STATE OF NEW JERSEY BOARD OF PUBLIC UTILITIES

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IN THE MATTER OF THE PETITION OF SOUTH JERSEY GAS COMPANY FOR APPROVAL OF INCREASED BASE TARIFF RATES AND CHARGES FOR GAS SERVICE, CHANGES TO DEPRECIATION RATES AND OTHER TARIFF REVISIONS

PETITION

BPU DOCKET NO.

CASE SUMMARY, PETITION, NOTICE AND EXHIBITS

Volume 2 of 3

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Attorney for Petitioner South Jersey Gas Company

INSERT TAB:

B. SCHOMBER

IN THE MATTER OF THE PETITION OF SOUTH JERSEY GAS COMPANY FOR APPROVAL OF INCREASED BASE TARIFF RATES AND CHARGES FOR GAS SERVICE, CHANGES TO DEPRECIATION RATES AND OTHER TARIFF REVISIONS

BPU DOCKET NO. GR20_____

DIRECT TESTIMONY

OF

BRENT W. SCHOMBER

Vice President, Operations South Jersey Gas Company

On Behalf Of South Jersey Gas Company

Exhibit P-4

March 13, 2020

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SOUTH JERSEY GAS COMPANY DIRECT TESTIMONY OF BRENT W. SCHOMBER

1 I. INTRODUCTION

2 Q. PLEASE STATE YOUR NAME, AFFILIATION AND BUSINESS ADDRESS.

A. My name is Brent W. Schomber, and my business address is 1 South Jersey Place, Atlantic
City, NJ 08401. I am Vice President of Operations for South Jersey Gas ("SJG"). In this
position, I am responsible for providing leadership and direction for all operational
activities including but not limited to construction, asset, utility, and engineering
operations. I also have responsibility for the capital spending program and operations of
South Jersey Gas Company ("SJG" or "the Company").

9 Q. PLEASE SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL 10 BACKGROUND.

11 I am a 1998 graduate of Rowan University with a Bachelor of Science degree in Criminal A. 12 Justice. I began my career in 1998 with Utility Line Services, a subcontractor for SJG, 13 where I worked in the field until 2001 and then in management from 2001 to 2007. I was 14 then employed by SJG in 2007 and have held various management positions of increasing 15 responsibility as follows: SJG Construction Supervisor from 2007 to 2009, SJG Manager 16 from 2009 to 2012, SJG General Manager of Construction from 2012 to 2015, SJG Director 17 of Construction from 2015 to 2017 and SJG Sr. Director of Construction from 2017 to 18 2018. In November 2018, I became Vice President SJIU, Construction and Shared 19 Services and was recently promoted to my current position of Vice President, Operations, 20 for SJG in December 2019.

1		I am a member of the American Gas Association and currently serve on the	
2		Construction Operations Committee. I am also a member of the Northeast Gas Association	
3		and currently serve on the Operations Committee.	
4	Q.	HAVE YOU PREVIOUSLY TESTIFIED OR SUBMITTED TESTIMONY	
5		BEFORE THE NEW JERSEY BOARD OF PUBLIC UTILITIES ("BPU OR	
6		BOARD")?	
7	А.	Yes, I have submitted testimony on behalf of SJG in various proceedings, including most	
8		recently, the Company's 2019 annual cost roll-in filing under its Accelerated Infrastructure	
9		Replacement Program ("AIRP II") and Storm Hardening And Reliability Program	
10		("SHARP") in BPU Docket Nos. GR19040529 and GR19040528.	
11			
12	II.	PURPOSE OF TESTIMONY	
12	11,		
12	Q.	WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?	
13 14	Q. A.	<td column="" column<="" td=""></td>	
13 14 15	Q. A.	WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING? My testimony in this case will address SJG's recovery of capital expenditures incurred since the Company's prior base rate case. Specifically, I will provide a summary of SJG's	
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13 14 15 16 17 18 19 20 21	Q. A.	WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING? My testimony in this case will address SJG's recovery of capital expenditures incurred since the Company's prior base rate case. Specifically, I will provide a summary of SJG's capital expenditures for the twelve-month test year period ending June 30, 2020 and the six month post-test year period from July 1, 2020 through December 31, 2020, as well as a description of the categories of expenditures that comprise the capital expenditures forecast. I will also discuss the Company's accomplishments under its AIRP II and SHARP II. Finally, I will discuss certain elements of the major capital projects that will be placed in service during the post-test year period, as well as the circumstances giving	
13 14 15 16 17 18 19 20 21 22	Q. A.	WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING? My testimony in this case will address SJG's recovery of capital expenditures incurred since the Company's prior base rate case. Specifically, I will provide a summary of SJG's capital expenditures for the twelve-month test year period ending June 30, 2020 and the six month post-test year period from July 1, 2020 through December 31, 2020, as well as a description of the categories of expenditures that comprise the capital expenditures forecast. I will also discuss the Company's accomplishments under its AIRP II and SHARP II. Finally, I will discuss certain elements of the major capital projects that will be placed in service during the post-test year period, as well as the circumstances giving rise to the Company's proposal to recover costs associated with an abandoned project to	
13 14 15 16 17 18 19 20 21 22 23	Q. A.	WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING? My testimony in this case will address SJG's recovery of capital expenditures incurred since the Company's prior base rate case. Specifically, I will provide a summary of SJG's capital expenditures for the twelve-month test year period ending June 30, 2020 and the six month post-test year period from July 1, 2020 through December 31, 2020, as well as a description of the categories of expenditures that comprise the capital expenditures forecast. I will also discuss the Company's accomplishments under its AIRP II and SHARP II. Finally, I will discuss certain elements of the major capital projects that will be placed in service during the post-test year period, as well as the circumstances giving rise to the Company's proposal to recover costs associated with an abandoned project to provide service to an electric generation facility referred to as BL England.	

1	Q.	DO	YOU	SPONSOR	ANY	SCHE	DULES	AS	PART	OF	YOUR	DIRECT
2		TEST	rimon	NY?								
3	А.	Yes.	I am	sponsoring	the fo	ollowing	schedule	s, su	apporting	the	Company	's capital

expenditures included in rate base, which were prepared by me or under my supervision or
direction:

- 6 Schedule BWS-1 Utility Plant in Service ("UPIS");
 - Schedule BWS-2 Test Year Plant Additions;
 - Schedule BWS-3 Post-Test Year Plant Additions; and
- 9 Schedule BWS-4 Post-Test Year Major Capital Projects.
- 10 This information will be updated over the course of the proceeding to include actual data 11 for the full twelve-month test year period ending June 30, 2020.
- 12

7

8

13 III. OVERVIEW OF THE COMPANY'S DISTRIBUTION SYSTEM

14 Q. PLEASE PROVIDE A BRIEF OVERVIEW OF SJG'S DISTRIBUTION SYSTEM.

South Jersey Gas provides natural gas service to approximately 398,000 customers within 15 A. 16 its service territory of approximately 2,500 square miles, which includes all or portions of 17 Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem counties. 18 As of December 31, 2019, the Company operates a network of 146.3 miles of transmission 19 pipelines, 6,551 miles of distribution mains, and 315,475 service lines that total 5,556 miles 20 in length. SJG's transmission pipelines range in diameter from 8 to 24 inches, and the 21 distribution mains range in diameter from 1 1/4 to 20 inches. The service lines are 22 predominantly (+85%) 1-inch or less in diameter. The distribution system also includes various other forms of infrastructure, including line valves, pressure regulators and meter 23

1 stations. The network operates in various pressure configurations depending on a variety 2 of factors, including material type and vintage. Specifically, portions of the SJG 3 transmission system operate at a maximum allowable operating pressure ("MAOP") of 700 4 pounds per square inch gauge ("psig"), while other areas of the distribution system operate 5 at an MAOP of only 15 psig. The distribution system also contains a Liquefied Natural Gas ("LNG") peak shaving facility that provides important pressure support to the system 6 7 in addition to serving as on-system storage for LNG supplies that the Company liquifies 8 with its recently constructed liquefaction facility. Since 2009, SJG has made significant 9 progress in retiring and replacing its vintage and leak prone infrastructure, primarily bare 10 steel and cast iron, under numerous accelerated programs. As discussed below, SJG 11 continues these efforts on an accelerated basis through the Board approved AIRP II and 12 SHARP II.

13

14 IV. <u>UTILITY PLANT IN SERVICE/CAPITAL EXPENDITURES</u>

15 Q. PLEASE DESCRIBE SJG'S CAPITAL SPENDING SINCE ITS LAST BASE RATE 16 CASE.

A. The Company's distribution rates were last reset in a base rate case approved by the Board
in 2017. Since the conclusion of that case, South Jersey Gas has continued to invest a
substantial amount of capital in new distribution plant and services and replacement plant
and services. Since that time, the Company has made approximately \$341 million of plant
additions that are not currently reflected in rates, and projects that an additional
approximately \$238 million will be added to its plant in service balance by December 31,
2020, exclusive of our SHARP and AIRP investments. As reflected on Schedule BWS-1,

the Company's actual utility plant in service ("UPIS") as of December 31, 2019 totaled approximately \$3.0 billion. Excluding investments made under the AIRP II and SHARP II, the majority of plant additions since the previous base rate case were related to investments for the improvement, replacement and expansion of distribution mains and services required for the continued safe and reliable operation of the Company's gas delivery system.

7 Q. PLEASE SUMMARIZE THE CAPITAL EXPENDITURES DURING THE TEST 8 YEAR.

9 A. Schedule BWS-2, provides a summary of the test year capital expenditures based on six 10 months of actual data and six months of projected data. The projected six months of capital 11 expenditures from January 1, 2020 through June 30, 2020, as well as projected plant 12 retirements for the same period, were utilized to calculate the projected UPIS balance for 13 the test year ending June 30, 2020. As shown on Schedule BWS-1, the total projected plant 14 additions and plant retirements for the remaining months of the test year period are 15 approximately \$128.8 million and \$7.0 million, respectively. This results in a total projected UPIS balance of approximately \$3.1 billion as of June 30, 2020, which is 16 17 reflected in Schedule SMG-2 (Statement of Rate Base) as sponsored by Company witness 18 Stefany Graham. Once the test year is over, SJG will replace the projected data with actual 19 data through June 2020 in the Company's 12-month update to be submitted in this case.

20 Q.

21

FOR WHICH SJG IS SEEKING RATE RELIEF IN THIS PROCEEDING.

PLEASE SUMMARIZE THE POST-TEST YEAR CAPITAL EXPENDITURES

A. SJG is proposing to include in rate base capital expenditures in the post-test year period
which are known and measurable, and consistent with Board precedent, including *In Re*

Elizabethtown Water Company Rate Case, BPU Docket No. WR8504330 (May 23, 1985).
 SJG's proposed post-test year capital expenditures are "prudent and major in nature and consequence," and therefore, should be included in rate base.

4 In this initial filing, I am sponsoring post-test year adjustments based on a 5 projection of capital expenditures to be made by the Company during the six-month period July 1, 2020 through December 31, 2020. As shown on Schedule BWS-1, the total 6 7 projected plant additions and plant retirements for the post-test year period are 8 approximately \$55.1 million and \$7.0 million, respectively. These expenditures total 9 approximately \$48.1 million, summarized in Schedule BWS-3. The Company also projects approximately \$101.7 million post-test year major capital expenditures 10 summarized on Schedule BWS-4. These projects include: 11

12

16

> New Sentury Compression Project (Transmission Equipment)

- 13➤ 24 New Sentury Traffic Study HDD (Replacement Mains)
- 14 > 8 Ocean Heights Offset (Improvement Mains)
- - Farm Tap Encapsulations (Transmission Equipment)
- 17 > Stokes Road Station Replacement (Transmission Equipment)
- 18 > Upgrade LNG SCADA (Production Equipment/Information Technology
 19 ("IT"))
- 20 > Timothy Lane Regulation Station Replacement (Transmission Equipment)
- 22 > Gate Station Odorization (Transmission Equipment)

1		Maximo & CC&B Upgrade (IT)
2		 SJG Contact Center Modernization (IT)
3		ServiceNow Enhancement (ITSM, ITBM) (IT)
4		 SCADA Intrusion Prevention System (IPS) Upgrade (IT)
5		 Role-Based Access Control (IT)
6		 Safety Management Solution (IT)
7		Cyber Risk Remediation (IT)
8		NextGen Portal (IT)
9		 Windows/SQL Upgrades (IT)
10		 Customer Meter Set #3 Replacement (Replacement Meters)
11		The IT projects identified on Schedules BWS-2, BWS-3 and BWS-4 are discussed in
12		further detail by Company witness Leonard Brinson. Moreover, certain of the projects are
13		discussed more fully below. As reflected on Schedule BWS-1, by the end of the post-test
14		year, the Company projects a utility plant in service balance of approximately \$3.2 billion.
15	Q.	WHAT ARE THE CAPITAL EXPENDITURE CATEGORIES REFLECTED ON
16		SCHEDULES BWS-2 AND BWS-3?
17	А.	The expenditure categories reflected on Schedules BWS-2 and BWS-3 include those
18		associated with New Business, Improvement Mains, Replacements, Automotive
19		Equipment, Production Equipment, Transmission Equipment, Distribution Equipment,
20		Office Furniture & Equipment, Building Improvements, Cathodic Protection,
21		Communications Equipment, Information Technology, Infrastructure Investment, and
22		Transfer from CWIP to UPIS.

1	Q.	PLEASE EXPLAIN THE TYPES OF COSTS ASSOCIATED WITH THE
2		CAPITAL EXPENDITURE CATEGORIES REFLECTED ON SCHEDULES BWS-
3		2 AND BWS-3.
4	A.	New Business Mains This category includes the costs of installed distribution system
5		mains, related to SJG's new business.
6		New Business Services This category includes the cost of service pipes and accessories
7		leading to the customers' premise, related to SJG's new business.
8		New Business Meters This category includes the cost of installed meters and/ or devices
9		used in measuring gas delivered to users, related to SJG's new business.
10		New Business Regulators This category includes the cost of labor and materials associated
11		with the installation of house regulators, related to SJG's new business.
12		Improvement Mains This category includes the cost of installed improvement distribution
13		system mains.
14		Replacement Mains This category includes the cost of installed distribution system mains
15		related to replacement mains, including replacements associated with the Company's AIRP
16		II Compliance Stipulated Base as approved by the Board on October 31, 2016 in Docket
17		No. GR16020175. The Stipulated Base represents a level of capital expenditures that the
18		Company must incur outside the AIRP II cost recovery framework.
19		Replacement Services This category includes the cost of installed distribution system
20		services related to replacement services, including those associated with the Company's
21		Service Replacement Programs and Stipulated Base requirements under the Board
22		approved AIRP II and SHARP II programs.

- <u>Leak Clamping</u> This category is a subset of mains and reflects the cost of labor and
 materials associated with leak clamping.
- 3 **<u>Replacement Meters</u>** This category includes the cost of installed meters and/or devices
- 4 used in measuring gas delivered to end users.
- 5 **<u>Replacement Regulators</u>** This category includes the cost of labor and materials
- 6 associated with the installation of replacement house regulators.
- 7 <u>Automotive Equipment</u> This category includes the cost of transportation vehicles used
 8 for utility purposes.
- 9 <u>Production Equipment</u> This category includes the cost of equipment used in the
 10 production of gas. The production system ends where the gas enters a gathering system,
 11 transmission system or distribution system.
- 12 **Transmission Equipment** This category includes the cost of equipment used in the 13 transmission of gas from a production plant, delivery point of purchased gas, gathering 14 system, storage area, or other wholesale source of gas, to one or more distribution areas.
- 15 **Distribution Equipment** This category includes the cost of miscellaneous distribution 16 systems equipment, such as gas testers and indicators, fire protection equipment, and power 17 operated equipment used in construction or repair work. Specifically, costs associated with 18 miscellaneous tools and equipment purchased by the Company, as well as Compressed 19 Natural Gas ("CNG") Station costs, are included here.
- 20 <u>Office Furniture and Equipment</u> This category includes the cost of office furniture and
 21 equipment owned by the utility and devoted to utility service.
- Building Improvements This category includes the cost associated with structures and
 improvements for utility purposes.

<u>Cathodic Protection</u> This category reflects the cost of labor and materials associated with
 cathodic protection. The cost included here is a subset of Mains.

<u>Communication Equipment</u> This category includes the cost of installed telephone and
 wireless equipment for general use in connection with the Company's gas operations.
 Currently, no costs are included in this category.

Information Technology This category reflects the cost of information technology
 systems and equipment. Specifically, costs associated with several technology upgrades
 and enhancements are included here.

9 <u>Infrastructure Investment</u> This category includes investments included in the
 10 Company's AIRP II and SHARP II programs, which is discussed in further detail in
 11 Sections VI and VII of my testimony.

12 **Transfer from CWIP to UPIS** This category reflects existing construction work in 13 progress expenditures as of December 31, 2019 that will be transferred to utility plant in 14 service during the test year and post test year. This transfer captures actual utility plant 15 that will be in service and reflected in rate base, as shown on Schedule SMG-2. As 16 indicated earlier, utility plant in service will be updated over the course of the proceeding 17 to include actual data for the full twelve-month test year period ending June 30, 2020.

18 Q. PLEASE DESCRIBE THE STEPS THAT SJG TAKES TO ENSURE THE 19 REASONABLENESS OF CAPITAL PROJECTS EXPENDITURES.

A. SJG follows a number of practices to ensure that its capital expenditures are reasonable.
 These include competitive bidding, contractor quality assurance and cost tracking. With
 respect to competitive bidding, once a project is approved, individual project design
 documents are prepared for competitive bid so that the project can be bid for construction

Exhibit P-4

1 following design and permitting. Contractor bids are evaluated utilizing a combination of 2 criteria including safety, cost, contractor quality, experience, availability, and timing. As 3 to contractor quality, we continuously monitor the performance of our contractors and we 4 use that information to evaluate the bids we receive from contractors who have worked for 5 us previously. This helps us to ensure that the work they perform delivers pipeline assets 6 constructed in a safe, quality, compliant, and most cost-effective way possible. Finally, we 7 track our capital expenditures after a project commences to monitor the financial 8 performance. Specifically, we examine projects through the project life cycle with 9 monthly (or more frequently as needed) reviews to determine the existence of any 10 variances. If there are significant variances, we undertake a review to determine the causes, 11 identify potential cost mitigation solutions and/or modify the scope of the project as 12 appropriate.

13 Q. WHAT EFFORTS HAS THE COMPANY UNDERTAKEN TO CONTROL 14 MUNICIPAL COSTS RELATED TO ITS CAPITAL PROJECTS?

15 A. The Company continues to experience increases in the costs associated with pipeline replacements due to increases in municipal costs. The biggest components of these 16 municipal costs are attributable to the following: repaying requirements; traffic control 17 18 plans; permit fees; and night work restrictions. The Company continues to maintain an 19 ongoing dialogue with the municipalities it serves during the pre-construction phase and 20 beyond to minimize these requirements. In addition, the Company has increased outreach 21 efforts with local officials concerning these activities. Despite these efforts, the costs are 22 ultimately subject to the determination of the individual municipalities.

1	With respect to repaying, where possible, SJG seeks to coordinate with other utility
2	or municipal projects to share costs and ultimately save money on repaving, which also has
3	the added benefit of reducing inconvenience to the community. Furthermore, the Company
4	continues to seek to increase use of infrared restoration technology for repaving. This
5	technology is much less expensive than mill and replace repairs. Infrared technology
6	expedites repair by heating, fusing, and compacting recycled asphalt; saving labor,
7	equipment and new material compared to conventional repairs that require the removal of
8	old asphalt from a damaged site and replacement with new asphalt. The ability to use
9	infrared technology depends on the size and extent of a project and the willingness of the
10	individual municipality to agree to its use.
11	

12 V. <u>PIPELINE INTEGRITY MANAGEMENT ("PIM") AND DISTRIBUTION</u> 13 INTEGRITY MANAGEMENT PROGRAM ("DIMP")

14 Q. HOW DOES THE COMPANY ENSURE PIPELINE SAFETY THROUGHOUT ITS 15 SYSTEM?

A. SJG has maintained compliance with the Federal pipeline safety regulations on pipeline
 integrity as found at 49 CFR 192 - Subpart O since those regulations went into effect in
 December of 2003. Achieving compliance with the regulations required the development
 and subsequent implementation of an integrity management program for the specific
 transmission pipelines covered under this part. As of December 31, 2019, South Jersey
 operates 146.3 miles of transmission pipeline that are subject to the PIM regulations. The
 Company's detailed and comprehensive program includes:

- An ongoing identification of "high consequence areas" to delineate covered pipeline
 segments;
 - The development of a baseline assessment and reassessment plan;

3

- Data integration and risk assessment to determine how to address each covered
 pipeline segment; and
- The selection and implementation of a baseline integrity assessment technique, which
 addresses the specific risks associated with each covered pipeline segment.
- 8 SJG successfully met the December 17, 2012 regulatory deadline established for the 9 completion of the initial baseline integrity assessments of its covered facilities. 10 Additionally, some of these facilities have been reassessed ahead of the seven-year Federal 11 requirement at the request of the BPU's Bureau of Pipeline Safety.

12 Q. WHAT DO THE PIM REGULATIONS REQUIRE WITH RESPECT TO THE 13 DIMP PLAN?

14 A. The regulations mandate that a risk-based approach to distribution main and service 15 integrity management plans be prepared by each operator. While the regulations prescribe 16 a specific framework for documenting operating practices and procedures into a plan, the 17 regulations provide significant operator flexibility to satisfy the requirements. At a 18 minimum, each distribution pipeline operator's DIMP plan must address the seven major 19 elements described below. South Jersey's DIMP plan documents the Company's risk-20 based approach to integrity management according to the required elements as follows:

(1) Knowledge. "Knowledge" entails the documentation of information pertaining to
 system design, materials, operating characteristics and environmental factors. SJG's DIMP
 plan references data contained in the Company's Field Book geographic information

Exhibit P-4

1 2

3

system, including leak and asset management and the corrosion control records system. The combination of these tools allows South Jersey to maintain, store, report and analyze critical data related to its distribution infrastructure.

4 (2) Identify threats. Threat identification determines broad issues that may affect the safe
5 operation of the distribution system. Potential threats include the categories of potential
6 operational hazards established by PHMSA. SJG relies on both internal and external data
7 sources to identify threats. Internal data sources include various design and operating
8 records contained in the systems noted previously. External data sources include industry9 wide data, and data related to soil conditions or prepared by independent researchers.

(3) Evaluate and rank risks. The process of evaluating and ranking risks determines the
 relative importance of all identified risks. This process takes into consideration both the
 likelihood of an occurrence and the consequences of such occurrence. SJG relies on
 standard industry analyses, such as population densities in specific areas, to evaluate
 consequences of failure and ranks risks accordingly.

(4) Identify and implement measures to address risks. This element included in SJG's
DIMP plan documents measures taken to reduce risk of failure. Programs at SJG that
address risks include leak management, damage prevention, corrosion control, public
awareness and operator qualification programs. Specific actions include prevention,
detection, repair, rehabilitation, and/or replacement and upgrade, depending on the riskbased probability of an occurrence and consequences of the specific integrity threat.

(5) Measure performance, monitor results, and evaluate effectiveness. Monitoring and measurement activities allow SJG to evaluate the effectiveness of actions implemented by the Company to address risks. SJG measures performance from a variety of information

- including the collection of data on leak causes and leaks repaired or eliminated. This data
 is reported and communicated within SJG for evaluating trends and to provide input for
 future planning purposes.
- (6) Periodic evaluation and improvement. Periodic evaluations establish a definitive
 feedback loop for the overall distribution integrity management processes. Additionally,
 as knowledge concerning the distribution system or information on potential threats is
 gained, elements of the DIMP plan or required actions may be revised to take into account
 the impact of the enhanced understanding as it impacts SJG's integrity management
 activities.
- (7) Report results. Reporting on integrity management actions and results provides
 information to SJG's internal management, and further satisfies Federal and State
 mandated reporting requirements.

Q. WHAT ACTIONS HAS THE COMPANY TAKEN TO ENSURE COMPLIANCE WITH THE DIMP REQUIREMENTS?

15 A. In accordance with Federal regulations, SJG finalized and began implementation of its 16 DIMP in August 2011. Since then, the DIMP plan has been reviewed and updated 17 annually, reflecting the most current data and system risk profile for SJG's distribution 18 system. This updated profile forms the basis for actions taken by the Company to mitigate 19 the most significant identified risks. Additionally, a complete program re-evaluation is 20 conducted at least every three years. The most recent re-evaluation occurred in 2017.

1

2

Q. HAS THE COMPANY INCURRED EXPENSES ASSOCIATED WITH

ENSURING PIM/DIMP COMPLIANCE?

3 A. The Company has incurred both capital upgrade expenditures and incremental operating 4 and maintenance ("O&M") expenses associated with complying with the transmission and 5 distribution PIM regulations. The capital upgrades have included expenditures associated 6 with physical piping replacements, valve change outs, and station piping retrofits to 7 accommodate in-line inspection tools. The incremental O&M expenses have included 8 expenditures such as the consulting and inspection fees associated with running the in-line 9 inspection tools, and the costs of performing confirmatory field excavations on the pipe to 10 remediate or repair any identified anomalies. The additional capital expenditures have 11 been absorbed by the Company in its annual capital construction budget each year as 12 incurred. The incremental O&M expenses associated with complying with the PIM regulations have been treated as a deferred expense.¹ As of December 31, 2019, these 13 14 deferred expenses totaled \$4,294,911 for transmission integrity management activities, and 15 \$807,210 for distribution integrity management activities, including carrying costs. As 16 more pipeline segments have integrity assessments performed, these costs will continue to 17 accrue, and their magnitude will be directly related to the findings associated with the 18 results of each assessment. Projected deferred expenses as of the end of the test year at 19 June 30, 2020 total \$4,787,282 for transmission integrity management activities and 20 \$848,136 for distribution integrity management activities, including carrying costs. The

¹ *I/M/O the Petition of South Jersey Gas Company for Approval of Increased Base Tariff Rates and Charges for Gas Service and Other Tariff Revisions*, BPU Docket No. GR17010071, "Order Adopting Initial Decision and Stipulation," p. 4 (October 20, 2017).

Exhibit P-4

1

2

Company's proposed recovery and amortization of these amounts are addressed by Company witness Stefany Graham and included in Schedule SMG-23.

3 Q. ARE THERE ANY NEW PHMSA REGULATIONS THAT COULD INCREASE 4 TRANSMISSION INTEGRITY MANAGEMENT COSTS?

5 A. Yes. On October 1, 2019 Part 1 of the Gas Transmission Rule (Mega Rule) was listed to 6 the Federal Register. It will significantly impact operating costs associated with material 7 verification, MAOP reconfirmation, and additional integrity assessment methodologies. In 8 addition, capital expenditures related to pipeline replacements or modifications will likely 9 be required as a result of this regulation. This regulation was related to "Part 1" of the 10 Rule; however, SJG anticipates impacts to the Transmission Integrity Management costs 11 will occur when "Part 2" and "Part 3" are issued in the future. The Company estimates 12 potential annual O&M expenses of approximately \$300,000 related to this new regulation. 13 As discussed by Company witness Ms. Graham, the Company has not reflected these costs 14 in the test-year O&M expenditures and is instead proposing to track and defer for later 15 recovery the Company's incremental transmission integrity management costs.

16

17 VI. ACCELERATED INFRASTRUCTURE REPLACEMENT PROGRAM (AIRP II)

18 Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE COMPANY'S BOARD 19 APPROVED AIRP II.

A. SJG maintains and upgrades it infrastructure to ensure that it continuously provides safe,
 adequate and proper service to its customers. To that end, the Board has recognized the
 prudence and need for accelerating the replacement of aging and leak prone materials in a
 number of accelerated infrastructure proceedings in place and approved throughout the

State since 2009, including SJG's Capital Investment Recovery Tracker ("CIRT"), AIRP
 and AIRP II.

SJG's AIRP was initially approved by the Board on February 20, 2013 in Docket
No. GO12070670. The AIRP was approved as a four-year program pursuant to which
South Jersey was permitted to invest \$35.3 million annually on the replacement of cast iron
and/or unprotected bare steel mains and services. The Company fully utilized the
authorized AIRP expenditure budget as of August 31, 2016.

8 On October 31, 2016, in Docket No. GR16020175, the Board issued an order 9 authorizing the Company to extend the AIRP through the implementation of the AIRP II. 10 The AIRP II was approved as a five-year program permitting SJG to invest up to \$302.5 11 million, excluding an Allowance for Funds Used During Construction ("AFUDC"). This 12 authorized investment amount was derived by applying an average cost per mile cap of 13 \$550,000 to a mileage cap of 110 miles per year, or 550 miles over the five-year term of 14 the program. In addition, the Company agreed to a stipulated base replacement amount of 15 no less than 30 miles per year, or 150 miles over the five-year term of the program, which 16 is not recoverable through the AIRP II but is considered base capital to be recovered in 17 future base rate cases.

18 Q. PLEASE EXPLAIN HOW THE COMPANY RECOVERS ITS AIRP II 19 INVESTMENT COSTS AND PROVIDE AN OVERVIEW OF THE 20 INVESTMENTS TO DATE.

A. Pursuant to the Board's October 31, 2016 Order in Docket No. GR16020175 approving
 the AIRP II, cost recovery for the AIRP II investments occurs annually. Generally

Exhibit P-4

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speaking, AIRP II investments that are in service through June 30th of each year are added to base rates effective October 1st of the same year.

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By dedicating these investments to the replacement of aging mains and services, SJG has made, and will continue to make, significant improvements to its distribution system. As of December 31, 2019, SJG has invested a total of approximately \$214 million in AIRP II projects and has replaced 366 miles of main and 19,251 services. The Company's treatment of the revenue requirements associated with AIRP II investments that will be made through June 30, 2020 is discussed in Ms. Graham's Direct Testimony.

9 Q. PURSUANT TO THE BOARD'S ORDER APPROVING THE AIRP II, THE
10 PRUDENCE AND NEED FOR THE COMPANY'S INVESTMENTS ARE TO BE
11 REVIEWED IN THE COMPANY'S NEXT BASE RATE CASE. DO YOU
12 BELIEVE THAT THE COMPANY'S AIRP II INVESTMENTS WERE PRUDENT
13 AND NECESSARY CAPITAL INVESTMENTS?

14 Yes. The operational and public safety benefits of the AIRP II have been apparent and A. 15 abundant since inception of the programs. The AIRP II has and will continue to modernize 16 the Company's distribution system by removing from service a significant portion of the 17 Company's inventory of pipe that is aging and more susceptible to leaks, thus reducing 18 potential safety hazards, increasing the resiliency and reliability of the system, and 19 reducing methane emissions. By replacing these materials with modern plastic pipe, the 20 Company is more readily able to isolate and shutoff a smaller area of the system when 21 performing repairs and maintenance, increasing reliability to its customers. The Company 22 has also installed Excess Flow Valves ("EFVs") on a vast majority of services replaced 23 under the AIRP II, thereby increasing safety for its customers and the general public.

1 The Company continues to approach the work in a multi-year, planned fashion, and 2 utilizes a competitive bidding process, as described earlier in my testimony, in an effort to 3 achieve the lowest possible unit cost. The Company also makes significant efforts to 4 coordinate with municipalities to mitigate increasing costs for governing agency required 5 fees, paving, and traffic control, all of which contribute to the year over year price per foot 6 increase and are largely beyond the Company's control. At the same time, AIRP II has 7 helped the Company control O&M and capital costs associated with leak repair, leak 8 survey, and leak management work that would have occurred as the Company's leak prone 9 pipe continued to age. Specifically, one of the benefits of the programs to SJG's 10 distribution system is the elimination of open leaks. Pursuant to the Board's Order 11 approving the AIRP II, SJG is required to further reduce its leak inventory, from October 12 2016 through September 30, 2021, by twenty percent (20%) per year. SJG expects that, 13 with the AIRP II program, it will eliminate all open leaks in inventory and convert to a 14 "find and fix" mode for new incoming leaks by 2021.

When AIRP was first proposed by the Company in 2012, the Company estimated that it would reduce the time it would take to replace all of its aging cast iron and bare steel infrastructure from 50 years to approximately 10 years. Due to the success of AIRP and AIRP II thus far, South Jersey anticipates that it will achieve this 10 year target on or ahead of schedule, and will have eliminated all remaining bare steel and cast iron mains in its distribution system by 2021.

21

1 VII. STORM HARDENING AND RELIABILITY PROGRAM (SHARP II)

2 Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE COMPANY'S BOARD 3 APPROVED SHARP.

A. On September 3, 2013, the Company filed with the Board its proposal to implement the
SHARP. The filing was made pursuant to the Board's March 20, 2013 Order in *In the Matter of the Board's Establishment of a Generic Proceeding to Review Costs, Benefits and Reliability Impacts of Major Storm Event Mitigation Efforts*, Docket No.
AX13030197, which directed Board Staff to invite all regulated utilities subject to Board
jurisdiction to submit detailed proposals for infrastructure upgrades designed to protect the
State's utility infrastructure from future "Major Storm Events."

11 At that time, South Jersey had within its system 179 miles of distribution main 12 operating at low pressure in Atlantic City, Ventnor, Margate, Longport, Pleasantville, 13 Somers Point, Ocean City, Wildwood, North Wildwood, Wildwood Crest, Cape May and 14 West Cape May. Approximately 26,000 customers had services off this low pressure 15 distribution system. Low pressure mains, services and regulator stations are susceptible to water intrusion during Major Storm Events, as water intrusion occurs when storm force 16 17 flooding overcomes the internal operating pressure within a main. This forces water into 18 susceptible points of entry, such as joints and non-welded fittings.

19 The Company found that a direct hit from a major storm, similar to that experienced 20 by portions of this State during Superstorm Sandy, could render SJG's low pressure system 21 inoperable and interrupt service to thousands of customers. In the event of flooding of 22 SJG's low pressure mains, and a system shutdown, the system would need to be nitrogen 23 purged and pressure tested prior to reintroducing gas. Old bare steel and cast iron mains

comprising a low pressure system would not be able to withstand such testing. As a result,
 if the low pressure system was shut off, it could not be placed back into service and would
 need to be replaced in its entirety. The net result would include extremely long periods of
 time, throughout a cold winter, with customer outages causing a significant detriment to
 peoples' lives, and the economy of the State of New Jersey.

6 With this in mind, South Jersey proposed and received approval in August 2014 to 7 replace these low-pressure mains and services with high pressure mains and associated 8 services through the SHARP. At the conclusion of the program in June 2017, the Company 9 had invested a total of \$103.5 million and replaced approximately 92 miles of main and 10 11,090 services.

