM AND
ASSOCIATED COST RECOVERY MECHANISM
("GSMP II")

BPU Docket No. __________

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DIRECT TESTIMONY
OF
STEPHEN SWETZ
SENIOR DIRECTOR – CORPORATE RATES AND
REVENUE REQUIREMENTS

July 27, 2017

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
DIRECT TESTIMONY
OF
STEPHEN SWETZ
SENIOR DIRECTOR – CORPORATE RATES AND REVENUE REQUIREMENTS

Q. Please state your name, affiliation and business address.

A. My name is Stephen Swetz and I am the Senior Director – Corporate Rates and Revenue Requirements for PSEG Services Corporation. My principal place of business is 80 Park Plaza, Newark, New Jersey 07102. My credentials are set forth in the attached Schedule SS-GSMPII-1.

Q. Please describe your responsibilities as the Senior Director – Corporate Rates and Revenue Requirements for PSEG Services Corporation.

A. As Senior Director - Corporate Rates and Revenue Requirements, my primary duties are to plan, develop and direct Public Service Electric and Gas Company's (PSE&G or the Company) calculation of electric and gas revenue requirements for the Company's base rates as well as all cost recovery clauses. I also direct the retail pricing strategies, retail rate design, embedded and marginal cost studies, and development and interpretation of tariff provisions.

Q. What is the purpose of your direct testimony in this proceeding?

A. My testimony provides the details for the calculation of PSE&G's Gas System Modernization Program II (GSMP II or the Program) revenue requirements, the associated cost recovery methodology and rate design for the GSMP II Petition filed with the New Jersey Board of Public Utilities (BPU or the Board). This testimony also provides detailed schedules setting forth the projected revenue requirements, rates and bill impacts over the expected Program life.

Q. Please briefly describe PSE&G's proposed GSMP II cost recovery methodology.

A**.** PSE&G is proposing a cost recovery mechanism for GSMP II that is consistent with the recently proposed BPU Infrastructure Investment And Recovery (IIR) regulations (Proposed New Subchapter: N.J.A.C. 14:3-2A, BPU Docket Number: AX17050469) and the existing Gas System Modernization Program (GSMP I) where applicable, which was approved by the Board in Docket No. GR15030272 on November 16, 2015. The details of the costs to be recovered, as well as the mechanism to recover such costs, are set forth in this testimony.

Q. How does PSE&G propose to calculate the revenue requirements?

A. PSE&G proposes to calculate the revenue requirements associated with the Program costs using the following formula:

*Revenue Requirements = ((After Tax Cost of Capital * Net Rate Base)*

*+ Net of Tax Amortization and/or Depreciation + Tax Adjustment)**

Revenue Factor

This calculation is the same as the calculation in PSE&G's GSMP I approved by the Board in Docket No. GR15030272 on November 16, 2015. The Company is proposing to recover the revenue requirements through semi-annual base rate roll-in filings as described below, which is consistent with the BPU's proposed IIR regulations.

Q. Please describe the components and defined terms in PSE&G's proposed revenue requirement calculation.

A. The following is a description of each term proposed in PSE&G's revenue requirement calculation. The term "Cost of Capital" is PSE&G's overall weighted average cost of capital (WACC) for the Program. PSE&G shall earn a return on its net investment in the GSMP II based upon an authorized return on equity (ROE) and capital structure including income tax effects. The Company's initial cost of capital for the Program will be based on the ROE, long-term debt rate and capital structure approved in the Solar 4 All Extension II filing in Docket No. EO16050412, which was the latest new program approved for the Company by the Board on November 30, 2016. Any change in the WACC authorized by the Board in a subsequent base rate case will be reflected in the subsequent monthly revenue requirement calculations. Any changes to current tax rates would be reflected in an adjustment to the Pre-Tax WACC. See Schedule SS-GSMPII-2 for the calculation of the current Pre-Tax WACC. Any change in the WACC authorized by the Board in a subsequent electric, gas, or combined base rate case will be reflected in the appropriate corresponding roll-in filing explained in more detail below.

The term "Net Rate Base" refers to Gross Plant less the associated accumulated depreciation and/or amortization and less Accumulated Deferred Income Taxes (ADIT). Gross Plant is equal to all Plant In-Service. The book recovery of each asset class and its associated tax depreciation will be based on current depreciation rates. The annual book depreciation rate for Mains and Services is currently 1.61%. ADIT is calculated as Book Depreciation (Tax Basis) less Tax Depreciation, multiplied by the Company's effective tax rate, which is currently 40.85%. Mains and Services are depreciated for tax purposes using a 20 year MACRS schedule. Cost of Removal Expenditures are depreciated 100% in the year incurred for tax purposes. Any future changes to the book or tax depreciation rates, such as "bonus depreciation" during the construction period of the Program and at the time of each base rate roll-in, will be reflected in the accumulated depreciation and/or ADIT calculation described above.

The "Net of Tax Depreciation and/or Amortization" allows for recovery of the Company's investment in the Program assets over the useful book life of each asset class. PSE&G proposes to depreciate the GSMP II assets in accordance with the Company's approved capitalization policy or as ordered by the Board. The book recovery of each asset class will be based on current depreciation rates (1.61%). For plant in service investment, the net of tax depreciation expense is calculated as the depreciation expense multiplied by one minus the current tax rate. For CWIP projects, there is no tax deduction for the equity portion of the capitalized AFUDC. As a result, the net of tax depreciation expense is calculated as the depreciation expense associated with the Plant In-Service, excluding the equity portion of AFUDC, multiplied by one minus the current tax rate plus the depreciation expense associated with the equity portion of the AFUDC. Since the equity portion of AFUDC will not be included in the tax basis of the Program assets, the equity portion must be grossed-up for taxes in order for the Company to earn its allowed rate of return. Any future changes to the book depreciation or tax rates during the construction period of the Program and at the time of each base rate roll-in, will be reflected in the net of tax depreciation expense calculation described above.

The term "Tax Adjustment" refers to any applicable tax items that may impact the revenue requirement calculation for the Program. There are no tax adjustments forecasted for the program at this time.

The “Revenue Factor” adjusts the Revenue Requirement Net of Tax for federal and state income taxes and the costs associated with the BPU and Rate Counsel (RC) Annual Assessments and Gas Revenue Uncollectibles. The BPU/RC Assessment Expenses consist of payments, based upon a percentage of revenues collected (updated annually), to the State based on the gas intrastate operating revenues for the utility. The Company has utilized the respective BPU and RC assessment rates based on the 2017 fiscal year assessment. In addition, gas revenue uncollectible expenses need to be recovered for these Program revenues. The percentage used to calculate the gas uncollectible expense is based upon the percentage determined in the Company’s latest base rate case. When this percentage is updated in future base rate cases, the revised percentage would be applied to this Program effective on the date new base rates become effective.

Q. Please describe the type of expenditures to be included in Net Rate Base?

A. The Program will include requests for recovery in base rates of all capital expenditures associated with the GSMP II projects, including actual costs of engineering, design and construction, cost of removal (net of salvage) and property acquisition, including actual labor, materials, overhead, and capitalized AFUDC associated with the projects (the “Capital Investment Costs”). Capital Investment Costs will be recorded, during construction, in an associated CWIP account or in a Plant In-Service account upon the respective project being deemed used and useful.

Q. Are there any items that may affect the tax impacts of the Program?

A. Yes. While other items may arise in the future, such as tax bonus depreciation, there are two areas that the Company wishes to make the BPU aware of that may affect this Program in the future. These are:

1. The amount and vintage of assets that will be removed and retired may impact various tax deductions such as repair allowance, retirements, and cost of removal. At the time such actual information becomes available, the impact of these deductions on either rate-base or tax expense will be incorporated into the ADIT balance.
2. The IRS has announced that it will be issuing further guidance regarding the tax repair deduction that applies to gas distribution activities. This guidance is anticipated to be released and effective within the Program investment period. As these rules are not yet known, they have not been incorporated in this filing.
3. Congress is contemplating reforming the income tax code. Among other items this may include reducing the corporate income tax rate, eliminating or increasing tax deductions or a border adjustment tax. In the event income tax reform is enacted any changes will be incorporated into the applicable filing.

Q. Will any of the Gas System Modernization Program II expenditures be eligible for AFUDC?

A. Yes, but only for those projects that meet the Company's criteria for accrual of AFUDC. AFUDC is a component of construction costs representing the net cost of borrowed funds and an equity return rate used during the period of construction. Under the Company's current policy, only projects that have both costs exceeding $5,000 and a construction period longer than 60 days are eligible for AFUDC. Most of the investments under this Program are not anticipated to be eligible for AFUDC because they will take less than 60 days to construct. However, it is possible that some projects will require more than 60 days of construction and will therefore accrue AFUDC. In the event the Company's criteria for the accrual of AFUDC changes, the Company's criteria in place at the time the expenditures are incurred would be applied.

Q. How will AFUDC be calculated on eligible projects?

A. The Company accrues AFUDC on eligible projects utilizing the "full FERC method" as set forth in FERC Order 561. AFUDC is accrued monthly and capitalized to CWIP until the project is placed into service.

Q. Will the Company utilize AFUDC once the projects are placed into service?

A. No. Consistent with the proposed IIP regulations, the Company will not accrue any AFUDC on projects that have already been placed into service.

Q. What is the source of the capital expenditures you use to calculate the revenue requirements?

A. The projected monthly cash flow for the Program projects was provided by Mr. Wade Miller. See Schedule WEM-GSMPII-2. As discussed in the testimony of Mr. Miller, the Company envisions a long term, continuous effort to replace or rehabilitate all cast iron and unprotected steel mains in its system and pursue other gas system modernization activities, but is only proposing an initial five year program at this time.

Q. Is the Company planning capital expenditures similar to those included in GSMP II not to be recovered via GSMP II?

A. Yes, the Company plans to maintain capital expenditures of at least 10% of the approved GSMP II expenditures on projects similar to those proposed in GSMP II. These capital expenditures shall be made in the normal course of business and recovered in future base rate proceedings, and shall not be subject to the recovery via the GSMP II cost recovery mechanism.

Q. Is there a schedule showing the calculation of the revenue requirements?

A. Yes. See Schedule SS-GSMPII-3 for the calculation of the GSMP II revenue requirements based on the forecasted cash flow provided in Schedule WEM-GSMPII-4.

Q. How does the Company propose to recover the revenue requirements as described above?

A. The Company proposes to recover the revenue requirements associated with the Program through semi-annual rate base roll-in filings, which is consistent with the recently proposed BPU IIP regulations and the same used for our Energy Strong program (for electric investments). The Company's GSMP I utilizes annual roll-ins, which causes a significant amount of regulatory lag as investments are made, placed in service and depreciated, but not recovered in rates for sometimes as long as fifteen months. As stated in Mr. Miller's Program testimony, the Company plans to begin main replacement work January 1, 2019.

The proposed schedule for the Rates Effective, Initial Filing, Investment as of, and True-up Filing dates for all roll-ins is listed below:

GSMP II Rate Roll-in Schedule				
Roll-in #	**Rates Effective**	**Initial Filing**	**Investment as of**	**True-up Filing**
1	6/1/20	12/31/19	2/29/20	3/15/20
2	12/1/20	6/30/20	8/31/20	9/15/20
3	6/1/21	12/31/20	2/28/21	3/15/21
4	12/1/21	6/30/21	8/31/21	9/15/21
5	6/1/22	12/31/21	2/28/22	3/15/22
6	12/1/22	6/30/22	8/31/22	9/15/22
7	6/1/23	12/31/22	2/28/23	3/15/23
8	12/1/23	6/30/23	8/31/23	9/15/23
Final	TBD			

As stated in Mr. Miller's Program testimony, the main replacement work for GSMP II is scheduled to be complete December 31, 2023. However, close out work such as final paving must wait 3 to 6 months following main installation to allow ground to settle. In addition, trailing charges from contractors may lag into 2024. Without a firm date for completion of this close out work, the Company is proposing a final roll- in no later than July 15, 2024 with all actual data for rates effective October 1, 2024.