11 On May 22, 2018, in Docket No. GO17111130, the Board issued an order 12 authorizing the Company to continue its successful storm hardening efforts through a phase 13 two of the SHARP ("SHARP II"). The SHARP II was approved as a three-year program, 14 ending June 30, 2021, focused on 4 targeted system enhancement projects in the coastal 15 regions, with a total budget of approximately \$100.25 million, excluding AFUDC. The scope of the SHARP II Projects includes three pipeline looping projects, including the 16 17 Absecon Island Loop Project, Ocean City Loop Project, and Brigantine Bridget Project, as 18 well as the installation of approximately 20,000 EFVs in coastal areas. In addition, the 19 Company agreed to a stipulated base amount of \$10 million over the three year program 20 period, which is not recoverable through the SHARP II but is considered base capital to be 21 recovered in future base rate cases.

1 Q. PLEASE EXPLAIN HOW THE COMPANY RECOVERS ITS SHARP II 2 INVESTMENT COSTS AND PROVIDE AN **OVERVIEW** OF THE 3 **INVESTMENTS TO DATE.**

4 A. Pursuant to the Board's May 22, 2018 Order in Docket No. GO17111130 approving the 5 SHARP II, cost recovery for the SHARP II investments occurs annually. Similar to the 6 AIRP II cost recovery, SHARP II investments that are in service through June 30th of each 7 year are added to base rates effective October 1st of the same year.

8 As of December 31, 2019, capital expenditures incurred under the SHARP II total 9 approximately \$50.3 million, with approximately 7,900 EFVs installed. The Company has 10 also begun the engineering and design associated with Ocean City Loop project and 11 anticipates completion of the Absecon Island Loop projects in year 2 of the program. The 12 Ocean City Loop and Brigantine Bridge projects are anticipated to be placed in service 13 during Year 3 of the program. The Company's treatment of the revenue requirements 14 associated with SHARP II investments made through June 30, 2020 is discussed in Ms. 15 Graham's Direct Testimony.

PURSUANT TO THE BOARD'S ORDER APPROVING THE SHARP II, THE 16 Q. 17 PRUDENCE AND NEED FOR THE COMPANY'S INVESTMENTS ARE TO BE 18 **REVIEWED AT THE TIME OF THE COMPANY'S NEXT BASE RATE CASE.**

19

DO YOU BELIEVE THAT THE COMPANY'S SHARP II INVESTMENTS WERE **PRUDENT AND NECESSARY CAPITAL INVESTMENTS?** 20

21 Through implementation of the SHARP, SJG has dramatically improved system reliability A. 22 in coastal areas that are susceptible to flooding. The Company has experienced numerous 23 coastal flooding events since the commencement of the SHARP and, due to the significant

operational benefits that have been achieved through the SHARP, has not experienced any significant customer outages.

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3 SHARP II Program is designed to improve both safety and The 4 redundancy/reliability through two separate types of projects. Our core safety initiative, 5 the EFV Project, will provide for the installation of excess flow valves throughout our coastal communities that do not currently have them. This project will improve safety and 6 7 reduce the need for potential curtailment should a major coastal storm or weather event 8 occur. In addition, our core redundancy/reliability projects, the Absecon Island Loop, 9 Ocean City Loop and Brigantine Bridge Project, will bring redundant and more reliable 10 feeds to all our customers along these barrier islands. The projects will fortify the gas 11 supply in all our barrier islands between Ocean City, and Brigantine City. With the 12 completion of this program, all barrier islands will have two feeds serving each island. The 13 investments in this program will help improve the safety, redundancy, and reliability of our 14 system in the coastal regions, further mitigating potential storm related service disruptions 15 for all our current and future coastal customers.

16 The Company has taken all reasonable steps to implement its SHARP II Program 17 at a reasonable cost. The Company's cost control processes, which are discussed in greater 18 detail earlier in my testimony, include competitive bidding for projects as well as 19 coordination with municipalities in which work is being performed. These processes have 20 been followed by the Company in proceeding with the SHARP II Program.

Q. HAVE THE COSTS OF THE SHARP II PROGRAM VARIED FROM THE AMOUNTS THAT THE COMPANY ORIGINALLY FORECAST IN SEEKING BOARD APPROVAL OF THE PROGRAM?

4 Yes. The costs reflected in the Company's filing seeking approval of the SHARP II A. 5 program were based on the best information available to the Company at that time. Nonetheless, the actual costs of components of the program, such as the costs of the excess 6 7 flow valves installed as part of the program, have turned out to be more expensive based 8 on the response to the Company's competitive bids. Specifically, the forecast cost to install 9 excess flow valves was \$3,650 per installation while the actual cost based on the results of 10 competitive bids has been approximately \$4,700 per installation. In addition, in forecasting 11 the original costs of SHARP II, the Company estimated that most main would be behind 12 the curb, thus minimizing the Company's restoration costs. Unfortunately, most of the 13 main is in the street, resulting in increased labor and restoration costs. While the costs have 14 exceeded the Company's original estimates, the Company continues to believe that the 15 benefits of the program in terms of increased reliability justify full recovery of the 16 program's costs.

17

18 VIII. <u>NEW SENTURY COMPRESSION PROJECT</u>

19 Q. PLEASE BRIEFLY DESCRIBE THE COMPANY'S NEW SENTURY 20 COMPRESSION PROJECT.

A. The New Sentury Pipeline is an existing 24-inch gas transmission pipeline that was
 installed in 1998 and operated at 700 PSIG MAOP. The pipeline provides a direct
 connection to both the Transcontinental Gas Pipe Line Company, L.L.C. ("Transco") and

Columbia Gas Transmission System, LLC ("Columbia") interstate pipelines in
 Swedesboro, New Jersey and directly serves five of the seven counties that SJG operates
 in. Gas flows from Swedesboro, Gloucester County to Vineland, Cumberland County and
 is taken as far south as Cape May Point in Cape May County through various facilities.

5 Based on contractual operating pressures and gas flow analyses, the Company 6 determined that both Transco and Columbia are not able to provide the pressure necessary 7 to adequately deliver gas to the various subsystems that the New Sentury pipeline feeds. 8 On peak days the gas pressure supplied by Transco and Columbia does not meet SJG's 9 peak demand and creates supply challenges to our customers in these areas.

10 South Jersey has concluded that the most safe, reliable and cost effective method 11 to enhance the pressure on its transmission system is by installing a compressor station to 12 elevate the pressure back to the pipelines' MAOPs on days where the system needs it most. 13 This system enhancement will provide adequate operating pressure to various counties that 14 the New Sentury pipeline feeds on coldest days, alleviating growth restrictions and 15 allowing older parts of SJG's gas system to operate as originally intended.

In conducting its analysis, South Jersey evaluated a number of operational 16 17 alternatives to address the system constraints and concluded that the New Sentury 18 Compression Project is the most prudent and cost effective option to resolve the issues that 19 have been identified. The alternatives considered additional capacity options as well as 20 discussions with our pipeline suppliers about incremental capacity increases. In comparing 21 the operation and cost components of each of these alternatives, South Jersey concluded 22 that the New Sentury Compression Project was the most viable and cost-effective approach 23 to reinforce the gas transmission system in this area. As of March 2019, the engineering,

design and construction management contract for the New Sentury Compression project
 has been awarded and permitting is underway. The Company projects that the project will
 be completed and placed in service in December 2020 at a total cost of approximately \$61.5
 million, as summarized on Schedule BWS-4.

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IX. <u>24 NEW SENTURY TRAFFIC STUDY HDD</u>

7 Q. PLEASE BRIEFLY DESCRIBE THE COMPANY'S NEW SENTURY TRAFFIC 8 STUDY HORIZONTAL DIRECTIONAL DRILL ("HDD") PROJECT.

9 A. During Gloucester County's most recent traffic study, the County identified a potential 10 safety issue with the proximity of the 24" New Sentury Pipeline to County Road 538. The 11 existing pipeline crosses South Branch Raccoon Creek above ground and along an exterior 12 wall of the bridge. The bridge walls are short in height and in close proximity to the travel 13 way. This provides very little protection to the 24" New Sentury Pipeline. Additionally, 14 it creates a safety issue for passing motorists. South Jersey Gas agreed that the existing 15 pipeline should be relocated and as an immediate measure, worked with the county to have more guardrail installed for protection. To further address this issue, SJG will relocate the 16 17 pipeline. Rather than an above ground crossing, SJG is working to install the new pipeline 18 using HDD technology. At the time of the project's completion the old pipeline will be 19 abandoned, and the safety issue will be rectified. This project is projected to be placed in 20 service in December 2020 at a cost of approximately \$1.5 million, as summarized on 21 Schedule BWS-4.

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X. <u>RENOVATION OF FOLSOM OFFICE FACILITY</u>

2 Q. PLEASE DESCRIBE THE RENOVATION OF THE COMPANY'S FOLSOM 3 OFFICE FACILITY.

4 A. The Company's Folsom New Jersey office facility was first constructed in the late 1960s, 5 with an extension later added in the early 1980s. Other than minor renovations such as 6 painting and flooring, the original structure has not been updated and requires substantial 7 renovation. The renovation involves the replacement of all mechanical systems, furniture, 8 Information Technology and the building roof. In addition, all interior walls are being 9 demolished and the space of the building is being reconfigured and updated to appeal to 10 and address the needs of a new younger workforce. Two current emergency generators are 11 being replaced with a single emergency generator and a new cafeteria and kitchen are being 12 installed. Finally, the customer walk-in payment center is being relocated and updated. 13 The total cost of the project is approximately \$19.1 million, as reflected on Schedule BWS-14 4, and it is projected to be placed in service in July 2020. The Company believes that its 15 renovated facility will help it to attract and retain qualified employees.

16 Q. HOW ARE THE COSTS OF THE FOLSOM OFFICE REFLECTED IN THE 17 REVENUE REQUIREMENT?

A. The manner in which the costs associated with the Folsom office are reflected in the
 revenue requirement is discussed in Company Witness O'Brien's testimony.

1 XI. <u>BL ENGLAND FACILITIES</u>

2 Q. PLEASE DESCRIBE THE PROJECT THE COMPANY UNDERTOOK TO 3 PROVIDE SERVICE TO BL ENGLAND'S ELECTRIC GENERATION 4 FACILITY.

5 RC Cape May, LLC ("RCCM") owns the BL England electric generation facility in Upper A. 6 Township, New Jersey. In 2012, RCCM sought gas service from the Company to convert 7 the facility from a coal-fired plant to a natural gas-fired plant. In 2013, SJG and RCCM 8 entered into an agreement (the "Agreement") in which SJG agreed to construct pipeline 9 and other related facilities to enable SJG to provide natural gas transportation service to 10 the BL England facility. The Agreement was initially approved by the BPU by order dated 11 April 29, 2013. The Agreement required RCCM to retrofit unit 2 of the BL England facility 12 to burn natural gas, and it required South Jersey to build a pipeline to provide service to 13 BL England.

14 The opportunity to provide service to BL England afforded SJG the opportunity to 15 develop a project that would not only enable the Company to serve BL England but also to provide an important reliability benefit to other customers. Specifically, the Company 16 17 presently serves approximately 145,000 customers in Atlantic and Cape May Counties 18 from a single transmission pipeline feed, as well as two distribution lines. In the event of 19 an outage of the transmission feed, the remaining distribution facilities would not be 20 adequate to avoid significant customer outages. The project that the Company proposed 21 to provide service to BL England afforded it the additional opportunity to greatly enhance 22 reliability by installing a pipeline facility that would enable the Company to provide service 23 to these customers in the event of an interruption of the transmission pipeline feed.

Q. PLEASE DESCRIBE THE PIPELINE PROJECT THAT THE COMPANY PROPOSED TO CONSTRUCT TO SERVE BL ENGLAND AND ENHANCE THE RELIABILITY OF THE SERVICE PROVIDED TO CUSTOMERS IN ATLANTIC AND CAPE MAY COUNTIES.

5 The proposed pipeline project consisted of two segments that traveled approximately 22 A. 6 miles. The first segment, the Reliability Line, was to interconnect with SJG's existing 7 distribution system and provide service to both BL England's generation facility and to 8 SJG's remaining customers in Atlantic and Cape May Counties in the event of an 9 interruption on the transmission line that currently serves those customers. The second 10 segment, the Dedicated Line, was to connect SJG's existing distribution system in Cape 11 May County to BL England's facility in Upper Township, New Jersey. RCCM agreed to 12 pay rates providing a return on and of the projected cost of the Dedicated Line.

Q. WHY WAS THE SERVICE TO THE BL ENGLAND FACILITY A NECESSARY PREREQUISITE TO THE CONSTRUCTION OF BOTH THE RELIABILITY LINE AND THE DEDICATED LINE?

16 A. The regulations that govern the construction and operation of natural gas facilities in the 17 Pinelands require that any new facility must be installed "primarily to serve the needs of 18 the Pinelands." The service to BL England provided by the proposed project allowed the 19 Company to meet this test. The pipeline project that the Company proposed would have 20 benefitted a significant number of our customers and residents of the Pinelands by 21 achieving both greater gas reliability through the construction of the Reliability Line and 22 greater electric reliability through local generation that would have been provided by BL 23 England.

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Q. PLEASE DESCRIBE THE PROCESS THAT WAS FOLLOWED TO OBTAIN APPROVAL OF THE PROPOSED PROJECT.

3 A. Over the period 2013-2019, the proposed pipeline project was the subject of extensive 4 litigation before the BPU, the Pinelands Commission and the Appellate Division of the 5 New Jersey Superior Court. The process involved numerous administrative hearings. Throughout the course of the litigation, RCCM affirmatively supported the project. 6 7 However, on February 17, 2019, RCCM notified the Appellate Division that it no longer 8 intended to use the pipeline to repower the BL England power plant. Subsequently, the 9 Pinelands Commission requested the Appellate Division to remand South Jersey's 10 application to build the pipeline because the repowering of the BL England facility was 11 fundamental to the Commission's decision to approve SJG's application. While SJG 12 opposed the request for remand, the Appellate Division granted it by Order dated May 29, 2019. 13

14

Q.

DID THE BPU SUPPORT THE PROPOSED PROJECT?

15 A. Yes. Upon completion of its review process, the BPU found in its December 11, 2015 order in BPU Docket No. GO13111049 that the construction of the Reliability Line "will 16 17 enhance the reliability of the eastern and southern portions of SJG's service territory by 18 enabling an alternative route for natural gas to be supplied to Atlantic and Cape May 19 Counties." Further, with respect to the entire project, the Board found that "the Project 20 will serve the goals of the EMP ("Energy Master Plan") in that the use of the proposed 21 combined cycle system for the facility should result in significant improvement in air 22 quality and other positive environmental impacts, while also increasing overall system reliability and reinforcement in SJG's service area." In addition, the BPU's Energy 23

Division Director testified in support of the proposed project in proceedings before the
 Pinelands Commission.

3 Q. DOES THE COMPANY PLAN TO CONTINUE TO SEEK WAYS TO ENHANCE 4 THE RELIABILITY OF THE SERVICE IT PROVIDES TO CUSTOMERS IN 5 ATLANTIC AND CAPE MAY COUNTIES?

A. Yes. The Company will continue to look to develop projects that can be constructed and
operated in a manner consistent with applicable laws and regulations. At this point
however, it is clear that BL England will not proceed with the repowering of its generation
facility and thus the Company will not be able to proceed with the project as proposed.

10Q.HAS SOUTH JERSEY INCURRED COSTS ASSOCIATED WITH THE11DEVELOPMENT OF THE RELIABILITY LINE AND THE DEDICATED LINE?

A. Yes. SJG has incurred approximately \$10.1 million through December 31, 2019 in
 connection with the project. These costs consist of engineering, legal, consulting and other
 costs.

15 Q. IS THE COMPANY SEEKING TO RECOVER THESE COSTS IN THIS 16 PROCEEDING?

17 A. Yes. The Company's proposal is discussed more fully by Company witness O'Brien.

18
1 XII. <u>SUMMARY</u>

2 Q. CAN YOU BRIEFLY SUMMARIZE YOUR TESTIMONY?

A. The issues discussed in my testimony address the significant levels of capital expenditures
for both the test year and post-test year periods that are prudent and necessary to provide
safe and reliable service to South Jersey's customers. SJG's construction program has
increased the safety, operation and reliability of our distribution system. Additionally, the
Company's AIRP II and SHARP II investments have significantly reduced leak inventory
and help to protect utility infrastructure from Major Storm Events. As such, the Board's
approval of the proposals set forth herein is fully justified.

10 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

11 A. Yes, it does.

SOUTH JERSEY GAS COMPANY STATEMENT OF RATE BASE UTILITY PLANT IN SERVICE (UPIS)

Lin	e
No	

	-			
				Reference
1				
2	Actual UPIS as of 12/31/19		\$2,971,973,300	SMG-2
3				
4	Projected Test Year Plant Additions (1/1/20 - 6/30/20)	\$ 128,780,876		BWS-2
5	Projected Test Year Plant Retirements (1/1/20 -6/30/20)	\$ (6,972,659)		BWS-2
6	Total Projected Test Year Net Plant Additions (1/1/20-6/30/20)	\$ 121,808,217		
7				
8	Projected Test Year Ending UPIS at 6/30/20		\$3,093,781,517	
9				
10	Projected Post Test Year Plant Additions (7/1/20 - 12/31/20)	\$ 55,116,440		BWS-3
11	Projected Post Test Year Plant Retirements (7/1/20 - 12/31/20)	\$ (6,972,659)		BWS-3
12	Projected Post Test Year Major Capital Projects	\$ 101,727,060		BWS-4
13	Total Projected Post Test Year Net Plant Additions (7/1/20-12/31/20)	\$ 149,870,840		
14				

15 Projected Post Test Year Ending UPIS at 12/31/20

\$3,243,652,358

SOUTH JERSEY GAS COMPANY ADJUSTMENT TO JUNE 30, 2020 RATE BASE

	July	August	September	October	November	December	January	February	March	April	May	June	2019-202
	Actual 2019	Actual 2019	Actual 2019	Actual 2019	Actual 2019	Actual 2019	Projected 2020	Projected 2020	Projected 2020	Projected 2020	Projected 2020	Projected 2020	Test Year Total
New Business													
1.0 Mains	1,656,732	1,918,260	1,624,729	2,106,621	1,252,980	1,538,894	1,034,600	1,295,400	1,898,200	2,118,700	1,597,800	1,427,200	19,470,116
1.1 Services	1,815,218	1,811,642	2,409,461	2,604,810	2,395,199	3,184,307	1,404,300	1,731,400	2,559,200	2,875,300	2,211,700	1,955,300	26,957,838
1.2 Meters	405,570	540,221	863,745	685,155	796,586	795,043	725,200	784,300	882,700	1,044,600	1,079,000	1,077,400	9,679,519
1.3 Regulators	224,115	295,911	255,012	427,243	471,362	436,350	246,500	246,700	246,700	246,700	246,700	246,700	3,589,994
Total New Business	4,101,634	4,566,034	5,152,947	5,823,829	4,916,128	5,954,595	3,410,600	4,057,800	5,586,800	6,285,300	5,135,200	4,706,600	59,697,467
2.0 Improvement Mains	26,997	3,158	31,370	65,795	114,800	39,272	58,900	58,700	58,700	58,700	58,700	58,700	633,792
Replacements													
3.0 Replacement Mains	909,687	1,117,275	1,357,792	1,052,852	1,174,232	795,678	1,395,400	1,489,900	1,869,400	2,463,500	522,200	153,900	14,301,815
3.1 Replacement Services	942,104	2,173,407	905,/18	953,858	1,501,008	1,328,006	2,613,900	2,664,100	2,672,100	3,031,000	2,229,200	2,154,600	22,969,000
3.3 Penlacement Meters	22 825	9 805	35 454	222,558	424,341	28 302	18 200	18 200	18 200	439,100	18 200	18 200	254 211
3.4 Replacement Regulators	539,829	717 297	605 135	656 964	586 798	347 733	866 800	866 800	866 800	866 800	866 800	866 800	8 654 556
Total Replacements	2,802,773	4,322,201	3,270,418	3,238,204	3,514,010	2,871,576	5,435,800	5,614,700	5,945,800	6,818,600	3,998,200	3,513,000	51,345,283
4.0 Land & Buildings	-	-	-	-	-	-	-	-	-	-	-	-	-
5.0 Automotive Equipment	25,366	42,535	6,778	6,778	27,824	1,584	1,014,700	1,135,900	636,200	105,000	305,000	699,800	4,007,465
6.0 Production Equipment	(102,752)	15,516	61,760	349,409	102,467	105,897	2,300	2,300	57,500	36,200	51,400	90,300	772,296
7.0 Transmission Equipment	45,391	85,676	29,732	99,318	73,457	263,019	66,000	66,300	66,600	66,900	65,700	49,800	977,894
8.0 Distribution Equipment	56,568	575,089	934,703	530,869	507,838	676,757	134,800	80,000	53,200	26,300	26,300	26,300	3,628,724
9.0 Office Furniture & Equipment	5,734	-	2,992	17,830	(10,224)	4,913	-	-	25,000	-	30,200	20,000	96,445
10.0 Building Improvements	71,336	230,886	61,257	86,793	123,865	11,552	109,200	260,500	437,700	964,500	1,110,000	409,900	3,877,490
11.0 Cathodic Protection	228,739	270,989	182,929	298,574	193,681	198,638	201,500	201,500	270,800	306,400	315,700	326,600	2,996,050
12.0 Communications Equipment	-	-	-	-	-	-	-	-	-	-	-	-	-
13.0 Information Technology	282,215	93,120	351,599	151,896	192,992	150,898	84,100	83,600	130,800	127,700	107,100	65,800	1,821,821
14.0 Infrastructure Investment													
SHARP II	(234,131)	1,369,633	423,500	6,375,932	4,045,250	4,297,321	3,045,597	1,824,401	2,370,278	2,208,998	1,984,403	2,051,700	29,762,882
AIRPII	7,892,082	7,516,563	6,650,978	5,971,331	5,212,988	6,509,977	3,944,590	4,457,132	4,626,867	3,990,193	2,346,488	523,476	59,642,665
Total Infrastructure Investment	7,657,951	8,880,190	7,074,479	12,347,265	9,258,238	10,807,298	6,990,187	6,281,535	6,997,145	6,199,191	4,330,891	2,575,176	89,405,546
TOTAL SJG Capex	15,201,953	19,091,400	17,160,963	23,016,558	19,015,077	21,085,999	17,508,087	17,842,833	20,266,245	20,994,791	15,534,391	12,541,976	219,260,273
Transfer from CWIP to UPIS	=	-	-	-	-	-	326,387	478,054	2,035,900	521,387	120,842	20,609,984	24,092,554
Total	15,201,953	19,091,400	17,160,963	23,016,558	19,015,077	21,085,999	17,834,474	18,320,886	22,302,145	21,516,178	15,655,233	33,151,960	243,352,827
Total Retirements	3,120,679	2,809,595	1,722,498	3,420,998	1,471,065	11,842,817	1,162,110	1,162,110	1,162,110	1,162,110	1,162,110	1,162,110	31,360,310
Total	12.081.274	16.281.806	15.438.465	19.595.560	17.544.012	9 243 182	16 672 364	17 158 777	21 140 036	20.354.068	14 493 123	31.989.850	211.992.516

Schedule BWS-2 6&6

SOUTH JERSEY GAS COMPANY PRO FORMA ADJUSTMENT TO JUNE 30, 2020 RATE BASE

New Dusines: 1.350.300 1.355.900 1.579.600 1.522.000 1.477.900 1.256.200 8.541.900 1.2 Metrs: 1.050.300 1.041.300 1.018.357.00 2.062.400 1.988.00 1.270.900 1.266.200 1.275.200 1.471.900 1.266.200 2.46.700 2.46.700 2.46.700 2.46.700 2.46.700 2.46.700 2.46.700 2.46.700 2.26.700 2.46.700 2.75.700 1.509.200 1.01 Nerv Busines: 4.515.700 4.505.600 4.998.700 4.715.200 4.481.400 3.986.600 72.1203.200 2.0 Improvement Mains: 1.302.900 1.309.600 1.309.600 1.309.600 1.309.600 58.700 58.700 58.700 58.700 58.700 4.814.400 5.87.00 4.855.200 3.1 Replacement Mains: 1.302.900 1.309.600 1.309.600 1.309.600 5.000 6.68.000 56.700 3.68.000 56.700 3.68.000 56.700 3.68.700 5.20.200 1.121.00 1.12.00 1.82.00 18.200 18.200 18.200		July Budget 2020	August Budget 2020	September Budget 2020	October Budget 2020	November Budget 2020	December Budget 2020	Total Post Test Year Budget 2020
1.0 Mains 1.350,300 1.535,000 1.579,000 1.522,000 1.470,000 1.526,200 8.541,000 1.1 Services 1.367,000 1.246,700 2.457,700 3.52,200 3.52,200 3.52,200 3.52,200 3.52,200 3.52,200 3.246,200 3.248,200 1.82,200 1.82,200 1.82,200 1.82,200 1.82,200 1.82,200 1.82,200 1.82,200 1.82,200 1.82,200 1.82,200 3.52,200,200 5.66,800 3.66,800 3.66,800 3.66,800 3.66,800 3.66,800 <td><u>New Business</u></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	<u>New Business</u>							
1.1 Services 1.855,700 2.153,700 2.062,400 1.958,000 1.710,900 11.641,200 1.2 Meters 1.056,000 1.041,3100 1.018,700 246,700 246,700 246,700 236,700 236,700 236,700 236,700 236,700 236,700 236,700 236,700 358,700 358,700 358,700 358,700 358,700 358,700 358,700 358,700 358,700 358,700 358,700 358,700 358,700 358,700 1.309,600 1.309,600 1.309,600 58,700 551,000 358,700 350,700 350,700 350,700 350,700 350,700<	1.0 Mains	1,350,300	1,355,900	1,579,600	1,522,000	1,477,900	1,256,200	8,541,900
1.2 Meters 1.063.000 1.043.100 1.018,700 884.100 783.200 743.800 5.51.0900 1.3 Regulators 246.700	1.1 Services	1,855,700	1,859,900	2,153,700	2,062,400	1,998,600	1,710,900	11,641,200
13. Regulators 246,700 246,700 246,700 246,700 27,700 1.509,200 Total New Business 4,515,700 4,505,600 4,998,700 4,715,200 4,481,400 3,986,600 27,203,200 2.0 Improvement Mains 1,302,900 1,309,600 1,309,600 1,309,600 1,309,600 678,100 7,219,400 3.1 Replacements 1,302,900 1,309,600 1,309,600 1,309,600 678,100 7,219,400 3.1 Replacement Metrics 1,302,000 13,009,600 1,309,600 1,82,00 18,200 4,862,200 3,263,400 3.4 Replacement Keylators 866,800 866	1.2 Meters	1,063,000	1,043,100	1,018,700	884,100	758,200	743,800	5,510,900
Total New Business 4,515,700 4,505,600 4,998,700 4,715,200 4,481,400 3,986,600 27,203,200 2.0 Improvement Mains 58,700 4,26,200 1,309,600 1,309,600 1,309,600 1,309,600 510,700 2,2631,000 12,600 18,200 18,200 18,200 18,200 18,200 12,000,800 5,000 5,000 3,455,700 3,508,000 2,631,000 2,631,000 2,034,900 10,030,00 2,034,900 10,030,00 2,034,900 1,030,000 2,631,00 2,631,00 2,631,00 2,631,00 2,631,00 2,631,00	1.3 Regulators	246,700	246,700	246,700	246,700	246,700	275,700	1,509,200
2.0 Improvement Mains 58,700 45,200 13,09,600 1,300,600 2,30,00 2,631,000 2,003,00 2,00,00 2,631,000 2,00,00 2,631,000 2,631,00	Total New Business	4,515,700	4,505,600	4,998,700	4,715,200	4,481,400	3,986,600	27,203,200
Replacements 1,302,900 1,309,600 3,45,700 3,50,800 2,63,100 2,00,30,90 2,00,31,900 2,00,31,900 2,00,31,900 2,00,31,900 2,00,31,900 2,00,31,900 2,00,31,900 2,00,31,900 2,00,31,900 2,00,30,90 2,00,30,90 2,00,90 1,1,40,90 1,1,900 1,1,900 1,1,900 1,1,900 1,1,900	2.0 Improvement Mains	58,700	58,700	58,700	58,700	58,700	58,700	352,200
3.0 Replacement Services 1,309,000 1,309,000 1,309,000 1,309,000 678,100 7,219,400 3.1 Replacement Services 377,000 921,600 889,000 889,000 442,000 452,300 499,200 510,700 2,637,400 3.1 Replacement Meters 18,200 18,200 18,200 18,200 12,000 12,000 2,631,000 2,637,400 3.4 Replacement Meters 3,380,600 3,542,800 3,516,600 3,455,700 3,500,6200 2,631,000 20,034,900 4.0 Land & Buildings - 50,300 50,000 - - 100,300,0 5.0 Automotive Equipment 1,562,100 1,426,000 668,000 44,000 - 3,700,100 6.0 Production Equipment 1,562,100 1,426,000 668,000 44,000 - 14,700 7.0 Transmission Equipment 31,100 11,900 11,900 11,900 11,900 11,900 11,900 15,700 9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 10.0 Building Improvements 211,700 264,700	Replacements							
3.1 Replacement Services 87,000 921,600 889,000 808,900 814,400 554,300 4,865,200 3.2 Lack Linpping 315,700 426,600 182,200 182,200 182,200 182,200 12,000 12,100 112,100 3.4 Replacement Megulators 3,380,000 3,542,800 3,650,00 3,455,700 3,508,200 2,631,000 2,034,900 4.0 Land & Buildings - 50,300 50,000 - - 100,300,0 5.0 Automotive Equipment 1,562,100 1,426,000 668,000 44,000 - - 100,300,0 6.0 Production Equipment 3,11,00 11,900 11,900 11,900 11,900 11,900 90,600 8.0 Distribution Equipment 26,300 26,400 26,400 26,400 26,400 1,736,300 9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 1.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000<	3.0 Replacement Mains	1,302,900	1,309,600	1,309,600	1,309,600	1,309,600	678,100	7,219,400
3.2 Leak Clamping 315,700 426,600 433,000 452,200 499,200 510,700 2,637,400 3.3 Replacement Meters 18,200 18,200 18,200 18,200 21,100 112,100 3.4 Replacement Kegulators 3,380,600 3,542,800 3,516,600 3,455,700 3,508,200 2,631,000 20,034,900 4.0 Land & Buildings - 50,300 50,000 - - - 100,300.0 5.0 Automotive Equipment 1,562,100 1,426,000 668,000 44,000 - - 3,700,100 6.0 Production Equipment 1,562,100 1,426,000 668,000 44,000 - - 3,700,100 7.0 Transmission Equipment 31,100 11,900 11,900 11,900 11,900 11,900 11,900 11,900 15,8700 9.0 Office Furniture & Equipment 26,300 26,600 26,400 27,000 874,000 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 10.0 Cummunications Equipment - - - -	3.1 Replacement Services	877,000	921,600	889,000	808,900	814,400	554,300	4,865,200
3.3 Replacement Meters 18,200 18,200 18,200 18,200 21,100 112,100 3.4 Replacement Regulators 866,800 866,800 866,800 3,668,800 5,200,800 4.0 Land & Buildings - 50,300 50,000 - - 100,300,00 5.0 Automotive Equipment 1,562,100 1,426,000 668,000 44,000 - - 3,700,100 6.0 Production Equipment 1,562,100 1,426,000 668,000 44,000 - - 14,700 7.0 Transmission Equipment 31,100 11,900 11,900 11,900 11,900 119,00 90,600 8.0 Distribution Equipment 26,300 26,300 26,400 26,400 27,000 158,700 9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 12.0 Communications Equipment - - - - - - - - - - - -	3.2 Leak Clamping	315,700	426,600	433,000	452,200	499,200	510,700	2,637,400
3.4 Replacement Regulators 866,800 866,800 3,300,800 5,200,800 5,200,800 Total Replacements 3,380,600 3,542,800 3,516,600 3,455,700 3,508,200 2,631,000 20,034,900 4.0 Land & Buildings - 50,300 50,000 - - - 100,300.0 5.0 Automotive Equipment 1,562,100 1,426,000 668,000 44,000 - - 3,700,100 6.0 Production Equipment 8,400 2,400 2,400 1,300 200 - 14,700 7.0, Transmission Equipment 31,100 11,900 11,900 11,900 11,900 11,900 11,900 90,600 8.0 Distribution Equipment 26,300 26,300 26,400 27,000 158,700 9.0 Office Furniture & Equipment 211,700 264,700 201,900 140,700 30,000 23,4900 1,736,300 1.0 Cathodic Protection 326,600 326,600 32,600 23,000 23,100 22,300 199,000 14.0 Infrastru	3.3 Replacement Meters	18,200	18,200	18,200	18,200	18,200	21,100	112,100
Total Replacements 3,380,600 3,542,800 3,516,600 3,455,700 3,508,200 2,631,000 20,034,900 4.0 Land & Buildings - 50,300 50,000 - - 100,300,0 5.0 Automotive Equipment 1,562,100 1,426,000 668,000 44,000 - - 3,700,100 6.0 Production Equipment 8,400 2,400 1,300 200 - 14,700 7.0, Transmission Equipment 31,100 11,900 11,900 11,900 11,900 11,900 11,900 158,700 9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 12.0 Communications Equipment -	3.4 Replacement Regulators	866,800	866,800	866,800	866,800	866,800	866,800	5,200,800
4.0 Land & Buildings - 50,300 50,000 - - 100,300.0 5.0 Automotive Equipment 1,562,100 1,426,000 668,000 44,000 - - 3,700,100 6.0 Production Equipment 8,400 2,400 1,300 200 - 14,700 7.0,Transmission Equipment 31,100 11,900 11,900 11,900 11,900 90,600 8.0 Distribution Equipment 26,300 26,300 26,400 27,000 158,700 9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 12.0 Communications Equipment - <td>Total Replacements</td> <td>3,380,600</td> <td>3,542,800</td> <td>3,516,600</td> <td>3,455,700</td> <td>3,508,200</td> <td>2,631,000</td> <td>20,034,900</td>	Total Replacements	3,380,600	3,542,800	3,516,600	3,455,700	3,508,200	2,631,000	20,034,900
5.0 Automotive Equipment 1,562,100 1,426,000 668,000 44,000 - - 3,700,100 6.0 Production Equipment 8,400 2,400 2,400 1,300 200 - 14,700 7.0 Transmission Equipment 31,100 11,900 11,900 11,900 11,900 11,900 90,600 8.0 Distribution Equipment 26,300 26,300 26,400 26,400 27,000 158,700 9.0 Office Furniture & Equipment 25,100 50,000 - - - 7 75,100 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 12.0 Communications Equipment -	4.0 Land & Buildings	-	50,300	50,000	-	-	-	100,300.0
6.0 Production Equipment 8.400 2.400 1.300 100 - 14,700 7.0 Transmission Equipment 31,100 11,900 11,900 11,900 11,900 11,900 11,900 8.0 Distribution Equipment 26,300 26,300 26,400 26,400 27,000 158,700 9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 11.0 Cathodic Protection 326,600 326,600 326,600 274,900 246,700 234,900 1,736,300 12.0 Communications Equipment -	5.0 Automotive Equipment	1,562,100	1,426,000	668,000	44,000	-	-	3,700,100
7.0, Transmission Equipment 31,100 11,900 11,900 11,900 11,900 11,900 11,900 90,600 8.0 Distribution Equipment 26,300 26,300 26,400 26,400 27,000 158,700 9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 11.0 Cathodic Protection 326,600 326,600 326,600 274,900 246,700 234,900 1,736,300 12.0 Communications Equipment -	6.0 Production Equipment	8,400	2,400	2,400	1,300	200	-	14,700
8.0 Distribution Equipment 26,300 26,300 26,400 26,400 27,000 158,700 9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 11.0 Cathodic Protection 326,600 326,600 326,600 274,900 246,700 234,900 1,736,300 12.0 Communications Equipment - - - - - - - 13.0 Information Technology 80,400 27,200 23,000 23,000 23,100 22,300 199,000 14.0 Infrastructure Investment -	7.0 Transmission Equipment	31,100	11,900	11,900	11,900	11,900	11,900	90,600
9.0 Office Furniture & Equipment 25,100 50,000 - - - 75,100 10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 11.0 Cathodic Protection 326,600 326,600 326,600 274,900 246,700 234,900 1,736,300 12.0 Communications Equipment - - - - - - - 13.0 Information Technology 80,400 27,200 23,000 23,000 22,300 22,300 199,000 14.0 Infrastructure Investment SHARP II - <td< td=""><td>8.0 Distribution Equipment</td><td>26,300</td><td>26,300</td><td>26,300</td><td>26,400</td><td>26,400</td><td>27,000</td><td>158,700</td></td<>	8.0 Distribution Equipment	26,300	26,300	26,300	26,400	26,400	27,000	158,700
10.0 Building Improvements 211,700 264,700 201,900 140,700 30,000 25,000 874,000 11.0 Cathodic Protection 326,600 326,600 326,600 274,900 246,700 234,900 1,736,300 12.0 Communications Equipment - - - - - - - 13.0 Information Technology 80,400 27,200 23,000 23,000 23,100 22,300 199,000 14.0 Infrastructure Investment - <td>9.0 Office Furniture & Equipment</td> <td>25,100</td> <td>50,000</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>75,100</td>	9.0 Office Furniture & Equipment	25,100	50,000	-	-	-	-	75,100
11.0 Cathodic Protection 326,600 326,600 326,600 274,900 246,700 234,900 1,736,300 12.0 Communications Equipment - - - - - - - 13.0 Information Technology 80,400 27,200 23,000 23,000 23,100 22,300 199,000 14.0 Infrastructure Investment SHARP II - - - - - - Total Infrastructure Investment - - - - - - - Total Infrastructure Investment - - - - - - - - - Total Infrastructure Investment -	10.0 Building Improvements	211,700	264,700	201,900	140,700	30,000	25,000	874,000
12.0 Communications Equipment - - - - - - - - 13.0 Information Technology 80,400 27,200 23,000 23,000 23,100 22,300 199,000 14.0 Infrastructure Investment SHARP II - - - - - - - - SHARP II - <td>11.0 Cathodic Protection</td> <td>326,600</td> <td>326,600</td> <td>326,600</td> <td>274,900</td> <td>246,700</td> <td>234,900</td> <td>1,736,300</td>	11.0 Cathodic Protection	326,600	326,600	326,600	274,900	246,700	234,900	1,736,300
13.0 Information Technology 80,400 27,200 23,000 23,000 23,100 22,300 199,000 14.0 Infrastructure Investment SHARP II -	12.0 Communications Equipment	-	-	-	-	-	-	-
14.0 Infrastructure Investment - <td< td=""><td>13.0 Information Technology</td><td>80,400</td><td>27,200</td><td>23,000</td><td>23,000</td><td>23,100</td><td>22,300</td><td>199,000</td></td<>	13.0 Information Technology	80,400	27,200	23,000	23,000	23,100	22,300	199,000
SHARP II -<	14.0 Infrastructure Investment							
AIRP II - </td <td>SHARP II</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td>	SHARP II	-	-	-	-	-	-	-
Total Infrastructure Investment Image: Constructure Investment Image: Constructure Investment Image: Constructure Investment TOTAL SJG Capex 10,226,700 10,292,500 9,884,100 8,751,800 8,386,600 6,997,400 54,539,100 Transfer from CWIP to UPIS 296,842 1,431 - 64,607 - 214,459 577,340 Total 10,523,542 10,293,931 9,884,100 8,816,407 8,386,600 7,211,859 55,116,440 .<	AIRP II Total Infractructure Investment	-	-	-	-	-	-	-
TOTAL SJG Capex 10,226,700 10,292,500 9,884,100 8,751,800 8,386,600 6,997,400 54,539,100 Transfer from CWIP to UPIS 296,842 1,431 - 64,607 - 214,459 577,340 Total 10,523,542 10,293,931 9,884,100 8,816,407 8,386,600 7,211,859 55,116,440 Total Retirements 1,162,110 1,162,110 1,162,110 1,162,110 1,162,110 1,162,110 6,972,659 Total 9,361,433 9,131,821 8,721,990 7,654,297 7,224,490 6,049,749 48,143,781		-	-	-	-	-	-	-
Transfer from CWIP to UPIS 296,842 1,431 - 64,607 - 214,459 577,340 Total 10,523,542 10,293,931 9,884,100 8,816,407 8,386,600 7,211,859 55,116,440 Total Retirements 1,162,110 1,162,110 1,162,110 1,162,110 1,162,110 1,162,110 6,972,659 Total 9,361,433 9,131,821 8 721 990 7 654 297 7 224 490 6 049 749 48 143 781	TOTAL SJG Capex	10,226,700	10,292,500	9,884,100	8,751,800	8,386,600	6,997,400	54,539,100
Total 10,523,542 10,293,931 9,884,100 8,816,407 8,386,600 7,211,859 55,116,440	Transfer from CWIP to UPIS	296,842	1,431	-	64,607	-	214,459	577,340
Total Retirements 1,162,110 1,162,110 1,162,110 1,162,110 1,162,110 1,162,110 1,162,110 6,972,659 Total 9,361,433 9,131,821 8,721,990 7,654,297 7,224,490 6,049,749 48,143,781	Total	10,523,542	10,293,931	9,884,100	8,816,407	8,386,600	7,211,859	55,116,440
Total 9.361.433 9.131.821 8.721.990 7.654.297 7.224.490 6.049.749 48.143.781	Total Retirements	1,162,110	1,162,110	1,162,110	1,162,110	1,162,110	1,162,110	6,972,659
	Total	9,361.433	9,131.821	8,721,990	7,654.297	7,224.490	6,049.749	48,143.781

SOUTH JERSEY GAS COMPANY PRO FORMA ADJUSTMENTS TO DECEMBER 31, 2020 MAJOR CAPITAL PROJECTS

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Line			Α	ctuals as of	,	Test Year	Po	ost-Test Year		Total	Projected
No.	Project Name	Type of Project		Dec-19	Projection			Projection	Projection		In Service Date
1	New Sentury Compression Project	Transmission Equipment	\$	19,638,938	\$	12,624,100	\$	29,236,962	\$	61,500,000	December 2020
2	24 New Sentury Traffic Study HDD	Replacement Mains	\$	-	\$	122,400	\$	1,365,800	\$	1,488,200	December 2020
3	8 Ocean Heights Offset	Improvement Mains	\$	-	\$	451,700	\$	435,800	\$	887,500	November 2020
4	Wheaton & K Reg Station Replacement	Transmission Equipment	\$	-	\$	146,200	\$	505,800	\$	652,000	September 2020
5	Farm Tap Encapsulations 2020	Transmission Equipment	\$	-	\$	105,900	\$	517,200	\$	623,100	December 2020
6	Stokes Road Station Replacement	Transmission Equipment	\$	-	\$	32,100	\$	451,900	\$	484,000	October 2020
7	Upgrade LNG SCADA	Production Equipment/IT	\$	-	\$	174,000	\$	225,900	\$	399,900	October 2020
8	Timothy Lane Reg Station Replacement	Transmission Equipment	\$	-	\$	329,200	\$	51,100	\$	380,300	July 2020
9	Above Grade Station Asbuilt Program	Transmission Equipment	\$	-	\$	164,700	\$	168,300	\$	333,000	December 2020
10	Gate Station Odorization	Transmission Equipment	\$	-	\$	25,700	\$	301,200	\$	326,900	November 2020
11	Renovation of Folsom Office Facility	Building Improvements	\$	4,696,907	\$	9,046,193	\$	5,356,900	\$	19,100,000	July 2020
12	Maximo & CC&B Upgrade	Information Technology	\$	2,749,602	\$	5,535,400	\$	1,535,700	\$	9,820,702	August 2020
13	SJG Contact Center Modernization	Information Technology	\$	1,812,815	\$	557,600	\$	385,400	\$	2,755,815	December 2020
14	ServiceNow Enhancement (ITSM, ITBM)	Information Technology	\$	-	\$	305,900	\$	312,700	\$	618,600	December 2020
15	SCADA Intrusion Prevention System (IPS) Upgrade	Information Technology	\$	-	\$	201,700	\$	406,800	\$	608,500	October 2020
16	Role-Based Access Control	Information Technology	\$	442,586	\$	62,200	\$	17,400	\$	522,186	August 2020
17	Safety Management Solution	Information Technology	\$	156,304	\$	65,800	\$	202,200	\$	424,304	August 2020
18	Cyber Risk Remediation	Information Technology	\$	64,106	\$	84,300	\$	118,100	\$	266,506	October 2020
19	NextGen Portal	Information Technology	\$	-	\$	55,200	\$	112,200	\$	167,400	December 2020
20	Windows/SQL 2008 Upgrades	Information Technology	\$	91,547	\$	98,100	\$	16,800	\$	206,447	August 2020
21	Customer Meter Set #3 Replacement	Replacement Meters	\$	-	\$	-	\$	161,700	\$	161,700	September 2020
22	Total Post Test Year Major Capital Projects		\$	29,652,805	\$	30,188,393	\$	41,885,862	\$	101,727,060	

INSERT TAB:

L. BRINSON

IN THE MATTER OF THE PETITION OF SOUTH JERSEY GAS COMPANY FOR APPROVAL OF INCREASED BASE TARIFF RATES AND CHARGES FOR GAS SERVICE, CHANGES TO DEPRECIATION RATES AND OTHER TARIFF REVISIONS

BPU DOCKET NO. GR20_____

DIRECT TESTIMONY

OF

LEONARD BRINSON JR. Vice President and Chief Information Officer South Jersey Industries, Inc.

> On Behalf of South Jersey Gas Company

> > Exhibit P-5

March 13, 2020

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SOUTH JERSEY GAS COMPANY DIRECT TESTIMONY OF LEONARD BRINSON JR.

1 I. INTRODUCTION

2 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Leonard Brinson Jr. My business address is 1001 South Grand Street,
Hammonton, New Jersey 08037.

5 Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

6 A. I am employed by South Jersey Industries, Inc. ("SJI") as Vice President and Chief
7 Information Officer.

8 Q. PLEASE DESCRIBE YOUR PROFESSIONAL RESPONSIBILITIES.

9 A. I provide strategic vision and advise executive management on the use of technology to
10 meet strategic business goals. I am accountable for the management of the Information
11 Technology ("IT") department, projects, initiatives, systems and assets. I oversee the
12 critical area of cybersecurity and actively engage in the coordination and development of
13 relationships with third party service providers.

14 Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND INDUSTRY 15 RELATED EXPERIENCE.

A. I graduated from Millikin University in 1979 with a Bachelor of the Arts in Political
 Science and later earned an Executive M.B.A. from Jacksonville University. After
 graduating from Millikin University, I worked at Prudential Financial Florida and New
 Jersey from 1980 until 2004, where I held a number of positions including Director,
 Information Systems, Enterprise Tax Systems and Manager, Technology Services, Output
 Services and LAN Administration. After Prudential, I worked at Enterprise Technology
 Partners, LLC from 2004 to 2005, serving as Client Relationship Director. In 2005, I joined

Williams Companies, where I held a number of management positions, including
Transformation Manager; Manager, Planning & Governance; Manager, IT Operations; and
Manager, Information Management. From 2013 to 2017, I worked at Axalta Coating
Systems where I held several Director roles, including Global IT Director, Corporate
Applications & Reporting; Global IT Director, Global Applications; and Global IT
Director, Office of the CIO. I joined SJI in my current position in April 2017.

Q. HAVE YOU PREVIOUSLY TESTIFIED OR SUBMITTED PREPARED TESTIMONY IN ANY PROCEEDING BEFORE THE NEW JERSEY BOARD OF PUBLIC UTILITIES OR ANY OTHER REGULATORY AGENCY?

- 10 A. Yes. I previously submitted testimony on behalf of Elizabethtown Gas Company
 11 ("Elizabethtown") in its most recent base rate case in BPU Docket No. GR19040486.
- 12
- 13

II. <u>PURPOSE OF TESTIMONY</u>

14 Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

15 The purpose of my testimony is to support the IT investments that South Jersey Gas A. Company ("South Jersey," "SJG," or the "Company") has included for recovery in the base 16 17 rates proposed in this proceeding. To this end, I will explain the IT investments projected to be placed in service during the test year ended June 30, 2020 and prior to December 31, 18 19 2020, the end of the post-test year period, and why these investments are needed to support 20 the operations of South Jersey and ensure that the systems enable the Company to comply 21 with all applicable regulatory requirements and continue to provide high quality service to 22 customers.

Q. PLEASE DESCRIBE THE ORGANIZATIONAL STRUCTURE OF THE SJI IT DEPARTMENT AND ITS AREAS OF RESPONSIBILITY.

A. The IT Department is housed within SJI and provides technology services to all companies
within the SJI organization, including South Jersey, with an emphasis on the customer
experience, utility operations and enterprise service systems. The IT Department oversees
system applications and has responsibility for all devices, including personal computers,
laptops and mobile devices, as well as all infrastructure, including all networks, layered
security devices, communications devices, and physical and virtual servers. The IT
Department is responsible for the following five functional areas:

- 10(i)**Plan Function**, which consists of four major components: (1) development and11management of the SJI IT budget; (2) management of the SJI IT portfolio,12including responsibility for prioritizing IT projects and helping to ensure that13they remain within the agreed upon scope, budget and timeline; (3)14management of SJI's IT-related vendor relationships, including the negotiation15of contracts and monitoring vendor performance; and (4) IT-related Sarbanes16Oxley ("SOX") and other internal and external IT-related compliance;
- 17 (ii) <u>Build Function</u>, which involves the development of new applications as well
 18 as enhancements to existing applications, providing new functionality to the
 19 organization;
- 20 (iii) <u>Run Function</u>, which involves the delivery of IT services in three major areas,
 21 including (1) infrastructure, including the network and software that provides
 22 the foundation on which all IT services are built; (2) applications, which deploy
 23 and support IT applications that provide automation and consistency to IT-

1 enabled SJI business processes; and (3) service, which provides first and second 2 tier IT support to business users; 3 Protect Function, which involves maintaining information security and (iv) 4 cybersecurity across the entire SJI enterprise; and 5 **Report Function**, which involves ensuring the integrity and security of all data **(v)** 6 assets, data systems, business intelligence, and data-related processes. 7 8 III. **DISCUSSION OF IT INVESTMENTS** 9 Q. PLEASE DESCRIBE EACH OF THE SIGNIFICANT IT SYSTEMS THAT SOUTH 10 JERSEY IS PLANNING TO PLACE IN SERVICE DURING THE TEST YEAR AND POST TEST YEAR PERIOD OF THIS CASE AND EXPLAIN WHAT THOSE 11 12 SYSTEMS ARE OR WILL BE USED FOR. The following major systems were already placed in service, or are projected to be placed 13 A. 14 in service, during the test year and/or post-test year periods: 15 (i) IBM Maximo & Oracle Customer Care and Billing ("CC&B") Upgrade: 16 This project includes an upgrade to South Jersey's Oracle CC&B and IBM Maximo operating systems, along with a reconfiguration and upgrade of 17 18 associated middleware. These upgrades to the latest versions of Maximo and 19 CC&B are needed to continue to receive support from IBM and Oracle insofar 20 as these vendors will not be providing support for older versions of these 21 products in the near future. Investments to upgrade SJG's Maximo and CC&B 22 systems are also needed to align systems and standardize business practices 23 across SJI's gas utilities.

Exhibit P-5

1		IBM Maximo is an asset management system that provides a single
2		point of control over all of SJG's physical assets, allowing the Company to
3		share and enforce uniform management practices, inventory, resources and
4		personnel, and serving as the field work management system for SJG.
5		Oracle CC&B is the main customer support system that provides
6		customer support in the SJG call center(s). CC&B is a complete billing and
7		customer care application. CC&B handles every aspect of the customer life
8		cycle, from establishing new customers, meter reading, billing, rates, payment
9		processing, collections, and creating field work.
10		Middleware is the critical middle layer between applications and
11		databases that enables a seamless flow of data/information across applications.
12		For example, when CC&B captures a customer complaint of a gas leak, that
13		data is sent to Maximo to create a work order and interface with the Oracle
14		dispatch tool to schedule an appointment with a technician. Middleware
15		ensures that the CC&B complaint data flows through this process. The IBM
16		Maximo and Oracle CC&B Upgrade is projected to be placed in-service in
17		August 2020.
18	(ii)	South Jersey Contact Center Modernization: SJG's Contact Center
19		currently uses a Cisco platform, which is widely considered by industry experts
20		as the leading technology platform for the Contact Center. The Cisco platform
21		requires modernization to upgrade the core platform, expand features and
22		functionality, improve the customer experience, and enhance the platform's
23		resiliency. SJI employed a Request For Proposal process to determine much of

1 the work to be completed in 2020. This is a two-phase project. Phase 1 of the 2 project includes upgrades to existing technologies, including Core telephony 3 (Cisco), Workforce Management (Calabrio), Agent Call Recording (Calabrio), 4 Customer Callback, Text to Speech (Nuance), the interactive voice response 5 ("IVR") menu, as well as the addition of new capabilities, including Agent 6 Screen Recording (Calabrio), Extension Mobility (i.e., the ability to move 7 employees' telephone extensions to new locations, which was needed to support the transition to the Company's Atlantic City office) and network 8 9 infrastructure to support the CustomerLink outsourced call center. Phase 1 was 10 completed and investments were put in service prior to the test year. Phase 2 11 includes implementation of an Outbound Dialer system, a complete redesign of 12 the Company's IVR system, implementation of an intelligent email management system, and a credit and address validation solution. 13 The 14 investments related to the Outbound Dialer System were placed in service in 15 February 2020, during the test year. The remaining investments in Phase 2 are 16 projected to be placed in service during the post test year, with all investments 17 projected to be placed in service by December 2020.

(iii) <u>ServiceNow Enhancement:</u> SJG has been on the ServiceNow Platform since
2018 for change and incident management. This platform has streamlined
processes and has created more agile IT for these purposes but needs to be
enhanced to include configuration management to improve impact analysis of
IT changes and deliver the effective scale and scope of changes to the SJG IT
environment. This project consists of an ongoing, multi-phase effort to build

1South Jersey's IT Service Management ("ITSM") capabilities in the2ServiceNow application. The project is currently in Phase 4, which includes3Application Mapping, Orchestration, and Asset Management. Phase 5 will4continue to build-out the ServiceNow platform capabilities, and will include an5assessment workshop to plan future investments, Application Mapping,6configuration management database, and IT business management initiatives.7Phases 4 and 5 are projected to be completed by December 2020.

8 Supervisory Control and Data Acquisition ("SCADA") Intrusion (iv) 9 **Prevention System:** This system is an upgrade and enhancement of South 10 Jersey's Intrusion Prevention System to address cyber security risks to the 11 system and facilitate compliance with the cybersecurity requirements set forth 12 in the Board's March 18, 2016 Order in Docket No. AO16030196 ("Cyber Order"). Phase 1 of the project will be placed in service during the test year 13 14 and includes an upgrade to the legacy Intrusion Protection System with a 15 NextGen security system that supports Unified Threat Management. Phase 2 16 of the project is projected to be placed in service in October 2020, during the 17 post-test year period, and includes implementation of industrial cybersecurity 18 software that identifies SCADA network assets, pinpoints malicious activity, 19 and provides step-by-step guidance to investigate and respond to incidents. SJG 20 is currently evaluating the specific tool sets to be used for this implementation. 21 In making this decision, the Company will leverage a similar approach 22 employed in the selection of its other security systems, including documenting requirements, discussions with peers within and outside the utility industry and 23

leveraging SJI's relationship with Gartner, Inc. ("Gartner"), an industry leader in IT service management.

- 3 **Role-Based Access Control:** This project will improve South Jersey's overall **(v)** 4 Identity and Access Management ("IAM") program and starts to set the 5 foundational components to mature the program. The work included in this 6 project is an IAM roadmap and blueprint, implementation of a privileged access 7 management solution, build-out of a Single Sign-On ("SSO") solution, and expansion of the current Multi-Factor Authentication ("MFA"). This is an 8 9 ongoing, multi-phased project that began prior to the test year and continues 10 through the test year and post-test year period. The projected in-service date 11 for this project is August 2020. The initial roadmap assessment for this project 12 provided areas of focus for SJI to start with regarding Identity and Access Management. Privileged Access Management ("PAM") and expansion of our 13 14 SSO and MFA solution were key risk areas that provide the foundation for these 15 investments. For PAM, the SJI IT team narrowed down the selection to two 16 leading providers, and had discussions with peers within and outside the utility 17 industry, including Gartner, to help select a PAM solution. For SSO and MFA, SJI IT leveraged its existing solution and expanded the implementation to 18 19 protect additional applications.
- 20 (vi) <u>Safety Management Solution:</u> The Company will implement a Safety
 21 Management Solution through a SharePoint add in called HSEQ Innovate.
 22 This application will provide automation to the manual reporting and tracking
 23 processes currently used by the Safety Department. Phase I of the project

1 includes the definition, configuration, integration, and testing of the new 2 application, as well as work to implement the application on SJG's system. This 3 work is projected to be completed in the test year, in June 2020. Phase II of the 4 project includes the integration of the application with Salesforce and Workday 5 applications in 2020. In developing this project, the SJI IT team assessed 6 available software and tools specifically built for the 7 entering/tracking/reporting of safety incident data to determine how best to improve the incident tracking. The Company ultimately decided that the HSEQ 8 9 Innovate tool provided the best available solution. This tool is a SharePoint 10 add-in that leverages SJI's existing SharePoint infrastructure, provides an 11 industry standard and extensible solution, and improves the overall accuracy 12 and timeliness of safety incident management and reporting. This project will begin during the test year and continue in the post-test year period, with a 13 14 projected completion date of August 2020.

15 (vii) Upgrade Liquefied Natural Gas ("LNG") SCADA: This project will 16 upgrade the hardware and software at the Company's LNG SCADA facility in 17 McKee City to the latest versions. The LNG SCADA system at SJG is currently running on an older SCADA system software, legacy windows operating 18 systems and aging server hardware. The SJI IT team determined that an 19 20 upgrade to the existing system is needed to bring the system up to a level that 21 is supported by our vendors. All hardware and software will be upgraded to the 22 latest versions. This mitigates cyber security, support and operational risk. The 23 upgraded hardware and software will align with that in place at SJI's other

2

operating utilities and will simplify support and patching. This project is projected to be placed in-service in October 2020.

- 3 **Cyber Risk Remediation:** This project is a multi-year, multi-phase project (viii) 4 designed to evaluate, monitor, mitigate, and resolve cyber risks to South Jersey 5 and facilitate compliance with the Cyber Order. The Cyber Risk Remediation 6 project includes investments during the test year and post-test year period, and 7 has a projected in-service date of October 2020. This project will include 8 penetration testing and vulnerability assessments and leveraging the results of these assessments to address critical areas discovered to address system and 9 10 process vulnerabilities for the systems currently in place at SJG. This will allow the SJI IT team to continuously improve cybersecurity posture and maturity at 11 12 SJG. The SJI IT team is currently evaluating the specific tool sets, consulting resources and/or systems required for this project and will leverage its 13 14 experience in prior security system selections. This process includes 15 documenting requirements, and discussions with peers within and outside the 16 utility industry.
- 17(ix)NextGen Portal:
NextGen Portal:This project includes the installation of a Security Appliance18onsite at SJI as part of a three-year engagement with Presidio, Inc. ("Presidio").19The appliance is required for information gathering, technical testing, and20information sharing and will provide ongoing access for SJI to the results and21reports of the various testing and assessment activities performed throughout22the 3-year engagement so that SJI can leverage this data for additional insights.23This will assist in measuring the cybersecurity maturity of the SJI cybersecurity

- program. The NextGen Portal project is projected to be placed in service during
 the post test year, in December 2020.
- 3 Windows/SQL 2008 Upgrades: Microsoft ended support, including regular **(x)** 4 security updates and patching, for Windows Server 2008 and 2008r2 on January 5 14, 2020. South Jersey currently has 70 servers running applications that need 6 to be migrated to 2016 servers or be decommissioned. As of February 2020, 7 the Company had migrated or decommissioned 32 of these servers. The 8 Company is currently evaluating the remaining servers for migration or 9 decommissioning. The server upgrades are projected to be completed by 10 August 2020.
- 11 The actual and forecast expenditures for each of these projects, as well as the 12 projected in-service dates, are shown on Schedule BWS-4 to Company witness Brent W. 13 Schomber's testimony.

14 Q. PLEASE DESCRIBE HOW THE SPECIFIC SYSTEMS TO BE INSTALLED FOR
15 SOUTH JERSEY WERE SELECTED.

A. In assessing its options for each of these projects, South Jersey used a competitive bidding
 process with multiple vendors to allow the Company to find the most cost-efficient solution
 to its IT needs. The Company determined that each of the systems being implemented best
 addressed the Company's particular needs in a cost-efficient manner.

Q. WILL THE NEW SYSTEMS BEING DEVELOPED FOR SOUTH JERSEY HAVE
 GREATER FUNCTIONALITY OR CAPABILITIES THAN THE CURRENT
 SYSTEMS USED BY THE COMPANY?

A. Yes, South Jersey will benefit from increased functionality or capabilities from many of its
new or enhanced systems. For example, the current SJG versions of the IBM Maximo and
Oracle CC&B systems were implemented in 2014 and are nearing the end of their useful
lives and will no longer be supported by the vendor. Enhancements available with the
latest versions will increase productivity across the 400 Maximo and 250 CC&B users, and
also reduce support and maintenance costs.

10 The Contact Center Modernization efforts also include multiple new and enhanced 11 An automated system for contacting delinquent customers will be capabilities. 12 implemented, which is intended to improve collections department efficiencies. In 13 addition, a redesigned IVR system and automated email management solution will be 14 implemented. The IVR and email management solutions are intended to help speed 15 response to customer inquiries, enhance the customer experience and improve contact center efficiencies. 16

17

Q. HOW WILL THIS GREATER FUNCTIONALITY BENEFIT CUSTOMERS?

A. Customers will benefit from the greater functionality of these new and enhanced systems
 in many ways. For example, the overall objective of the Contact Center Modernization
 initiatives is to improve the speed and quality of service provided to our customers. The
 Contact Center Modernization will further benefit customers by improving "self-service"
 capabilities, enabling customers to more quickly and efficiently access their desired
 information, reducing wait times for customers seeking access to a customer service

Exhibit P-5

representative, and providing more accurate and timely responses to customer email inquiries. In addition, the automated system for contacting delinquent customers will ensure customers are promptly notified and have clear and accurate information regarding resolution of issues associated with their accounts.

5 Additionally, several of the Company's IT investments, including SCADA 6 Intrusion Prevention System, Role-Based Access Control, Cyber Risk Remediation, and 7 NextGen Cyber Risk Management Portal projects, will enhance the Company's 8 cybersecurity capabilities, resulting in greater protection of confidential customer 9 information, enhanced integrity and reliability of the Company's system, data, and 10 customer services.

11 Q. WILL THE NEW SYSTEMS CREATE ANY OPPORTUNITIES FOR 12 EFFICIENCIES FOR SOUTH JERSEY?

A. The new systems may create opportunities for efficiencies at South Jersey. The Maximo and CC&B system in place at SJG is outdated and is an older model than was implemented at its affiliate, Elizabethtown. As such, these updates will allow SJI to better align systems and standardize the business across the family of SJI companies. Further, as the versions of Maximo and CC&B currently in place at South Jersey are no longer supported by their respective vendors, the upgrades will allow the Company to continue to obtain technical vendor support, rather than seeking or developing customized support solutions.

20 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

21 A. Yes.

INSERT TAB:

•

B. O'BRIEN

IN THE MATTER OF THE PETITION OF SOUTH JERSEY GAS COMPANY FOR APPROVAL OF INCREASED BASE TARIFF RATES AND CHARGES FOR GAS SERVICE, CHANGES TO DEPRECIATION RATES AND OTHER TARIFF REVISIONS

BPU DOCKET NO. GR20_____

DIRECT TESTIMONY

OF

BRENDA J. O'BRIEN

Vice President, Accounting

On Behalf Of South Jersey Gas Company

Exhibit P-6

March 13, 2020

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SOUTH JERSEY GAS COMPANY DIRECT TESTIMONY OF BRENDA J. O'BRIEN

1 I. INTRODUCTION

2 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Brenda J. O'Brien. My business address is 1001 South Grand Street,
Hammonton, New Jersey 08037.

5 Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

6 A. I am employed by South Jersey Industries, Inc. ("SJI") as Vice President, Accounting.

7 Q. PLEASE DESCRIBE YOUR PROFESSIONAL RESPONSIBILITIES.

8 I oversee the Accounting, Tax, and Payroll functions of SJI and its subsidiaries. In this A. 9 position, I am responsible for providing leadership and strategic direction for the South Jersey Gas Company's ("South Jersey" or the "Company") accounting, financial systems, 10 11 and public reporting activities. My responsibilities include, but are not limited to, the 12 implementation of appropriate accounting policies, practices, and procedures; review of 13 monthly and quarterly financial closing packages; maintenance and oversight of upgrades 14 to fixed asset and general ledger accounting systems; assurance of adequate internal control 15 structure for SJI's financial records; compliance with timely external reporting with the 16 Securities and Exchange Commission (Form 10-K and 10-Q); and preparation of internal 17 reports to Board of Directors and Senior Management.

18

19

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND INDUSTRY-RELATED EXPERIENCE.

A. I graduated with Highest Honors from the University of Pittsburgh in 2006 with a Bachelor
 of Science in Business Administration Degree, majoring in Accounting and Finance. I am
 a Certified Public Accountant, holding an active license from the State of Pennsylvania. In

Exhibit P-6

1		2018, I earned a Master's in Business Administration Degree with a concentration in
2		Finance from Temple University. I am a member of the American Institute of Certified
3		Public Accountants and serve on the Virtua Health Foundation Board of Trustees.
4		Upon completion of my undergraduate degree, I worked for the Big Four public
5		accounting firm of Deloitte, LLP from 2006 to 2012. During that time, I provided audit
6		services to a variety of clients, including SJI. In July 2012, I joined SJI as the Corporate
7		Finance Manager and have since held several finance-related roles in Risk Management,
8		Financial Planning and Analysis, and most recently Accounting. In June 2019, I was
9		promoted to Vice President, Accounting.
10		
11	II.	PURPOSE OF TESTIMONY
12	Q.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?
12 13	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY? The purpose of my direct testimony is to support South Jersey's base rate filing with the
12 13 14	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?The purpose of my direct testimony is to support South Jersey's base rate filing with theNew Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey's
12 13 14 15	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?The purpose of my direct testimony is to support South Jersey's base rate filing with theNew Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey'sproposals to reflect and recover certain regulatory assets in the revenue requirement in this
12 13 14 15 16	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?The purpose of my direct testimony is to support South Jersey's base rate filing with theNew Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey'sproposals to reflect and recover certain regulatory assets in the revenue requirement in thisproceeding.These regulatory assets are associated with pension and other post-
12 13 14 15 16 17	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY? The purpose of my direct testimony is to support South Jersey's base rate filing with the New Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey's proposals to reflect and recover certain regulatory assets in the revenue requirement in this proceeding. These regulatory assets are associated with pension and other post- employment benefits ("OPEB") costs, an Early Retirement Incentive Plan ("ERIP")
12 13 14 15 16 17 18	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY? The purpose of my direct testimony is to support South Jersey's base rate filing with the New Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey's proposals to reflect and recover certain regulatory assets in the revenue requirement in this proceeding. These regulatory assets are associated with pension and other post- employment benefits ("OPEB") costs, an Early Retirement Incentive Plan ("ERIP") offered by the Company in 2018 and costs associated with the cancellation of a pipeline
12 13 14 15 16 17 18 19	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY? The purpose of my direct testimony is to support South Jersey's base rate filing with the New Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey's proposals to reflect and recover certain regulatory assets in the revenue requirement in this proceeding. These regulatory assets are associated with pension and other post- employment benefits ("OPEB") costs, an Early Retirement Incentive Plan ("ERIP") offered by the Company in 2018 and costs associated with the cancellation of a pipeline project that was intended to provide service to an electric generation facility referred to as
12 13 14 15 16 17 18 19 20	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY? The purpose of my direct testimony is to support South Jersey's base rate filing with the New Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey's proposals to reflect and recover certain regulatory assets in the revenue requirement in this proceeding. These regulatory assets are associated with pension and other post- employment benefits ("OPEB") costs, an Early Retirement Incentive Plan ("ERIP") offered by the Company in 2018 and costs associated with the cancellation of a pipeline project that was intended to provide service to an electric generation facility referred to as BL England. I will also discuss certain elements of the revenue requirement including the
12 13 14 15 16 17 18 19 20 21	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY? The purpose of my direct testimony is to support South Jersey's base rate filing with the New Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey's proposals to reflect and recover certain regulatory assets in the revenue requirement in this proceeding. These regulatory assets are associated with pension and other post- employment benefits ("OPEB") costs, an Early Retirement Incentive Plan ("ERIP") offered by the Company in 2018 and costs associated with the cancellation of a pipeline project that was intended to provide service to an electric generation facility referred to as BL England. I will also discuss certain elements of the revenue requirement including the calculation of depreciation expense, the interest synchronization adjustment, the
 12 13 14 15 16 17 18 19 20 21 22 	Q. A.	WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY? The purpose of my direct testimony is to support South Jersey's base rate filing with the New Jersey Board of Public Utilities ("BPU" or "Board"). I will discuss South Jersey's proposals to reflect and recover certain regulatory assets in the revenue requirement in this proceeding. These regulatory assets are associated with pension and other post- employment benefits ("OPEB") costs, an Early Retirement Incentive Plan ("ERIP") offered by the Company in 2018 and costs associated with the cancellation of a pipeline project that was intended to provide service to an electric generation facility referred to as BL England. I will also discuss certain elements of the revenue requirement including the calculation of depreciation expense, the interest synchronization adjustment, the determination of the amounts of accumulated depreciation and accumulated deferred

1		with the Company's Folsom New Jersey office building. I will also sponsor various
2		financial and accounting data required by the Board's regulations as set forth in Section
3		14:1-5.12 of the New Jersey Administrative Code ("NJAC"). The information required by
4		the Board's regulations consists of balance sheets, income statements and other financial
5		data.
6	Q.	DO YOU SPONSOR ANY SCHEDULES IN YOUR DIRECT TESTIMONY?
7	А.	Yes. I am sponsoring the following schedules which were prepared or compiled under my
8		direction and supervision:
9		• Schedule BJO-1 – South Jersey's Balance Sheet for twelve months ended December
10		31, 2017, 2018 and 2019;
11		• Schedule BJO-2 – South Jersey's Statements of Income for the twelve months ended
12		December 31, 2017, 2018 and 2019;
13		• Schedule BJO-3 – South Jersey's Statement of Gas Operating Revenues for the twelve
14		months ended December 31, 2019;
15		• Schedule BJO-4 – South Jersey's Payments and Accruals to Affiliates for the twelve
16		months ended December 31, 2019;
17		• Schedule BJO-5 – <i>Pro Forma</i> Depreciation Expense & Accumulated Depreciation;
18		• Schedule BJO-6 – <i>Pro Forma</i> Non-Legal Asset Retirement Obligation;
19		• Schedule BJO-7 – Adjusted Deferred FIT Included in Rate Base;
20		• Schedule BJO-8 – Adjusted Deferred CBT Included in Rate Base;
21		• Schedule BJO-9 – Interest Synchronization Adjustment;
22		• Schedule BJO-10 – <i>Pro Forma</i> Revenue and O&M Expense – Folsom Facility;
23		• Schedule BJO-11 – <i>Pro Forma</i> Pension and Retirement Benefit Expense;

- 1 Schedule BJO-12 – ERIP Costs; and • 2 • Schedule BJO-13 – BL England Costs. 3 4 III. FILING REQUIREMENTS UNDER NJAC 5 Q. PLEASE DESCRIBE SCHEDULES BJO-1 THROUGH BJO-4. Schedule BJO-1 through BJO-4 present statements and financial data required by the 6 A. 7 Board's regulations. Schedules BJO-1 and BJO-2 provide historical comparative balance 8 sheets and income statements, respectively, for South Jersey Gas, for the twelve months 9 ended December 31, 2017, 2018 and 2019. Schedule BJO-3 provides South Jersey's 10 statement of gas operating revenues for the twelve months ended December 31, 2019 and 11 Schedule BJO-4 provides South Jersey's payments and accruals to affiliates for the twelve 12 months ended December 31, 2019. 13 14 IV. **DEPRECIATION ADJUSTMENTS** PLEASE EXPLAIN THE COMPANY'S CALCULATION OF DEPRECIATION 15 Q. 16 EXPENSE AND ACCUMULATED DEPRECIATION. 17 A. Schedule BJO-5 is a summary of pro forma adjustments to depreciation expense and
- 20 to the Direct Testimony of Company witness Stefany Graham.

accumulated depreciation. These adjustments are reflected on line 9 on Schedule SMG-3

(Operating Income Statement) and on line 2 on Schedule SMG-2 (Statement of Rate Base),

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19

The first adjustment on Schedule BJO-5 is the annualization of depreciation expense utilizing the Company's proposed depreciation rates, as discussed in the Direct Testimony of Dane Watson. The resulting adjustment totaling \$3,107,510 (Schedule BJO- 5, line 7) is based upon projected depreciable plant as of the test year ending June 30, 2020.
 This adjustment is necessary to reflect the proper annual level of depreciation expense as
 of the end of the test year.