Q. Is the Company proposing a minimum investment level to complete a base rate roll-in?

A. Yes. Consistent with the proposed IIP regulations, the Company proposes to limit each base rate roll-in to a minimum investment level of 10 percent of the total program investment. The program investment is defined as all capital expenditures as defined previously in my testimony excluding AFUDC. As a result, based on the proposed capital expenditure forecast, the first base rate roll-in filing will not occur until December of 2019 for rates effective June 1, 2020.

Q. Is there any other proposed limit that could impact the amount of investment to be included in a rate base roll-in?

A. Yes, the Company is also proposing to limit the amount of investment to be included in the rate base roll-in by an earnings test. If the Company exceeds the allowed ROE from the utility's last base rate case by fifty (50) basis points or more for the most recent twelve (12) month period, the pending base rate roll-in shall not be allowed for the applicable filing period.

Q. How does the Company propose to calculate this earnings test?

A. Per the proposed IIP regulations, the earnings test shall be determined based on the actual net income of the utility for the most recent twelve (12) month period divided by the average of the beginning and ending common equity balances for the corresponding period.

Q. What is the corresponding period for the earnings test?

A. The Company will utilize the 12 month period corresponding to the latest available SEC quarterly/annual filing. In the same manner as capital expenditures, the Company will provide 9 months of actual data and 3 months of forecast data at the time of its initial filing. The 3 months of forecasted data will be updated with actual information at the same time the Company updates investment for actuals per the schedule above.

Q. Is there any issue with calculating common equity balances for gas?

A. Yes. As the only combined Electric, Gas and Transmission Company in the State, calculating deferred taxes and rate base specific to the Gas utility on a monthly basis is impractical.

Q. So how do you propose to calculate the starting and ending common equity balance for the earnings test?

A. I'm proposing that the Common Equity balance to be used in the Company's earnings test be calculated based on the starting and ending Net Plant balances multiplied by the ratio of Net Plant to Common Equity determined in the Company's most recent base rate case.

Q. Is there precedence for this approach?

A. Yes. This is the same methodology utilized in the Company's Board approved Weather Normalization Clause.

Q. How will the Company address an extension of the GSMP as described in the testimony of Mr. Miller?

A. Consistent with the long term, continuous effort to replace or rehabilitate all cast iron and unprotected steel mains in its system described in the testimonies of Mr. Miller, PSE&G anticipates filing for a further extension of the Gas System Modernization Program approximately 24 months prior to the end of the period requested in the GSMP II Petition. The intent of the extension request before the end of the five year replacement period is to avoid the costs and delays of ramping down for the end of the current Program and then ramping investment back up for the extension.

Q. Under this proposal, what opportunity will the BPU and/or Rate Counsel have to review the actual expenditures of the Program?

A. Upon BPU approval of the Program, PSE&G will make semi-annual filings with actual expenditures based on the schedule described above. BPU Staff and Rate Counsel can review each roll-in filing to ensure that the revenue requirements and proposed rates are being calculated in accordance with the BPU Order approving the Program. The actual prudency of the Company's expenditures in GSMP II will be reviewed as part of PSE&G's subsequent base rate case(s) following the roll-in(s).

Q. Does the Company plan to file a base rate case in connection to the proposed GSMP II?

A. Yes. The Company proposes that it will file its next rate case not later than five (5) years after the commencement of GSMP II (December 31, 2023).

Q. What is the gas revenue requirement for the initial rate recovery period?

A. The revenue requirement for the first rate change will be for plant in-service from Board approval through August 31, 2019, and is currently forecasted to be $41.151 million. See Schedule SS-GSMPII-3.

Q. Does the Company plan to do engineering work once Board approval is received for GSMP II?

A. Yes. The Company anticipates conducting engineering work as soon as Board approval is received and include those costs in the first roll-in.

Q. What rate design is the Company proposing to use for this base rate adjustment?

A. The detailed calculations supporting the gas rate design for the first forecasted roll-in is shown in Schedule SS-GSMPII-4. The rate design for the roll-ins made prior to new base rates being set from the 2017 Base Rate Case will use the same methodology as in the Company's GSMP I approved by the Board in Docket No. GR15030272 on November 16, 2015. For base rate roll-ins made as part of or after the 2017 base rate case, the Company may propose modifications to the roll-in rate design associated with this Program. If no modifications are made to the base rate roll-in methodology as part of the 2017 base rate case or any subsequent base rate case, all subsequent roll-ins shall use the rate design methodology corresponding to the latest Board approved gas base rate case. In addition, Schedule SS-GSMPII-5 provides a summary of the proposed rates for all forecasted roll-ins. The weather normalized billing determinants from the calendar year 2012 were used to estimate the change in base rates for this Program to reflect current usage. The rate design methodology described above is the same as the rate design methodology approved for the GSMP I.

Q. What billing determinants does the Company propose to use for each roll-in filing?

A. The Company proposes to use the latest weather normalized billing determinants available for setting the rates in each roll-in. The estimated rates calculated in Schedule SS-GSMPII-4 for the first forecasted roll-in are based on weather normalized billing determinants for calendar year 2012, which are currently being used for GSMP I. For roll-ins that are effective subsequent to the Company's base rate cases, those corresponding billing determinants will be used once approved by the BPU. To the extent the Company seeks to utilize more current weather normalized billing determinants for any future roll-in filings subsequent to the latest approved base rate case or to change the methodology used to weather normalize billing determinants, PSE&G shall provide those updated billing determinants and supporting data to Board Staff and Rate Counsel a minimum of 60 days prior to any GSMP II roll-in filing. The ability to update billing determinants and weather normalization methodology is consistent with GSMP I.

Q. What are the annual rate impacts to the typical residential customer?

A. Based upon the forecasted rates shown in Schedule SS-GSMPII-5, the typical annual bill impacts for a residential customer as well as rate class average customers compared to rates as of July 10, 2017 are set forth in Schedule SS-GSMPII-6.[1] Based on the estimated roll-in revenue requirements provided in Schedule SS-GSMPII-3, the initial annual impact of the proposed rates for the first roll-in period to the typical residential gas heating customer who uses 165 therms in a winter month and 1,010 therms annually is an increase of $22.86 or approximately 2.65%. The maximum **cumulative** impact (impact from the entire Program) on the typical residential gas heating customer is an average annual increase of approximately 3.92% or about a $14.11 increase in their average monthly bill.

Q. Will the Company hold public comment hearings?

A. Although PSE&G is not proposing a rate increase at this time, the Company proposes public comment hearings similar to those that are held when rate increases are proposed. A

[1]The bill impacts assume that customers receive commodity service from PSE&G under the applicable Basic Gas Supply Service (BGSS) rate.

proposed form of public notice of filing and public hearings, including the proposed rates and bill impacts attributable to the proposed implementation of the Program are set forth in Schedule SS-GSMPII-7.

Q. Does this conclude your testimony?

A. Yes, it does.

SCHEDULE INDEX

CREDENTIALS
OF
STEPHEN SWETZ
DIRECTOR-CORPORATE RATES AND REVENUE REQUIREMENTS

My name is Stephen Swetz and I am employed by PSEG Services Corporation. I am the Director - Corporate Rates and Revenue Requirements where my main responsibility is to contribute to the development and implementation of electric and gas rates for Public Service Electric and Gas Company (PSE&G, the Company).

EDUCATIONAL BACKGROUND

I graduated from Worcester Polytechnic Institute with a Bachelor of Science degree in Mechanical Engineering. I also earned the degree of Master of Business Administration from Fairleigh Dickinson University.

WORK EXPERIENCE

I have over 20 years' experience in Rates, Analysis, and Operations for three Fortune 500 companies. Since 1991, I have worked in various positions within PSEG. I have held positions in Rates & Regulation, Pricing, Corporate Planning & Finance with over thirteen years of direct experience in Northeastern retail and wholesale electric and gas markets. I am presently the Director - Corporate Rates and Revenue Requirements and contribute to the development and implementation of PSE&G electric and gas rates.

I have submitted pre-filed direct cost recovery testimony as well as oral testimony to the New Jersey Office of Administrative Law. A history of prior filings in which I have provided testimony can be found on page 3 of this document. I have also contributed to other filings that the Company has made to the New Jersey Board of Public Utilities, including the Capital Economic Stimulus Infrastructure Investment Programs, as well as unbundling electric rates and Off-Tariff Rate Agreements. I have had a leadership role in various economic analyses, asset valuations, rate design and pricing efforts and participated in electric and gas marginal cost studies.

I am an active member of the American Gas Association's Rate and Strategic Issues Committee and the Edison Electric Institute's Rates and Regulatory Affairs Committee. I am also a member of the New Jersey Utility Association (NJUA) Finance and Regulatory Committee.