The second adjustment reflects additional annual depreciation expense associated with projected post-test year net plant additions of \$149,870,840 from July 2020 through December 2020, as discussed in the Direct Testimonies of Company witnesses Brent W. Schomber, Leonard Brinson and Stefany Graham. The resulting increase in depreciation expense related to post test year plant is \$5,759,758 (line 9).

9 Also included in Schedule BJO-5 is the impact of the additional post-test year 10 depreciation expense, retirements, and cost of removal on the Company's provision for 11 Accumulated Depreciation. The total adjustments result in a \$30,337,349 increase in the 12 provision for Accumulated Depreciation, which is included in line 2 of Schedule SMG-2 13 (Statement of Rate Base) to Ms. Graham's testimony.

14 Q. PLEASE EXPLAIN THE COMPANY'S ADJUSTMENT FOR THE NON-LEGAL 15 ASSET RETIREMENT OBLIGATION.

A. Under the Board-approved stipulation that resolved the Company's previous base rate case in BPU Docket No. GR17010071, the parties agreed that SJG would record an annual negative net salvage allowance of \$4,659,755 and that the Company would be made whole for its actual cost of removal. In addition, the parties agreed that a regulatory liability for net salvage owed to customers of \$24,137,762 would be recorded on SJG's books and that current rates would reflect an annual credit to amortize this liability to customers over 33 and 1/12th years at a rate of \$729,605. In addition, it was agreed that the Company would

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continue to reduce the regulatory liability by the amount by which SJG's actual annual net salvage expense exceeded the annual net salvage amount of \$4,659,755.

As shown on Schedule BJO-6, net salvage amounts incurred since the conclusion 3 4 of the Company 2017 base rate case have exceeded the annual net salvage allowance 5 provided in rates in that case. As such, the current non-legal ARO amortization must be 6 adjusted again to further incorporate the projected shortfall of \$8,209,842 from the time of 7 the last base rate case through June 30, 2020. Because there will be 30 1/6 years remaining 8 of the initial 40-year amortization period at the end of the test period, the annual reduction 9 in the depreciation credit is \$271,960 (Schedule BJO-6, line 14), which reduces the annual 10 amount being returned to customers from \$729,605 to \$457,645.

11 Q. PLEASE EXPLAIN THE COMPANY'S NET SALVAGE ADJUSTMENT.

A. The Company proposes an increase in its annual provision for negative salvage to
 \$7,251,586 to reflect the average of three consecutive years of expenditures for negative
 salvage projected through June 30, 2020, which more accurately reflects the level of net
 salvage currently being incurred primarily as a result of the Company's accelerated
 infrastructure programs. This adjustment is described more fully in the testimony of Dane
 Watson.

18Q.DOESTHECOMPANYPROPOSETOCONTINUETHE19RATEMAKING/REGULATORYTREATMENT OF NET SALVAGE AGREED20TO IN THE COMPANY'S PREVIOUS BASE RATE CASE?

A. Yes. The Company proposes that the updated regulatory liability of \$13,805,618 should
 be amortized over 30 1/6 years at an annual rate of \$457,645. The Company further
 proposes that to the extent that actual net salvage incurred exceeds the annual net salvage

of \$7,251,586 established in this proceeding, the Company would credit the difference to
 the regulatory liability balance.

3

4 V. FEDERAL AND STATE DEFERRED INCOME TAXES

5 Q. PLEASE EXPLAIN THE COMPANY'S CALCULATION OF FEDERAL AND 6 STATE DEFERRED INCOME TAXES AS SET FORTH ON SCHEDULES BJO-7 7 AND BJO-8.

8 A. The calculation of deferred Federal and State Income Taxes used to reduce rate base 9 reflects the normalization of timing differences between book and tax accounting. The 10 deferred taxes are the accumulation of vintage years' net timing differences calculated at 11 the statutory tax rates. Federal and State Deferred Taxes included in rate base for the 12 adjusted test year ending June 30, 2020 are (\$272,156,872) and (\$94,703,238), 13 respectively. Federal and State Deferred Taxes included in rate base for the adjusted post-14 test year ended December 31, 2020 are (\$295,566,289) and (\$96,920,739), respectively. 15 The derivation of these amounts is shown in Schedules BJO-7 and BJO-8. The deferred income taxes included in rate base also reflect a reduction for excess deferred income taxes 16 17 as described by Company witness Alan Felsenthal. The total from each of these schedules 18 is included in Schedule SMG-2 to Ms. Graham's testimony.

VI. INTEREST SYNCHRONIZATION

2 Q. PLEASE EXPLAIN THE COMPANY'S INTEREST SYNCHRONIZATION 3 ADJUSTMENT AS SET FORTH ON SCHEDULE BJO-9.

4 A. Schedule BJO-9 sets forth the calculation of the pro forma adjustment to income tax 5 expense related to interest expense synchronization. The interest expense synchronization adjustment is based on the tax effect of the difference in projected annualized interest 6 7 expense and test year interest expense. The annualized interest expense is calculated on 8 the projected rate base shown on Schedule SMG-2 to Ms. Graham's testimony, multiplied 9 by the total weighted cost of long-term debt of 1.71%, as set forth in the Direct Testimony 10 of Robert Hevert. This adjustment is necessary to synchronize the Federal income tax 11 associated with interest expense in the test year with the projected tax expense based on an 12 interest calculation using the weighted average cost of debt in the capital structure utilized 13 to support Rate Base. The resulting \$408,994 adjustment is an increase to Federal Income 14 Taxes included on Schedule SMG-3, Line 15 to Ms. Graham's testimony.

15

16 VII. FOLSOM OFFICE COSTS

17 Q. PLEASE DESCRIBE THE COMPANY'S PROPOSAL TO RECOVER COSTS 18 ASSOCIATED WITH ITS OFFICE LOCATED IN FOLSOM, NEW JERSEY.

19 A. The Company has owned the Folsom, New Jersey office building for many years. As 20 described by Company witness Schomber, the Folsom office is currently undergoing a 21 substantial renovation that is projected to be completed in July 2020. Once the renovation 22 is complete, the office will be used by SJI to house various administrative functions that 23 are provided to South Jersey and its utility and non-utility operating affiliates.

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Q.

1

OPERATION AND MAINTENANCE OF THE FOLSOM OFFICE BUILDING?

WHAT COSTS DOES SJG EXPECT TO INCUR IN CONNECTION WITH THE

A. In addition to the capital costs associated with the Folsom office, which are included in rate
base, SJG projects that it will incur \$640,000 of annual operation and maintenance
expenses for the Folsom office. This amount compared to the projected test year expense
of \$236,981 results in a pro forma increase of \$403,019, as shown on Schedule BJO-12.

7 Q. WILL SJI COMPENSATE SOUTH JERSEY FOR THE USE OF THE FOLSOM 8 OFFICE?

9 A. Yes. SJI will pay market-based rent to South Jersey for the use of the facility. Because 10 the Folsom office was being renovated in the first six months of the test year, it is necessary 11 to make a normalization adjustment to SJG's revenue requirement to reflect the full annual 12 rental income that is projected to be received by SJG as set forth on Schedule BJO-10. This 13 adjustment must, in turn, account for the fact that a portion of the rental income -14 approximately 58 percent – will be assessed to South Jersey by SJI for the administrative 15 services provided to South Jersey by SJI. The net adjustment of \$634,148, as set forth on 16 Schedule BJO-10, was determined by applying the cost assignment and allocation 17 procedures followed by SJI under its cost allocation methodology.

18 Q. PLEASE SUMMARIZE THE OPERATING AND MAINTENANCE 19 ADJUSTMENTS ASSOCIATED WITH THE FOLSOM OFFICE THAT ARE 20 REFLECTED IN SJG'S REVENUE REQUIREMENT IN THIS PROCEEDING.

A. As set forth on Schedule BJO-10, SJG proposes to modify the revenue requirement to
 reflect an annualized level of facilities costs of \$640,000. This amount will be offset by

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the annual net rental income of \$634,148 that SJG will receive from SJI once the renovation is complete, and the offices are reoccupied.

3

4 VIII. <u>PENSION & POSTRETIREMENT BENEFIT EXPENSE</u>

5 Q. PLEASE EXPLAIN THE COMPANY'S DEFERRED PENSION AND 6 POSTRETIREMENT EXPENSE.

7 A. In the Company's previous rate case, the Board authorized the Company to defer 8 incremental pension and postretirement healthcare expenses resulting from an Accounting 9 Standards Update ("ASU") change effective December 15, 2017 that permitted the 10 Company to capitalize only pension and postretirement benefit service costs. As of 11 December 31, 2019, the Company deferred \$3,461,196 costs associated with this ASU 12 change. The Company projects a total deferral amount of \$3,485,947 as of test year end 13 June 30, 2020, as shown on Schedule BJO-11. The Company proposes to end the deferral as of June 30, 2020, the end of the Test Year. The Company further proposes a three-year 14 15 amortization of these costs, as discussed in further detail by Company witness Graham.

In addition, the Company is proposing a *pro forma* adjustment of \$49,503 to capture
ongoing annual O&M expenses associated with pension and other post-retirement benefits.
This is calculated based on the previously projected monthly deferred expense of \$4,125
multiplied by 12 months, as shown on Schedule BJO-11, lines 22-24.

IX. EARLY RETIREMENT INCENTIVE PLAN ("ERIP")

2 Q. PLEASE DESCRIBE THE ERIP.

3 In 2018, SJI offered non-office management employees aged fifty-five years or older with A. 4 twenty or more years of service an ERIP. The ERIP was also offered to officers aged fifty-5 five years or older with five or more years of service. To encourage employees to accept the early retirement, SJI offered employees lump sum severances and enhanced retirement 6 7 benefits. Twenty-four SJG employees took advantage of the program. The ERIP caused 8 South Jersey to incur one-time incremental costs of \$5,073,202. At the same time, the 9 ERIP produced annual savings for SJG of approximately \$3.8 million that are fully 10 reflected in the revenue requirement in this proceeding.

11 Q. WHAT IS THE COMPANY'S PROPOSAL WITH RESPECT TO ITS ERIP 12 COSTS?

A. The Company proposes to amortize its ERIP costs over a three-year period. The Company
is not proposing to include the unamortized balance of its ERIP costs in rate base or
otherwise accrue carrying costs on that balance. The Company's proposal is supported by
the fact that the annual savings of the ERIP outweigh the costs by approximately \$6.3
million over the proposed three-year amortization period.

18

19 X. <u>BL ENGLAND COSTS</u>

20 **Q**.

PLEASE DESCRIBE THE BL ENGLAND PROJECT.

A. As discussed by Company witness Schomber, the Company incurred costs in connection
 with the development of a pipeline project that would have enabled the Company to
 provide gas service to BL England's electric generation facility located in Upper Township,

New Jersey. The project also would have significantly enhanced the reliability of the service provided by the Company to customers in Atlantic and Cape May Counties. As a result of the fact that BL England's owner no longer seeks to repower the electric generation facility, the project is no longer viable and must therefore be cancelled. The Company incurred approximately \$10.1 million of costs to develop the project over the period 2012-2019.

7 Q. WHAT IS THE COMPANY'S PROPOSAL WITH RESPECT TO THESE COSTS?

A. The Company proposes to recover these costs in base rates by amortizing them over a 10year period. The Company is not proposing to include the unamortized balance in rate
base or otherwise accrue any carrying charges on the unamortized balance. The Company
believes that its proposal is reasonable because the costs were prudently and reasonably
incurred to serve customers and the decision to cancel the project was prudently and
reasonably arrived at in response to the decision of regulators. The derivation of annual
amortization is set forth on Schedule BJO-13.

15

16 XI. <u>CONCLUSION</u>

17 Q. CAN YOU BRIEFLY SUMMARIZE YOUR TESTIMONY?

A. The adjustments presented in this testimony should be adopted by the Board because they
 are prudent and reasonable. The test year information detailed herein is based upon six
 months' actual and six months' estimated data. It is the Company's intention to update
 the test year information and adjustments thereto on a regular basis throughout this
 proceeding, ending with a 12 month actual test year.

23 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.
South Jersey Gas Balance Sheet As of December 31, 2017, 2018 & 2019

AS 01 December 51, 2017, 2016 & 2019	Period Ending 12/31/2019	Period Ending 12/31/2018	Period Ending 12/31/2017
PROPERTY. PLANT & EQUIPMENT			
Utility Plant, original cost	3.154.736.433	2.907.201.841	2.652.243.751
Accum Deprec & Amortization	(558.634.458)	(523.742.648)	(498,160,660)
Property, Plant & Equip, Net	2,596,101,975	2,383,459,193	2,154,083,091
INVESTMENTS			
Available for Sale Securities	-	-	-
Restricted Investments	4,073,274	1,277,520	2,912,307
Total Investments	4,073,274	1,277,520	2,912,307
CURRENT & ACCRUED ASSETS			
Cash & Temp Cash Invest	2,677,809	1,983,850	1,707,410
Notes Receivable	-	-	-
Accounts Receivable	84,940,436	101,572,319	78,571,342
Accts Rec - Unbilled Revenue	45,016,036	43,270,691	54,979,874
Provision for Uncollectibles	(14,031,681)	(13,643,418)	(13,799,186)
Accts Rec - Assc Companies	2,155,913	2,026,920	619,057
Accts Rec - Affiliated Company	177,158	415,153	368,516
Nat Gas in Storage. Avg Cost	14.838.685	16.335.702	14.931.910
Materials & Supplies, Avg Cost	618.809	619,103	825.341
Accum Deferred Income Taxes	-	-	
Prepaid Taxes	19.547.377	28,772,390	38.325.997
Derivatives-Energy Assets	16 904 059	5 463 881	7 327 040
Other Prepaids & Current Asset	25 074 235	11 279 821	12 669 029
Total Current & Accr Assets	197,918,836	198,096,412	196,526,330
REGULATORY ASSETS			
Environmental Remed-Expended	156 278 664	136 226 914	100 327 271
Environmental Remed-Liability	131 261 567	1/18 071 /67	171 605 078
Income Taxes-Flowthru Deprec	101,201,007		-
Deferred ARO Costs	36 514 953	31 006 /81	12 367 808
Deferred Fuel Costs-Net	49 469 130	57 880 372	16 838 270
Deferred Postretirement Ben	-	51,003,512	10,000,270
		-	26 651 832
Societal Repofits Costs	1 478 218	2 172 822	20,001,002
Premium for Early Debt Retire	1,470,210	2,172,022	2,403,703
Regulatory Assets - ASC 715	72 010 301	80 120 770	78 211 237
Other Regulatory Assets	41 307 505	30 021 075	23 620 120
MTM Interest Pate Swap	7 856 483	5 867 241	7 027 034
Total	496,176,821	492,366,151	469,224,258
Acoum Deferred Income Taxos			
Accuil Deletted filcome Taxes	-	-	-
Prepaid Perision Derivativas Other	-	-	-
Unemertized Debt leave Cente			
	-	-	-
An-ivier changes	30,938,203	20,030,774	20,001,024
Dei - N/C Energy Related Asset	4,82U	14,578	4,///
Uner Non-Current Assets	<u> </u>	17,490,013	17,372,036
I OLAI NON-CUITENLASSEIS	54,285,112	43,035,965	43,227,837
Total Assets	3,348,556,018	3,118,235,241	2,865,973,823

South Jersey Gas Balance Sheet As of December 31, 2017, 2018 & 2019

	Period Ending 12/31/2019	Period Ending 12/31/2018 	Period Ending 12/31/2017
COMMON EQUITY			
Common Stk \$2.50 Par Value	5,847,848	5,847,848	5,847,848
Prem on Cap Stk & Misc PIC	355,743,634	355,743,634	355,743,634
Accumulated OCI	(27,874,952)	(22,357,456)	(25,997,099)
Retained Earnings	756,180,196	668,786,544	585,837,939
Total Common Equity	1,089,896,726	1,008,020,570	921,432,322
LONG TERM DEBT	547,161,406	874,506,699	758,052,261
CURRENT & ACCRUED LIABILITIES:			
Notes Payable to Banks	171,300,000	107,500,000	52,000,000
Current Maturities of LTD	417,909,000	18,909,000	63,809,000
AP-Commodity	17,361,226	48,490,361	43,340,551
AP-Other	60,797,299	52,965,815	41,365,222
Derivatives-Energy Liabilities	14,671,226	2,146,189	9,269,753
Derivatives-Other Current	488.486	343.448	388.641
Accts Pavable to Assc Comp	9.483.317	12.316.997	16.789.281
A/P Affiliated Comp	268.454	246.157	239,782
Customer Deposits	22.430.497	23.862.105	41.655.614
Accum Deferred Income Taxes	-	-	-
Taxes Accrued	1,906,977	1,890,674	1,760,336
Pension & Postretirement Liability	3,692,583	3,597,406	2,353,228
Environmental Remediation Cost	29,568,566	33,022,266	66,039,705
Interest Accrued	6.789.203	7.133.776	7.615.079
Other Current Liabilities	12.489.765	9,442,853	7.026.915
Total Current & Accrued Liab	769,156,599	321,867,047	353,653,107
DEF CREDITS & NONCORRENT LIAB:	00 081 408	06 052 925	00 070 206
Acoum Deferred Income Texes	99,901,490	90,032,023	00,070,390
Accum Deletted income Taxes	357,037,303	323,000,193	200,740,202
Investment Tax Credit	-	-	-
Accet Retirement Obligations	101,093,000	115,049,200	103,030,272
Asset Retirement Obligations	90,506,010	19,009,090	30,7 14,340
	94,044	43,274	6 620 202
Other Ner Current Liebilities	7,307,997	5,523,793	0,039,293
Total NonCurrent Liabilities	<u>4,575,814</u> 667.859.134	627.301.251	<u>4,934,613</u> 545.731.361
		- , , -	, - ,
REGULATORY LIABILITIES:			
Deterred Revenues-Net	-	-	-
Excess Plant Removal Costs	16,333,134	20,805,321	23,295,482
Other Regulatory Liabilities	258,149,019	265,734,353	263,809,290
I otal Regulatoy Liabilities	274,482,153	286,539,674	287,104,772
Total Capital & Liabilities	3,348,556,018	3,118,235,241	2,865,973,823

South Jersey Gas Income Statement For the Years ending 2017,2018,and 2019

	2019 YTD	2018 YTD	2017 YTD
	December 31, 2019	December 31, 2018	December 31, 2017
OPERATING REVENUES	569,226	548,000	517,254
OPERATING EXPENSE			
Cost of Sales	211,344	209,649	204,432
Operation	108,638	112,920	98,992
Maintenance	30,899	28,742	19,727
Depreciation	65,965	59,755	53,887
Other Taxes	4,886	4,246	3,729
Total Operating Expense	421,732	415,312	380,767
OPERATING INCOME	147,494	132,688	136,487
OTHER INCOME & EXPENSE NET	4,376	4,685	6,475
INTEREST CHARGES			
Long Term Debt	32,238	30,251	27,436
Short Term Debt & Other	(584)	(2,240)	(2,731)
Total Interest Charges	31,654	28,011	24,705
	· ·	·	· · ·
Income Before Income Taxes	120,216	109,362	118,257
INCOME TAXES			
Current Fed & State Inc Taxes	12,929	(12,765)	-
Deferred Fed & State Inc Taxes	19,893	39,179	45,700
Total Income Taxes	32,822	26,414	45,700
Income from Continuing Ops	87,394	82,948	72,557

South Jersey Gas Statement of Gas Operating Revenues For the twelve months ended December 31, 2019

Operating Revenues:		<u>2019</u>
Firm Residential	\$	347,225,691
Firm Commercial		76,295,734
Firm Industrial		3,838,976
Firm Cogen & Electric Gen		3,854,393
Firm Transportation - Residential		10,662,800
Firm Transportation - Commerical		37,936,897
Firm Transportation - Industrial		24,099,585
Firm Transportation - Cogen		6,137,602
Total Firm Operating Revenues		510,051,677
Deferred BGSS		0
CIP Revenue Deferred		(923,077)
All Other Deferred Accts		(758,226)
Total Deferred		(1,681,303)
Interruptible		63,263
Interruptible Transportation		1,222,989
Off-System		51,787,055
Capacity Release & Storage		6,550,137
Other		1,232,137
Total Non-Firm Operating Rev		60,855,581
	_	
TOTAL	\$	569,225,956

South Jersey Gas Company Payments and Accruals to Affiliated Companies For the 12 months ending December 31, 2019

	2019
1 Millennium Account Services (meter reading services)	3,253,869
2 South Jersey Industries, Inc. (corporate support)	72,636,978
3 South Jersey Energy Service Plus (heater conversion installations)	N/A
4 South Jersey Energy Service Plus (billing servcies remittances)	N/A
5 South Jersey Energy Company (billing service remittances)	4,708,151
6 SJI Services, LLC (administrative and professional	N/A
7 South Jersey Energy Solutions (accounting support)	157,491
8 South Jersey Resources Group, LLC (commodity purchases)	9,612,674

9 (a) South Jersey Industries, Inc. includes the following major pass-through items:

10 Common Dividends	-
11 Federal Income Taxes	-
12 Pension Plan Contributions	7,356,000
13 Benefits	2,813,891
14 Subtotal of Major Pass-Through Items	10,169,891

SOUTH JERSEY GAS COMPANY PRO FORMA ADJUSTMENTS TO JUNE 30, 2020 OPERATING INCOME DEPRECIATION EXPENSE AND ACCUMULATED DEPRECIATION

Line No.	Utility Plant in Service		Utility Plant <u>in Service</u>	D <u>(Pr</u>	Depreciation Expense Proposed Rates)	Schedule <u>Reference</u>	
1	Depreciation Expense:						
2							
3 4	Utility Plant In Service as of June 30, 2020	\$	3,093,781,517	\$	70,011,010		
5 6	Test Year Depreciation Expense			\$	66,903,500	SMG-3	
7	Pro Forma Depreciation Expense Annualization Adjustment			\$	3,107,510		
9 10	Post Test Year Depreciation Expense Annualization Adjustment	\$	149,870,840	\$	5,759,758		
11	Adjustment due to Increase in Proposed Annual Net Negative Salvage Allowance			\$	2,591,831	BJO-6	
12	Adjustment due to Decrease in Non-Legal Asset Retirement Obligation (ARO) Credit			\$	271,960	BJO-6	
14	Total Pro Forma Adjustment to Depreciation Expense (Income Statement)	\$	3,243,652,358	\$	11,731,060		
10							
18	Accumulated Depreciation:						
19							
20 21	Accumulated Depreciation as of June 2020			\$	(567,972,209)	SMG-2	
22 23	Post Test Year Depreciation on UPIS as of June 30, 2020 (Jul 20 -Dec 20)			\$	(35,005,505)	Line 3 / 2	
24 25	Post Test Year Depreciation on PTY Plant (Jul 20 -Dec 20)			\$	(2,879,879)	Line 7 / 2	
26 27	Post Test Year Retirements (Jul 20 -Dec 20)			\$	6,972,659	BWS-1	
28	Post Test Year Net Salvage (Jul 20 -Dec 20)			\$	4,201,169	BJO-6	
27 30 21	Post Test Year Net Salvage Allowance (Jul 20 -Dec 20)			\$	(3,625,793)	BJO-6	
32	Accumulated Depreciation as of Dec 31, 2020 (Rate Base)			\$	(598,309,558)		

SOUTH JERSEY GAS COMPANY NON-LEGAL ASSET RETIREMENT OBLIGATION (ARO) AMORTIZATION

			(a)	(b)	(c)	(d)		(e)
					Net	Net		
Line			Start	COR	Salvage	Salvage		End
No.			<u>Reserve</u>	Amort.	<u>Allowance</u>	Incurred		<u>Reserve</u>
1	Jul-17	\$	24,657,876	(88,344)	199,181	(613,270)		24,155,442
2	Aug-17	\$	24,155,442	(88,344)	199,181	(128,516)		24,137,762
3	Sep-17	\$	24,137,762	(88,344)	177,936	(758,741)	\$	23,468,612
4	Oct-17	\$	23,468,612	(88,344)	199,181	(453,737)	\$	23,125,712
5	Nov-17	\$	23,125,712	(60,800)	388,313	(208,184)	\$	23,245,040
6	Dec-17	\$	23,245,040	(60,800)	388,313	(277,070)	\$	23,295,482
7	2018	\$	23,295,482	(729,605)	4,659,755	(6,420,311)	\$	20,805,321
8	2019	\$	20,805,321	(729,605)	4,659,755	(8,402,337)	\$	16,333,134
9	Jan to June 2020	\$	16,333,134	(364,803)	2,329,878	(4,492,592)	\$	13,805,618
10 11 12 13	Projected Balance A Number of Years R Projected Annual A Current Annual Ar	New Availal Availal Remain Amortiz nortiza	Shortfall (net col's c & d) ole to be Returned to Cu ing from the Original 40 cation of Regulatory Liab tion of Regulatory Liab	ustomer as of June 3 D-Year Amortization ability ility included in Rat	(8,209,842) 0, 2020 Period es (BPU Docket No. GF	- R17010071)	\$ \$ \$	13,805,618 <u>30</u> 1/6 457,645 729,605
14	Proposed Provision	o for A	nnual Net Negative Salv	vage (3-year average)	=	به خ	7 251 586
15	1100030011001500		initian free fregative Salv	age (5-year average	,		Ŷ	7,231,300
16	Current Provision f	for Ann	uual Net Negative Salva	ge			\$	4,659,755
17	Proposed Change	in An	nual Net Negative Salv	vage		_	\$	2,591,831

SOUTH JERSEY GAS COMPANY CALCULATION OF ADJUSTED TEST YEAR DEFERRED FEDERAL INCOME TAX (DFIT) INCLUDED IN RATE BASE

Line		POST TEST YEAR	ADDED TAX	DFIT IN
<u>No.</u>		ADDITIONS	DEPRECIATION	<u>RATE BASE</u>
1	Projected DFIT Rate Base Balance 6/30/20			(272,156,872)
2				
3	Normalization on 6/30/20 Plant (PTY 7/20-12/20):			
4				
5	Book Depreciation	33,299,700		
6				
7	Tax Depreciation-Federal	(58,008,403)		
8				
9	Federal Tax Depreciation Over Book		<u>(24,708,703)</u>	
10				
11	Normalization on PTY Additions (PTY //20-12/20):			
12	Deale Democratica	2 970 970		
15	Book Depreciation	2,879,879		
14	Tax Depresiation Federal	(2, 810, 078)		
15	Tax Depreciation-redenat	(2,810,078)		
10	Federal Tax Depreciation Over Book		69 801	
18	reachar fan Deprecharon over Book		07,001	
19	Total Added Tax Depreciation		(24,638,903)	
20	ľ			
21	Deferred FIT (@ effective FIT rate of 21%)			(5,174,170)
22				
23	Federal benefit of state taxes - 21%			465,675
24				
25	NOL Carryforward			<u>(18,700,923)</u>
26				
27	Adjusted DFIT Rate Base Balance 12/31/20			(295,566,289)

SOUTH JERSEY GAS COMPANY CALCULATION OF ADJUSTED TEST YEAR DEFERRED NJ CORPORATE BUSINESS TAX (CBT) INCLUDED IN RATE BASE

Line No.		POST TEST YEAR <u>ADDITIONS</u>	ADDED TAX DEPRECIATION	DFIT IN <u>RATE BASE</u>
1	Projected DFIT Rate Base Balance 6/30/20			(94,703,238)
2				
3	Normalization on 6/30/20 Plant (PTY 7/20-12/20):			
4				
5	Book Depreciation	33,299,700		
6				
7	Tax Depreciation-Federal	(58,008,403)		
8				
9	Federal Tax Depreciation Over Book		(24,708,703)	
10				
11	Normalization on PTY Additions (PTY 7/20-12/20):			
12		0.070.070		
15	Book Depreciation	2,879,879		
14	Tax Doprogiation Foderal	(2, 810, 078)		
15	Tax Depreciation-rederat	(2,810,078)		
10	Federal Tax Depreciation Over Book		69 801	
18	reactar fux Depreciation Over Dook		00,001	
19	Total Added Tax Depreciation		(24.638.903)	
20	······································		()/	
21	Pro Forma Adjustment - Deferred NJ CBT @ 9.00%			(2,217,501)
22	-			
23	Adjusted DCBT Rate Base Balance 12/31/20			(<u>96,920,739</u>)

SOUTH JERSEY GAS COMPANY PRO FORMA ADJUSTMENTS TO JUNE 30, 2020 OPERATING INCOME INCOME TAXES - INTEREST SYNCHRONIZATION

Line No.

1	Adjusted Rate Base	\$ 2,183,729,657	
2			
3	Total Weighted Cost of Long Term Debt	 1.71%	
4			
5	Annualized Interest Expense	\$ 37,331,824	
6			
7	Less: Test Year Interest Expense	\$ (38,814,200)	
8			
9	Net Interest Expense		\$ (1,482,376)
10			
11	Income Tax Rate		 28.11%
12			
13	(Increase)/Decrease to test year income taxes		\$ (416,696)
14			
15	AIRP II AFUDC Tax Adjustment		\$ 2,031
16			
17	SHARP II AFUDC Tax Adjustment		\$ 5,671
18			
19	Total (Increase)/Decrease to test year income taxes		\$ (408,994)

SOUTH JERSEY GAS COMPANY PRO FORMA ADJUSTMENTS TO JUNE 30, 2020 OPERATING INCOME REVENUE AND O&M EXPENSE - FOLSOM FACILITY

Line				
No.				
1	Rental Income:			
2	Annualized Test Year Rental Income	\$ 634,148		
3	Less: Test Year Rental Income	\$ -	i	
4	Pro Forma Rental Income Adjustment		\$	634,148
<i>_</i>				
5	Facility Expense:			
6	Annualized Test Year Facility Expense	\$ 640,000		
7	Less: Test Year Facility Expense	\$ 236,981		
8	Pro Forma Facility Expense Adjustment		\$	403,019

SOUTH JERSEY GAS COMPANY PRO FORMA ADJUSTMENTS TO JUNE 30, 2020 OPERATING INCOME PENSION EXPENSE

Line No.	_		Pension	SERP	FAS 106		
1			Acct 182387	Acct 182388	 Acct 182389		Total
2	Total Unamortized Deferred Balance as of December 2019	\$	1,509,398	\$ 2,888,988	\$ (937,190)	\$	3,461,196
3							
4	Projected Monthly Deferred Expenses ⁽¹⁾						
5	Jan-20	\$	16,213	\$ 119,865	\$ (131,953)	\$	4,125
6	Feb-20	\$	16,213	\$ 119,865	\$ (131,953)	\$	4,125
7	Mar-20	\$	16,213	\$ 119,865	\$ (131,953)	\$	4,125
8	Apr-20	\$	16,213	\$ 119,865	\$ (131,953)	\$	4,125
9	May-20	\$	16,213	\$ 119,865	\$ (131,953)	\$	4,125
10	Jun-20	\$	16,213	\$ 119,865	\$ (131,953)	\$	4,125
11		\$	97,278	\$ 719,191	\$ (791,717)	\$	24,751
12							
13	Projected Unamortized Deferred Balance as of June 2020	\$	1,606,676	\$ 3,608,179	\$ (1,728,907)	\$	3,485,947
14							
15	⁽¹⁾ Projected Monthly expenses based on 2020 estimates from T	owers	Watson.				
16							
17	Total Projected Deferred Balance at Test Year End June 30, 202	0				\$	3.485.947
18	Amortization Period (Years)						3
19	Pro Forma Annual Amortization Adjustment					\$	1.161.982
20						<u> </u>	<u> </u>
20							
21	Projected Monthly Pension Expense					\$	4 125
22	Months					Ψ	12
23	Pro Forma Annual Pension Expense Adjustment					\$	49 503
24	r i o i oi mu rimuur i ension Expense Aujustment					Ψ	-7,505

Schedule BJO-12 6&6

SOUTH JERSEY GAS COMPANY PRO FORMA ADJUSTMENTS TO JUNE 30, 2020 OPERATING INCOME EARLY RETIREMENT INCENTIVE PLAN

Line No.		F	Expense
1	Early Retirement Incentive Plan Deferred Balance at June 30, 2020	\$	5,073,202
2	Pro-Forma Adjustment - Three Year Amortization of Deferred Expense	\$	1,691,067

Schedule BJO-13 6&6

SOUTH JERSEY GAS COMPANY PRO FORMA ADJUSTMENTS TO JUNE 30, 2020 OPERATING INCOME B.L. ENGLAND COSTS

Line No.		Expense
1	BL England Project Costs at December 31, 2019	\$ 10,119,921
2	Pro-Forma Adjustment - Ten Year Amortization of Deferred Expense	\$ 1,011,992

INSERT TAB:

R. HEVERT

•

IN THE MATTER OF THE PETITION OF SOUTH JERSEY GAS COMPANY FOR APPROVAL OF INCREASED BASE TARIFF RATES AND CHARGES FOR GAS SERVICE AND OTHER TARIFF REVISIONS

BPU DOCKET NO. GR20_____

DIRECT TESTIMONY

OF

ROBERT B. HEVERT

ScottMadden, Inc.

On Behalf of South Jersey Gas Company

Exhibit P-7

March 13, 2020

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TERM	DESCRIPTION
Beta Coefficient	A component of the Capital Asset Pricing Model that measures the risk of a given stock relative to the risk of the overall market
Bond Vield Plus Risk Premium	A risk premium model used to estimate the Cost of
Approach	Fauity The Bond Vield Plus Risk Premium
Approach	approach assumes that investors required a risk
	premium over the cost of debt as compensation for
	assuming the greater risk of common equity
	investment. The model is expressed as a bond yield
	plus equity risk premium.
Capital Asset Pricing Model	A risk premium-based model used to estimate the
("CAPM")	Cost of Equity, assuming the stock is added to a well-
	diversified portfolio. The CAPM assumes that
	investors are compensated for the time value of
	money (represented by the Risk-Free Rate), and risk
	(represented by the combination of the Beta
	Coefficient and the Market Risk Premium).
Constant Growth DCF Model	A form of the Discounted Cash Flow model that
	assumes cash flows will grow at a constant rate, in
	perpetuity. The model simplifies to a form that
	expresses the Cost of Equity as the sum of the
	expected dividend yield and the expected growth rate.
Cost of Equity	The return required by investors to invest in equity
	securities. The terms "Return on Equity" and "Cost
	of Equity" are used interchangeably.
Discounted Cash Flow ("DCF") Model	A model used to estimate the Cost of Equity based on
	expected cash flows. The Cost of Equity equals the
	discount rate that sets the current market price equal
	to the present value of expected cash flows.
Dividend Yield	For a given stock, the current annualized dividend
	divided by its current market price.
Empirical Capital Asset Pricing Model	Empirical CAPM is a variant of the CAPM model.
("ECAPM")	ECAPM adjusts for the CAPM's tendency to under-
	estimate returns for companies that have Beta
	coefficients less than one, and over-estimate returns
	for relatively high-Beta coefficient stocks.
Expected Earnings Analysis	An analysis of actual expected earnings used to
Maulaat Datawa	The supported network on the survive survive to the
Market Return	The expected return on the equity market, taken as a
	portiono.

GLOSSARY OF FREQUENTLY USED TERMS

TERM	DESCRIPTION	
Market Risk Premium	The additional compensation required by investors in	
	the equity market as a portfolio over the Risk-Free	
	rate. The Market Risk Premium is a component of	
	the CAPM.	
Proxy Group	A group of publicly traded companies used as the	
	"proxy" for the subject company (in this case, South	
	Jersey Gas Company). Proxy companies are	
	sometimes referred to as "Comparable Companies."	
Return on Equity ("ROE")	The return required by investors to invest in equity	
	securities. The terms "Return on Equity" and "Cost	
	of Equity" are used interchangeably. Please note that	
	the ROE in this context is distinct from the	
	accounting measure sometimes referred to as the	
	"Return on Average Common Equity".	
Risk-Free Rate	The rate of return on an asset with no risk of default.	
Risk Premium	The additional compensation required by investors	
	for taking on additional increments of risk. Risk	
	Premium-based approaches are used in addition to the	
	DCF and CAPM to estimate the Cost of Equity.	
Treasury Yield	The return on Treasury securities; the yield on the 30-	
	year Treasury bonds is considered to be a measure of	
	the Risk-Free Rate.	

SOUTH JERSEY GAS COMPANY DIRECT TESTIMONY OF ROBERT B. HEVERT

1 I. INTRODUCTION

2 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Robert B. Hevert. I am a Partner with ScottMadden, Inc., a general
management consultancy firm. My business address is 1900 West Park Drive, Suite 250,
Westborough, MA 01581.

6 Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS TESTIMONY?

A. I am submitting this direct testimony ("Direct Testimony") before the New Jersey Board
of Public Utilities (the "BPU" or the "Board") on behalf of South Jersey Gas Company
("South Jersey Gas" or the "Company").

10 Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I hold a Bachelor's degree in Business and Economics from the University of Delaware,
 and an MBA with a concentration in Finance from the University of Massachusetts. I also
 hold the Chartered Financial Analyst designation.

14 Q. PLEASE DESCRIBE YOUR EXPERIENCE IN THE ENERGY AND UTILITY 15 INDUSTRIES.

16 A. I have worked in regulated industries for over 30 years, having served as an executive and 17 manager with consulting firms, a financial officer of a publicly traded natural gas utility, 18 and an analyst at a telecommunications utility. In my role as a consultant, I have advised 19 numerous energy and utility clients across North America on a wide range of financial 20 and economic issues, including corporate and asset-based transactions, asset and 21 enterprise valuation, transaction due diligence, and strategic matters. As an expert 22 witness, I have provided testimony in nearly 300 proceedings regarding financial and

regulatory policy matters before numerous state utility regulatory agencies (including the
 BPU), the Federal Energy Regulatory Commission ("FERC"), the U.S. District Court, and
 the Alberta Utilities Commission. A summary of my professional and educational
 background, including a list of my testimony in prior proceedings, is included in Schedule
 RBH-1 to my Direct Testimony.

5

6 II. <u>PURPOSE AND OVERVIEW OF TESTIMONY</u>

7 Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

8 A. My Direct Testimony presents evidence and provides a recommendation regarding the 9 Company's proposed Return on Equity ("ROE")¹ and capital structure to be used for 10 ratemaking purposes in this proceeding. My analyses and conclusions are supported by 11 the data presented in Schedules RBH-2 through RBH-11, which have been prepared by 12 me or under my direction.

Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE APPROPRIATE COST OF EQUITY FOR THE COMPANY?

A. My analyses indicate that a ROE in the range of 10.00 percent to 10.70 percent represents
the range of equity investors' required return for investment in a natural gas utility such
as South Jersey Gas in today's capital markets. Based on the quantitative and qualitative
analyses discussed throughout my Direct Testimony, and taking into consideration the
Board's decisions in prior proceedings, I propose a ROE of 10.40 percent.

¹ Throughout my Direct Testimony, I interchangeably use the terms "ROE" and "Cost of Equity."

1 2

Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE ANALYSES THAT LED TO YOUR ROE RECOMMENDATION.

A. Because all financial models are subject to various assumptions and constraints, equity
analysts and investors tend to use multiple methods to develop their return requirements.
I relied on four widely accepted approaches to develop my ROE recommendation: (1) the
Constant Growth form of the Discounted Cash Flow ("DCF") model; (2) the Capital Asset
Pricing Model ("CAPM"), including the Empirical Form (the "ECAPM"); (3) the Bond
Yield Plus Risk Premium approach; and (4) the Expected Earnings approach, which I
consider a corroborating method.

In addition to the methods noted above, I considered current and evolving capital market and business conditions, the Company's business risks, and the effect of the Company's small size relative to the proxy group. Although I did not make explicit adjustments to my ROE estimates for those factors, I did consider them in determining where the Company's Cost of Equity falls within the range of analytical results.

15 My analyses recognize that estimating the Cost of Equity is an empirical, but not 16 an entirely mathematical exercise; it relies on both quantitative and qualitative data and 17 analyses, all of which are used to inform the judgment that inevitably must be applied. I 18 therefore considered my analytical results in the context of such Company-specific and 19 general capital market factors as those summarized above. Based on the quantitative and 20 qualitative analyses discussed throughout my Direct Testimony, I find 10.40 percent to be 21 a reasonable and appropriate estimate of the Company's Cost of Equity.

As my Direct Testimony explains, no single model is more reliable than all others under all market conditions, and all require the use of reasoned judgment in their

1 application, and in interpreting their results. Therefore, the results of each ROE model 2 must be assessed in the context of current and expected capital market conditions, and 3 relative to other appropriate benchmarks. In developing my recommendation, I 4 recognized that the low and high analytical results (set by the low end of the Constant 5 Growth DCF model results, and the high end of the CAPM and ECAPM results) are not 6 reasonable estimates of the Company's Cost of Equity. In large measure, that is because 7 those results are far removed from the returns recently authorized in other jurisdictions. 8 As discussed in more detail later in my Direct Testimony, because the Constant Growth 9 DCF model's fundamental assumptions do not align with current and expected market 10 conditions, it will not always produce reliable results; other regulatory commissions have 11 found as much. Because Risk Premium-based methods more directly reflect measures of 12 capital market risk, they may be more likely than other approaches (such as the Constant 13 Growth DCF method) to provide reliable ROE estimates in evolving or unstable capital 14 markets.

15

16

Q. HOW HAVE CAPITAL MARKETS CHANGED SINCE THE COMPANY REQUESTED AN ROE OF 11.00 PERCENT IN DOCKET NO. GR17010071?

A. As discussed in Section VII, increases in equity market volatility (as measured by the VIX
 Index) are coincident with decreases in interest rates, indicating investors focus on capital
 preservation during periods of volatility. Moreover, because investors during those
 periods are risk averse, it reasons that return requirements would increase in response to
 abrupt periods of volatility.

Although the Cost of Equity is the market-based measure of the return investors require in the current market, the authorized ROE is a visible indicator of the regulatory

1 Equity and debt investors consider the stability, predictability, and environment. 2 supportiveness of the regulatory environment important factors in assessing risk, and 3 determining required returns. The authorized ROE in this proceeding therefore will have 4 a direct bearing on South Jersey Gas' financial profile, and its ability to access capital at 5 competitive prices, even under constrained market conditions.

6 Q. PLEASE NOW SUMMARIZE THE RESULTS OF THE FOUR METHODS 7 DISCUSSED ABOVE, AND HOW THEY CONTRIBUTED TO YOUR ROE 8 **RECOMMENDATION.**

9 A. The range of results produced by the four approaches noted above are as follows:

- 10 The Constant Growth DCF method indicates an ROE in the range of approximately 7.32 • 11 percent to 11.48 percent (please refer to Schedule RBH-2);²
- 12 Giving less weight to the highest and lowest results, the CAPM model suggests an ROE
- in the range of approximately 8.55 percent to 11.42 percent (please refer to Table 3a)³ and 13
- 14 the ECAPM model indicates an ROE in the range of approximately 9.77 percent to 12.49
- percent (please refer to Table 3b);⁴ 15
- 16 The Bond Yield Plus Risk Premium approach suggests an ROE in the range of approximately 9.90 percent (see, Schedule RBH-7);⁵ and 17
- 18 The Expected Earnings approach indicates an ROE in the range of approximately 10.18 19
 - percent to 10.35 percent (see, Schedule RBH-8).⁶

² As discussed above, my estimate of the indicated range is narrower than the overall range of model results. Moreover, for the reasons discussed below, I find the underlying assumptions of the Constant Growth DCF model inconsistent with the current capital market and believe the model's results should be viewed with caution.

³ As discussed above, my estimate of the indicated range is narrower than the overall range of model results.

⁴ Results rounded.

⁵ Results rounded.

⁶ Results rounded.

1		Based on those estimates, I recommend an ROE in the range of 10.00 percent to
2		10.70 percent and, within that range, believe an ROE of 10.40 percent is reasonable and
3		appropriate. As discussed in more detail throughout the balance of my Direct Testimony,
4		my conclusions and recommendations reflect the following considerations:
5	•	The small size of South Jersey Gas relative to the proxy group;
6	•	The effect of flotation costs, which represent a permanent reduction to the capital needed
7		to support the assets required to provide safe and reliable utility service; and
8	٠	The need to maintain the financial profile required to access capital at reasonable rates,
9		even during periods of capital market volatility.
10	Q.	ARE THERE OTHER FACTORS THAT SHOULD BE CONSIDERED IN
11		DETERMINING THE WEIGHT GIVEN TO THE METHODS AND RESULTS
12		SUMMARIZED ABOVE?
13	А.	Yes. Each model used to estimate the Cost of Equity is subject to its own assumptions,
14		which may become more, or less, relevant as market conditions evolve and market data
15		change. An important consideration is the consistency of each model's underlying
16		assumptions with current and expected market conditions, and the reasonableness of its
17		results relative to observable benchmarks.
18		For example, the Constant Growth DCF model assumes the estimated Cost of
19		Equity will remain constant in perpetuity, regardless of whether and how market
20		conditions change. Risk Premium-based methods (such as the CAPM), on the other hand,
21		provide a measure of risk by directly considering investors' expectations regarding future
22		market returns. Other Risk Premium approaches (e.g., the Bond Yield Plus Risk Premium
23		approach) reflect the well-documented finding that the Cost of Equity does not move in

1 lockstep with interest rates. For example, at times interest rates fall because investors are 2 so risk averse, they would rather accept a very modest return on Treasury securities than 3 take on the risk of equity ownership. In such circumstances, low interest rates suggest an 4 increasing, not a decreasing, Cost of Equity. The Expected Earnings analysis calculates 5 the Cost of Equity based on the opportunity cost of the return of an alternative investment 6 in an enterprise with similar risk, and corroborates the findings from the DCF, CAPM, 7 and Bond Yield Plus Risk Premium approaches. Because those methods provide different 8 perspectives on investor return requirements, their use in combination enables a more 9 comprehensive assessment of the Cost of Equity.

10 In summary, because each model has strengths and weaknesses, it is important to 11 recognize differences among them in estimating the Cost of Equity. As noted above, the 12 Constant Growth DCF model requires constant assumptions, inputs, and results in 13 perpetuity, while Risk Premium-based methods provide the ability to reflect investors' 14 views of risk, future market returns, and the relationship between interest rates and the 15 Cost of Equity. The Expected Earnings method provides a way of corroborating other 16 model results without the need to model investor behavior, or draw inferences from market 17 data. With those considerations in mind, I believe my recommendation reasonably 18 reflects the methods investors apply, and the factors they consider in developing their 19 return requirements.

20 Q. PLEASE SUMMARIZE YOUR CONCLUSIONS REGARDING THE 21 COMPANY'S PROPOSED CAPITAL STRUCTURE.

A. The Company's proposal, which includes 54.18 percent common equity and 45.82 percent
 long-term debt, is consistent with the capital structures that have been in place over several

6	0	HOW IS THE DEMAINDED OF VOUD DIDECT TESTIMONY ODCANIZED?
5		and supports its Standard & Poor's ("S&P") issuer rating of BBB (stable).
4		utility companies, I find the Company's proposed capital structure is entirely reasonable,
3		need to access external capital, and the consistency of its proposal with similarly situated
2		authorized for other gas local distribution companies in New Jersey. Given its continuing
1		fiscal quarters at comparable utility companies and with the equity ratios recently

6 Q. HOW IS THE REMAINDER OF YOUR DIRECT TESTIMONY ORGANIZED?

- 7 A. The balance of my Direct Testimony is organized as follows:
- 8 <u>Section III</u> Provides a summary of the issues regarding Cost of Equity estimation in 9 regulatory proceedings and discusses the regulatory guidelines pertinent to the 10 development of the cost of capital;
- Section IV Explains my selection of the proxy group used to develop my analytical
 results;
- 13 <u>Section V</u> Explains my analyses and the analytical bases for my ROE
 14 recommendation;
- 15 <u>Section VI</u> Provides a discussion of specific business risks and other considerations
 16 that have a direct bearing on the Company's Cost of Equity;
- 17 <u>Section VII</u> Highlights the current capital market conditions and their effect on the
 18 Company's Cost of Equity;

19 <u>Section VIII</u> – Addresses the reasonableness of the Company's proposed capital 20 structure;

- 21 <u>Section IX</u> Derives the Company's weighted average cost of capital; and
- 22 <u>Section X</u> Summarizes my conclusions and recommendations.

I also have included Appendices A and B, which explain in detail the selection
 criteria used to develop my utility proxy group, and the analysis and inputs for each of my
 Cost of Equity analyses.

4 III. <u>SUMMARY OF ISSUES SURROUNDING COST OF EQUITY ESTIMATION IN</u> 5 <u>REGULATORY PROCEEDINGS</u>

6 Q. BEFORE ADDRESSING THE SPECIFIC ASPECTS OF THIS PROCEEDING, 7 PLEASE PROVIDE A GENERAL OVERVIEW OF THE ISSUES 8 SURROUNDING THE COST OF EQUITY IN REGULATORY PROCEEDINGS.

9 A. In general terms, the Cost of Equity is the return investors require to make an equity
investment in a firm. That is, investors will only provide funds to a firm if the return they *expect* is equal to, or greater than, the return they *require* to accept the risk of providing
funds to the firm. From the firm's perspective, that required return, whether it is provided
to debt or equity investors, has a cost. Individually, we speak of the "Cost of Debt" and
the "Cost of Equity" as measures of those costs; together, they are referred to as the "Cost
of Capital."

16 The Cost of Capital (including the costs of both debt and equity) is based on the 17 economic principle of "opportunity costs." Investing in any asset, whether debt or equity 18 securities, implies a forgone opportunity to invest in alternative assets. For any investment 19 to be sensible, its expected return must be at least equal to the return expected on 20 alternative, comparable risk investment opportunities. Because investments with like 21 risks should offer similar returns, the opportunity cost of an investment should equal the 22 return available on an investment of comparable risk. In that important respect, the returns 23 required by debt and equity investors represent a cost to the Company.

1	Although both debt and equity have required costs, they differ in certain
2	fundamental ways. Most noticeably, the Cost of Debt is contractually defined and can be
3	directly observed as the interest rate, or yield, on debt securities. ⁷ The Cost of Equity, on
4	the other hand, is neither directly observable nor a contractual obligation. Rather, equity
5	investors have a claim on cash flows only after debt holders are paid; the uncertainty (or
6	risk) associated with those residual cash flows determines the Cost of Equity. Because
7	equity investors bear that additional "residual risk", they require higher returns than debt
8	holders. Simply, debt and equity are fundamentally distinct securities, facing different
9	risks and requiring different returns.

10 Whereas the Cost of Debt can be directly observed, the Cost of Equity must be 11 estimated or inferred based on market data and various financial models. As discussed throughout my Direct Testimony, each of those models is subject to its own set of specific 12 13 assumptions, which may be more or less applicable as market conditions change. Further, 14 because the Cost of Equity is based on the principle of opportunity costs, the models used 15 to estimate the Cost of Equity typically are applied to a group of "comparable" or "proxy" 16 companies. The choice of models (including their inputs), the selection of proxy 17 companies, and the interpretation of model results all require the application of reasoned 18 judgment. That judgment should consider data and information, both quantitative and 19 qualitative, not necessarily included in the models themselves.

In the end, the estimated Cost of Equity should reflect the return that investors require considering the subject company's risks, and the returns available on comparable investments. A given utility stock may require a higher return based on the risks to which

⁷ The observed interest rate may be adjusted to reflect issuance or other directly observable costs.

1		it is exposed relative to other utilities. That is, although utilities may be viewed as a
2		"sector", not all require the same return. The assessment of relative risk and its effect on
3		the Cost of Equity requires the application of reasoned, experienced judgment applied to
4		a variety of data, much of which is qualitative.
5	Q.	PLEASE PROVIDE A BRIEF SUMMARY OF THE REGULATORY
6		GUIDELINES ESTABLISHED FOR THE PURPOSE OF DETERMINING THE
-		
/		ROE.
8	А.	The United States Supreme Court (the "Supreme Court") established the guiding
9		principles for establishing a fair return for capital in two cases: (1) Bluefield Water Works
10		and Improvement Co. v. Public Service Comm'n of West Virginia, 262 U.S. 679 (1923)
11		("Bluefield"); and (2) Federal Power Comm'n v. Hope Natural Gas Co., 320 U.S. 591
12		(1944) ("Hope"). In those cases, the Supreme Court recognized that the fair ROE should
13		be: (1) comparable to returns investors expect to earn on other investments of similar risk;
14		(2) sufficient to assure confidence in the company's financial integrity; and (3) adequate
15		to maintain and support the company's credit and to attract capital.
16	Q.	DOES NEW JERSEY PRECEDENT PROVIDE SIMILAR GUIDANCE?
17	А.	Yes. For example, in its Final Order in BPU Docket No. ER12111052 (issued March 26,
18		2015) concerning Jersey Central Power & Light Company, the Board found:
19 20 21 22		[i]t is well-established that a public utility is entitled to such rates as will permit it to earn a return on the value of the property that it employs for the convenience of the public, equal to that generally being made at the same time and in the same general part of the country on
23		investments in other business undertakings, which are attended by
24		corresponding risks and uncertainties. Bluefield Water Works &
25		Improvement Company v. Public Service Commission of West Virginia,
26		262 U.S. 679, 692 (1923). The Board is empowered to determine what,
27		in a particular situation, is a just and reasonable return for a public
28		utility and it has broad discretion in the exercise of that authority.

1 2 3 4 5 6		Atlantic City Sewerage Co. v. Board of Public Utility Com'rs, 128 N.J.L. 359 (1942), aff'd 129 N.J.L. 401. Board-approved public utility rates will be considered valid so long as they enable the utility to operate successfully, maintain its financial integrity, attract capital and compensate its investors for the risk assumed. <i>FPC v. Hope Natural Gas Co.</i> , 320 U.S. 591, 605 (1944).
7		Based on those standards, the authorized ROE should provide the Company with
8		the opportunity to earn a fair and reasonable return, and should enable efficient access to
9		external capital under a variety of market conditions.
10	Q.	ASIDE FROM THOSE LONG-HELD STANDARDS, WHY IS IT IMPORTANT
11		FOR A UTILITY TO BE ALLOWED THE OPPORTUNITY TO EARN A
12		RETURN ADEQUATE TO ATTRACT CAPITAL AT REASONABLE TERMS?
13	А.	A return adequate to attract capital at reasonable terms enables the utility to provide
14		service while maintaining its financial integrity. As discussed above, and in keeping with
15		the Hope and Bluefield standards, that return should be commensurate with the returns
16		expected elsewhere in the market for investments of equivalent risk. Based on those
17		standards, the Board's decision in this case should provide the Company with the
18		opportunity to earn an ROE that is: (1) adequate to attract capital at reasonable terms; (2)
19		sufficient to ensure its financial integrity; and (3) commensurate with returns on
20		investments in enterprises having corresponding risks. To the extent the Company is
21		provided a reasonable opportunity to earn its market-based Cost of Equity, neither
22		customers nor shareholders should be disadvantaged. A return adequate to attract capital
23		at reasonable terms enables the Company to continue to provide safe, reliable natural gas
24		service while maintaining its financial integrity.

1Q.HOW IS THE COST OF EQUITY ESTIMATED IN REGULATORY2PROCEEDINGS?

3 Α. As noted earlier (and as discussed later in my Direct Testimony), the Cost of Equity is 4 estimated using various financial models. By their nature, those models produce a range 5 of results from which the ROE is determined. That determination must be based on a 6 comprehensive review of relevant data and information; it does not necessarily lend itself 7 to a strict mathematical solution. The key consideration in determining the ROE is to 8 ensure the overall analysis reasonably reflects investors' view of the financial markets in 9 general, and the subject company (in the context of the proxy companies), in particular. 10 In summary, practitioners, academics, and regulatory commissions recognize that

11 financial models are general descriptions of investor behavior, not precise quantifications 12 of it; they are tools to be used in the ROE estimation process. Investors and regulatory 13 commissions also appreciate that the strict adherence to any single approach, or to the 14 specific results of any single approach, can lead to flawed or misleading conclusions. That 15 position is consistent with the Hope and Bluefield principle that it is the analytical result, 16 as opposed to the method employed, that controls in determining just and reasonable rates. 17 A reasonable ROE estimate therefore considers multiple methods, and the reasonableness of their individual and collective results in the context of observable, relevant market 18 19 information.

1 IV. <u>PROXY GROUP SELECTION</u>

2 Q. AS A PRELIMINARY MATTER, WHY IS IT NECESSARY TO SELECT A 3 GROUP OF PROXY COMPANIES TO DETERMINE THE COST OF EQUITY 4 FOR THE COMPANY?

5 A. First, it is important to bear in mind that the Cost of Equity for a given enterprise depends 6 on the risks attendant to the business in which the company is engaged. According to 7 financial theory, the value of a given company is equal to the aggregate market value of 8 its constituent business units. The value of the individual business units reflects the risks 9 and opportunities inherent in the business sectors in which those units operate. In this 10 proceeding, we are focused on estimating the Cost of Equity for the Company's South 11 Jersey Gas operations. Because the ROE is a market-based concept, and given that South 12 Jersey Gas is not a publicly traded entity, it is necessary to establish a group of companies 13 that are both publicly traded and comparable to South Jersey Gas to serve as its "proxy" 14 for purposes of the ROE estimation process. Even if the Company were publicly traded, 15 it is possible that transitory events could bias its market value in one way or another over 16 a given period. A significant benefit of using a proxy group is that it serves to moderate 17 the effects of anomalous, temporary events associated with any one company. Please see 18 Appendix A to this Direct Testimony for a description of how I selected the proxy group. 19 Applying the screening criteria discussed in Appendix A results in a proxy group that, 20 taken as a whole, is fundamentally comparable to the Company's investment profile.

1 Q. PLEASE PROVIDE A SUMMARY PROFILE OF SOUTH JERSEY GAS.

2 A. South Jersey Gas is a wholly owned subsidiary of SJI Utilities, Inc., providing natural gas

3 distribution service to over 398,000 customers in southern New Jersey.⁸ SJI Utilities, Inc.

- 4 is a wholly owned subsidiary of South Jersey Industries, Inc., which is publicly traded on
- 5 the New York Stock Exchange under ticker symbol "SJI". South Jersey Industries, Inc.'s,
- 6 and South Jersey Gas' current long-term S&P issuer credit ratings both are BBB (stable).⁹

7 Q. WHAT COMPANIES ARE INCLUDED IN YOUR PROXY GROUP?

8 A. The criteria discussed in Appendix A resulted in a proxy group of the following six
9 companies:

Company	Ticker
Atmos Energy Corporation	ATO
New Jersey Resources Corporation	NJR
Northwest Natural Holding Company	NWN
ONE Gas, Inc.	OGS
Southwest Gas Holdings, Inc.	SWX
Spire Inc.	SR

Table 1: Proxy Group Screening Results

Q. DOES THE SELECTION OF A PROXY GROUP ENSURE ANALYTICAL
 RESULTS WILL BE TIGHTLY CLUSTERED AROUND THE AVERAGE (*I.E.*,
 MEAN) RESULTS?

13 A. No. For example, the DCF approach calculates the Cost of Equity using the expected

- 14 dividend yield and projected growth. Despite the care taken to ensure risk comparability,
- 15 market expectations with respect to future risks and growth opportunities will vary from

⁸ Source: South Jersey Gas Company, Annual Report for the year ended December 31, 2018.

Source: Bloomberg Professional.

1 company to company. Therefore, even within a group of similarly situated companies, it 2 is common for analytical results to reflect a seemingly wide range.¹⁰ An ongoing issue is 3 how to best estimate the market-required ROE from within that range. That determination 4 necessarily must consider a wide range of both empirical and qualitative information. As 5 noted earlier, it is not an entirely mathematical analysis.

6

V. <u>COST OF EQUITY ESTIMATION</u>

7 Q. PLEASE BRIEFLY DISCUSS THE ROE IN THE CONTEXT OF THE 8 REGULATED RATE OF RETURN.

9 A. Regulated utilities primarily use common stock and long-term debt to finance their capital
10 investments. The overall rate of return ("ROR") weighs the costs of the individual sources
11 of capital by their respective book values. As noted earlier, while the Cost of Debt can be
12 directly observed, the Cost of Equity is market-based and, therefore, must be estimated
13 based on observable market information.

14 **Q.**

HOW HAVE YOU DETERMINED THE INVESTOR-REQUIRED ROE?

A. Because the Cost of Equity is not directly observable, it must be estimated based on both quantitative and qualitative information. Although several empirical models have been developed for that purpose, all are subject to limiting assumptions or other constraints. Consequently, many finance texts recommend using multiple approaches to estimate the Cost of Equity.¹¹ When faced with the task of estimating the Cost of Equity, analysts and investors are inclined to gather and evaluate as much relevant data as reasonably can be analyzed and, therefore, rely on multiple analytical approaches.

¹⁰ In Appendix B, I provide more substantive descriptions of the models used to estimate the ROE.

¹¹ See, for example, Eugene Brigham, Louis Gapenski, <u>Financial Management: Theory and Practice</u>, 7th Ed., 1994, at 341, and Tom Copeland, Tim Koller and Jack Murrin, <u>Valuation: Measuring and Managing the Value of Companies</u>, 3rd Ed., 2000, at 214.

1 Regulatory commissions in other regulatory jurisdictions, such as Hawaii, 2 Massachusetts, and North Carolina, have found that no individual model is more reliable 3 than all others under all market conditions, and that the application of judgement is important in developing ROE estimates.¹² Therefore, it is prudent and appropriate to use 4 5 multiple methods to mitigate the effects of assumptions and inputs associated with any 6 single approach. As such, I have considered the results of the Constant Growth DCF 7 model, the Capital Asset Pricing Model (including the "Empirical" form), the Bond Yield 8 Plus Risk Premium approach, and the Expected Earnings approach.

9

Q. WHY DID YOU SELECT THOSE FOUR MODELS?

10 A. I did so for two reasons. First, because the purpose of ROE analyses is to estimate the 11 return investors require, it is important to use the models investors often use. As discussed 12 in Appendix B, the models I have applied are commonly used in practice. Second, the 13 models focus on different aspects of return requirements, and provide different insights to 14 investors' views of risk and return. Using multiple models provides a broader, and 15 therefore a more reliable perspective on investors' return requirements.

16 Q. PLEASE BRIEFLY DESCRIBE THE CONSTANT GROWTH DCF MODEL.

A. The Constant Growth DCF approach defines the Cost of Equity as the sum of (1) the
 expected dividend yield, and (2) expected long-term growth. The expected dividend yield
 generally equals the expected annual dividend divided by the current stock price, and the

¹² See, for example: (1) Public Utilities Commission of the State of Hawaii, Docket No. 7700, Order No. 13704 in Docket No. 7700, In the Matter of the Application of Hawaiian Electric Company, Inc. For Approval of Rate Increases and Revised Rate Schedules and Rules, December 28, 1994 at 92; (2) The Commonwealth of Massachusetts Department of Public Utilities, Investigation by the Department of Public Utilities, Docket D.P.U. 15-155, September 30, 2016, at 376-378; and (3) State of North Carolina Utilities Commission, In the Matter of Application of Public Service Company of North Carolina, Inc. for a General Increase in its Rates and Charges, Docket No. G-5, Sub 565, Order Approving Rate Increase and Integrity Management Tracker, October 28, 2016, at 35-36.
growth rate is based on analysts' expectations of earnings growth. Under the model's strict assumptions, the growth rate equals the rate of capital appreciation (that is, the growth in the stock price).¹³ Given that structure, it does not matter whether the investor holds the stock in perpetuity, or whether they hold the stock for a specific period, collect the dividends, then sell at the prevailing market price. Under the model's assumptions, the result is the same regardless of the holding period.

7

Q. PLEASE BRIEFLY DESCRIBE THE CAPITAL ASSET PRICING MODEL.

A. Whereas DCF models focus on expected cash flows, Risk Premium-based models, such
as the CAPM, focus on the additional return that investors require for taking on additional
risk. In finance, "risk" generally refers to the variation in expected returns, rather than the
expected return, itself. Consider two firms, X and Y, with expected returns, and the
expected variation in returns noted in Chart 1, below. Although the two have the same
expected return (12.50 percent), Firm Y's are far more variable. From that perspective,
Firm Y would be considered the riskier investment.

¹³ As discussed in Appendix B, the model assumes that earnings, dividends, book value, and the stock price all grow at the same constant rate in perpetuity.





Now consider two other firms, Firm A and Firm B. Both have expected returns of
12.50 percent, and both are equally risky as measured by their volatility. But as Firm A's
returns go up, Firm B's returns go down. That is, the returns are negatively correlated.





If we were to combine Firms A and B into a portfolio, we would expect a 12.50 percent return with no uncertainty because of the opposing symmetry of their risk profiles.

1 That is, we can diversify the risk away. As long as two stocks are not perfectly correlated, 2 we can achieve diversification benefits by combining them into a portfolio. That is the 3 essence of the CAPM; because we can combine firms into a portfolio, the only risk that 4 matters is the risk that remains after diversification, *i.e.*, the "non-diversifiable" risk.

5 The CAPM defines the Cost of Equity as the sum of the "risk-free" rate, and a 6 premium to reflect the additional risk associated with equity investments. The "risk-free" 7 rate is the yield on a security viewed as having no default risk, such as long-term Treasury 8 bonds. The risk-free rate essentially sets the baseline of the CAPM. That is, an investor 9 would expect a higher return than the risk-free rate to purchase an asset that carries risk. 10 The difference between that higher return (*i.e.*, the required return) and the risk-free rate 11 is the risk premium.