LIST OF PRIOR TESTIMONIES

Company	Utility	Docket	Testimony	Date	Case / Topic
Public Service Electric & Gas Company	G	GR17060720	written	Jul-17	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	E/G	ER17070724	written	Jul-17	Green Programs Recovery Charge (GPRC)-Including CA, DR, EEE, EEE Ext, S4All, S4AEXT, S4AEXT II, SLII, SLIII / Cost Recovery
Public Service Electric & Gas Company	E	ER17070723	written	Jul-17	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR17060593	written	Jun-17	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER17030324 - GR17030325	written	Mar-17	Energy Strong / Revenue Requirements & Rate Design - Sixth Roll-in
Public Service Electric & Gas Company	E/G	EO14080897	written	Mar-17	Energy Efficiency 2017 Program
Public Service Electric & Gas Company	E	ER17020136	written	Feb-17	Societal Benefits Charge (SBC) / Cost Recovery
Public Service Electric & Gas Company	E	EO16080788	written	Aug-16	Construction of Mason St Substation
Public Service Electric & Gas Company	E	ER16090918	written	Sep-16	Energy Strong / Revenue Requirements & Rate Design - Fifth Roll-in
Public Service Electric & Gas Company	E	ER16080785	written	Aug-16	Non-Utility Generation Charge (NGC) / Cost Recovery
Public Service Electric & Gas Company	G	GR16070711	written	Jul-16	Gas System Modernization Program (GSMP) - First Roll-In
Public Service Electric & Gas Company	G	GR16070617	written	Jul-16	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	E/G	ER16070613 - GR16070614	written	Jul-16	Green Programs Recovery Charge (GPRC)-Including CA, DR, EEE, EEE Ext, S4All, S4AEXT, SLII, SLIII / Cost Recovery
Public Service Electric & Gas Company	E	ER16070616	written	Jul-16	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR16060484	written	Jun-16	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E	EO16050412	written	May-16	Solar 4 All Extension II (S4Allext II) / Revenue Requirements & Rate Design
Public Service Electric & Gas Company	E/G	ER16030272 - GR16030273	written	Mar-16	Energy Strong / Revenue Requirements & Rate Design - Fourth Roll-in
Public Service Electric & Gas Company	E/G	GR15111294	written	Nov-16	Remediation Adjustment Charge-RAC 23
Public Service Electric & Gas Company	E	ER15101180	written	Sep-15	Energy Strong / Revenue Requirements & Rate Design - Third Roll-in
Public Service Electric & Gas Company	E/G	ER15070757-GR15070758	written	Jul-15	Green Programs Recovery Charge (GPRC)-Including CA, DR, EEE, EEE Ext, S4All, S4AEXT, SLII, SLIII / Cost Recovery
Public Service Electric & Gas Company	E	ER15060754	written	Jul-15	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR15060748	written	Jul-15	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	G	GR15060646	written	Jun-15	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER15050558	written	May-15	Societal Benefits Charge (SBC) / Cost Recovery
Public Service Electric & Gas Company	E	ER15050558	written	May-15	Non-Utility Generation Charge (NGC) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER15030389-GR15030390	written	Mar-15	Energy Strong / Revenue Requirements & Rate Design - Second Roll-in
Public Service Electric & Gas Company	G	GR15030272	written	Feb-15	Gas System Modernization Program (GSMP)
Public Service Electric & Gas Company	E/G	GR14121411	written	Dec-14	Remediation Adjustment Charge-RAC 22
Public Service Electric & Gas Company	E/G	ER14091074	written	Sep-14	Energy Strong / Revenue Requirements & Rate Design - First Roll-in
Public Service Electric & Gas Company	E/G	EO14080897	written	Aug-14	EEE Ext II
Public Service Electric & Gas Company	G	ER14070656	written	Jul-14	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	E/G	ER14070651-GR14070652	written	Jul-14	Green Programs Recovery Charge (GPRC)-Including CA, DR, EEE, EEE Ext, S4All, S4AEXT, SLII, SLIII / Cost Recovery
Public Service Electric & Gas Company	E	ER14070650	written	Jul-14	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR14050511	written	May-14	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	GR14040375	written	Apr-14	Remediation Adjustment Charge-RAC 21
Public Service Electric & Gas Company	E/G	ER13070603-GR13070604	written	Jun-13	Green Programs Recovery Charge (GPRC)-Including DR, EEE, EEE Ext, CA, S4All, SLII / Cost Recovery
Public Service Electric & Gas Company	E	ER13070605	written	Jul-13	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	G	GR13070615	written	Jun-13	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	G	GR13060445	written	May-13	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	E/G	EO13020155-GO13020156	written/oral	Mar-13	Energy Strong / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	G	GO12030188	written/oral	Mar-13	Appliance Service / Tariff Support
Public Service Electric & Gas Company	E	ER12070599	written	Jul-12	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	E/G	ER12070606-GR12070605	written	Jul-12	RGGI Recovery Charges (RRC)-Including DR, EEE, EEE Ext, CA, S4All, SLII / Cost Recovery
Public Service Electric & Gas Company	E	EO12080721	written/oral	Jul-12	Solar Loan III (SLIII) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E	EO12080721	written/oral	Jul-12	Solar 4 All Extension(S4Allext) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	G	GR12060489	written	Jun-12	Margin Adjustment Charge (MAC) / Cost Recovery
Public Service Electric & Gas Company	G	GR12060583	written	Jun-12	Weather Normalization Charge / Cost Recovery
Public Service Electric & Gas Company	E/G	ER12030207	written	Mar-12	Societal Benefits Charge (SBC) / Cost Recovery
Public Service Electric & Gas Company	E	ER12030207	written	Mar-12	Non-Utility Generation Charge (NGC) / Cost Recovery
Public Service Electric & Gas Company	G	GR11060338	written	Jun-11	Margin Adjustment Charge (MAC) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	G	GR11060395	written	Jun-11	Weather Normalization Charge / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E	EO11010030	written	Jan-11	Economic Energy Efficiency Extension (EEEext) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E/G	ER10100737	written	Oct-10	RGGI Recovery Charges (RRC)-Including DR, EEE, CA, S4All, SLII / Cost Recovery
Public Service Electric & Gas Company	E/G	ER10080550	written	Aug-10	Societal Benefits Charge (SBC) / Cost Recovery
Public Service Electric & Gas Company	E	ER10080550	written	Aug-10	Non-Utility Generation Charge (NGC) / Cost Recovery
Public Service Electric & Gas Company	E/G	GR09050422	written/oral	Mar-10	Base Rate Proceeding / Cost of Service & Rate Design
Public Service Electric & Gas Company	E	ER10030220	written	Mar-10	Solar Pilot Recovery Charge (SPRC-Solar Loan I) / Cost Recovery
Public Service Electric & Gas Company	E	EO09030249	written	Mar-09	Solar Loan II(SLII) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E/G	EO09010056	written	Feb-09	Economic Energy Efficiency(EEE) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E	EO09020125	written	Feb-09	Solar 4 All (S4All) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E	EO08080544	written	Aug-08	Demand Response (DR) / Revenue Requirements & Rate Design - Program Approval
Public Service Electric & Gas Company	E/G	ER10100737	written	Jun-08	Carbon Abatement (CA) / Revenue Requirements & Rate Design - Program Approval

ATTACHMENT 2
Schedule SS-GSMPII-2

PSE&G Gas System Modernization Program II
Weighted Average Cost of Capital (WACC)

		Percent	Embedded Cost	Weighted Cost	Pre-Tax Weighted Cost	Pre-Tax Weighted Cost	After Tax Weighted Cost
Other Capital		48.1848%	4.1439%	1.9967%	1.0000	1.9967%	
Customer Deposits		0.6152%	0.1100%	0.0007%	1.0000	0.0007%	
	Sub-total	48.8000%		1.9974%		1.9974%	1.1815%
Preferred Stock		0.0000%	0.0000%	0.0000%	1.6906	0.0000%	0.0000%
Common Equity		51.2000%	9.7500%	4.9920%	1.6906	8.4396%	4.9920%
	Total	100.0000%		6.99%		10.44%	6.1735%

Federal Income Tax	35.00%
State NJ Business Incm Tax	9.00%
Tax Rate	40.8500%

ATTACHMENT 2

Schedule SS-GSMPII-3

PSE&G Gas System Modernization Program II
Gas Forecasted Annual Roll-in Calculation
in ($000)

	Roll-in Filing	Roll-in 1	Roll-in 2	Roll-in 3	Roll-in 4	Roll-in 5	Roll-in 6	Roll-in 7	Roll-in 8	Final Roll-in
	Rate Effective Date									
	Plant In Service as of Date	2/29/2020	8/31/2020	2/28/2021	8/31/2021	2/28/2022	8/31/2022	2/28/2023	8/31/2023	6/1/2024
	Rate Base Balance as of Date	5/31/2020	11/30/2020	5/31/2021	11/30/2021	5/31/2022	11/30/2022	5/31/2023	11/30/2023	9/30/2024

RATE BASE CALCULATION

		Roll-in 1	Roll-in 2	Roll-in 3	Roll-in 4	Roll-in 5	Roll-in 6	Roll-in 7	Roll-in 8	Final Roll-in	Total	
1	Gross Plant	$362,153	$253,923	$249,533	$254,398	$249,934	$254,227	$250,334	$259,571	$360,093	**$2,494,166**	= ln 16
2	Accumulated Depreciation	$23,062	$17,238	$16,544	$17,271	$16,571	$17,259	$16,599	$17,622	$20,997	**$163,162**	= ln 19
3	Net Plant	$385,215	$271,161	$266,078	$271,669	$266,505	$271,485	$266,933	$277,193	$381,089	**$2,657,328**	= ln 1 + ln 2
4	Accumulated Deferred Taxes	-$51,748	-$10,349	-$13,081	-$10,368	-$13,103	-$10,361	-$13,114	-$10,579	-$18,462	**-$151,166**	= See "Dep-UPCI" Wkps
5	Rate Base	$333,467	$260,813	$252,997	$261,301	$253,401	$261,124	$253,818	$266,614	$362,627	**$2,506,162**	= ln 3 + ln 4
6	Rate of Return - After Tax (Schedule WACC)	6.17%	6.17%	6.17%	6.17%	6.17%	6.17%	6.17%	6.17%	6.17%	**6.17%**	See Schedule SS-GSMPII-2
7	Return Requirement (After Tax)	$20,586	$16,101	$15,619	$16,131	$15,644	$16,120	$15,669	$16,459	$22,387	**$154,717**	= ln 5 * ln 6
8	Depreciation Exp, net	$3,449	$2,418	$2,376	$2,423	$2,380	$2,421	$2,384	$2,472	$3,429	**$23,752**	= ln 25
9	Tax Adjustment	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	N/A
10	Revenue Factor	1.7121	1.7121	1.7121	1.7121	1.7121	1.7121	1.7121	1.7121	1.7121	**1.7121**	
11	**Total Revenue Requirement**	**$41,151**	**$31,707**	**$30,809**	**$31,766**	**$30,859**	**$31,745**	**$30,909**	**$32,412**	**$44,199**	**$305,557**	= (ln 7 + ln 8 + ln 9) * ln 10

SUPPORT

Gross Plant

		Roll-in 1	Roll-in 2	Roll-in 3	Roll-in 4	Roll-in 5	Roll-in 6	Roll-in 7	Roll-in 8	Final Roll-in	Total	
12	Plant in-service	$362,153	$253,923	$249,533	$254,398	$249,934	$254,227	$250,334	$259,571	$360,093	**$2,494,166**	= See "Dep-UPCI" Wkp
13	CWIP Transferred into Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	= See "Dep-UPCI" Wkp
14	AFUDC on CWIP Transferred Into Service - Debt	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	= See "Dep-UPCI" Wkp
15	AFUDC on CWIP Transferred Into Service - Equity	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	= See "Dep-UPCI" Wkp
16	**Total Gross Plant**	**$362,153**	**$253,923**	**$249,533**	**$254,398**	**$249,934**	**$254,227**	**$250,334**	**$259,571**	**$360,093**	**$2,494,166**	= ln 12 + ln 13 + ln 14 + ln 15

Accumulated Depreciation

		Roll-in 1	Roll-in 2	Roll-in 3	Roll-in 4	Roll-in 5	Roll-in 6	Roll-in 7	Roll-in 8	Final Roll-in	Total	
17	Accumulated Depreciation	-$4,197	-$1,874	-$2,238	-$1,878	-$2,242	-$1,876	-$2,243	-$1,916	-$6,107	**-$24,571**	= See "Dep-UPCI" Wkp
18	Cost of Removal	$27,259	$19,112	$18,782	$19,148	$18,812	$19,135	$18,842	$19,538	$27,104	**$187,733**	= See "Dep-UPCI" Wkp
19	**Net Accumulated Depreciation**	**$23,062**	**$17,238**	**$16,544**	**$17,271**	**$16,571**	**$17,259**	**$16,599**	**$17,622**	**$20,997**	**$163,162**	= ln 17 + ln 18

Depreciation Expense (Net of Tax)

		Roll-in 1	Roll-in 2	Roll-in 3	Roll-in 4	Roll-in 5	Roll-in 6	Roll-in 7	Roll-in 8	Final Roll-in	Total	
20	Depreciable Plant (xAFUDC-E)	$362,153	$253,923	$249,533	$254,398	$249,934	$254,227	$250,334	$259,571	$360,093	**$2,494,166**	= ln 12 + ln 13 + ln 14
21	AFUDC-E	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**	= ln 15
22	Depreciation Rate	1.61%	1.61%	1.61%	1.61%	1.61%	1.61%	1.61%	1.61%	1.61%		= See "Dep-UPCI" Wkp
23	Depreciation Expense	$5,830.67	$4,088.16	$4,017.49	$4,095.81	$4,023.94	$4,093.05	$4,030.37	$4,179.10	$5,797.49	**$40,156**	= (ln 20 + ln 21) * ln 22
24	Tax @40.85%	$2,381.83	$1,670.01	$1,641.14	$1,673.14	$1,643.78	$1,672.01	$1,646.41	$1,707.16	$2,368.28	**$16,404**	= ln 20 * ln 22 * Tax Rate
25	Depreciation Expense (Net of Tax)	**$3,448.84**	**$2,418.15**	**$2,376.34**	**$2,422.67**	**$2,380.16**	**$2,421.04**	**$2,383.96**	**$2,471.94**	**$3,429.22**	**$23,752**	= ln 23 - ln 24

Gas Rate Design (Proof of Revenue by Rate Class)

Explanation of Format

The summary provides by rate schedule the Annualized Weather Normalized (all customers assumed to be on BGSS) revenue based on current tariff rates and the proposed initial rate change. The detailed rate design by rate schedule follows the summary page. The pages presented in Schedule SS-GSMPII-4 are the 9 relevant pages from the complete rate change workpapers from the Company's 2009 Gas Base Rate Case and have been appropriately modified per my testimony to reflect this GSMPII roll-in.