12

Risk-Free Rate + *Risk Premium* = *Required Return* [1]

The risk premium is defined as a security's Beta coefficient multiplied by the risk premium of the overall market (the "Market Risk Premium" or "MRP"). The Beta coefficient is a measure of the subject company's risk relative to the overall market, *i.e.*, the "non-diversifiable" risk. A Beta coefficient of 1.00 means that the security is equally as risky as the overall market; a value below 1.00 represents a security with less risk than the overall market, and a value over 1.00 represents a security with more risk than the overall market. Equation [2] provides the general format of the CAPM formula:

20

Risk-Free Rate + (Beta Coefficient x MRP) = Required Return [2]

I also applied the "Empirical CAPM", which calculates the product of the adjusted Beta coefficient and the Market Risk Premium, and applies a weight of 75.00 percent to that result. The model then applies a 25.00 percent weight to the Market Risk Premium, without any effect from the Beta coefficient. The results of the two calculations are summed, along with the risk-free rate, to produce the ROE estimate. This approach helps
 correct for the tendency of low-Beta coefficient securities to realize returns somewhat
 higher than the traditional CAPM would predict, and high-Beta coefficient securities to
 realize returns lower than predicted. That is, the ECAPM addresses the tendency of the
 CAPM to underestimate the Cost of Equity for low-Beta coefficient companies, such as
 regulated utilities.

7 Q. PLEASE BRIEFLY DESCRIBE THE BOND YIELD PLUS RISK PREMIUM 8 METHOD.

9 A. This approach is based on the basic financial principle that equity investors bear the risk associated with ownership and therefore require a premium over the return they would have earned as a bondholder. That is, because returns to equity holders are more risky than returns to bondholders, equity investors must be compensated for bearing that additional risk (that difference often is referred to as the "Equity Risk Premium"). Bond Yield Plus Risk Premium approaches estimate the Cost of Equity as the sum of the Equity Risk Premium and the yield on a class of bonds.

16

Bond Yield + Equity Risk Premium = Required Return [3]

17 Q. PLEASE BRIEFLY DESCRIBE THE EXPECTED EARNINGS APPROACH.

A. The Expected Earnings analysis is based on the principle of opportunity costs. Because
investors may invest in, and earn returns on alternative investments of similar risk, those
rates of return can provide a useful benchmark in determining the appropriate rate of return
for a firm. Further, because those results are based solely on the returns expected by
investors, exclusive of market-data or models, the Expected Earnings approach provides
a direct comparison. I have applied this approach as a corroborating method to the results
of my other models.

Q. WHAT ARE THE RESULTS OF YOUR CONSTANT GROWTH DCF-BASED ANALYSIS?

A. The results of the Constant Growth DCF model described in Appendix B, part A are
 provided in Table 2, below.¹⁴

5

Table 2: S	Summary of	f Constant	Growth	DCF	Results ¹²	5
------------	------------	------------	--------	-----	-----------------------	---

	Mean Low	Mean	Mean High
30-Day Average	7.45%	9.86%	14.08%
90-Day Average	7.46%	9.88%	14.10%
180-Day Average	7.42%	9.83%	14.06%
	Median Low	Median	Median High
30-Day Average	7.32%	9.35%	11.48%
90-Day Average	7.36%	9.39%	11.41%
180-Day Average	7.35%	9.42%	11.27%

6 Q. PLEASE NOW SUMMARIZE YOUR REMAINING ANALYTICAL RESULTS.

7 A. The Risk Premium-based results, including the CAPM, ECAPM and Bond Yield Plus
8 Risk Premium methods, explained in detail in Appendix B, parts B and C, respectively,
9 are provided in Tables 3a, 3b and 4 below. Table 5 summarizes the Expected Earnings
10 results, which are explained in detail in Appendix B, part D.

¹⁴ See, Appendix B for a more detailed description of the models, assumptions, and inputs described in Section V.

¹⁵ For the purposes of my Direct Testimony, I have put more emphasis on the median results of my Constant Growth DCF analysis, because the mean results are affected by an anomalously high growth rate for Northwest Natural Gas Company of 27.00 percent from Value Line due to the company's significant losses in 2017.

	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coeffi	cient	
Current 30-Year Treasury (2.25%)	8.55%	9.15%
Near Term Projected 30-Year Treasury (2.42%)	8.71%	9.31%
Long Term Projected 30-Year Treasury (3.45%)	9.74%	10.35%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (2.25%)	9.52%	10.22%
Near Term Projected 30-Year Treasury (2.42%)	9.69%	10.38%
Long Term Projected 30-Year Treasury (3.45%)	10.72%	11.42%

Table 3a: Summary of CAPM Results

1

Table 3b: Summary of Empirical CAPM Results

	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coeffi	cient	
Current 30-Year Treasury (2.25%)	9.77%	10.49%
Near Term Projected 30-Year Treasury (2.42%)	9.93%	10.65%
Long Term Projected 30-Year Treasury (3.45%)	10.97%	11.69%
Average Value Line Beta Coefficient		
Current 30-Year Treasury (2.25%)	10.50%	11.29%
Near Term Projected 30-Year Treasury (2.42%)	10.66%	11.45%
Long Term Projected 30-Year Treasury (3.45%)	11.70%	12.49%

Table 4: Bond Yield Risk Premium Results

Treasury Yield	Return on Equity
Current 30-Year Treasury (2.25%)	9.90%
Near Term Projected 30-Year Treasury (2.42%)	9.87%
Long Term Projected 30-Year Treasury (3.45%)	9.93%

	Return on Equity
Low	9.08%
Median	10.18%
High	11.57%
Average	10.35%

Table 5: Expected Earnings Results

2 VI. OTHER CONSIDERATIONS

3 Q. WHAT OTHER FACTORS HAVE YOU CONSIDERED IN DETERMINING 4 YOUR RECOMMENDED ROE?

A. Because the analytical methods discussed above provide a range of estimates, there are
several additional factors that should be taken into consideration when establishing a
reasonable range for the Company's Cost of Equity. Those factors include the risks
associated with the Company's comparatively small size on the Cost of Equity, and
flotation costs associated with equity issuances.

10

A. SMALL SIZE PREMIUM

11 Q. PLEASE EXPLAIN THE RISK ASSOCIATED WITH SMALL SIZE.

A. Both the financial and academic communities have long accepted the proposition that the
 Cost of Equity for small firms is subject to a size effect.¹⁶ Although empirical evidence
 of the size effect often is based on studies of industries beyond regulated utilities, utility
 analysts also have noted the risks with associated small market capitalizations.
 Specifically, Ibbotson Associates noted:

17For small utilities, investors face additional obstacles, such as smaller18customer base, limited financial resources, and a lack of diversification

¹⁶ See, Mario Levis, The Record on Small Companies: A Review of the Evidence, Journal of Asset Management, Mar. 2002, at 368-397, for a review of literature relating to the size effect.

- 1across customers, energy sources, and geography. These obstacles2imply a higher investor return.¹⁷
- Small size, therefore, leads to two categories of increased risk for investors: (1) liquidity
 risk (*i.e.*, the risk of not being able to sell one's shares in a timely manner due to the
 relatively thin market for the securities); and (2) fundamental business risks.
- 5
- 6

7

Q.

HOW DOES SOUTH JERSEY GAS COMPARE IN SIZE TO THE PROXY COMPANIES?

A. South Jersey Gas is significantly smaller than the proxy group, both in terms of number
of customers and annual revenues. Because the Company is not a separately traded entity,
an estimated stand-alone market capitalization for South Jersey Gas must be calculated.
To do so, I applied the median market to book ratio for the six-member proxy group to
South Jersey Gas' implied book value of equity of \$1.19 billion.¹⁸ The implied market
capitalization based on that calculation is \$2.80 billion, which is approximately 66.00
percent of the median level of the proxy group.

15 Q. HOW DOES THE SMALLER SIZE OF SOUTH JERSEY GAS AFFECT ITS

16 BUSINESS RISKS RELATIVE TO THE PROXY GROUP OF COMPANIES?

17 A. In general, smaller companies are less able to withstand adverse events that affect their 18 revenues and expenses. The effect of weather variability, the loss of large customers to 19 bypass opportunities, or the destruction of demand as a result of general macroeconomic 20 conditions or fuel price volatility will have a proportionately greater effect on the earnings 21 and cash flow volatility of smaller utilities. Similarly, capital expenditures for non-22 revenue producing investments, such as system maintenance and replacements, will put

¹⁷ Michael Annin, *Equity and the Small-Stock Effect*, Public Utilities Fortnightly, October 15, 1995.

¹⁸ Stockholder equity was calculated by applying the proposed equity ratio of 54.18 percent to the proposed rate base for South Jersey Gas of \$2.20 billion.

Exhibit P-7

2

3

1

proportionately greater pressure on customer costs, potentially leading to customer attrition or demand reduction. Taken together, such risks affect the return required by investors for smaller companies.

4 Q. HOW DID YOU ESTIMATE THE SIZE PREMIUM FOR SOUTH JERSEY GAS?

5 In its 2019 Stocks, Bonds, Bills and Inflation® Yearbook, Duff and Phelps calculate the A. 6 size premium for deciles of market capitalizations relative to the S&P 500 Index. As 7 shown on Schedule RBH-9, the proxy group's mean and median market capitalization are 8 approximately \$5.58 billion and \$4.21 billion, respectively. Those levels correspond to 9 the fourth and fifth deciles of Morningstar's market capitalization data. Using the median 10 market capitalization in the Morningstar analysis, the proxy group has a size premium of 11 1.28 percent. The implied market capitalization for South Jersey Gas is approximately 12 \$2.80 billion, which falls within the sixth decile and corresponds to a size premium of 13 1.50 percent (or 150 basis points). The difference between those size premiums is 22 basis 14 points (1.50 percent - 1.28 percent).

15 Q. HAVE YOU CONSIDERED THE SMALLER SIZE OF SOUTH JERSEY GAS IN

16 YOUR RECOMMENDED RETURN ON EQUITY FOR THE COMPANY?

A. Yes. Although I have quantified the small size effect, rather than proposing a specific
 premium, I have considered the small size of South Jersey Gas in my assessment of
 business risks in order to determine where, within a reasonable range of returns, South
 Jersey Gas' required ROE appropriately falls.

1

B. FLOTATION COSTS

- 2 Q. WHAT ARE FLOTATION COSTS?
- A. Flotation costs are the costs associated with the sale of new issues of common stock.
 These include out-of-pocket expenditures for preparation, filing, underwriting, and other
 costs of issuance.

6 Q. WHY IS IT IMPORTANT TO RECOGNIZE FLOTATION COSTS IN THE 7 ALLOWED ROE?

A. To attract and retain new investors, a regulated utility must have the opportunity to earn a
return that is both competitive and compensatory. To the extent the opportunity to recover
prudently incurred flotation costs is denied, actual returns will fall short of expected (or
required) returns, thereby diminishing its ability to attract adequate capital on reasonable
terms.

13 Q. ARE FLOTATION COSTS PART OF THE UTILITY'S INVESTED COSTS OR 14 PART OF THE UTILITY'S EXPENSES?

15 A. Flotation costs are part of capital costs, which are properly reflected on the balance sheet 16 under "paid in capital" rather than current expenses on the income statement. Flotation 17 costs are incurred over time, just as investments in rate base or debt issuance costs. As a 18 result, the great majority of flotation costs are incurred prior to the test year, but remain 19 part of the cost structure during the test year and beyond, and as such, should be 20 recognized for ratemaking purposes. The recovery of flotation costs therefore is 21 appropriate even if no new issuances are planned in the near future; failure to allow such 22 cost recovery may deny South Jersey Gas the opportunity to earn its required rate of return 23 in the future.

1	Q.	DO THE DCF, CAPM, AND BOND YIELD PLUS RISK PREMIUM MODELS
2		ALREADY INCORPORATE INVESTOR EXPECTATIONS OF A RETURN IN
3		ORDER TO COMPENSATE FOR FLOTATION COSTS?

A. No. The models used to estimate the appropriate ROE assume no "friction" or transaction
costs, as these costs are not reflected in the market price (in the case of the DCF model)
or risk premium (in the case of the CAPM and the Bond Yield Plus Risk Premium model).
Therefore, it is appropriate to consider flotation costs when determining where the
Company's return should fall.

9 Q. IS THE NEED TO CONSIDER FLOTATION COSTS ELIMINATED BECAUSE 10 SOUTH JERSEY GAS IS A WHOLLY OWNED SUBSIDIARY?

11 A. No, it is not. Wholly owned subsidiaries such as South Jersey Gas receive equity capital 12 from their parents, and provide returns on the capital that roll up to the parent, which is 13 designated to attract and raise capital based on the returns of those subsidiaries. To deny 14 recovery of issuance costs associated with capital that is invested in the subsidiaries 15 ultimately would penalize the investors that fund the utility operations, and would inhibit 16 the utility's ability to obtain new equity capital at a reasonable cost. This is important for 17 companies such as South Jersey Gas that are planning continued capital expenditures in 18 the near term, and for which access to capital (at reasonable cost rates) to fund such 19 required expenditures will be critical.

20Q.HOW DID YOU CALCULATE THE FLOTATION COST RECOVERY21ADJUSTMENT?

A. I modified the DCF calculation to provide a dividend yield that would reimburse investors
 for issuance costs. My estimate of flotation costs recognizes the costs of issuing equity

that were incurred by the proxy companies in their most recent two issuances. As shown
 in Schedule RBH-10, an adjustment of 0.07 percent (*i.e.*, seven basis points) reasonably
 represents flotation costs for the Company.

4

Q. IS THE NEED TO CONSIDER FLOTATION COSTS RECOGNIZED BY THE

5

14

ACADEMIC AND FINANCIAL COMMUNITIES?

6 A. Yes. The need to reimburse investors for equity issuance costs is recognized by the 7 academic and financial communities in the same spirit that investors are reimbursed for 8 the costs of issuing debt. For example, Dr. Morin notes that "[t]he costs of issuing 9 [common stock] are just as real as operating and maintenance expenses or costs incurred 10 to build utility plants, and fair regulatory treatment must permit the recovery of these costs."¹⁹ Dr. Morin further notes that "equity capital raised in a given stock issue remains 11 12 on the utility's common equity account and continues to provide benefits to ratepayers indefinitely."²⁰ This treatment is consistent with the philosophy of a fair rate of return. 13

15 Flotation costs occur when a company issues new stock. The business usually incurs several kinds of flotation or transaction costs, which 16 17 reduce the actual proceeds received by the business. Some of these are 18 direct out-of-pocket outlays, such as fees paid to underwriters, legal 19 expenses, and prospectus preparation costs. Because of this reduction 20 in proceeds, the business's required returns must be greater to 21 compensate for the additional costs. Flotation costs can be accounted 22 for either by amortizing the cost, thus reducing the net cash flow to 23 discount, or by incorporating the cost into the cost of equity capital. Since flotation costs typically are not applied to operating cash flow, 24 they must be incorporated into the cost of equity capital.²¹ 25

As explained by Dr. Shannon Pratt:

¹⁹ Roger A. Morin, <u>New Regulatory Finance</u>, Public Utility Reports, Inc., 2006, at 321.

²⁰ *Id.*, at 327.

²¹ Shannon P. Pratt, Roger J. Grabowski, <u>Cost of Capital: Applications and Examples, 4th ed.</u> (John Wiley & Sons, Inc., 2010), at 586.

1		Similarly, Morningstar has commented on the need to reflect flotation costs in the Cost of
2		Capital:
3 4 5 6 7		Although the cost of capital estimation techniques set forth later in this book are applicable to rate setting, certain adjustments may be necessary. One such adjustment is for flotation costs (amounts that must be paid to underwriters by the issuer to attract and retain capital). ²²
8	Q.	HAVE COMMISSIONS IN OTHER REGULATORY JURISDICTIONS
9		RECOGNIZED FLOTATION COSTS WHEN DETERMINING THE
10		AUTHORIZED ROE?
1	А.	FERC, along with regulatory commissions in jurisdictions such as Arkansas, Connecticut,
12		and Mississippi, have recognized flotation costs when determining the authorized ROE. ²³
13		Although the method by which flotation costs are reflected in rates may vary (e.g., implicit
14		versus explicit basis point increases to authorized ROE), the recognition of those costs is
15		not limited to, or constrained by recent equity issuances. For instance, the Arkansas Public
16		Service Commission stated that "including some level of valid, sustainable, measurable,
17		and material flotation costs in equity return is appropriate."24

²² Morningstar, Inc. Ibbotson SBBI 2013 Valuation Yearbook, at 25.

²³ See, for example, FERC Docket Nos. EL05-19-002 and ER05-168-001, Golden Spread Electric Cooperative, Inc., v. Southwestern Public Service Company, Opinion No. 501, 123 FERC ¶ 61,0047, (April 21, 2008); Arkansas Public Service Commission, Docket No. 04-176-U, In the Matter of the Application of Arkansas Western Gas Company for Approval of a General Change in Rates and Tariffs, Order No. 6, October 31, 2005, at 34; Connecticut Public Utilities Regulatory Authority, Docket No. 14-05-06, Application of the Connecticut Light and Power Company to Amend Rate Schedules, Decision, December 17, 2014, at 133-134, 145 (Table 64), and 223 (PP 280-281); Mississippi Public Service Commission, Docket No. 01-UN-0548, Notice of Intent of Mississippi Power Company to Change Rates for Electric Service in its Certificated Areas in the Twenty-Three Counties of Southeast Mississippi, Final Order, December 3, 2001, at 26.

1	Q.	ARE YOU PROPOSING TO ADJUST YOUR RECOMMENDED ROE BY SEVEN
2		BASIS POINTS TO REFLECT THE EFFECT OF FLOTATION COSTS ON THE
3		COMPANY'S ROE?
4	А.	No. Rather, I have considered the effect of flotation costs, in addition to the Company's
5		small size relative to the proxy group, in determining where the Company's ROE falls
6		within the range of results.
7		C. ELECTRIFICATION
8	Q.	WHAT IS ELECTRIFICATION?
9	А.	Electrification is the conversion of fossil-fuel based transportation (i.e., gasoline powered
10		vehicles) and end-use heating and appliance loads (such as oil and natural gas-fired
11		heating systems) to electricity.
12	Q.	WHAT RISKS DO ELECTRIFICATION POSE FOR THE NATURAL GAS
13		UTILITY SECTOR?
14	A.	As noted in a recent ICF study for the American Gas Association, as states and local
15		municipalities contemplate "deep decarbonization" of their economies as the electric grid
16		becomes less carbon-intensive, policy-makers and environmental advocates are
17		considering electrification as an option for further reducing greenhouse gas emissions. ²⁵
18		If successful, these policies could affect the natural gas utility sector by drastically
19		reducing demand for natural gas, leaving natural gas utilities at risk of holding stranded
20		assets. ²⁶

²⁵ See, Implications of Policy Driven Residential Electrification, An American Gas Association Study prepared by ICF, July 2018, at 1.

²⁶ McKinsey & Company, "Are US gas utilities nearing the end of their golden age?", September 2018, <u>https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/are-us-gas-utilities-nearing-the-end-of-their-golden-age.</u>

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VII. <u>CAPITAL MARKET ENVIRONMENT</u>

2 Q. DOES YOUR RECOMMENDATION CONSIDER THE CURRENT CAPITAL 3 MARKET ENVIRONMENT?

A. Yes, it does. From an analytical perspective, it is important that the inputs and
assumptions used to arrive at an ROE recommendation, including assessments of capital
market conditions, are consistent with the recommendation itself. Although all analyses
require an element of judgment, the application of that judgment must be made in the
context of the quantitative and qualitative information available to the analyst and the
capital market environment in which the analyses were undertaken.

10 Q. IS THERE A RELATIONSHIP BETWEEN EQUITY MARKET VOLATILITY 11 AND INTEREST RATES?

12 Yes, there is. Significant and abrupt increases in volatility tend to be associated with A. 13 declines in Treasury yields. That relationship makes intuitive sense; as investors see 14 increasing risk, their objectives may shift principally to capital preservation (that is, 15 avoiding a capital loss). A means of doing so is to allocate capital to the relative safety of 16 Treasury securities, in a "flight to safety." Because Treasury yields are inversely related 17 to Treasury bond prices, as investors bid up the prices of bonds, they bid down the yields. 18 As Chart 3, below, demonstrates, decreases in the 30-year Treasury yield are coincident 19 with significant increases in the VIX.



Chart 3: 30-Year Treasury Yields vs. VIX (1/1/2000 – 1/31/2020)²⁷

In those instances, the fall in yields does not reflect a reduction in required returns, it reflects an increase in risk aversion and, therefore, an increase in required equity returns.

5 Q. HAS MARKET VOLATILITY CHANGED RECENTLY?

6 A. Yes, it has. A visible and widely reported measure of expected volatility is the Chicago 7 Board Options Exchange ("Cboe") Volatility Index, often referred to as the VIX. As Cboe 8 explains, the VIX "is a calculation designed to produce a measure of constant, 30-day 9 expected volatility of the U.S. stock market, derived from real-time, mid-quote prices of S&P 500® Index (SPXSM) call and put options."²⁸ Simply, the VIX is a market-based 10 11 measure of expected volatility. Because volatility is a measure of risk, increases in the 12 VIX, or in its volatility, are a broad indicator of expected increases in market risk. 13 Although the VIX is not expressed as a percentage, it should be understood as such. That 14 is, if the VIX stood at 15.00, it would be interpreted as an expected standard deviation in 15 annual market returns of 15.00 percent over the coming 30 days. Since 2000, the VIX has

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²⁷ Sources: S&P Global Market Intelligence; and Bloomberg Professional.

²⁸ Source: <u>http://www.cboe.com/vix</u>.

1	averaged about 19.46, which is highly consistent with the long-term standard deviation on
2	annual market returns (19.80 percent, as reported by Duff & Phelps). ²⁹
3	Table 6, below, demonstrates the increase in market uncertainty from 2017 to early
4	2020. As that table notes, the standard deviation (that is, the volatility of volatility) from
5	2018 through early 2020 is about 2.98 times higher than its 2017 level (1.36).

VIX Level and Volatil	ity
Long-term Average	19.13
2018-2020 Average	15.93
2018-2020 Maximum	37.32
2018-2020 Minimum	9.15
2018-2020 Standard Deviation	4.04
2017 Average	11.09
2017 Maximum	16.04
2017 Minimum	9.14
2017 Standard Deviation	1.36

 Table 6: VIX Levels and Volatility³⁰

6 The increase in volatility is not surprising as market participants re-assess the Federal 7 Reserve's long-term objective of monetary policy normalization, and the increasing risks 8 associated with federal trade policy initiatives.

9 Q. IS MARKET VOLATILITY EXPECTED TO INCREASE FROM ITS CURRENT

10 LEVELS?

11 A. Yes, it is. One means of assessing market expectations regarding the future level of

12 volatility is to review Cboe's "Term Structure of Volatility." As Cboe points out:

13	The implied volatility term structure observed in SPX options markets
14	is analogous to the term structure of interest rates observed in fixed
15	income markets. Similar to the calculation of forward rates of interest,
16	it is possible to observe the option market's expectation of future
17	market volatility through use of the SPX implied volatility term

²⁹ Source: Duff & Phelps, 2019 SBBI Yearbook, at 6-17.

³⁰ Source: Yahoo! Finance.

structure.³¹
 Cboe's term structure data is upward sloping, indicating market expectations of increasing
 volatility. The expected VIX value in December 2020 is 18.82, suggesting investors see
 a reversion to long-term average volatility over the coming months.³²
 Q. HAVE RECENT DECLINES IN TREASURY YIELDS BEEN ASSOCIATED

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WITH INCREASES IN MARKET VOLATILITY?

7 A. Yes, they have. Since November 2018, the periods during which Treasury yields fell
8 coincided with increases in the VIX (*see*, Chart 4, below).





Chart 4: 30-Year Treasury Yields vs. VIX (11/1/2018 - 1/31/2020)³³

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11 Q. HAVE AUTHORIZED RETURNS MOVED IN STEP WITH THE LOW 12 INTEREST RATE ENVIRONMENT?

A. No, they have not. As Chart 5 (below) demonstrates, despite the decline in yields in 2015
and 2016, and again in late 2018 through 2019, regulatory commissions have not been

³¹ Source: <u>http://www.cboe.com/trading-tools/strategy-planning-tools/term-structure-data</u>.

³² Source: <u>http://www.cboe.com/trading-tools/strategy-planning-tools/term-structure-data</u>, as of January 31, 2020.

³³ Source: S&P Global Market Intelligence.

inclined to reduce authorized returns for natural gas distribution utilities. The constancy
 of authorized returns as interest rates fell also is consistent with the widely accepted
 principle that the Equity Risk Premium increases as interest rates fall.

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AUTHORIZED RETURNS FOR NATURAL GAS DISTRIBUTION UTILITIES?

Chart 5: Authorized Returns for Natural Gas Distribution Utilities (2015 – 2020)³⁴

6 Q. WHAT ARE YOUR OBSERVATIONS RELATED TO RECENTLY

A. As Chart 5 demonstrates, there has been no meaningful trend since 2015; time explains
no more than 1.00 percent of the change in ROEs, and the trend is statistically
insignificant. Over that same period, authorized returns ranged from 8.70 percent to 11.88
percent, with an average and median of 9.62 percent and 9.60 percent, respectively.
Authorized returns for natural gas distribution utilities from January 1, 2019 through
January 31, 2020 ranged from 8.80 percent to 10.25 percent, with an average and median
of 9.67 and 9.70 percent, respectively.³⁵

³⁴ Excludes Limited Issue Riders. Source: Regulatory Research Associates.

³⁵ The lowest twelve authorized returns for natural gas distribution utilities, ranging from 8.70 percent to 9.00 percent from January 1, 2015 through January 31, 2020 were all authorized by the New York Public Service

1 Q. WHAT CONCLUSIONS DO YOU DRAW FROM THOSE ANALYSES?

A. It is important to consider whether changes in long-term interest rates reflect fundamental
 changes in investor sentiment, or whether they reflect potentially transitory factors. The
 recent, sudden decline in interest rates appears to be related to the increase in equity
 market volatility, which may be event-driven rather than a fundamental change. Because
 the methods used to estimate the Cost of Equity are forward-looking, it is important to
 consider those distinctions in assessing model results.

8 Q. HAVE NATURAL GAS UTILITY DIVIDEND YIELDS CLOSELY FOLLOWED 9 LONG-TERM TREASURY YIELDS?

10 A. Although they have been directionally related over time, the fundamental relationship between Treasury yields and natural gas utility³⁶ dividend yields changed after the 11 12 2008/2009 financial crisis. From 2000 through 2008, Treasury yields generally exceeded 13 dividend yields; the exception was the 2002-2003 market contraction. Then, as in 2008-14 2009, investors sought the safety of Treasury securities, accepting lower yields in 15 exchange for a greater likelihood of capital preservation. Once the contraction ended (in 16 the latter half of 2003), the relationship was restored, and Treasury yields again exceeded 17 dividend yields.

Commission, including a 8.80 percent authorized return in 2020. There were no other authorized returns by other utility commissions as low as 9.00 percent.

³⁶ Defined as the proxy group calculated as an index.



Chart 6: Natural Gas Utility Dividend Yields and 30-Year Treasury Yields³⁷

3 During the 2008/2009 financial crisis, Treasury bond prices increased (yields 4 decreased), and utility stock prices decreased (dividend yields increased) such that the 5 prior relationship became less stable. As the Federal Reserve implemented and 6 maintained "unconventional" monetary policies in reaction to the financial crisis (*i.e.*, 7 Quantitative Easing) with the intended consequence of lowering long-term interest rates, 8 the unstable relationship between Treasury yields and utility dividend yields persisted.

Even though the "yield spread"³⁸ became inverted for a period following the
financial crisis, it has not been static. That is, as Treasury yields fell in response to central
bank policies, dividend yields did not fall to the same degree, or necessarily exhibit similar
movements. In fact, at times the yield spread has widened (*see*, Chart 6, above). That
data suggests that, although utility prices are sensitive to long-term Treasury yields, the
relationship is not unbounded.

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³⁷ Source: S&P Global Market Intelligence. Proxy Group Dividend Yield calculated as an index.

³⁸ Defined here as dividend yields less Treasury yields.

1 Q. IS THAT RELATIONSHIP ALSO SEEN IN UTILITY P/E RATIOS?

- A. Yes, it is. Looking to the period following the Federal Reserve's Quantitative Easing
 policy, the proxy group P/E ratios have varied, often reverting once it has largely breached
 its 90-day moving average (*see*, Chart 7, below).
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Chart 7: Proxy Group Average Price/Earnings Ratio³⁹

From a somewhat different perspective, the proxy group's P/E ratio has traded within a
two-standard deviation range, although that range recently has widened, indicating
increasing variability in the group's valuation (*see*, Chart 8, below).

³⁹ Source: S&P Global Market Intelligence. Proxy Group Dividend Yield calculated as an index.



Chart 8: Proxy Group Average P/E Ratio Bands⁴⁰

3 That data supports the conclusion discussed earlier, that utility stock prices are sensitive 4 to changes in interest rates, to a degree. The "reach for yield" that sometimes occurs when 5 interest rates fall has a limit; investors will not accept the incremental risk of capital losses 6 when utility valuation levels become "stretched." That also may be the case when 7 investors see interest rates reacting to market volatility that is event-driven, rather than a 8 fundamental change in the capital market environment or investor risk tolerances. The 9 increasing variability can be seen in Chart 8 (above), when the bands around the 90-day 10 moving average P/E ratios widen. During those periods, the risk of capital loss increases, implying a further limit on valuation levels. 11

12 Q. DOES THE REDUCTION IN THE FEDERAL FUNDS TARGET RATE BY THE

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FEDERAL RESERVE ALTER ANY OF THE CONCLUSIONS ABOVE?

A. No, it does not. As explained above, utility stock prices are sensitive to changes in interest
 rates, but only to a point. To the extent investors expect further reductions in the Federal

⁴⁰ Calculated as an index. Bands represent two standard deviations calculated over 90 days. Source: S&P Global Market Intelligence.

1		Funds Target Rate or an inversion to the yield curve, the effects on utility stock prices are
2		not certain to be directionally related. Further, although the Federal Open Market
3		Committee ("FOMC") reduced the overnight Federal Funds rate by a quarter percentage
4		point three times in 2019, it noted that in determining the timing and size of future rate
5		adjustments,
6 7 8 9 10 11 12		the Committee will assess realized and expected economic conditions relative to its maximum employment objective and its symmetric 2 percent inflation objective. This assessment will take into account a wide range of information, including measures of labor market conditions, indicators of inflation pressures and inflation expectations, and readings on financial and international developments. ⁴¹
13		As to the longer-term, the FOMC's December 2019 Projection Materials suggest an
14		increase in the Federal Funds rate over the "longer-run."42
15	Q.	HAVE YOU ALSO CONSIDERED THE EFFECT OF THE TAX CUTS AND JOBS
16		ACT OF 2017 ("TCJA") ON THE UTILITY INDUSTRY?
17	А.	Yes, I have. The TCJA was enacted on December 22, 2017. Since then, the major rating
18		agencies have observed that a reduction in utilities' revenue associated with lower income
19		taxes and the potential return of excess accumulated deferred income taxes, and that the
20		loss of bonus depreciation also may reduce utilities' cash flow, may put downward
21		pressure on key credit metrics. Because rating agencies have assessed the consequences
22		of the TCJA to utilities' cash flow and credit statistics, we reasonably can assume equity

⁴¹ *Federal Reserve Press Release*, January 29, 2020.

⁴² Federal Open Market Committee, *Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy,* December 2019. The projection materials explain that "[1]onger-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy."

Q. WHAT CONCERNS HAVE THE MAJOR RATING AGENCIES RAISED AS THEY CONSIDER THE IMPLICATIONS OF THE TCJA FOR UTILITIES' CASH FLOW AND CREDIT STATISTICS?

4 The major rating agencies have observed that a reduction in utilities' revenue associated A. 5 with lower income taxes and the potential return of excess accumulated deferred income taxes may reduce utilities' cash flow.⁴³ As FitchRatings ("Fitch") pointed out "[a]bsent 6 7 mitigating strategies on the regulatory front, this is expected to lead to weaker credit 8 metrics and negative rating actions for issuers with limited headroom to absorb the leverage creep."44 In a similar vein, S&P observed that the TCJA is "...negative for credit 9 10 quality because the combination of a lower tax rate and the loss of stimulus provisions 11 related to bonus depreciation or full expensing of capital spending will create headwinds in operating cash-flow generation capabilities as customer rates are lowered in response 12 to the new tax code."⁴⁵ Moody's Investors Service ("Moody's") stated the following: 13 14 Tax reform is credit negative for US regulated utilities because the 15 lower 21% statutory tax rate reduces cash collected from customers, 16 while the loss of bonus depreciation reduces tax deferrals, all else being

- lower 21% statutory tax rate reduces cash collected from customers,
 while the loss of bonus depreciation reduces tax deferrals, all else being
 equal. Moody's calculates that the recent changes in tax laws will dilute
 a utility's ratio of cash flow before changes in working capital to debt
 by approximately 150 250 basis points on average, depending to some
 degree on the size of the company's capital expenditure programs.
 From a leverage perspective, Moody's estimates that debt to total
 capitalization ratios will increase, based on the lower value of deferred
 tax liabilities.⁴⁶
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All three rating agencies, therefore, have observed the negative effects of the TCJA on

25 utilities' cash flow, and the potential consequences for their credit profiles.

⁴³ See, S&P Global Market Intelligence, *Rating agencies warn tax reform could drag US utility sector credit quality*, January 25, 2018.

⁴⁴ FitchRatings Special Report, *Tax Reform Impact on the U.S. Utilities, Power & Gas Sector*, January 24, 2018.

⁴⁵ S&P Global Ratings, U.S. Tax Reform: For Utilities' Credit Quality, Challenges Abound, January 24, 2018.

⁴⁶ Moody's Investors' Service, *Rating Action: Moody's changes outlooks on 25 US regulated utilities primarily impacted by tax reform*, January 19, 2018.

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Q. DID MOODY'S UPDATE ITS REVIEW OF THE UTILITY SECTOR?

2 A. Yes. On June 18, 2018 Moody's changed its outlook on the U.S. regulated utility sector 3 to "negative" from "stable". Moody's explained that its change in outlook "...primarily 4 reflects a degradation in key financial credit ratios, specifically the ratio of cash flow from operations to debt, funds from operations (FFO) to debt and retained cash flow to debt, as 5 well as certain book leverage ratios."47 The sector's outlook could remain "negative" if 6 7 cash flow-based metrics continue to decline, or if there emerge signs of a more 8 "contentious" regulatory environment (which, Moody's notes, is not fully reflected in 9 lower authorized returns). Moody's also noted that "[m]anagement teams' defensive 10 efforts and a few initial signs of supportive regulatory responses to tax reform are 11 important first steps in addressing the sector's increased financial risk," and explained that 12 in its view, "it will take longer than 12-18 months for the sector to exhibit a material financial improvement from these actions."48 13

14 Q. IS THE TCJA EXPECTED TO AFFECT SOUTH JERSEY GAS' FINANCIAL 15 PROFILE ON A FORWARD BASIS?

A. Yes, the TCJA's effect on South Jersey Gas is expected to be similar to that of its peers. As discussed by Company witness Alan D. Felsenthal,⁴⁹ the Company has incorporated the lower tax provision and the flowback of excess accumulated deferred income taxes in its cost of service, which reduce its cash flows. In addition, the Company is no longer able to use bonus depreciation as a financing source for its capital expenditures. As a result, the TCJA's effect on the Company represents a meaningful reduction to its cash

⁴⁷ See, Moody's Investors Service, Announcement: Moody's changes the US regulated utility sector outlook to negative from stable, June 18, 2018.