Annualized Weather Normalized (all customers assumed to be on BGSS) and the Proposed Detailed Rate Design.

In the detailed rate design pages, all the components are separated into Delivery and Supply. In addition to the Distribution components of Delivery, also included in the schedule are lines for Balancing, Societal Benefits Charge, Realignment Adjustment Charge, Margin Adjustment Charge, Weather Normalization Charge, GPRC Recovery Charge, CIP 1 Capital Adjustment Charges (CAC), Miscellaneous items, and Unbilled Revenue.

Column (1) shows the annualized weather normalized billing units. Column (2) shows present Delivery rates (without Sales and Use Tax, SUT) effective July 10, 2017. The commodity rates in the Column (2) reflect the 2012 class-weighted averages (BGSS-RSG uses the rate as of 5/1/2017). Column (3) presents annualized revenue assuming all customers are provided service under their applicable BGSS provision. Column (4) repeats the billing units of Column (1). Column (5) shows the proposed rates without SUT that result in the proposed revenues shown in Column (6). Columns (7) and (8) show the proposed base rate revenue increase, in thousands of dollars and percent increase, respectively, for each of the billing unit blocks. The proposed tariff charges (with and without SUT) are provided on pages 1 and 2 of Schedule SS-GSMPII-5.

PSE&G Gas System Modernization Program II

GAS PROOF OF REVENUE
SUMMARY
GAS RATE INCREASE
12 Months Ended December 31, 2012
(Therms & Revenue - Thousands, Rate - $/Therm)

Annualized

	Rate Schedule		Weather Normalized Therms	Weather Normalized Revenue	Proposed with GSMP Roll-in Therms	Proposed with GSMP Roll-in Revenue	Increase Revenue	Increase Percent
			(1)	(2)	(3)	(4)	(5)	(6)
1	RSG		1,381,959	$1,133,912	1,381,959	$1,163,342	$29,430	2.60
2	GSG		263,897	251,967	263,897	256,656	$4,689	1.86
3	LVG		641,990	503,108	641,990	509,733	$6,625	1.32
6	SLG		682.345	688.566	682.345	709.680	$21.114	3.07
7		Subtotal	2,288,528	1,889,676	2,288,528	1,930,441	$40,765	2.16
8								
9	TSG-F		28,062	16,295.181	28,062	16,486.181	$191.000	1.17
10	TSG-NF		864,596	154,739	864,596	155,689	$950	0.61
11	CIG		58,147	26,041	58,147	26,241	$200	0.77
12		Subtotal	950,805	197,075	950,805	198,416	$1,341	0.68
13								
14		Totals	3,239,333	$2,086,751	3,239,333	$2,128,857	$42,106	2.02

Less change in MAC included above	$955	
Gas Revenue Requirement	$41,151	proposed roll-in

		Increase Before Mac Adjustment	Increase Above	MAC Adjustment
RSG		$28,859	$29,430	$571
GSG		4,581	4,689	108
LVG		6,359	6,625	266
SLG		20.835	21.114	0.279
	Subtotal	$39,820	$40,765	$945
TSG-F		$179.719	$191.000	$11.281
TSG-NF		950	950	0
CIG		200	200	0
	Subtotal	$1,330	$1,341	$11
	Totals	$41,150	$42,106	$957

Notes: All customers assumed to be on BGSS.
SLG units and revenues shown to 3 decimals.
TSG-F revenues shown to 3 decimals.
Annualized Weather Normalized Revenue reflects Delivery rates in effect 7/10/2017
plus applicable BGSS charges.

PSE&G Gas System Modernization Program II

RATE SCHEDULE RSG
RESIDENTIAL SERVICE
12 Months Ended December 31, 2012
(Therms & Revenue - Thousands, Rate - $/Therm)

Annualized

		Weather Normalized			Proposed with GSMP Roll-in			Increase	
		Units	Rate	Revenue	Units	Rate	Revenue	Revenue	Percent
	Delivery	(1)	(2)	(3=1*2)	(4)	(5)	(6=4*5)	(7=6-3)	(8=7/3)
1	Service Charge	19,018.784	5.46	$103,843	19,018.784	5.46	$103,843	$0	0.00
2	Distribution Charge	1,381,894	0.307818	425,372	1,381,894	0.329144	454,842	29,470	6.93
3	Off-Peak Dist	65	0.153909	10	65	0.164572	11	1	10.00
4	Balancing Charge	840,052	0.084457	70,948	840,052	0.084457	70,948	0	0.00
5	SBC	1,381,959	0.045695	63,149	1,381,959	0.045695	63,149	0	0.00
6	Realignment Adjustment	1,381,959	0.000000	0	1,381,959	0.000000	0	0	0.00
7	Margin Adjustment	1,381,959	-0.006338	-8,759	1,381,959	(0.006338)	(8,759)	0	0.00
8	Weather Normalization	840,052	0.022795	19,149	840,052	0.022795	19,149	0	0.00
9	GPRC	1,381,959	0.004661	6,441	1,381,959	0.004661	6,441	0	0.00
10	Capital Adjustment Charges (CIP I)								
11	Service Charge	19,018.784	0.00	0	19,018.784	0.00	0	0	0.00
12	Distribution Charge	1,381,894	0.000000	0	1,381,894	0.000000	0	0	0.00
13	Off-Peak Use	65	0.000000	0.000	65	0.000000	0.000	0	0.00
14	Margin Adjustment Charge	1,381,959	0.000000	0	1,381,959	0.000000	0	0	0.00
15									
16	Facilities Charges			0			0	0	0.00
17	Minimum			0			0	0	0.00
18	Miscellaneous			189			189	0	0.00
19	Delivery Subtotal	1,381,959		680,342	1,381,959		709,813	$29,471	4.33
20	Unbilled Delivery			5,774			6,023	249	4.31
21	Delivery Subtotal w unbilled			686,116			715,836	$29,720	4.33
22									
23	**Supply**								
24	BGSS-RSG	1,381,959	0.320017	$442,251	1,381,959	0.320017	$442,251	$0	0.00
25	Emergency Sales Service	0	0.000000	0	0	0.000000	0	0	0.00
26	BGSS Contrib. from TSG-F, TSG-NF & CIG	0	0.000000	0	1,381,959	(0.000207)	(286)	(286)	0.00
27	Off-Peak Comm. Charge	62	0.305228	19	62	0.305228	19	0	0.00
28	Capital Adjustment Charges	1,381,959	0.000000	0	1,381,959	0.000000	0	0	0.00
29	Miscellaneous			(22)			(22)	0	0.00
30	Supply subtotal	1,382,021		$442,248	1,382,021		$441,962	($286)	(0.06)
31	Unbilled Supply			5,548			5,544	(4)	(0.07)
32	Supply Subtotal w unbilled			$447,796			$447,506	($290)	(0.06)
33									
34	Total Delivery + Supply	1,381,959		$1,133,912	1,381,959		$1,163,342	$29,430	2.60
35									
36									
37									

38 Notes:
39 All customers assumed to be on BGSS.
40 Annualized Weather Normalized Revenue reflects Delivery rates in effect 7/10/2017
41 plus applicable BGSS charges.
42

PSE&G Gas System Modernization Program II

RATE SCHEDULE GSG
GENERAL SERVICE
12 Months Ended December 31, 2012
(Therms & Revenue - Thousands, Rate - $/Therm)

Annualized

		Weather Normalized			Proposed with GSMP Roll-in			Increase	
		Units	Rate	Revenue	Units	Rate	Revenue	Revenue	Percent
	Delivery	(1)	(2)	(3=1*2)	(4)	(5)	(6=4*5)	(7=6-3)	(8=7/3)
1	Service Charge	1,683.715	11.59	$19,514	1,683.715	12.56	$21,147	$1,633	8.37
2	Distribution Charge - Pre 7/14/97	2,367	0.251844	596	2,367	0.263528	624	28	4.70
3	Distribution Charge - All Others	261,497	0.251844	65,856	261,497	0.263528	68,912	3,056	4.64
4	Off-Peak Dist Charge - Pre 7/14/97	0	0.125922	0	0	0.131764	0	0	0.00
5	Off-Peak Dist Charge - All Others	33	0.125922	4	33	0.131764	4	0	0.00
6	Balancing Charge	160,049	0.084457	13,517	160,049	0.084457	13,517	0	0.00
7	SBC	263,897	0.045695	12,059	263,897	0.045695	12,059	0	0.00
8	Realignment Adjustment	263,897	0.000000	0	263,897	0.000000	0	0	0.00
9	Margin Adjustment	263,897	-0.006338	-1,673	263,897	(0.006338)	(1,673)	0	0.00
10	Weather Normalization	160,049	0.022795	3,648	160,049	0.022795	3,648	0	0.00
11	GPRC	263,897	0.004661	1,230	263,897	0.004661	1230	0	0.00
12	Capital Adjustment Charges (CIP I)								
13	Service Charge	1,683.715	0.00	0	1,683.715	0.00	0	0	0.00
14	Distribution Charge - Pre July 14, 1997	2,367	0.000000	0	2,367	0.000000	0	0	0.00
15	Distribution Charge - All Others	261,497	0.000000	0	261,497	0.000000	0	0	0.00
16	Off-Peak Use Dist Charge - Pre July 14, 1997	0	0.000000	0	0	0.000000	0	0	0.00
17	Off-Peak Use Dist Charge - All Others	33	0.000000	0	33	0.000000	0	0	0.00
18	Margin Adjustment Charge	263,897	0.000000	0	263,897	0.000000	0	0	0.00
19									
20	Facilities Charges			0			0	0	0.00
21	Minimum			6			6	0	0.00
22	Miscellaneous			(1,275)			(1,275)	0	0.00
23	Delivery Subtotal	263,897		$113,482	263,897		$118,199	$4,717	4.16
24	Unbilled Delivery			68			70	2	2.94
25	Delivery Subtotal w unbilled			$113,550			$118,269	$4,719	4.16
26									
27	**Supply**								
28	BGSS	263,897	0.526198	$138,862	263,897	0.526198	$138,862	$0	0.00
29	Emergency Sales Service	0	0.000000	0	0	0.000000	0	0	0.00
30	BGSS Contrib. from TSG-F, TSG-NF & CIG	0	0.000000	0	263,897	(0.000115)	(30)	(30)	0
31	Capital Adjustment Charges	263,897	0.000000	0	263,897	0.000000	0	0	0
32	Miscellaneous			(1,705)			(1,705)	0	0.00
33	Supply subtotal	263,897		$137,157	263,897		$137,127	(30)	(0.02)
34	Unbilled Supply			1,260			1,260	0	0.00
35	Supply Subtotal w unbilled			$138,417			$138,387	(30)	(0.02)
36									
37	Total Delivery + Supply	263,897		$251,967	263,897		$256,656	$4,689	1.86
38									
39									
40									
41	Notes:								
42	All customers assumed to be on BGSS.								
43	Annualized Weather Normalized Revenue reflects Delivery rates in effect 7/10/2017								
44	plus applicable BGSS charges.								
45									

ATTACHMENT 2

PSE&G Gas System Modernization Program II

RATE SCHEDULE LVG
LARGE VOLUME SERVICE
12 Months Ended December 31, 2012
(Therms & Revenue - Thousands, Rate - $/Therm)