⁴⁸ *Id*.

⁴⁹ Exhibit P-9, Direct Testimony of Alan D. Felsenthal.

flows. As a consequence, South Jersey Gas will require access to the capital markets on
 a more frequent basis to finance its capital investments, including significant investments
 in infrastructure replacement. The need to more frequently access external capital,
 together with the dilution of its cash flow-related credit metrics, creates additional risks
 and challenges for the Company.

6 Q. WHAT CONCLUSIONS DO YOU DRAW FROM THE DATA AND 7 INFORMATION REGARDING THE TCJA DISCUSSED ABOVE?

8 There is little question the TCJA has increased cash flow-related risks, and created the A. 9 potentially dilutive effects of additional equity issuances, for utilities. Those risks are 10 reflected in the comments of financial participants such as Moody's, S&P, and Fitch. 11 Further, because non-regulated companies may benefit from the TCJA in ways utilities 12 cannot, it is reasonable to conclude investors have begun to see utilities as less attractive 13 relative to other industry sectors. Lastly, the dilution in cash flow may increase short-14 term borrowing requirements to fund day-to-day utility operations. Because those effects 15 weigh against utilities, we should focus on the upper end of the range of analytical results.

16Q.WHAT CONCLUSIONS DO YOU DRAW FROM YOUR ANALYSES OF THE17CURRENT CAPITAL MARKET ENVIRONMENT, AND HOW DO THOSE

18 CONCLUSIONS AFFECT YOUR ROE RECOMMENDATION?

19 A. Because certain models used to estimate the Cost of Equity require long-term 20 assumptions, it is important to understand whether those assumptions hold. The current 21 market environment is one in which changes in interest rates may be associated with 22 events, more than they are a function of fundamental economic conditions. Further, utility

valuations have a limit, even when investors look to them for an alternate source of income
 as interest rates fall.

On balance, it remains important to consider changes in market conditions, the likely causes of those changes, and how model results are affected by them. Those assessments necessarily involve the application of reasoned and experienced judgment. As discussed throughout my Direct Testimony, that judgment supports my recommended range of 10.00 percent to 10.70 percent.

8 **VIII.**

CAPITAL STRUCTURE

9 Q. WHAT IS THE COMPANY'S PROPOSED CAPITAL STRUCTURE?

A. In this proceeding, the Company proposes a ratemaking capital structure that consists of
54.18 percent common equity and 45.82 percent long-term debt which, as I explain below,
is consistent with the proxy group. The Company's proposed common equity is
significantly lower than the Company's actual common equity ratio as of December 31,
2019, which was 67.21 percent (discussed below).

15 Q. IS THERE A GENERALLY ACCEPTED APPROACH TO ASSESSING THE

16 CAPITAL STRUCTURE FOR A REGULATED NATURAL GAS UTILITY?

A. Yes, there is. In general, it is important to consider the capital structure in light of industry
 norms and investor requirements. That is, the capital structure should be reasonably
 consistent with industry practice, and enable the subject company to maintain its financial
 integrity, thereby enabling access to capital at competitive rates under a variety of
 economic and financial market conditions.

HOW DOES THE CAPITAL STRUCTURE AFFECT THE COST OF CAPITAL? 1 Q.

2 It is well understood that from a financial perspective, there are two general categories of A. 3 risk: business risk and financial risk. Business risk includes operating, market, regulatory, 4 and competitive uncertainties, while financial risk is the incremental risk to investors 5 associated with additional levels of debt. As such, the capital structure relates to a 6 Company's financial risk, which represents the risk that a company may not have adequate 7 cash flows to meet its financial obligations, and is a function of the percentage of debt (or 8 financial leverage) in its capital structure. In that regard, as the percentage of debt in the 9 capital structure increases, so do the fixed obligations for the repayment of that debt. 10 Consequently, as the degree of financial leverage increases, the risk of financial distress 11 (*i.e.*, financial risk) also increases. In essence, even if two firms face the same business 12 risks, a company with meaningfully higher levels of debt in its capital structure is likely to have a higher cost of both debt and equity.⁵⁰ Because the capital structure can affect 13 14 the subject company's overall level of risk, it is an important consideration in establishing 15 a just and reasonable rate of return.

16 IS THERE SUPPORT FOR THE PROPOSITION THAT THE CAPITAL Q. 17 STRUCTURE IS A KEY CONSIDERATION IN ESTABLISHING AN 18 **APPROPRIATE RETURN ON EQUITY?**

19 A. Yes. The Supreme Court and various utility commissions have long recognized the role 20 of capital structure in the development of a just and reasonable rate of return for a

⁵⁰ See, Modigliani & Miller Pro position II. The cost of equity capital increases with the percentage of debt in the capital structure. In fact, $ROE = Ro + \frac{D}{E}x(Ro - Rd)$ where Ro is the cost of capital if the firm were financed entirely with equity and Rd is the cost of debt.

1		regulated utility. In particular, a utility's leverage, or debt ratio, has been explicitly
2		recognized as an important element in determining a just and reasonable rate of return:
3 4 5		Although the determination of whether bonds or stocks should be issued is for management, the matter of debt ratio is not exclusively
5 6		of obtaining new capital. It is therefore an important factor in the rate
7		of return and must necessarily be considered by and come within the
8		authority of the body charged by law with the duty of fixing a just and
9		reasonable rate of return. ⁵¹
10		Perhaps ultimate authority for balancing the issues of cost and financial integrity
11		is found in the Supreme Court's statement in Hope Natural Gas:
12 13 14		The rate-making process under the Act, i.e., the fixing of "just and reasonable' rates, involves a balancing of the investor and the consumer interests," 320 U.S. at 603, 64 S. Ct. at 288. The equity
15 16		investor's stake is made less secure as the company's debt rises, but the consumer rate-payer's burden is alleviated. ⁵²
17		Consequently, the principles of fairness and reasonableness with respect to the allowed
18		rate of return and capital structure are considered at both the federal and state levels.
19	Q.	IS THE COMPANY'S PROPOSED EQUITY RATIO OF 54.18 PERCENT
20		GENERALLY CONSISTENT WITH THE EQUITY RATIOS THAT RECENTLY
21		HAVE BEEN APPROVED BY THE BOARD FOR NEW JERSEY'S OTHER GAS
22		DISTRIBUTION UTILITIES?
23	А.	Yes. The Board most recently approved rates for Public Service Electric and Gas

24 Company and New Jersey Natural Gas Company that reflect a 54.00 percent equity ratio.⁵³

⁵¹ New England Telephone & Telegraph Co. v. State, 98 N.H. 211, 220, 97 A.2d 213, 220 (1953), citing New England Tel. & Tel. Co. v. Department of Pub. Util., (Mass.) 327 Mass. 81, 97 N.E. 2d 509, 514; Petitions of New England Tel. & Tel. Co. 116 Vt. 480, 80 A2d 671.

⁵² Communications Satellite Corp. et. al. v. FCC, 198 U.S. App. D.C. 60, 63-64611 F.2d 883.

See, Agenda Item: 2K dated 10/29/18 in BPU Docket Nos. ER18010029, GR18010030, AX18010001, and ER18030231; OAL Docket Nos. PUC 01151-18 and PUC 07232-2018N; and Agenda Item: 2D dated 11/13/19 in BPU Docket Nos. GR19030420 and GR18101096; OAL Docket No. 06769-2019S. The Board also has approved rates that reflect a 51.50 percent equity component for Elizabethtown Gas Company. See, Agenda Item: 2C dated 11/13/19 in BPU Docket No. GR19040486; OAL Docket No. PUC 06692-2019N.,

1 Q. WHAT IS SOUTH JERSEY GAS' ACTUAL CAPITAL STRUCTURE?

- 2 A. South Jersey Gas' actual capital structure as of December 31, 2019 reflects a 66.88 percent
- 3 equity ratio. Please see Table 7 (below).
- 4

 Table 7: Actual Capital Structure as of December 31, 2019⁵⁴

	Amount	Percent of Capital
Common Equity	\$1,117,771,678	66.88%
Long-Term Debt	\$553,446,000	33.12%
Total Capitalization	\$1,671,217,678	100.00%

5 Q. WHY HAVE YOU EXCLUDED SHORT-TERM DEBT FROM THE COMPANY'S

6 **RATEMAKING CAPITAL STRUCTURE?**

7 A	4.	There are several reasons why short-term debt should be excluded. First, prudent
8		financing practice calls for long-term assets (such as rate base items) to be financed with
9		long-term securities (the "matching principle"). Doing otherwise would expose the
10		Company's customers to both refinancing risk (that is, the risk of not being able to roll-
11		over short-term debt as it comes due), and interest rate risk (incurring higher interest costs
12		as maturing short-term debt is refinanced). Although short-term debt may be used as an
13		interim source of financing (that is, until a sufficiently large balance has been accumulated
14		to be efficiently financed by long-term securities), it should not be seen as a permanent
15		source of capital. Rather short-term debt is more appropriate to fund non-rate base items
16		recovered over shorter durations of time under the Company's Tariff for Gas Service
17		including site investigation and remediation costs that are recovered through the
18		Remediation Adjustment Clause ("RAC"), energy efficiency costs that are recovered

⁵⁴ Company-provided data.

Exhibit P-7

through the Energy Efficiency Tracker ("EET"), and gas costs that are recovered through
 the Basic Gas Supply Service Charge ("BGSS").

Second, although short-term debt may be used, at least in part, to fund Construction Work In Progress ("CWIP"), the Company has not requested that CWIP be part of the rate base. Because CWIP is not reflected in its rate base, the short-term debt balance associated with CWIP should not be part of the ratemaking capital structure.

Lastly, even when short-term debt is not included in the ratemaking capital
structure, customers still realize the benefit of short-term debt in the determination of the
Allowance for Funds Used During Construction ("AFUDC") rate that is applied to CWIP.
That approach, which matches short-term funding requirements with short-term sources
of funds, reduces costs to customers, and mitigates the refinancing and interest risks noted
above.

13 Q. PLEASE EXPLAIN THE "MATURITY MATCHING" PRINCIPLE.

A. Like other utilities, South Jersey Gas follows the long-used financing practice, sometimes
referred to as "maturity matching", in which the lives of assets being financed are matched
with the maturity of the securities issued to finance those assets. Under that practice, the
overall term structure of the utility's long-term liabilities – including both debt and equity
– correspond to the life of its long-term assets. As noted by Brigham and Houston, "[t]his
strategy minimizes the risk that the firm will be unable to pay off its maturing obligations."
Brigham and Houston went on to note that:

21In practice, firms don't finance each specific asset with a type of capital22that has a maturity equal to the asset's life. However, academic studies23do show that most firms tend to finance short-term assets from short-

Exhibit P-7

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term sources and long-term assets from long-term sources.⁵⁵

As a matter of industry practice, it would be unusual for a company such as South Jersey
Gas to permanently fund its long-lived assets with short-term debt.

4 Q. IS SHORT-TERM DEBT SOMETIMES USED AS AN INTERIM SOURCE OF 5 FINANCING?

6 A. Yes, but that does not mean it should be included in the ratemaking capital structure. In 7 my practical experience, cash requirements associated with capital investments may be temporarily funded with short-term debt, until the balances are sufficiently large that it 8 9 becomes cost-effective to roll those balances into long-term securities. Long-term 10 securities, such as debt and equity, typically are issued in relatively large, discrete 11 amounts; fixed costs and other constraints (such as legal costs) effectively discourage 12 relatively small issuances because the effective cost rate would be prohibitively high. 13 Short-term debt, within the constraints of lending covenants and financial liquidity 14 requirements (that is, maintaining borrowing capacity to fund near-term, unforeseen 15 needs) provides a vehicle to fund investment requirements until a sufficiently large 16 balance has been accumulated to be efficiently refinanced on a long-term basis. It is not, 17 however, a vehicle used to permanently fund those investments. Rather, short-term debt 18 matches more appropriately as a funding source for CWIP, which is relatively short-lived 19 for gas distribution companies, due to most plant projects closing within a year or less.

- 20
- 21

In summary, although short-term debt may temporarily fund capital investments, such as CWIP, it is not an appropriate source of permanent financing. If a utility were to

⁵⁵ Brigham, Eugene F. and Joel F. Houston, <u>Fundamentals of Financial Management</u>, Concise 4th Ed., Thomson South-Western, 2004, p. 574.

use short-term debt for that purpose, it would reduce the borrowing capacity needed to
 fund working capital requirements, and expose customers to both refinancing risk and
 interest rate risk. For those reasons, and consistent with my experience, it is not the
 practice of natural gas utilities to fund permanent assets with short-term debt.

5 Q. WHAT DO YOU CONCLUDE FROM YOUR ANALYSES REGARDING SHORT 6 TERM DEBT?

A. First, although short-term debt may be used as a source of interim financing, it is not used
to finance long-lived assets on a permanent basis. Rather, the long-term assets included
in rate base are financed with securities of correspondingly long lives – common equity,
and long-term debt. Doing otherwise (that is, financing long-term assets with short-term
debt) would expose the Company and its customers to both refinancing risk, and interest
rate risk.

Second, although short-term debt may be used to finance CWIP and other nonrate base items such as the RAC, EET and BGSS, the Company has not included any of these balances in its rate base. Because these components are not included in the Company's rate base, nor should short-term debt associated with these components be part of its ratemaking capital structure.

18 Q. DOES THE COMPANY HAVE ANY ANTICIPATED FINANCING PLANS?

A. Yes, the Company plans to issue up to \$400 million of additional long-term debt and \$9.5
 million of common equity during the test year to refinance maturing debt and fund its
 capital expenditure program. The Company's *pro forma* capital structure, reflecting those
 issuances is shown in Table 8 below and reflects an equity ratio of 54.18 percent.

	Capital	New Debt Issuance	<i>Pro Forma</i> Capital	Percent of Capital
Common Equity	\$1,117,771,678	\$9,500,000	\$1,127,271,678	54.18%
Long-Term Debt	\$553,446,000	\$400,000,000	\$953,446,000	45.82%
Total Capitalization	\$1,671,217,678	\$409,500,000	\$2,080,717,678	100.00%

Table 8: Pro Forma Capital Structure

2 Q.

3

1

THE PROXY COMPANIES' CAPITAL STRUCTURES?

HOW DOES THE COMPANY'S PROPOSED EQUITY RATIO COMPARE TO

A. It is important to keep in mind that the proxy group has been selected to reflect comparable
 companies in terms of financial and business risk. As such, it is appropriate to review the
 proxy companies' capital structures as a means of assessing whether the proposed capital
 structure is consistent with industry practice. To the extent the Company's proposed
 capital structure differs from industry practice, the difference in financial risk should be
 considered when estimating its required Cost of Equity.

To make that assessment, I calculated the average capital structure for the operating utilities held within the proxy companies over the last eight quarters (*see*, Schedule RBH-11). The mean of the proxy group actual capital structures is 54.33 percent common equity and 45.67 percent long-term debt; the common equity ratios range from 49.31 percent to 62.04 percent.

15

16

Q. WHAT IS THE BASIS FOR USING AVERAGE CAPITAL COMPONENTS RATHER THAN A POINT-IN-TIME MEASUREMENT?

A. Measuring the capital components at a particular point in time can skew the capital
 structure by the specific circumstances of a particular period. Therefore, it is more
 appropriate to normalize the relative relationship between the capital components over a
 period of time.

1	Q.	WHAT IS YOUR CONCLUSION REGARDING THE COMPANY'S PROPOSED
2		RATEMAKING CAPITAL STRUCTURE IN RELATION TO YOUR PROXY
3		GROUP?

A. The proposed capital structure is consistent with, if not slightly below, those in place
among the proxy companies. As such, I find it reflects industry practice, and should be
adopted in this proceeding.

7 IX. WEIGHTED AVERAGE COST OF CAPITAL

8 Q. HAVE YOU CALCULATED THE COMPANY'S WEIGHTED AVERAGE COST 9 OF CAPITAL UTILIZING THE PROPOSED RATEMAKING CAPITAL 10 STRUCTURE?

A. Yes, I used 54.18 percent and 45.82 percent common equity and long-term debt ratios,
 respectively. For cost rates, I applied my recommended Return on Equity of 10.40
 percent, and an embedded cost of long-term debt of 3.731 percent.

14 Q. HOW DID YOU CALCULATE THE EMBEDDED COST OF LONG-TERM 15 DEBT?

A. The Company currently has fifteen issuances of senior debt with a combined total
principal amount of \$553.45 million maturing between 2024 and 2047. As noted earlier,
the Company plans to issue up to an additional \$400 million of first mortgage bonds before
the end of 2020. Table 9, below, provides the overall embedded cost of long-term debt of
3.731 percent.
Maturity	Principal	Unamortized Debt Issuance Costs and Reacquired Debt Costs	Net Principal	Coupon Rate	Annual Interest	Annual Debt Issuance Costs	Total Annual Costs	All-In Cost of Debt
09/20/24	\$40,000,000	\$164,684	\$39,835,316	3.000%	\$1,200,000	\$35,780	\$1,235,780	3.102%
11/30/24	\$28,000,000	\$98,909	\$27,901,091	3.030%	\$848,400	\$20,057	\$868,457	3.113%
12/30/25	\$4,546,000	\$40,338	\$4,505,662	3.630%	\$165,020	\$6,816	\$171,836	3.814%
03/01/26	\$15,000,000	\$165,343	\$14,834,657	4.840%	\$726,000	\$26,469	\$752,469	5.072%
06/30/26	\$45,000,000	\$192,612	\$44,807,388	4.930%	\$2,218,500	\$29,664	\$2,248,164	5.017%
12/30/27	\$45,000,000	\$213,423	\$44,786,577	4.030%	\$1,813,500	\$27,048	\$1,840,548	4.110%
11/21/30	\$34,000,000	\$245,991	\$33,754,009	4.010%	\$1,363,400	\$22,847	\$1,386,247	4.107%
01/30/30	\$30,000,000	\$153,186	\$29,846,814	4.230%	\$1,269,000	\$15,403	\$1,284,403	4.303%
04/01/32	\$35,000,000	\$449,548	\$34,550,452	3.740%	\$1,309,000	\$37,207	\$1,346,207	3.896%
07/15/33	\$32,000,000	\$854,838	\$31,145,162	5.550%	\$1,776,000	\$63,807	\$1,839,807	5.907%
08/01/34	\$10,000,000	\$163,334	\$9,836,666	6.213%	\$621,300	\$11,356	\$632,656	6.432%
09/14/35	\$10,000,000	\$375,850	\$9,624,150	5.450%	\$545,000	\$24,195	\$569,195	5.914%
04/01/36	\$24,900,000	\$954,961	\$23,945,039	3.430%	\$854,070	\$57,997	\$912,067	3.809%
01/25/47	\$200,000,000	\$1,648,532	\$198,351,468	3.000%	\$6,000,000	\$61,681	\$6,061,681	3.056%
New		· ·						
Issuance	\$400,000,000	\$2,600,000	\$397,400,000	3.495%	\$13,980,000	\$136,194	\$14,116,194	3.552%
Total	\$953,446,000	\$8,321,550	\$945,124,450	3.638%	\$34,689,190	\$576,521	\$35,265,710	3.731%

Table 9: Embedded Cost of Long-Term Debt⁵⁶

2

1

3 Q. WHAT IS THE RESULTING WEIGHTED AVERAGE COST OF CAPITAL?

4 A. Based on the 54.18 percent and 45.82 percent Common Equity and Long-Term Debt

5 ratios, respectively, and 10.40 percent and 3.731 percent for Return on Equity and cost of

6 long-term debt, respectively, the Company's weighted average cost of capital is 7.344

percent (see, Table 10, below).

8

7

Table 10): Weighted	Average	Cost of	Canital
I abic 10	· · · · · · · · · · · · · · · · · · ·	11, ci age		Capital

	Weight	Cost Rate	Weighted Average Cost of Capital
Common Equity	54.18%	10.400%	5.634%
Long-Term Debt	45.82%	3.731%	1.710%
Total Capitalization	100.00%		7.344%

⁵⁶ Company-provided data. Annual debt costs for new issuance assumes \$2.6 million of costs amortized over a 19-year life.

1

X. <u>CONCLUSIONS AND RECOMMENDATION</u>

2 Q. WHAT IS YOUR CONCLUSION REGARDING THE COMPANY'S COST OF 3 EQUITY?

4 A. As discussed earlier in my Direct Testimony, it is prudent and appropriate to consider 5 multiple methodologies to arrive at an ROE recommendation for South Jersey Gas. I have 6 performed several analyses to estimate the Company's Cost of Equity and have considered several market-wide and Company-specific issues. Given those considerations, I believe 7 8 an ROE in the range of 10.00 percent to 10.70 percent represents the range of equity 9 investors' required rate of return for investment in natural gas utilities, like South Jersey 10 Gas, in today's capital markets. Within that range, it is my view that an ROE of 10.40 11 percent is reasonable and appropriate.

As discussed earlier in my Direct Testimony, my recommendation reflects analytical results based on a proxy group of natural gas utilities. My recommendation also considers (but does not make specific adjustments for) other factors, including the Company's comparatively small size, and the direct costs associated with equity issuances.

17 Q. PLEASE ALSO SUMMARIZE YOUR CONCLUSIONS REGARDING THE 18 COMPANY'S PROPOSED CAPITAL STRUCTURE, AND OVERALL 19 WEIGHTED AVERAGE COST OF CAPITAL.

A. The Company's expected capital structure, which includes approximately 54.18 percent
 Common Equity and 45.82 percent Long-Term Debt is highly consistent with industry
 practice; from that perspective, it is reasonable and appropriate. That capital structure,
 together the Common Equity and Long-Term Debt cost rates of 10.40 percent and 3.731

- 1 percent, respectively, indicates an overall Weighted Average Cost of Capital of 7.344
- 2 percent, which I also find to be reasonable and appropriate.

3 Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

- 4 A. Yes, it does.
- 5

1		APPENDIX A: PROXY GROUP SELECTION
2	Q.	HOW DID YOU SELECT THE COMPANIES INCLUDED IN YOUR PROXY
3		GROUP?
4	А.	I began with the universe of companies that Value Line classifies as Natural Gas Utilities,
5		which includes ten domestic U.S. utilities, and applied the following screening criteria:
6		• Because certain of the models used in my analyses assume that earnings and dividends
7		grow over time, I excluded companies that do not consistently pay quarterly cash
8		dividends;
9		• To ensure that the growth rates used in my analyses are not biased by a single analyst,
10		all the companies in my proxy group are covered by at least two utility industry equity
11		analysts;
12		• All the companies in my proxy group have investment grade senior unsecured bond
13		and/or corporate credit ratings from S&P
14		• To incorporate companies that are primarily regulated gas distribution utilities, I
15		included companies with at least 60.00 percent of operating income derived from
16		regulated natural gas utility operations; and
17		• I eliminated companies currently known to be party to a merger, or transformative
18		transaction.
19	Q.	DID YOU INCLUDE SJI IN YOUR PROXY GROUP?
20	А.	No. To avoid the circular logic that would otherwise occur, it has been my consistent
21		practice to exclude the subject company (or its parent) from the proxy group. That is, it
22		would be inappropriate to include SJI in the proxy group because South Jersey Gas is an

- 1 indirectly wholly owned subsidiary of SJI. Because SJI's earnings are affected by South
- 2 Jersey Gas' operations, SJI is not an appropriate "proxy".

3 Q. WHAT COMPANIES MET THOSE SCREENING CRITERIA?

- 4 A. The criteria discussed above resulted in a proxy group of the following six companies:
- 5

 Table 11: Proxy Group Screening Results

Company	Ticker
Atmos Energy Corporation	ATO
New Jersey Resources Corporation	NJR
Northwest Natural Holding Company	NWN
ONE Gas, Inc.	OGS
Southwest Gas Holdings, Inc.	SWX
Spire Inc.	SR

APPENDIX B

1 A. CONSTANT GROWTH DCF MODEL

9

13

2 Q. PLEASE DESCRIBE THE THEORY BEHIND THE DCF APPROACH.

A. The Constant Growth DCF approach is based on the theory that a stock's current price
represents the present value of all expected future cash flows. DCF theory assumes that
an investor buys a stock for an expected total return rate which is derived from cash flows
received in the form of dividends plus appreciation in market price (the expected growth
rate). In its simplest form, the Constant Growth DCF model expresses the Cost of Equity
as the discount rate that sets the current price equal to expected cash flows:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \dots + \frac{D_t}{(1+k)^t} \quad [4]$$

10 where P_0 represents the current stock price, $D_1 \dots D_t$ represent expected future dividends, 11 and k is the discount rate, or required ROE. Equation [4] is a standard present value 12 calculation that can be simplified and rearranged into the familiar form:

 $k = \frac{D(1+g)}{P_0} + g \quad [5]$

Equation [5] often is referred to as the "Constant Growth DCF" model, in which the first term is the expected dividend yield and the second term is the expected long-term annual growth rate in perpetuity.

17 Q. WHAT ASSUMPTIONS UNDERLIE THE CONSTANT GROWTH DCF 18 MODEL?

A. The Constant Growth DCF model assumes: (1) earnings, book value, and dividends all
grow at the same, constant rate in perpetuity; (2) the dividend payout ratio remains
constant; (3) the Price to Earnings ("P/E") multiple remains constant in perpetuity; (4) the
discount rate (that is, the estimated Cost of Equity) is greater than the expected growth

1		rate; and (5) the calculated Cost of Equity remains constant, also in perpetuity. These
2		simplifying assumptions, which may become more or less relevant as market conditions
3		change, are required to derive the familiar Constant Growth DCF model provided in
4		Equation [5].
5	Q.	WHAT MARKET DATA DID YOU USE TO CALCULATE THE DIVIDEND
6		YIELD IN YOUR CONSTANT GROWTH DCF MODEL?
7	А.	The dividend yield is based on the proxy companies' current annualized dividend, and
8		average closing stock prices over the 30-, 90-, and 180-trading day periods as of January
9		31, 2020.
10	Q.	WHY DID YOU USE THREE AVERAGING PERIODS TO CALCULATE AN
11		AVERAGE STOCK PRICE?
12	А.	I did so to ensure the model's results are not skewed by anomalous events that may affect
13		stock prices on any given trading day. At the same time, the averaging period should be
14		reasonably representative of expected capital market conditions over the long term. In my
15		view, using 30-, 90-, and 180-day averaging periods reasonably balances those concerns.
16	Q.	DID YOU MAKE ANY ADJUSTMENTS TO THE DIVIDEND YIELD TO
17		ACCOUNT FOR PERIODIC GROWTH IN DIVIDENDS?
18	А.	Yes, I did. Because utilities increase their quarterly dividends at different times
19		throughout the year, it is reasonable to assume that dividend increases will be evenly
20		distributed over calendar quarters. Given that assumption, it is appropriate to calculate
21		the expected dividend yield by applying one-half of the long-term growth rate to the
22		current dividend yield. ⁵⁷ That adjustment ensures that the expected dividend yield is

⁵⁷ *See*, Schedule RBH-2.

representative of the coming 12-month period and does not overstate the dividends to be
 paid during that time.

3 Q. IS IT IMPORTANT TO SELECT APPROPRIATE MEASURES OF LONG-TERM 4 GROWTH IN APPLYING THE DCF MODEL?

5 A. Yes. In its Constant Growth form, the DCF model (*i.e.*, as presented in Equation [5] 6 above) assumes a single growth estimate in perpetuity. To reduce the long-term growth 7 rate to a single measure, we must assume a fixed payout ratio, and that earnings per share 8 ("EPS"), dividends per share ("DPS"), and book value per share all grow at the same 9 constant rate in perpetuity. Because dividend growth can only be sustained by earnings 10 growth, the model should incorporate a variety of long-term earnings growth estimates. 11 That can be accomplished by averaging measures of long-term growth that tend to be least 12 influenced by capital allocation decisions that companies may make in response to near-13 term changes in the business environment. Because such decisions may directly affect 14 near-term dividend payout ratios, estimates of earnings growth are more indicative of 15 long-term investor expectations than are dividend growth estimates. For the purposes of 16 the Constant Growth DCF model, therefore, growth in EPS represents the appropriate 17 measure of long-term growth.

Q. PLEASE SUMMARIZE THE FINDINGS OF ACADEMIC RESEARCH ON THE APPROPRIATE MEASURE OF GROWTH FOR ESTIMATING EQUITY RETURNS USING THE DCF MODEL.

A. The relationship between various growth rates and stock valuation metrics has been the
 subject of much academic research.⁵⁸ As noted over 40 years ago by Charles Phillips in

- 6 <u>The Economics of Regulation</u>:
- For many years, it was thought that investors bought utility stocks
 largely on the basis of dividends. More recently, however, studies
 indicate that the market is valuing utility stocks with reference to total
 per share earnings, so that the earnings-price ratio has assumed
 increased emphasis in rate cases.⁵⁹
- 12 Philips' conclusion continues to hold true. Subsequent academic research has
- 13 clearly and consistently indicated that measures of earnings and cash flow are strongly
- 14 related to returns, and that analysts' forecasts of growth are superior to other measures of
- 15 growth in predicting stock prices.⁶⁰ For example, Vander Weide and Carleton state that,
- 16 "[our] results ... are consistent with the hypothesis that investors use analysts' forecasts,
- 17 rather than historically oriented growth calculations, in making stock buy-and-sell
- 18 decisions."⁶¹

⁵⁸ See, Robert S. Harris, Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return, <u>Financial Management</u> (Spring 1986).

⁵⁹ Charles F. Phillips, Jr., <u>The Economics of Regulation</u>, at 285 (Rev. ed. 1969).

⁶⁰ See, e.g., Andreas C. Christofi, Petros C. Christofi, Marcus Lori and Donald M. Moliver, Evaluating Common Stocks Using Value Line's Projected Cash Flows and Implied Growth Rate, Journal of Investing (Spring 1999); Harris and Marston, Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts, Financial Management, 21 (Summer 1992); and Vander Weide and Carleton, Investor Growth Expectations: Analysts vs. History, The Journal of Portfolio Management (Spring 1988).

⁶¹ James H. Vander Weide and Willard T. Carleton, *Investor Growth Expectations: Analysts vs. History*, <u>The Journal of Portfolio Management</u> (Spring 1988). The Vander Weide and Carleton study was updated in 2004 under the direction of Dr. VanderWeide. The results of the updated study were consistent with the original study's conclusions.

1		Other research specifically notes the importance of analysts' growth estimates in
2		determining the Cost of Equity, and in the valuation of equity securities. Dr. Robert Harris
3		noted that "a growing body of knowledge shows that analysts' earnings forecast are indeed
4		reflected in stock prices."62 Citing Cragg and Malkiel, Dr. Harris notes that those authors
5		"found that the evaluations of companies that analysts make are the sorts of ones on which
6		market valuation is based."63 Similarly, Brigham, Shome and Vinson noted that
7		"evidence in the current literature indicates that (i) analysts' forecasts are superior to
8		forecasts based solely on time series data; and (ii) investors do rely on analysts'
9		forecasts." ⁶⁴
10		To that point, the research of Vander Weide and Carleton demonstrates that
11		earnings growth projections have a statistically significant relationship to stock valuation
12		levels, while dividend growth rates do not.65 Those findings suggest that investors form
13		their investment decisions based on expectations of growth in earnings, not dividends.
14		Consequently, earnings growth, not dividend growth, is the appropriate estimate for the
15		purpose of the Constant Growth DCF model.
16	Q.	PLEASE SUMMARIZE YOUR INPUTS TO THE CONSTANT GROWTH DCF
17		MODEL.
18	А.	I applied the DCF model to the proxy group of natural gas utility companies using the

19

following inputs for the price and dividend terms:

⁶² Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholder Required Rate of Return*, <u>Financial</u> <u>Management</u> (Spring 1986).

 $^{^{63}}$ Ibid.

⁶⁴ Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, *The Risk Premium Approach to Measuring a Utility's Cost of Equity*, <u>Financial Management</u> (Spring 1985).

⁶⁵ See, Vander Weide and Carleton, Investor Growth Expectations: Analysts vs. History, <u>The Journal of Portfolio</u> <u>Management</u> (Spring 1988).

1		• The average daily closing prices for the 30-, 90-, and 180-trading days ended January
2		31, 2020, for the term P_0 ; and
3		• The annualized dividend per share as of January 31, 2020, for the term D_0 .
4		I then calculated my DCF results using each of the following growth terms:
5		• The Zacks consensus long-term earnings growth estimates;
6		• The First Call consensus long-term earnings growth estimates;
7		• The Value Line long-term earnings growth estimates; and
8		• The Retention Growth estimates. ⁶⁶
9	Q.	PLEASE DESCRIBE THE RETENTION GROWTH ESTIMATE AS APPLIED IN
10		YOUR DCF MODEL.
11	А.	The Retention Growth model, which is a generally recognized and widely taught method
12		of estimating long-term growth, is an alternative approach to the use of analysts' earnings
13		growth estimates. The model estimates growth as a function of (1) expected earnings, and
14		(2) the extent to which earnings are retained. In its simplest form, the model represents
15		long-term growth as the product of the retention ratio (<i>i.e.</i> , the percentage of earnings not
16		paid out as dividends (referred to below as "b") and the expected return on book equity
17		(referred to below as "r")). Thus, the simple "b x r" form of the model projects growth as
18		a function of internally generated funds. That form of the model is limiting, however, in
19		that it does not provide for growth funded from external equity.
20		The "br + sv" form of the Retention Growth estimate used in my DCF analysis is
21		meant to reflect growth from both internally generated funds (i.e., the "br" term) and from
22		issuances of equity (i.e., the "sv" term). The first term, which is the product of the

⁶⁶ See, Schedule RBH-3.

1 retention ratio (i.e., "b", or the portion of net income not paid in dividends) and the 2 expected Return on Equity (*i.e.*, "r") represents the portion of net income that is "plowed 3 back" into the Company as a means of funding growth. The "sv" term is represented as:

4
$$\left(\frac{m}{b}-1\right) x$$
 Growth rate in Common Shares [6]

where $\frac{m}{h}$ is the Market-to-Book ratio. In this form, the "sv" term reflects an element of 5 6 growth as the product of (a) the growth in shares outstanding, and (b) that portion of the 7 market-to-book ratio that exceeds unity. As shown in Schedule RBH-3, all components 8 of the Retention Growth model may be derived from data provided by Value Line.