Annualized

		Weather Normalized			Proposed with GSMP Roll-in			Increase	
		Units	**Rate**	**Revenue**	**Units**	**Rate**	**Revenue**	**Revenue**	**Percent**
	Delivery	(1)	(2)	(3=1*2)	(4)	(5)	(6=4*5)	(7=6-3)	(8=7/3)
1	Service Charge	221.074	100.12	$22,134	221.074	100.12	$22,134	$0	0.00
2	Demand Charge	17,876	3.8295	68,456	17,876	4.0972	73,242	4,786	6.99
3	Distribution Charge 0-1,000 pre 7/14/97	10,437	0.044153	461	10,437	0.049467	516	55	11.93
4	Distribution Charge over 1,000 pre 7/14/97	57,522	0.039804	2,290	57,522	0.041913	2,411	121	5.28
5	Distribution Charge 0-1,000 post 7/14/97	138,521	0.044153	6,116	138,521	0.049467	6,852	736	12.03
6	Distribution Charge over 1,000 post 7/14/97	435,510	0.039804	17,335	435,510	0.041913	18,254	919	5.30
7	Balancing Charge	321,889	0.084457	27,186	321,889	0.084457	27,186	0	0.00
8	SBC	641,990	0.045695	29,336	641,990	0.045695	29,336	0	0.00
9	Realignment Adjustment	641,990	0.000000	0	641,990	0.000000	0	0	0.00
10	Margin Adjustment	641,990	(0.006338)	-4,069	641,990	(0.006338)	(4069)	0	0.00
11	Weather Normalization	321,889	0.022795	7,337	321,889	0.022795	7,337	0	0.00
12	GPRC	641,990	0.004661	2,992	641,990	0.004661	2,992	0	0.00
13	Capital Adjustment Charges (CIP I)								
14	Service Charge	221.074	0.00	0	221.074	0.00	0	0	0.00
15	Demand Charge	17,876	0.0000	0	17,876	0.0000	0	0	0.00
16	Distribution Charge 0-1,000 pre July 14, 1997	10,437	0.000000	0	10,437	0.000000	0	0	0.00
17	Distribution Charge over 1,000 pre July 14, 1997	57,522	0.000000	0	57,522	0.000000	0	0	0.00
18	Distribution Charge 0-1,000 post July 14, 1997	138,521	0.000000	0	138,521	0.000000	0	0	0.00
19	Distribution Charge over 1,000 post July 14, 1997	435,510	0.000000	0	435,510	0.000000	0	0	0.00
20	Margin Adjustment Charge	641,990	0.000000	0	641,990	0.000000	0	0	0.00
21									
22	Facilities Charges			0			0	0	0.00
23	Minimum			227			227	0	0.00
24	Miscellaneous			(764)			(764)	0	0.00
25	Delivery Subtotal	641,990		179,037	641,990		185,654	$6,617	3.70
26	Unbilled Delivery			2,100			2,178	78	3.71
27	Delivery Subtotal w unbilled			$181,137			$187,832	$6,695	3.70
28									
29									
30	**Supply**								
31	BGSS	641,990	0.523527	$336,099	641,990	0.523527	$336,099	$0	0.00
32	Emergency Sales Service	0	0.000000	0	0	0.000000	0	0	0.00
33	BGSS Contrib. from TSG-F, TSG-NF & CIG	0	0.000000	0	641,990	(0.000115)	(74)	(74)	0.00
34	Capital Adjustment Charges	641,990	0.000000	0	641,990	0.000000	0	0	0.00
35	Miscellaneous			2,184			2,184	0	0.00
36	Supply Subtotal	641,990		$338,283	641,990		$338,209	(74)	(0.02)
37	Unbilled Supply			(16,312)			(16,308)	4	(0.02)
38	Supply Subtotal w unbilled			$321,971			$321,901	(70)	(0.02)
39									
40	Total Delivery + Supply	641,990		$503,108	641,990		$509,733	$6,625	1.32
41									
42									
43									

44 Notes:
45 All customers assumed to be on BGSS.
46 Annualized Weather Normalized Revenue reflects Delivery rates in effect 7/10/2017
47 plus applicable BGSS charges.
48

PSE&G Gas System Modernization Program II

RATE SCHEDULE SLG
STREET LIGHTING SERVICE
12 Months Ended December 31, 2012
(Therms & Revenue - Thousands, Rate - $/Therm)

Annualized

		Weather Normalized			Proposed with GSMP Roll-in			Increase	
		Units	**Rate**	**Revenue**	**Units**	**Rate**	**Revenue**	**Revenue**	**Percent**
	Delivery	(1)	(2)	(3=1*2)	(4)	(5)	(6=4*5)	(7=6-3)	(8=7/3)
1	Single	10.392	9.6316	$100.092	10.392	9.6316	$100.092	$0.000	0.00
2	Double Inverted	0.108	9.4856	1.024	0.108	9.4856	1.024	0.000	0.00
3	Double Upright	0.588	8.3906	4.934	0.588	8.3906	4.934	0.000	0.00
4	Triple prior to 1/1/93	18.156	9.4856	172.221	18.156	9.4856	172.221	0.000	0.00
5	Triple on and after 1/1/93	0.432	61.9958	26.782	0.432	61.9958	26.782	0.000	0.00
6	Distribution Therm Charge	682.345	0.094750	64.652	682.345	0.125807	85.844	21.192	32.78
7									
8	SBC	682.345	0.045695	31.180	682.345	0.045695	31.180	0.000	0.00
9	Realignment Adjustment	682.345	0.000000	0.000	682.345	0.000000	0.000	0.000	0.00
10	Margin Adjustment	682.345	(0.006338)	(4.325)	682.345	(0.006338)	(4.325)	0.000	0.00
11									
12	GPRC	682.345	0.004661	3.180	682.345	0.004661	3.180	0.000	0.00
13	Capital Adjustment Charges (CIP I)								
14	Single-Mantle Lamp	10.392	0.0000	0.000	10.392	0.0000	0.000	0.000	0.00
15	Double-Mantle Lamp, inverted	0.108	0.0000	0.000	0.108	0.0000	0.000	0.000	0.00
16	Double Mantle Lamp, upright	0.588	0.0000	0.000	0.588	0.0000	0.000	0.000	0.00
17	Triple-Mantle Lamp, prior to January 1, 19933	18.156	0.0000	0.000	18.156	0.000000	0	0	0.00
18	Triple-Mantle Lamp, on and after January 1, 1993	0.432	0.0000	0.000	0.432	0.0000	0.000	0.000	0.00
19	Distribution Therm Charge	682.345	0.000000	0.000	682.345	0.000000	0.000	0.000	0.00
20	Margin Adjustment Charge	682.345	0.000000	0.000	682.345	0.000000	0.000	0.000	0.00
21									
22	Facilities Charges			0.000			0.000	0.000	0.00
23	Minimum			0.000			0.000	0.000	0.00
24	Miscellaneous			15.746			15.746	0.000	0.00
25	Delivery Subtotal	682.345		$415.486	682.345		$436.678	$21.192	5.10
26	Unbilled Delivery			0.000			0.000	0.000	0.00
27	Delivery Subtotal w unbilled			$415.486			$436.678	$21.192	5.10
28									
29	**Supply**								
30	BGSS	682.063	0.511642	$348.972	682.063	0.511642	$348.972	$0.000	0.00
31	Emergency Sales Service	0.000	0.000000	0.000	0.000	0.000000	0.000	0.000	0.00
32	BGSS Contrib. from TSG-F, TSG-NF & CIG	0.000	0.000000	0.000	682.345	(0.000115)	(0.078)	(0.078)	0.00
33	Capital Adjustment Charges	682.345	0.000000	0.000	682.345	0.000000	0.000	0.000	0.00
34	Miscellaneous			(75.892)			(75.892)	0.000	0.00
35	Supply Subtotal	682.063		$273.080	682.063		$273.002	($0.078)	(0.03)
36	Unbilled Supply			0.000			0.000	0.000	0.00
37	Supply Subtotal w unbilled			$273.080			$273.002	($0.078)	(0.03)
38									
39	Total Delivery + Supply	682.345		$688.566	682.345		$709.680	$21.114	3.07
40									
41									
42									

43 Notes:
44 All customers assumed to be on BGSS.
45 SLG units and revenues shown to 3 decimals.
46 Annualized Weather Normalized Revenue reflects Delivery rates in effect 7/10/2017
47 plus applicable BGSS charges.
48

PSE&G Gas System Modernization Program II

RATE SCHEDULE TSG-F
FIRM TRANSPORTATION GAS SERVICE
12 Months Ended December 31, 2012
(Therms & Revenue - Thousands, Rate - $/Therm)

Annualized

		Weather Normalized			Proposed with GSMP Roll-in			Increase	
		Units	**Rate**	**Revenue**	**Units**	**Rate**	**Revenue**	**Revenue**	**Percent**
	Delivery	(1)	(2)	(3=1*2)	(4)	(5)	(6=4*5)	(7=6-3)	(8=7/3)
1	Service Charge	0.622	550.09	$342.156	0.622	596.18	$370.824	$28.668	8.38
2	Demand Charge	575	1.8880	1,085.600	575	1.9911	1,144.883	59.283	5.46
3	Demand Charge, Agreements	16	1.6563	26.501	16	1.6563	26.501	0.000	0.00
4	Distribution Charge	27,094	0.072167	1,955.293	27,094	0.076109	2,062.097	106.804	5.46
5	Distribution Charge, Agreements	968	0.031380	30.376	968	0.031380	30.376	0.000	0.00
6	SBC	27,094	0.045695	1,238.060	27,094	0.045695	1,238.060	0.000	0.00
7	SBC, Agreements	968	0.050438	48.824	968	0.050438	48.824	0.000	0.00
8	Margin Adjustment	27,094	(0.006338)	(171.722)	27,094	(0.006338)	(171.722)	0.000	0.00
9	Margin Adjustment, Agreements	968	(0.006338)	(6.135)	968	(0.006338)	(6.135)	0.000	0.00
10									
11	GPRC	27,094	0.004661	126.285	27,094	0.004661	126	0	0.00
12	GPRC, Agreements	968	0.003908	3.783	968	0.003908	3.783	0.000	0.00
13	Capital Adjustment Charges (CIP I)								
14	Service Charge	0.622	0.00	0.000	0.622	0.00	0.000	0.000	0.00
15	Demand Charge	575	0.0000	0.000	575	0.0000	0.000	0.000	0.00
16	Demand Charge, Agreements	16	0.0000	0.000	16	0.0000	0.000	0.000	0.00
17	Distribution Charge	27,094	0.000000	0.000	27,094	0.000000	0.000	0.000	0.00
18	Distribution Charge, Agreements	968	0.000000	0.000	968	0.000000	0.000	0.000	0.00
19	Margin Adjustment Charge	27,094	0.000000	0.000	27,094	0.000000	0.000	0.000	0.00
20	Margin Adjustment Charge, Agreements	968	0.000000	0.000	968	0.000000	0.000	0.000	0.00
21									
22	Facilities Charges			0.000			0.000	0.000	0.00
23	Minimum			0.000			0.000	0.000	0.00
24	Miscellaneous			(20.523)			(20.492)	0.031	-0.15
25	Delivery Subtotal	28,062		4,658.498	28,062		4,853.284	$194.786	4.18
26	Unbilled Delivery			(90.542)			(94.328)	(3.786)	4.18
27	Delivery Subtotal w unbilled			$4,567.956			$4,758.956	$191.000	4.18
28									
29	**Supply**								
30	Commodity Charge, BGSS-F	27,094	0.515243	$13,960.000	27,094	0.515243	$13,960.000	$0.000	0.00
31	Emergency Sales Service	0	0.000000	0.000	0	0.000000	0.000	0.000	0.00
32	Miscellaneous			0.000			0.000	0.000	0.00
33	Supply Subtotal	27,094		$13,960.000	27,094		$13,960.000	$0.000	0.00
34	Unbilled Supply			(2,232.775)			(2,232.775)	0.000	0.00
35	Supply Subtotal w unbilled			$11,727.225			$11,727.225	$0.000	0.00
36									
37	Total Delivery + Supply	28,062		$16,295.181	28,062		$16,486.181	$191.000	1.17
38									
39									
40									

41 Notes:
42 All customers assumed to be on BGSS.
43 TSG-F revenues shown to 3 decimals.
44 Annualized Weather Normalized Revenue reflects Delivery rates in effect 7/10/2017
45 plus applicable BGSS charges.
46

PSE&G Gas System Modernization Program II

RATE SCHEDULE TSG-NF
NON-FIRM TRANSPORTATION GAS SERVICE
12 Months Ended December 31, 2012
(Therms & Revenue - Thousands, Rate - $/Therm)

Annualized

		Weather Normalized			Proposed with GSMP Roll-in			Increase	
		Units	Rate	Revenue	Units	Rate	Revenue	Revenue	Percent
	Delivery	(1)	(2)	(3=1*2)	(4)	(5)	(6=4*5)	(7=6-3)	(8=7/3)
1	Service Charge	2.703	550.09	$1,487	2.703	596.18	$1,611	$124	8.34
2	Dist Charge 0-50,000	99,166	0.071949	7,135	99,166	0.075549	7,492	357	5.00
3	Dist Charge 0-50,000, Agreements	26,064	0.017035	444	26,064	0.017035	444	0	0.00
4	Dist Charge over 50,000	136,943	0.071949	9,853	136,943	0.075549	10,346	493	5.00
5	Dist Charge over 50,000, Agreements	602,423	0.017061	10,278	602,423	0.017061	10,278	0	0.00
6	SBC	236,109	0.045695	10,789	236,109	0.045695	10,789	0	0.00
7	SBC, Agreements	628,487	0.005338	3,355	628,487	0.005338	3,355	0	0.00
8									
9	GPRC	236,109	0.004661	1,101	236,109	0.004661	1,101	0	0.00
10	GPRC, Agreements	628,487	0.000430	270	628,487	0.000430	270	0	0.00
11	Capital Adjustment Charges (CIP I)								
12	Service Charge	2.703	0.00	0	2.703	0.00	0	0	0.00
13	Distribution Charge 0-50,000	99,166	0.000000	0	99,166	0.000000	0	0	0.00
14	Distribution Charge 0-50,000, Agreements	26,064	0.000000	0	26,064	0.000000	0	0	0.00
15	Distribution Charge over 50,000	136,943	0.000000	0	136,943	0.000000	0	0	0.00
16	Distribution Charge over 50,000, Agreements	602,423	0.000000	0	602,423	0.000000	0	0	0.00
17									
18	Facilities Charges			936			936	0	0.00
19	Minimum			0			0	0	0.00
20	Miscellaneous			(970)			(970)	0	0.00
21	Delivery Subtotal	864,596		$44,678	864,596		$45,652	$974	2.18
22	Unbilled Delivery			(1,089)			(1,113)	(24)	2.20
23	Delivery Subtotal w unbilled			$43,589			$44,539	$950	2.18
24									
25	**Supply**								
26	Commodity Charge, BGSS-I	236,109	0.482582	$113,942	236,109	0.482582	$113,942	$0	0.00
27	Emergency Sales Service	0	0.000000	0	0	0.000000	0	0	0.00
28	Pilot Use	0	1.89	0	0	1.89	0	0	0.00
29	Penalty Use	0	0.000000	0	0	0.000000	0	0	0.00
30	Miscellaneous			160			160	0	0.00
31	Supply Subtotal	236,109		$114,102	236,109		$114,102	$0	0.00
32	Unbilled Supply			(2,952)			(2,952)	0	0.00
33	Supply Subtotal w unbilled			$111,150			$111,150	$0	0.00
34									
35	Total Delivery + Supply	864,596		$154,739	864,596		$155,689	$950	0.61
36									
37									
38									
39	Notes:								
40	All customers assumed to be on BGSS.								
41	Annualized Weather Normalized Revenue reflects Delivery rates in effect 7/10/2017								
42	plus applicable BGSS charges.								
43									

PSE&G Gas System Modernization Program II

RATE SCHEDULE CIG
COGENERATION INTERRUPTIBLE SERVICE
12 Months Ended December 31, 2012
(Therms & Revenue - Thousands, Rate - $/Therm)

Annualized

		Weather Normalized			Proposed with GSMP Roll-in			Increase	
		Units	**Rate**	**Revenue**	**Units**	**Rate**	**Revenue**	**Revenue**	**Percent**
	Delivery	(1)	(2)	(3=1*2)	(4)	(5)	(6=4*5)	(7=6-3)	(8=7/3)
1	Service Charge	0.240	142.09	$34	0.240	150.03	$36	$2	5.88
2	Margin 0-600,000	52,881	0.064359	3,403	52,881	0.067838	3,587	184	5.41
3	Margin over 600,000	5,266	0.052810	278	5,266	0.055665	293	15	5.40
4	Extended Gas Service	0	0.150000	0	0	0.150000	0	0	0.00
5	SBC	58,147	0.045695	2,657	58,147	0.045695	2,657	0	0.00
6									
7	GPRC Recovery Charge	58,147	0.004661	271	58,147	0.004661	271	0	0.00
8	Capital Adjustment Charges (CIP I)								
9	Service Charge	0.240	0.00	0	0.240	0.00	0	0	0.00
10	Distribution Charge 0-600,000	52,881	0.000000	0	52,881	0.000000	0	0	0.00
11	Distribution Charge over 600,000	5,266	0.000000	0	5,266	0.000000	0	0	0.00
12	Extended Gas Service, Special Delivery Charge	0	0.000000	0	0	0.000000	0	0	0.00
13									
14	Facilities Charges			0			0	0	0.00
15	Minimum			0			0	0	0.00
16	Miscellaneous			0			0	0	0.00
17	Delivery Subtotal	58,147		$6,643	58,147		$6,844	$201	3.03
18	Unbilled Delivery			(28)			(29)	-1	3.57
19	Delivery Subtotal w unbilled			$6,615			$6,815	$200	3.02
20									
21	**Supply**								
22	Commodity Component	58,147	0.331677	$19,286	58,147	0.331677	$19,286	$0	0.00
23	Pilot Use	0	1.89	0	0	1.89	0	0	0.00
24	Penalty Use	0		0	0		0	0	0.00
25	Extended Gas Service	0		0	0		0	0	0.00
26	Miscellaneous			0			0	0	0.00
27	Supply Subtotal	58,147		$19,286	58,147		$19,286	$0	0.00
28	Unbilled Supply			140			140	0	0.00
29	Supply Subtotal w unbilled			$19,426			$19,426	$0	0.00
30									
31	Total Delivery + Supply	58,147		$26,041	58,147		$26,241	$200	0.77
32									
33									
34									

35 Notes:
36 All customers assumed to be on BGSS.
37 Annualized Weather Normalized Revenue reflects Delivery rates in effect 7/10/2017
38 plus applicable BGSS charges.
39

PSE&G Gas System Modernization Program II
Gas Annual Tariff Rate Summary

		Present		6/1/2020		12/1/2020		6/1/2021		12/1/2021	
Rate Schedule		Charge w/o SUT	Charge Including SUT	Charge w/o SUT	Charge Including SUT	Charge w/o SUT	Charge Including SUT	Charge w/o SUT	Charge Including SUT	Charge w/o SUT	Charge Including SUT
RSG	Service Charge	$5.46	$5.84	$5.46	$5.84	$5.46	$5.84	$5.46	$5.84	$5.46	$5.84
	Distribution Charges	$0.307818	$0.328980	$0.329144	$0.351773	$0.345573	$0.369331	$0.361535	$0.386391	$0.377991	$0.403978
	Balancing Charge	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263
	Off-Peak Use	$0.153909	$0.164490	$0.164572	$0.175886	$0.172787	$0.184666	$0.180768	$0.193196	$0.188996	$0.201989
GSG	Service Charge	$11.59	$12.39	$12.56	$13.42	$13.33	$14.25	$14.09	$15.06	$14.89	$15.91
	Distribution Charge - Pre July 14, 1997	$0.251844	$0.269158	$0.263528	$0.281646	$0.272380	$0.291106	$0.280903	$0.300215	$0.289589	$0.309498
	Distribution Charge - All Others	$0.251844	$0.269158	$0.263528	$0.281646	$0.272380	$0.291106	$0.280903	$0.300215	$0.289589	$0.309498
	Balancing Charge	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263
	Off-Peak Use Dist Charge - Pre July 14, 1997	$0.125922	$0.134579	$0.131764	$0.140823	$0.136190	$0.145553	$0.140452	$0.150108	$0.144795	$0.154750
	Off-Peak Use Dist Charge - All Others	$0.125922	$0.134579	$0.131764	$0.140823	$0.136190	$0.145553	$0.140452	$0.150108	$0.144795	$0.154750
LVG	Service Charge	$100.12	$107.00	$100.12	$107.00	$100.12	$107.00	$100.12	$107.00	$100.12	$107.00
	Demand Charge	$3.8295	$4.0928	$4.0972	$4.3789	$4.3036	$4.5995	$4.5043	$4.8140	$4.7114	$5.0353
	Distribution Charge 0-1,000 pre July 14, 1997	$0.044153	$0.047189	$0.049467	$0.052868	$0.053327	$0.056993	$0.056932	$0.060846	$0.060484	$0.064642
	Distribution Charge over 1,000 pre July 14, 1997	$0.039804	$0.042541	$0.041913	$0.044795	$0.043611	$0.046609	$0.045306	$0.048421	$0.047105	$0.050343
	Distribution Charge 0-1,000 post July 14, 1997	$0.044153	$0.047189	$0.049467	$0.052868	$0.053327	$0.056993	$0.056932	$0.060846	$0.060484	$0.064642
	Distribution Charge over 1,000 post July 14, 1997	$0.039804	$0.042541	$0.041913	$0.044795	$0.043611	$0.046609	$0.045306	$0.048421	$0.047105	$0.050343
	Balancing Charge	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263
SLG	Single-Mantle Lamp	$9.6316	$10.2938	$9.6316	$10.2938	$9.6316	$10.2938	$9.6316	$10.2938	$9.6316	$10.2938
	Double-Mantle Lamp, inverted	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377
	Double Mantle Lamp, upright	$8.3906	$8.9675	$8.3906	$8.9675	$8.3906	$8.9675	$8.3906	$8.9675	$8.3906	$8.9675
	Triple-Mantle Lamp, prior to January 1, 19933	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377
	Triple-Mantle Lamp, on and after January 1, 1993	$61.9958	$66.2580	$61.9958	$66.2580	$61.9958	$66.2580	$61.9958	$66.2580	$61.9958	$66.2580
	Distribution Therm Charge	$0.094750	$0.101264	$0.125807	$0.134456	$0.149720	$0.160013	$0.172942	$0.184832	$0.196873	$0.210408
TSG-F	Service Charge	$550.09	$587.91	$596.18	$637.17	$632.64	$676.13	$668.76	$714.74	$706.68	$755.26
	Demand Charge	$1.8880	$2.0178	$1.9911	$2.1280	$2.0707	$2.2131	$2.1473	$2.2949	$2.2264	$2.3795
	Distribution Charges	$0.072167	$0.077128	$0.076109	$0.081341	$0.079153	$0.084595	$0.082081	$0.087724	$0.085103	$0.090954
TSG-NF	Service Charge	$550.09	$587.91	$596.18	$637.17	$632.64	$676.13	$668.76	$714.74	$706.68	$755.26
	Distribution Charge 0-50,000	$0.071949	$0.076895	$0.075549	$0.080743	$0.078298	$0.083681	$0.080958	$0.086524	$0.083690	$0.089444
	Distribution Charge over 50,000	$0.071949	$0.076895	$0.075549	$0.080743	$0.078298	$0.083681	$0.080958	$0.086524	$0.083690	$0.089444
	Special Provision (d)	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02
CIG	Service Charge	$142.09	$151.86	$150.03	$160.34	$156.15	$166.89	$162.09	$173.23	$168.22	$179.79
	Distribution Charge 0-600,000	$0.064359	$0.068784	$0.067838	$0.072502	$0.070531	$0.075380	$0.073118	$0.078145	$0.075810	$0.081022
	Distribution Charge over 600,000	$0.052810	$0.056441	$0.055665	$0.059492	$0.057874	$0.061853	$0.059997	$0.064122	$0.062206	$0.066483
	Special Provision (c) 1st para	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02
BGSS RSG	Commodity Charge including Losses	$0.317575	$0.339408	$0.317367	$0.339186	$0.317206	$0.339014	$0.317050	$0.338847	$0.316890	$0.338676
CSG	Service Charge	$ 550.09	$ 587.91	$ 596.18	$ 637.17	$ 632.64	$ 676.13	$ 668.76	$ 714.74	$ 706.68	$ 755.26

ATTACHMENT 2

PSE&G Gas System Modernization Program II
Gas Annual Tariff Rate Summary

		6/1/2022		12/1/2022		6/1/2023		12/1/2023		10/1/2024	
Rate Schedule		Charge w/o SUT	Charge Including SUT	Charge w/o SUT	Charge Including SUT	Charge w/o SUT	Charge Including SUT	Charge w/o SUT	Charge Including SUT	Charge w/o SUT	Charge Including SUT
RSG	Service Charge	$5.46	$5.84	$5.46	$5.84	$5.46	$5.84	$5.46	$5.84	$5.46	$5.84
	Distribution Charges	$0.393975	$0.421061	$0.410416	$0.438632	$0.426427	$0.455744	$0.443217	$0.473688	$0.466110	$0.498155
	Balancing Charge	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263
	Off-Peak Use	$0.196988	$0.210531	$0.205209	$0.219317	$0.213215	$0.227874	$0.221610	$0.236846	$0.233056	$0.249079
GSG	Service Charge	$15.68	$16.76	$16.51	$17.65	$17.33	$18.52	$18.20	$19.45	$19.41	$20.74
	Distribution Charge - Pre July 14, 1997	$0.297941	$0.318424	$0.306426	$0.327493	$0.314612	$0.336242	$0.323131	$0.345346	$0.334598	$0.357602
	Distribution Charge - All Others	$0.297941	$0.318424	$0.306426	$0.327493	$0.314612	$0.336242	$0.323131	$0.345346	$0.334598	$0.357602
	Balancing Charge	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263
	Off-Peak Use Dist Charge - Pre July 14, 1997	$0.148971	$0.159213	$0.153213	$0.163746	$0.157306	$0.168121	$0.161566	$0.172674	$0.167299	$0.178801
	Off-Peak Use Dist Charge - All Others	$0.148971	$0.159213	$0.153213	$0.163746	$0.157306	$0.168121	$0.161566	$0.172674	$0.167299	$0.178801
LVG	Service Charge	$100.12	$107.00	$100.12	$107.00	$100.12	$107.00	$100.12	$107.00	$100.12	$107.00
	Demand Charge	$4.9127	$5.2504	$5.1199	$5.4719	$5.3218	$5.6877	$5.5337	$5.9141	$5.8228	$6.2231
	Distribution Charge 0-1,000 pre July 14, 1997	$0.063809	$0.068196	$0.067059	$0.071669	$0.070083	$0.074901	$0.073165	$0.078195	$0.077113	$0.082415
	Distribution Charge over 1,000 pre July 14, 1997	$0.048897	$0.052259	$0.050790	$0.054282	$0.052681	$0.056303	$0.054684	$0.058444	$0.057503	$0.061456
	Distribution Charge 0-1,000 post July 14, 1997	$0.063809	$0.068196	$0.067059	$0.071669	$0.070083	$0.074901	$0.073165	$0.078195	$0.077113	$0.082415
	Distribution Charge over 1,000 post July 14, 1997	$0.048897	$0.052259	$0.050790	$0.054282	$0.052681	$0.056303	$0.054684	$0.058444	$0.057503	$0.061456
	Balancing Charge	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263	$0.084457	$0.090263
SLG	Single-Mantle Lamp	$9.6316	$10.2938	$9.6316	$10.2938	$9.6316	$10.2938	$9.6316	$10.2938	$9.6316	$10.2938
	Double-Mantle Lamp, inverted	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377
	Double Mantle Lamp, upright	$8.3906	$8.9675	$8.3906	$8.9675	$8.3906	$8.9675	$8.3906	$8.9675	$8.3906	$8.9675
	Triple-Mantle Lamp, prior to January 1, 19933	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377	$9.4856	$10.1377
	Triple-Mantle Lamp, on and after January 1, 1993	$61.9958	$66.2580	$61.9958	$66.2580	$61.9958	$66.2580	$61.9958	$66.2580	$61.9958	$66.2580
	Distribution Therm Charge	$0.220106	$0.235238	$0.243995	$0.260770	$0.252199	$0.269538	$0.260806	$0.278736	$0.272550	$0.291288
TSG-F	Service Charge	$744.19	$795.35	$783.43	$837.29	$822.29	$878.82	$863.69	$923.07	$921.06	$984.38
	Demand Charge	$2.3025	$2.4608	$2.3811	$2.5448	$2.4573	$2.6262	$2.5376	$2.7121	$2.6465	$2.8284
	Distribution Charges	$0.088010	$0.094061	$0.091013	$0.097270	$0.093925	$0.100382	$0.096993	$0.103661	$0.101156	$0.108110
TSG-NF	Service Charge	$744.19	$795.35	$783.43	$837.29	$822.29	$878.82	$863.69	$923.07	$921.06	$984.38
	Distribution Charge 0-50,000	$0.086324	$0.092259	$0.089026	$0.095147	$0.091648	$0.097949	$0.094376	$0.100864	$0.098086	$0.104829
	Distribution Charge over 50,000	$0.086324	$0.092259	$0.089026	$0.095147	$0.091648	$0.097949	$0.094376	$0.100864	$0.098086	$0.104829
	Special Provision (d)	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02
CIG	Service Charge	$174.17	$186.14	$180.29	$192.68	$186.25	$199.05	$192.50	$205.73	$201.03	$214.85
	Distribution Charge 0-600,000	$0.078397	$0.083787	$0.081071	$0.086645	$0.083659	$0.089411	$0.086386	$0.092325	$0.090092	$0.096286
	Distribution Charge over 600,000	$0.064329	$0.068752	$0.066524	$0.071098	$0.068647	$0.073366	$0.070885	$0.075758	$0.073926	$0.079008
	Special Provision (c) 1st para	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02	$1.89	$2.02
BGSS RSG	Commodity Charge including Losses	$0.316734	$0.338509	$0.316574	$0.338338	$0.316418	$0.338172	$0.316254	$0.337996	$0.316031	$0.337758
CSG	Service Charge	$ 744.19	$ 795.35	$ 783.43	$ 837.29	$ 822.29	$ 878.82	$ 863.69	$ 923.07	$ 921.06	$ 984.38

PSE&G Gas System Modernization Program II
Gas Annual Bill Impact Summary

Incremental Typical Annual Bill Impacts By Rate Class

Rate Class	If Your Annual Therm Use Is:	Current Bill ($)	Roll-In Date 6/1/2020	12/1/2020	6/1/2021	12/1/2021	6/1/2022	12/1/2022	6/1/2023	12/1/2023	10/1/2024	End of Program Customer Bill ($)
RSG	1,010	862.68	22.86	17.52	17.08	17.56	17.12	17.54	17.14	17.92	24.54	1,031.96
GSG	1,882	1,933.50	35.62	27.60	26.69	27.50	26.84	27.55	26.71	28.11	38.28	2,198.40
LVG	34,846	29,926.41	395.89	303.85	294.92	303.00	294.27	301.76	293.32	307.12	417.81	32,838.35
TSG-F	541,882	370,185.57	4,126.92	3,198.38	3,088.72	3,198.36	3,089.05	3,197.18	3,110.08	3,284.44	4,468.81	400,947.51
TSG-NF	1,118,999	670,235.28	4,897.03	3,755.15	3,644.62	3,753.71	3,631.07	3,734.95	3,633.80	3,792.86	5,172.56	706,251.03
CIG	2,907,364	1,299,529.09	10,210.02	7,902.97	7,592.64	7,900.16	7,592.76	7,847.73	7,595.76	8,003.41	10,877.04	1,375,051.58

Incremental Annual Percent Change From Current Typical Annual Bill By Rate Class[1]

Rate Class	If Your Annual Therm Use Is:	Current Bill ($)	Roll-In Date 6/1/2020	12/1/2020	6/1/2021	12/1/2021	6/1/2022	12/1/2022	6/1/2023	12/1/2023	10/1/2024	Total Percent Change from Current Bill
RSG	1,010	862.68	2.65%	2.03%	1.98%	2.04%	1.98%	2.03%	1.99%	2.08%	2.84%	19.62%
GSG	1,882	1,933.50	1.84%	1.43%	1.38%	1.42%	1.39%	1.42%	1.38%	1.45%	1.98%	13.69%
LVG	34,846	29,926.41	1.32%	1.02%	0.99%	1.01%	0.98%	1.01%	0.98%	1.03%	1.40%	9.74%
TSG-F	541,882	370,185.57	1.11%	0.86%	0.83%	0.86%	0.83%	0.86%	0.84%	0.89%	1.21%	8.29%
TSG-NF	1,118,999	670,235.28	0.73%	0.56%	0.54%	0.56%	0.54%	0.56%	0.54%	0.57%	0.77%	5.37%
CIG	2,907,364	1,299,529.09	0.79%	0.61%	0.58%	0.61%	0.58%	0.60%	0.58%	0.62%	0.84%	5.81%

PSE&G Gas System Modernization Program II
Gas Annual Bill Impact Summary

Cumulative Typical Annual Bill Impacts
By Rate Class

Rate Class	If Your Annual Therm Use Is:	Current Bill ($)	Roll-In Date 6/1/2020	12/1/2020	6/1/2021	12/1/2021	6/1/2022	12/1/2022	6/1/2023	12/1/2023	10/1/2024
RSG	1,010	862.68	22.86	40.38	57.46	75.02	92.14	109.68	126.82	144.74	169.28
GSG	1,882	1,933.50	35.62	63.22	89.91	117.41	144.25	171.80	198.51	226.62	264.90
LVG	34,846	29,926.41	395.89	699.74	994.66	1,297.66	1,591.93	1,893.69	2,187.01	2,494.13	2,911.94
TSG-F	541,882	370,185.57	4,126.92	7,325.30	10,414.02	13,612.38	16,701.43	19,898.61	23,008.69	26,293.13	30,761.94
TSG-NF	1,118,999	670,235.28	4,897.03	8,652.18	12,296.80	16,050.51	19,681.58	23,416.53	27,050.33	30,843.19	36,015.75
CIG	2,907,364	1,299,529.09	10,210.02	18,112.99	25,705.63	33,605.79	41,198.55	49,046.28	56,642.04	64,645.45	75,522.49

Cumulative Percent Changes From Current Typical Annual Bill
By Rate Class

Rate Class	If Your Annual Therm Use Is:	Current Bill ($)	Roll-In Date 6/1/2020	12/1/2020	6/1/2021	12/1/2021	6/1/2022	12/1/2022	6/1/2023	12/1/2023	10/1/2024
RSG	1,010	862.68	2.65%	4.68%	6.66%	8.70%	10.68%	12.71%	14.70%	16.78%	19.62%
GSG	1,882	1,933.50	1.84%	3.27%	4.65%	6.07%	7.46%	8.89%	10.27%	11.72%	13.70%
LVG	34,846	29,926.41	1.32%	2.34%	3.32%	4.34%	5.32%	6.33%	7.31%	8.33%	9.73%
TSG-F	541,882	370,185.57	1.11%	1.98%	2.81%	3.68%	4.51%	5.38%	6.22%	7.10%	8.31%
TSG-NF	1,118,999	670,235.28	0.73%	1.29%	1.83%	2.39%	2.94%	3.49%	4.04%	4.60%	5.37%
CIG	2,907,364	1,299,529.09	0.79%	1.39%	1.98%	2.59%	3.17%	3.77%	4.36%	4.97%	5.81%

[1]Total percent change may not tie to the cumulative percent due to rounding

NOTICE TO PUBLIC SERVICE ELECTRIC AND GAS COMPANY GAS CUSTOMERS

In The Matter Of The Petition Of Public Service Electric and Gas Company for Approval of the Next Phase of the Gas System Modernization Program and Associated Cost Recovery Mechanism ("GSMP II")

Notice of Filing and Notice of Public Hearings

BPU Docket No.: XXXXXXXXXX

TAKE NOTICE that, on July 27, 2017 Public Service Electric and Gas Company (Public Service, PSE&G, the Company) filed a Petition and supporting documentation with the New Jersey Board of Public Utilities (Board, BPU). The Company is seeking Board approval to implement and administer an extension to PSE&G's Gas System Modernization Program (GSMP II or the Program) and to approve an associated cost recovery mechanism.

PSE&G seeks Board approval to invest up to $2.68 billion in Program investments across its gas service territory over the duration of the Program. The implementation of the GSMP II program will complete projects to replace cast iron mains and unprotected steel mains and services; address the abandonment of district regulators associated with this cast iron and unprotected steel plant; rehabilitate large diameter elevated pressure cast iron; upgrade utilization pressure portions of the system to elevated pressure; replace limited amounts of protected steel and plastic mains; and relocate inside meter sets. At this time, the Company anticipates these expenditures will result in the replacement of approximately 870 miles of Utilization Pressure Cast Iron (UPCI), 130 miles of Elevated Pressure Cast Iron (EPCI), 200 miles of unprotected/bare steel mains, 50 miles of cathodically-protected steel and plastic main, and the reinforcement of approximately 4,000 EPCI, large diameter bell joints. Main replacement will result in approximately 266 abandoned district regulators, replacement of approximately 99,200 unprotected steel services, and the relocation of approximately 70,900 inside meter sets to the outside.

In conjunction with the implementation of the Program, PSE&G will seek Board approval to recover in base rates the revenue increases associated with the capital investment costs of the GSMP II. While the Company is not seeking an increase at this time, PSE&G is seeking to recover a return on and return of its investments of approximately $41.2 million from the Company's gas customers effective June 1, 2020. This rate change is only an estimate at this time and is subject to change.

With Board approval of the Company's request, each gas base rate charge is proposed to be adjusted. For illustrative purposes, the June 1, 2020 estimated base rates including New Jersey Sales and Use Tax (SUT) for residential Rate Schedule RSG is shown in Table #1. Table #2 provides customers with the approximate effect of the proposed change in base rates relating to the Program, if approved by the Board, effective June 1, 2020. The annual percentage increase applicable to specific customers will vary according to the applicable rate schedule and the level of the customer's usage.

Under the Company's proposal, a residential gas heating customer using 100 therms per month during the winter months and 610 therms on an annual basis would see an initial increase in the annual bill from $548.68 to $562.52, or $13.84 or approximately 2.52%. Also, a typical residential gas heating customer using 165 therms per month during the winter months and 1,010 therms on an annual basis would see an initial increase in the annual bill from $862.68 to $885.54, or $22.86 or approximately 2.65%. The approximate effect of the proposed gas base rate change on typical gas residential monthly bills, if approved by the Board, is illustrated in Table # 3.

Based upon current projections and assuming full implementation of the complete Program as proposed, the anticipated incremental annual bill impact for the typical residential gas heating customer using 1,010 therms annually would be: $22.86 or approximately 2.65% effective 6/1/2020; $17.52 or approximately 2.03% effective 12/1/2020; $17.08 or approximately 1.98% effective 6/1/2021; $17.56 or approximately 2.04% effective 12/1/2021; $17.12 or approximately 1.98% effective 6/1/2022; $17.54 or approximately 2.03% effective 12/1/2022; $17.14 or approximately 1.99% effective 6/1/2023; $17.92 or approximately 2.08% effective 12/1/2023; $24.54 or approximately 2.84% effective 10/1/2024.

Tables #4 & #5 provide customers with the estimated incremental and cumulative rate impacts of the Program to typical and class average customers for Residential, Commercial, and Industrial classes, respectively. The annual percentage increase applicable to specific customers will vary according to the applicable rate schedule and the level of the customer's usage. It is anticipated that the Company will make semi-annual filings each year of the Program to request the Board's approval to implement that Program Year's revenue requests. The Board's decisions may increase or decrease the percentages shown.

Any rate adjustments with resulting changes in bill impacts found by the Board to be just and reasonable as a result of the Company's filing may be modified and/or allocated by the Board in accordance with the provisions of N.J.S.A 48:2-21 and for other good and legally sufficient reasons to any class or classes of customers of the Company. Therefore, the described charges may increase or decrease based upon the Board's decision.

Copies of the Company's filing are available for review by the public at the Company's Customer Service Centers, online at the PSEG website at http://www.pseg.com/pseandgfilings and at the Board of Public Utilities at 44 South Clinton Avenue, Seventh Floor, Trenton, New Jersey 08625-0350.

The following dates, times and locations for public hearings have been scheduled on the Company's filing so that members of the public may present their views. Information provided at the public hearings will become part of the record of this case and will be considered by the Board in making its decision.

Date 1, 2017	Date 2, 2017	Date 3, 2017
Time 1	Time 2	Time 3
Location 1	Location 2	Location 3
Location 1 Overflow	Location 2 Overflow	Location 3 Overflow
Room 1	Room 2	Room 3
Room 1 Overflow	Room 2 Overflow	Room 3 Overflow
Address 1	Address 2	Address 3
City 1, New Jersey Zip 1	City 2, New Jersey Zip 2	City 3, New Jersey Zip 3

In order to encourage full participation in this opportunity for public comment, please submit any requests for needed accommodations, such as interpreters, listening devices or mobility assistance, no less than 48 hours prior to the above hearings to the Board's Secretary at the following address.

Customers may also file written comments with the Secretary of the Board of Public Utilities at 44 South Clinton Avenue, Third Floor, Suite 314, P.O. Box 350, Trenton, New Jersey 08625-0350 ATTN: Secretary Irene Kim Asbury whether or not they attend the public hearings. To review PSE&G's rate filing, visit http://www.pseg.com/pseandgfilings.

Table # 1
BASE RATES
For Residential RSG Customers
Rates if Effective June 1, 2020

Rate Schedule			Base Rates	
			Charges in Effect July 10, 2017 Including SUT	**Estimated Charges Including SUT**
RSG	Service Charge	per month	$5.84	$5.84
	Distribution Charge	$/Therm	0.328980	0.351773
	Off-Peak Use	$/Therm	0.164490	0.175886
	Basic Gas Supply Service-RSG (BGSS-RSG)	$/Therm	0.339408	0.339186

Table # 2
Proposed Percentage Change in Revenue by Customer Class For Gas Service
For Rates if Effective June 1, 2020

	Rate Class	Percent Change
Residential Service	RSG	2.60
General Service	GSG	1.86
Large Volume Service	LVG	1.32
Street Lighting Service	SLG	3.07
Firm Transportation Gas Service	TSG-F	1.17
Non-Firm Transportation Gas Service	TSG-NF	0.61
Cogeneration Interruptible Service	CIG	0.77
Overall		2.02

The percent increases noted above are based upon July 10, 2017 Delivery Rates, the applicable Basic Gas Supply Service (BGSS) charges, and assumes that customers receive commodity service from Public Service Electric and Gas Company.

Table # 3
Residential Gas Service For Rates if Effective June 1, 2020

If Your Annual Therm Use Is:	And Your Monthly Winter Therm Use Is:	Then Your Present Monthly Winter Bill (1) Would Be:	And Your Proposed Monthly Winter Bill (2) Would Be:	Your Monthly Winter Bill Change Would Be:	And Your Monthly Percent Change Would Be:
180	25	$25.66	$26.22	$0.56	2.18%
360	50	45.51	46.64	1.13	2.48
610	100	86.89	89.15	2.26	2.60
1,010	165	139.59	143.32	3.73	2.67
1,224	200	167.96	172.47	4.51	2.69
1,836	300	249.01	255.79	6.78	2.72

(1) Based upon Delivery Rates and Basic Gas Supply Service (BGSS-RSG) charges in effect July 10, 2017 and assumes that the customer receives commodity service from Public Service.

(2) Same as (1) except includes change for GSMP II Base Rate Adjustments.

Table # 4
Projected Incremental Percent Change
From Annual Bills Effective July 10, 2017

Rate Class	Forecasted % Increase 6/1/2020	Forecasted % Increase 12/1/2020	Forecasted % Increase 6/1/2021	Forecasted % Increase 12/1/2021	Forecasted % Increase 6/1/2022	Forecasted % Increase 12/1/2022	Forecasted % Increase 6/1/2023	Forecasted % Increase 12/1/2023	Forecasted % Increase 10/1/2024
RSG	2.65%	2.03%	1.98%	2.04%	1.98%	2.03%	1.99%	2.08%	2.84%
GSG	1.84%	1.43%	1.38%	1.42%	1.39%	1.42%	1.38%	1.45%	1.98%
LVG	1.32%	1.02%	0.99%	1.01%	0.98%	1.01%	0.98%	1.03%	1.40%
TSG-F	1.11%	0.86%	0.83%	0.86%	0.83%	0.86%	0.84%	0.89%	1.21%
TSG-NF	0.73%	0.56%	0.54%	0.56%	0.54%	0.56%	0.54%	0.57%	0.77%
CIG	0.79%	0.61%	0.58%	0.61%	0.58%	0.60%	0.58%	0.62%	0.84%

The percent increases noted above are based upon Delivery Rates in effect July 10, 2017 and the applicable Basic Gas Supply Service (BGSS) charges and assuming customers receive commodity service from Public Service Electric and Gas Company. It is anticipated that the Company will make semi-annual filings each year of the Program to request the Board's approval to implement that Program Year's revenue requests. The Board's decisions may increase or decrease the percentages shown above.

Table # 5
Projected Cumulative Percent Change
From Annual Bills Effective June 1, 2020

Rate Class	Forecasted Cumulative % Increase 6/1/2020	Forecasted Cumulative % Increase 12/1/2020	Forecasted Cumulative % Increase 6/1/2021	Forecasted Cumulative % Increase 12/1/2021	Forecasted Cumulative % Increase 6/1/2022	Forecasted Cumulative % Increase 12/1/2022	Forecasted Cumulative % Increase 6/1/2023	Forecasted Cumulative % Increase 12/1/2023	Forecasted Cumulative % Increase 10/1/2024
RSG	2.65%	4.68%	6.66%	8.70%	10.68%	12.71%	14.70%	16.78%	19.62%
GSG	1.84%	3.27%	4.65%	6.07%	7.46%	8.89%	10.27%	11.72%	13.70%
LVG	1.32%	2.34%	3.32%	4.34%	5.32%	6.33%	7.31%	8.33%	9.73%
TSG-F	1.11%	1.98%	2.81%	3.68%	4.51%	5.38%	6.22%	7.10%	8.31%
TSG-NF	0.73%	1.29%	1.83%	2.39%	2.94%	3.49%	4.04%	4.60%	5.37%
CIG	0.79%	1.39%	1.98%	2.59%	3.17%	3.77%	4.36%	4.97%	5.81%

The percent increases noted above are based upon Delivery Rates in effect July 10, 2017 and the applicable Basic Gas Supply Service (BGSS) charges and assuming customers receive commodity service from Public Service Electric and Gas Company. It is anticipated that the Company will make semi-annual filings each year of the Program to request the Board's approval to implement that Program Year's revenue requests. The Board's decisions may increase or decrease the percentages shown above. The cumulative totals in Table #5 may not agree to Table #4 due to rounding.

Matthew M. Weissman, Esq.
General Regulatory Counsel - Rates

PUBLIC SERVICE ELECTRIC AND GAS COMPANY