9 **Q**.

HOW DID YOU CALCULATE THE DCF RESULTS?

10 A. For each proxy company, I calculated the mean low, mean, and mean high DCF results 11 by using the maximum EPS growth rate as reported by Value Line, Zacks, First Call, and 12 the Retention Growth method for each proxy group company in combination with the 13 dividend yield for each of the proxy companies. The proxy group mean high results then 14 reflect the mean of the maximum DCF results for the proxy group as a whole. I used a 15 similar approach to calculate the proxy group mean low results using instead the minimum 16 of the Value Line, Zacks, First Call, and Retention Growth method growth rates for each 17 company. In Schedule RBH-2, I also have presented the median results to reflect the 18 atypically high Value Line growth rate for Northwest Natural Gas Company (27.00 19 percent), which reflects the company's unusual losses in 2017.

20 **Q**. WHAT ARE THE RESULTS OF YOUR CONSTANT GROWTH DCF 21 **ANALYSIS?**

22 A. My Constant Growth DCF results are summarized in Table 12, below (see, also, Schedule RBH-2). 23

	Mean Low	Mean	Mean High
30-Day Average	7.45%	9.86%	14.08%
90-Day Average	7.46%	9.88%	14.10%
180-Day Average	7.42%	9.83%	14.06%
	Median Low	Median	Median High
30-Day Average	7.32%	9.35%	11.48%
90-Day Average	7.36%	9.39%	11.41%
180-Day Average	7.35%	9.42%	11.27%

 Table 12: Constant Growth DCF Model Results⁶⁷

2 B. CAPM ANALYSIS

3 Q. PLEASE DESCRIBE THE GENERAL FORM OF THE CAPM ANALYSIS.

4 A. The CAPM analysis is a risk premium method that estimates the Cost of Equity for a given 5 security as a function of a risk-free return plus a risk premium (to compensate investors for the non-diversifiable or "systematic" risk of that security). The CAPM describes the 6 relationship between a security's investment risk and the market rate of return. The 7 8 CAPM assumes that all other risk, *i.e.*, all non-market or unsystematic risk, can be 9 eliminated through diversification. The risk that cannot be eliminated through 10 diversification is called market, or systematic, risk. In addition, the CAPM presumes that investors require compensation only for systematic risk that is the result of 11 12 macroeconomic and other events that affect the returns on all assets.

As shown in Equation [7], the CAPM is defined by four components, each of
which theoretically must be a forward-looking estimate:

$$K_e = r_f + \beta (r_m - r_f) \quad [7]$$

⁶⁷ *See*, Schedule RBH-2.

1 where:

2	k = the required market ROE for a security;
3	β = the Beta coefficient of that security;
4	r_f = the risk-free rate of return; and
5	r_m = the required return on the market as a whole.
6	Equation [7] describes the Security Market Line ("SML"), or the CAPM risk-
7	return relationship, which is graphically depicted in Chart 9 below. The intercept is the
8	risk-free rate (r_f) which has a Beta coefficient of zero, the slope is the expected market
9	risk premium $(r_m - r_f)$. By definition, r_m , the return on the market has a Beta coefficient
10	of 1.00. CAPM states that in well-behaving capital markets, the expected equity risk
11	premium on a given security is proportional to its Beta coefficient.



Chart 9: Security Market Line



13

Intuitively, higher Beta coefficients indicate the subject company's returns have
been relatively volatile and have moved in tandem with the overall market. Consequently,

if a company has a Beta coefficient of 1.00, it is considered as risky as the market and
 does not provide diversification benefit.

In Equation [7], the term $(r_m - r_f)$ represents the Market Risk Premium.⁶⁸ According to the theory underlying the CAPM, because unsystematic risk can be diversified away by adding securities to investment portfolios, the market will not compensate investors for bearing that risk. Therefore, investors should be concerned only with systematic or non-diversifiable risk. Non-diversifiable risk is measured by the Beta coefficient, which is defined as:

9

$$\beta_j = \frac{o_j}{\sigma_m} \, x \, \rho_{j,m} \quad [8]$$

10 where σ_j is the standard deviation of returns for company "*j*," σ_m is the standard deviation 11 of returns for the broad market (as measured, for example, by the S&P 500 Index), and 12 $\rho_{j,m}$ is the correlation of returns in between company *j* and the broad market. The Beta 13 coefficient therefore represents both relative volatility (*i.e.*, the standard deviation) of 14 returns, and the correlation in returns between the subject company and the overall market.

15 Q. DID YOU APPLY A SECOND FORM OF THE CAPM?

A. Yes. I also applied the "Empirical CAPM" approach (also referred to as the ECAPM).
The Empirical CAPM calculates the product of the adjusted Beta coefficient and the
Market Risk Premium, and applies a weight of 75.00 percent to that result. The model
then applies a 25.00 percent weight to the Market Risk Premium, without any effect from
the Beta coefficient. The results of the two calculations are summed, along with the riskfree rate, to produce the Empirical CAPM result, as provided in Equation [9]:

⁶⁸ The Market Risk Premium is defined as the incremental return of the market over the risk-free rate.

1		$k_e = r_f + 0.75\beta(r_m - r_f) + 0.25(r_m - r_f) $ [9]
2	Q.	WHY DID YOU CONSIDER THE ECAPM METHOD IN YOUR ANALYSIS?
3	А.	Numerous tests have measured the extent to which security returns and Beta coefficients
4		are related as predicted by the CAPM. The ECAPM reflects the finding that the actual
5		SML described by the CAPM formula is not as steeply sloped as the predicted SML. ⁶⁹
6		For example, Fama and French state that "[t]he returns on the low Beta portfolios are too
7		high, and the returns on the high Beta portfolios are too low." ⁷⁰ Similarly, as noted in Dr.
8		Roger Morin's New Regulatory Finance:
9 10 11		With few exceptions, the empirical studies agree that low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted. ⁷¹
12		Simply, the ECAPM method addresses the tendency of the CAPM to underestimate the
13		Cost of Equity for low-Beta coefficient companies, such as regulated utilities. In its text
14		on Cost of Capital analysis for regulated industries, for example, the Brattle Group
15		summarizes several studies estimating the alpha component of the ECAPM (see, Table
16		13, below).

⁶⁹ See, Roger A. Morin, <u>New Regulatory Finance</u>, Public Utility Reports, Inc., 2006, at 175. The Security Market Line plots the CAPM estimate on the Y-axis, and Beta coefficients on the X-axis.

⁷⁰ Eugene F. Fama and Kenneth R. French, "The Capital Asset Pricing Model: Theory and Evidence", *Journal of Economic Perspectives*, Vol. 18, No. 3, Summer 2004, at 33.

⁷¹ Roger A. Morin, <u>New Regulatory Finance</u>, Public Utility Reports, Inc., 2006, at 175.

Author	Year of Study	Range of Alpha	Study Period
Black	1993	1% for betas 0.00 – 0.80	1931-1991
Black, Jensen and Scholes	1972	4.31%	1931-1965
Fama and McBeth	1972	5.76%	1935-1968
Fama and French	1992	7.32%	1941-1990
Fama and French	2004	N/A	N/A
Litzenberger and Ramaswamy	1979	5.32%	1936-1977
Litzenberger, Ramaswamy and Sosin	1980	1.63% - 3.91%	1936-1978
Pettengil, Sundaram and Mathar	1995	4.60%	1936-1979

 Table 13: Empirical Evidence on the Alpha Factor in the ECAPM⁷²

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3 Q. HAS THE ECAPM BEEN RECOGNIZED IN OTHER REGULATORY 4 JURISDICTIONS?

5 A. Yes. For example, it has been used in Minnesota, Mississippi, and New York.⁷³

6 Q. WHAT ASSUMPTIONS DID YOU INCLUDE IN YOUR CAPM AND ECAPM

7 ANALYSES?

8 A. It is important to select the term (or maturity) of the risk-free rate that best matches the 9 life of the underlying investment. Natural gas utilities typically are long-duration 10 investments and, as such, the 30-year Treasury yield is more suitable for the purpose of 11 calculating the Cost of Equity. As such, I used three different estimates of the risk-free

⁷² Villadsen, Vilbert, Harris, and Kolbe, <u>Risk and Return for Regulated Industries</u>, 2017, Table 4.1 at 83. Alpha is an adjustment to the SML that increases the intercept and lowers the slope of the line.

⁷³ Minnesota Public Utilities Commission, MPUC Docket No. G011/GR-15-736, In the Matter of the Application of Minnesota Energy Resources Corporation for Authority to Increase Rates for Natural Gas Service in Minnesota, Findings of Fact, Conclusions of Law, and Recommendation, August 19, 2016, at 29; Mississippi Public Service Commission, Docket No. 01-UN-0548, Notice of Intent of Mississippi Power Company to Change Rates for Electric Service in its Certificated Areas in the Twenty-Three Counties of Southeast Mississippi, Final Order, December 3, 2001, at 19; New York Public Service Commission, Case 16-G-0058, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of KeySpan Gas East Corporation d/b/a National Grid for Gas Service, Order Adopting Terms of Joint Proposal and Establishing Gas Rate Plans, December 16, 2016, at 32.

1	rate: (1) the current 30-day average yield on 30-year Treasury bonds (<i>i.e.</i> , 2.25 percent) ⁷⁴ ;
2	(2) the near-term projected 30-year Treasury yield (<i>i.e.</i> , 2.42 percent); ⁷⁵ and (3) the long-
3	term projected 30-year Treasury yield (i.e., 3.45 percent). ⁷⁶

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Q. WHY HAVE YOU RELIED ON THE 30-YEAR TREASURY YIELD FOR YOUR CAPM AND ECAPM ANALYSES?

A. In determining the security most relevant to the application of the CAPM (and ECAPM),
it is important to select the term (or maturity) that best matches the life of the underlying
investment. Because utility equity has a perpetual life, the 30-year Treasury yield is the
appropriate measure of the risk-free rate.

10 Q. PLEASE DESCRIBE YOUR *EX-ANTE* APPROACH TO ESTIMATING THE 11 MARKET RISK PREMIUM.

12 The approach is based on the market required return, less the current 30-year Treasury A. 13 yield. To estimate the market required return, I calculated the market capitalization 14 weighted average ROE based on the Constant Growth DCF model. To do so, I relied on data from two sources: (1) Bloomberg; and (2) Value Line.⁷⁷ With respect to Bloomberg-15 16 derived growth estimates, I calculated the expected dividend yield (using the same one-17 half growth rate assumption described earlier), and combined that amount with the 18 projected earnings growth rate to arrive at the market capitalization weighted average DCF 19 result. I performed that calculation for each of the companies for which Bloomberg

⁷⁴ Source: Bloomberg Professional.

⁷⁵ See, <u>Blue Chip Financial Forecasts</u>, Vol. 39, No. 2, February 1, 2020, at 2. Consensus projections of the 30-year Treasury yield for the six quarters ending June 2021.

⁷⁶ See, <u>Blue Chip Financial Forecasts</u>, Vol. 38, No. 12, December 1, 2019, at 14. Consensus projections of the 30year Treasury yield for the periods 2021-2025 and 2026-2030.

⁷⁷ See, Schedule RBH-4.

provided both dividend yields and consensus growth rates. I then subtracted the current
 30-year Treasury yield from that amount to arrive at the DCF-derived *ex-ante* market risk
 premium estimate. In the case of Value Line, I performed the same calculation, again
 using all companies for which five-year earnings growth rates were available. The results
 of those calculations are provided in Schedule RBH-4.

6 Q. HOW DID YOU APPLY YOUR EXPECTED MARKET RISK PREMIUM AND 7 RISK-FREE RATE ESTIMATES?

8 A. I relied on each of the *ex-ante* Market Risk Premiums discussed above, together with the
 9 current, near-term, and long-term projected 30-year Treasury bond yields as inputs to my
 10 CAPM and ECAPM analyses.

11 Q. WHAT BETA COEFFICIENT DID YOU USE IN YOUR CAPM AND ECAPM 12 MODELS?

A. As shown in Schedule RBH-5, I considered the Beta coefficients reported by Value Line
and Bloomberg, both of which adjust their calculated (or raw) Beta coefficients to reflect
the tendency of the Beta coefficient to regress to the market mean of 1.00. A notable
difference between the two is that Value Line calculates the Beta coefficient over a fiveyear period, whereas Bloomberg's calculation is based on two years of data.

18 Q. WHAT ARE THE RESULTS OF YOUR CAPM AND ECAPM ANALYSES?

A. The results of the CAPM and ECAPM analyses are summarized in Tables 14a and 14b,
respectively, below (*see*, also, Schedule RBH-6).

	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coe	fficient	
Current 30-Year Treasury (2.25%)	8.55%	9.15%
Near Term Projected 30-Year Treasury (2.42%)	8.71%	9.31%
Long Term Projected 30-Year Treasury (3.45%)	9.74 %	10.35%
Average Value Line Beta Coe	fficient	
Current 30-Year Treasury (2.25%)	9.52%	10.22%
Near Term Projected 30-Year Treasury (2.42%)	9.69%	10.38%
Long Term Projected 30-Year Treasury (3.45%)	10.72%	11.42%

Table 14a: Summary of CAPM Results⁷⁸

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Table 14b: Summary of Empirical CAPM Results⁷⁹

	Bloomberg Derived Market Risk Premium	Value Line Derived Market Risk Premium
Average Bloomberg Beta Coe	fficient	
Current 30-Year Treasury (2.25%)	9.77%	10.49%
Near Term Projected 30-Year Treasury (2.42%)	9.93%	10.65%
Long Term Projected 30-Year Treasury (3.45%)	10.97%	11.69%
Average Value Line Beta Coej	fficient	
Current 30-Year Treasury (2.25%)	10.50%	11.29%
Near Term Projected 30-Year Treasury (2.42%)	10.66%	11.45%
Long Term Projected 30-Year Treasury (3.45%)	11.70%	12.49%

⁷⁸ See, Schedule RBH-6.

⁷⁹ *See*, Schedule RBH-6.

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C.

BOND YIELD PLUS RISK PREMIUM APPROACH

2 Q. PLEASE DESCRIBE THE BOND YIELD PLUS RISK PREMIUM APPROACH.

3 A. This approach is based on the basic financial tenet that equity investors bear the residual 4 risk associated with ownership and therefore require a premium over the return they would 5 have earned as a bondholder. That is, because returns to equity holders are riskier than 6 returns to bondholders, equity investors must be compensated for bearing that additional 7 risk. Risk premium approaches, therefore, estimate the Cost of Equity as the sum of the 8 equity risk premium and the yield on a particular class of bonds. Because the Equity Risk 9 Premium is not directly observable, it typically is estimated using a variety of approaches, 10 some of which incorporate *ex-ante*, or forward-looking, estimates of the Cost of Equity, 11 and others that consider historical, or *ex-post*, estimates. An alternative approach is to use 12 actual authorized returns for gas distribution companies to estimate the Equity Risk Premium. 13

14

15

Q.

PREMIUM ANALYSIS.

A. As indicated above, I first defined the Risk Premium as the difference between authorized ROEs and the then-prevailing level of long-term (*i.e.*, 30-year) Treasury yields. I then gathered data from 1,147 natural gas rate proceedings between January 1, 1980 and January 31, 2020. I also calculated the average period between the filing of the case and the date of the final order (that is, the lag period). To reflect the prevailing level of interest rates during the pendency of the proceedings, I calculated the average 30-year Treasury yield over the average lag period (approximately 187 days).

PLEASE EXPLAIN HOW YOU PERFORMED YOUR BOND YIELD PLUS RISK

Because the data cover several economic cycles⁸⁰, the analysis also may be used to assess the stability of the Equity Risk Premium. As noted above, the Equity Risk Premium is not constant over time; prior research has shown it is directly related to expected market volatility, and inversely related to the level of interest rates.⁸¹ That finding is particularly relevant given the relatively low level of current Treasury yields.

6

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Q. HOW DID YOU MODEL THE RELATIONSHIP BETWEEN INTEREST RATES AND THE EQUITY RISK PREMIUM?

8 A. The basic method used was regression analysis, in which the observed Equity Risk 9 Premium is the dependent variable, and the average 30-year Treasury yield is the 10 independent variable. Relative to the long-term historical average, the analytical period 11 includes interest rates and authorized ROEs that are quite high during one period (*i.e.*, the 12 1980s) and that are quite low during another (*i.e.*, the post-Lehman bankruptcy period). 13 To account for that variability, I used the semi-log regression, in which the Equity Risk 14 Premium is expressed as a function of the natural log of the 30-year Treasury yield: $RP = \alpha + \beta(LN(T_{30}) \quad [10]$ 15

As shown on Chart 10 (below), the semi-log form is useful when measuring an absolute change in the dependent variable (in this case, the Risk Premium) relative to a proportional change in the independent variable (the 30-year Treasury yield).

⁸⁰ See, National Bureau of Economic Research, U.S. Business Cycle Expansion and Contractions.

⁸¹ See, e.g., Robert S. Harris and Felicia C. Marston, Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts, Financial Management, Summer 1992, at 63-70; Eugene F. Brigham, Dilip K. Shome, and Steve R. Vinson, The Risk Premium Approach to Measuring a Utility's Cost of Equity, Financial Management, Spring 1985, at 33-45; and Farris M. Maddox, Donna T. Pippert, and Rodney N. Sullivan, An Empirical Study of Ex Ante Risk Premiums for the Electric Utility Industry, Financial Management, Autumn 1995, at 89-95.





As Chart 10 demonstrates, over time there has been a statistically significant, negative relationship between the 30-year Treasury yield and the Equity Risk Premium. An important consequence of that relationship is that simply applying the long-term average Equity Risk Premium of 4.76 percent would significantly understate the Cost of Equity. Based on the regression coefficients in Chart 10, however, the implied ROE is between 9.87 percent and 9.93 percent (*see*, Schedule RBH-7 and Table 15, below). ⁸³

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⁸² See, Schedule RBH-7.

⁸³ I recognize that in 169 FERC ¶ 61,129, Opinion No. 569 (para. 340), the FERC chose to exclude the Risk Premium approach from the methods it will use to determine the ROE. I have long applied this method, and continue to do so. In addition, certain of the FERC's concerns with the Risk Premium method are not applicable in my analysis. For example, the data set used in my analyses contains over 1,600 observations across multiple jurisdictions. Further, the model's results closely follow authorized returns during and after the Federal Reserve's unconventional monetary policies (*see*, Opinion No. 569, para. 344). In addition, in my experience there is little difference between ROEs authorized in litigated versus settled cases. In any event, the Risk Premium approach has been applied by other witnesses, including Staff witnesses, in other state jurisdictions.

	Return on Equity
Current 30-Year Treasury (2.25%)	9.90%
Near Term Projected 30-Year Treasury (2.42%)	9.87%
Long Term Projected 30-Year Treasury (3.45%)	9.93%

Table 15: Summary of Bond Yield Plus Risk Premium Results⁸⁴

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3 D. EXPECTED EARNINGS ANALYSIS

4 Q. PLEASE DESCRIBE THE EXPECTED EARNINGS ANALYSIS.

5 A. The Expected Earnings approach supplements market-based models by highlighting 6 information that is important to investors, providing a direct measure of the book-based 7 return comparable-risk utilities are expected to earn. The standard revenue requirements formula explicitly recognizes the validity of book value of equity by choosing to measure 8 9 capital structure based on book value rather than market value. Because it looks to the 10 earnings expected of comparable-risk companies, the approach is consistent with the Hope 11 and Bluefield "comparable return" standard. The Expected Earnings approach therefore 12 provides a simple and direct measure of equity investors' expected opportunity cost on 13 the book value of equity, without the need for assumptions regarding investor behavior. 14 I relied on Value Line's projected Return on Common Equity for the period 2022-15 2024, and adjusted those projected returns to account for the fact that they reflect common 16 shares outstanding at the end of the period, rather than the average shares outstanding over the course of the year.⁸⁵ The results range from 9.08 percent to 11.57 percent, with an 17

⁸⁴ See, Schedule RBH-7.

⁸⁵ The rationale for that adjustment is straightforward: Earnings are achieved over the course of a year, and should be related to the equity that was, on average, in place during that year. *See*, Leopold A. Bernstein, <u>Financial</u> <u>Statement Analysis: Theory, Application, and Interpretation</u>, Irwin, 4th Ed., 1988, at 630.

average value of 10.35 percent and median value of 10.15 percent (*see*, Schedule RBH 8).

Q. DO YOU RECOGNIZE THAT THE FERC RECENTLY DECIDED IT WOULD NOT INCLUDE EXPECTED EARNINGS ANALYSES AMONG THE METHODS USED TO DEVELOP ELECTRIC TRANSMISSION ROES?⁸⁶

6 A. Yes, I do. I am not suggesting the Expected Earnings model should be used to the 7 exclusion of others. As other Commissions have explained, because we are trying to 8 estimate an unobservable parameter (the Cost of Equity) we should not rule out any 9 particular methodology as unworthy of basing an ROE decision. Like all ROE models, 10 the Expected Earnings approach provides valuable information, even though it has 11 potential limitations. To that point, investors consider expected earnings when evaluating 12 their investment options. In my view, it is reasonable to consider the Expected Earnings 13 method in determining the Company's ROE.

⁸⁶ See, 169 FERC ¶ 61,129, Opinion No. 569, at para. 200.



Schedule RBH-1 Page 1 of 19

Resume of: Robert B. Hevert, Partner Rates and Regulation Practice Leader

Summary

Bob Hevert is a financial and economic consultant with more than 30 years of broad experience in the energy and utility industries. He has an extensive background in the areas of corporate finance, mergers and acquisitions, project finance, asset and business unit valuation, rate and regulatory matters, energy market assessment, and corporate strategic planning. He has provided expert testimony on a wide range of financial, strategic, and economic matters on nearly 300 occasions at the state, provincial, and federal levels.

Prior to joining ScottMadden, Bob served as managing partner at Sussex Economic Advisors, LLC. Throughout the course of his career, he has worked with numerous leading energy companies and financial institutions throughout North America. He has provided expert testimony and support of litigation in various regulatory proceedings on a variety of energy and economic issues. Bob earned a B.S. in business and economics from the University of Delaware and an M.B.A. with a concentration in finance from the University of Massachusetts at Amherst. Bob also holds the Chartered Financial Analyst designation.

Areas of Specialization

- Regulation and rates
- Utilities
- Fossil/hydro generation
- Markets and RTOs
- Nuclear generation
- Mergers and acquisitions
- Regulatory strategy and rate case support
- Capital project planning
- Strategic and business planning

Recent Expert Testimony Submission/Appearance

- Federal Energy Regulatory Commission Return on Equity
- New Jersey Board of Public Utilities Merger Approval
- New Mexico Public Regulation Commission Cost of Capital and Financial Integrity
- United States District Court PURPA and FERC Regulations
- Alberta Utilities Commission Return on Equity and Capital Structure

Recent Assignments

- Provided expert testimony on the cost of capital for ratemaking purposes before numerous state utility regulatory agencies, the Alberta Utilities Commission, and the Federal Energy Regulatory Commission
- For an independent electric transmission provider in Texas, prepared an expert report on the economic damages with respect to failure to meet guaranteed completion dates. The report was filed as part of an arbitration proceeding and included a review of the ratemaking implications of economic damages
- Advised the board of directors of a publicly traded electric and natural gas combination utility on dividend policy issues, earnings payout trends and related capital market considerations
- Assisted a publicly traded utility with a strategic buy-side evaluation of a gas utility with more than \$1 billion in assets. The assignment included operational performance benchmarking, calculation of merger synergies, risk analysis, and review of the regulatory implications of the transaction
- Provided testimony before the Arkansas Public Service Commission in support of the acquisition of SourceGas LLC by Black Hills Corporation. The testimony addressed certain balance sheet capitalization and credit rating issues
- For the State of Maine Public Utility Commission, prepared a report that summarized the Northeast and Atlantic Canada natural gas power markets and analyzed the potential benefits and costs associated with natural gas pipeline expansions. The independent report was filed at the Maine Public Utility Commission



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT
Regulatory Commission of Alaska	-			
Cook Inlet Natural Gas Storage Alaska, LLC	06/18	Cook Inlet Natural Gas Storage Alaska, LLC	Docket No. U-18-043	Return on Equity
ENSTAR Natural Gas Company	06/16	ENSTAR Natural Gas Company	Matter No. TA 285-4	Return on Equity
ENSTAR Natural Gas Company	08/14	ENSTAR Natural Gas Company	Matter No. TA 262-4	Return on Equity
Alberta Utilities Commission				
AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	01/20	AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	2021 Generic Cost of Capital, Proceeding ID. 24110	Rate of Return
AltaLink, L.P., and EPCOR Distribution & Transmission, Inc., and FortisAlberta Inc.	10/17	AltaLink, L.P., and EPCOR Distribution & Transmission, Inc., and FortisAlberta Inc.	2018 Generic Cost of Capital, Proceeding ID. 22570	Rate of Return
EPCOR Energy Alberta G.P. Inc.	01/17	EPCOR Energy Alberta G.P. Inc.	Proceeding 22357	Energy Price Setting Plan
AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	02/16	AltaLink, L.P., and EPCOR Distribution & Transmission, Inc.	2016 Generic Cost of Capital, Proceeding ID. 20622	Rate of Return
Arizona Corporation Commission				÷
Southwest Gas Corporation	05/19	Southwest Gas Corporation	Docket No. G-01551A-19-0055	Return on Equity
Southwest Gas Corporation	05/16	Southwest Gas Corporation	Docket No. G-01551A-16-0107	Return on Equity
Southwest Gas Corporation	11/10	Southwest Gas Corporation	Docket No. G-01551A-10-0458	Return on Equity
Arkansas Public Service Commission				
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas	07/19	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas	Docket No. 17-010-FR	Response to Direct Testimony of Staff Witness regarding Cost of Long Term Debt for Formula Rate Plan Rider
Southwestern Electric Power Company	02/19	Southwestern Electric Power Company	Docket No. 19-008-U	Return on Equity
Oklahoma Gas and Electric Company	09/16	Oklahoma Gas and Electric Company	Docket No. 16-052-U	Return on Equity
SourceGas Arkansas, Inc.	12/15	SourceGas Arkansas, Inc.	Docket No. 15-078-U	Response to Direct Testimony by Arkansas Attorney General related to Compliance Issues
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas	11/15	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas	Docket No. 15-098-U	Return on Equity
SourceGas Arkansas, Inc.	04/15	SourceGas Arkansas, Inc.	Docket No. 15-011-U	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas	01/07	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Arkansas Gas	Docket No. 06-161-U	Return on Equity



Sponsor	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
California Public Utilities Commission	-			
Southwest Gas Corporation	08/19	Southwest Gas Corporation	Docket No. A-19-08-015	Return on Equity
Southwest Gas Corporation	12/12	Southwest Gas Corporation	Docket No. A-12-12-024	Return on Equity
Colorado Public Utilities Commission	•	•		-
Atmos Energy Corporation	06/17	Atmos Energy Corporation	Docket No. 17AL-0429G	Return on Equity
Xcel Energy, Inc.	03/15	Public Service Company of Colorado	Docket No. 15AL-0135G	Return on Equity (gas)
Xcel Energy, Inc.	06/14	Public Service Company of Colorado	Docket No. 14AL-0660E	Return on Equity (electric)
Xcel Energy, Inc.	12/12	Public Service Company of Colorado	Docket No. 12AL-1268G	Return on Equity (gas)
Xcel Energy, Inc.	11/11	Public Service Company of Colorado	Docket No. 11AL-947E	Return on Equity (electric)
Xcel Energy, Inc.	12/10	Public Service Company of Colorado	Docket No. 10AL-963G	Return on Equity (electric)
Atmos Energy Corporation	07/09	Atmos Energy Colorado-Kansas Division	Docket No. 09AL-507G	Return on Equity (gas)
Xcel Energy, Inc.	12/06	Public Service Company of Colorado	Docket No. 06S-656G	Return on Equity (gas)
Xcel Energy, Inc.	04/06	Public Service Company of Colorado	Docket No. 06S-234EG	Return on Equity (electric)
Xcel Energy, Inc.	08/05	Public Service Company of Colorado	Docket No. 05S-369ST	Return on Equity (steam)
Xcel Energy, Inc.	05/05	Public Service Company of Colorado	Docket No. 05S-246G	Return on Equity (gas)
Connecticut Public Utilities Regulatory Aut	hority			
Connecticut Light and Power Company	11/17	Connecticut Light and Power Company	Docket No. 17-10-46	Return on Equity
Connecticut Light and Power Company	06/14	Connecticut Light and Power Company	Docket No. 14-05-06	Return on Equity
Southern Connecticut Gas Company	09/08	Southern Connecticut Gas Company	Docket No. 08-08-17	Return on Equity
Southern Connecticut Gas Company	12/07	Southern Connecticut Gas Company	Docket No. 05-03-17PH02	Return on Equity
Connecticut Natural Gas Corporation	12/07	Connecticut Natural Gas Corporation	Docket No. 06-03-04PH02	Return on Equity
Council of the City of New Orleans				
Entergy New Orleans, LLC	09/18	Entergy New Orleans, LLC	Docket No. UD-18-07	Return on Equity
Delaware Public Service Commission				
Delmarva Power & Light Company	02/20	Delmarva Power & Light Company	Docket No. 20-0150 (Gas)	Return on Equity
Delmarva Power & Light Company	08/17	Delmarva Power & Light Company	Docket No. 17-0977 (Electric)	Return on Equity
Delmarva Power & Light Company	08/17	Delmarva Power & Light Company	Docket No. 17-0978 (Gas)	Return on Equity
Delmarva Power & Light Company	05/16	Delmarva Power & Light Company	Case No. 16-649 (Electric)	Return on Equity
Delmarva Power & Light Company	05/16	Delmarva Power & Light Company	Case No. 16-650 (Gas)	Return on Equity



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT
Delmarva Power & Light Company	03/13	Delmarva Power & Light Company	Case No. 13-115	Return on Equity
Delmarva Power & Light Company	12/12	Delmarva Power & Light Company	Case No. 12-546	Return on Equity
Delmarva Power & Light Company	03/12	Delmarva Power & Light Company	Case No. 11-528	Return on Equity
District of Columbia Public Service Commis	ssion			
Washington Gas Light Company	01/20	Washington Gas Light Company	Formal Case No. 1162	Return on Equity
Potomac Electric Power Company	05/19	Potomac Electric Power Company	Formal Case No. 1156	Return on Equity
Potomac Electric Power Company	12/17	Potomac Electric Power Company	Formal Case No. 1150	Return on Equity
Potomac Electric Power Company	06/16	Potomac Electric Power Company	Formal Case No. 1139	Return on Equity
Washington Gas Light Company	02/16	Washington Gas Light Company	Formal Case No. 1137	Return on Equity
Potomac Electric Power Company	03/13	Potomac Electric Power Company	Formal Case No. 1103-2013-E	Return on Equity
Potomac Electric Power Company	07/11	Potomac Electric Power Company	Formal Case No. 1087	Return on Equity
Federal Energy Regulatory Commission				
LS Power Grid New York Corporation I	12/19	LS Power Grid New York Corporation I	Docket No. ER20-716-000	Return on Equity
Duke Energy Progress, LLC	11/19	Duke Energy Progress	Docket No. EL20-4-000	Answer testimony to Complainant Affidavit from Mr. Mac Mathuna regarding Return on Equity applied in the FRPPA
Edison Electric Institute	07/19	Edison Electric Institute	Docket No. PL19-4-000	Reply comments to FERC Notice of Inquiry regarding Return on Equity analysis
Sabine Pipeline, LLC	09/15	Sabine Pipeline, LLC	Docket No. RP15-1322-000	Return on Equity
NextEra Energy Transmission West, LLC	07/15	NextEra Energy Transmission West, LLC	Docket No. ER15-2239-000	Return on Equity
Maritimes & Northeast Pipeline, LLC	05/15	Maritimes & Northeast Pipeline, LLC	Docket No. RP15-1026-000	Return on Equity
Public Service Company of New Mexico	12/12	Public Service Company of New Mexico	Docket No. ER13-685-000	Return on Equity
Public Service Company of New Mexico	10/10	Public Service Company of New Mexico	Docket No. ER11-1915-000	Return on Equity
Portland Natural Gas Transmission System	05/10	Portland Natural Gas Transmission System	Docket No. RP10-729-000	Return on Equity
Florida Gas Transmission Company, LLC	10/09	Florida Gas Transmission Company, LLC	Docket No. RP10-21-000	Return on Equity
Maritimes and Northeast Pipeline, LLC	07/09	Maritimes and Northeast Pipeline, LLC	Docket No. RP09-809-000	Return on Equity
Spectra Energy	02/08	Saltville Gas Storage	Docket No. RP08-257-000	Return on Equity



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT
Panhandle Energy Pipelines	08/07	Panhandle Energy Pipelines	Docket No. PL07-2-000	Response to draft policy statement regarding inclusion of MLPs in proxy groups for determination of gas pipeline ROEs
Southwest Gas Storage Company	08/07	Southwest Gas Storage Company	Docket No. RP07-541-000	Return on Equity
Southwest Gas Storage Company	06/07	Southwest Gas Storage Company	Docket No. RP07-34-000	Return on Equity
Sea Robin Pipeline LLC	06/07	Sea Robin Pipeline LLC	Docket No. RP07-513-000	Return on Equity
Transwestern Pipeline Company	09/06	Transwestern Pipeline Company	Docket No. RP06-614-000	Return on Equity
GPU International and Aquila	11/00	GPU International	Docket No. EC01-24-000	Market Power Study
Florida Public Service Commission				
Florida Power & Light Company	03/16	Florida Power & Light Company	Docket No. 160021-EI	Return on Equity
Tampa Electric Company	04/13	Tampa Electric Company	Docket No. 130040-EI	Return on Equity
Georgia Public Service Commission				
Atlanta Gas Light Company	05/10	Atlanta Gas Light Company	Docket No. 31647-U	Return on Equity
Hawaii Public Utilities Commission				
Hawaiian Electric Company, Inc.	08/19	Hawaiian Electric Company, Inc.	Docket No. 2019-0085	Return on Equity
Hawai'i Electric Light Company, Inc.	12/18	Hawai'i Electric Light Company, Inc.	Docket No. 2018-0368	Return on Equity
Maui Electric Company, Limited	10/17	Maui Electric Company, Limited	Docket No. 2017-0150	Return on Equity
Hawaiian Electric Company, Inc.	12/16	Hawaiian Electric Company, Inc.	Docket No. 2016-0328	Return on Equity
Hawai'i Electric Light Company, Inc.	09/16	Hawai'i Electric Light Company, Inc.	Docket No. 2015-0170	Return on Equity
Maui Electric Company, Limited	12/14	Maui Electric Company, Limited	Docket No. 2014-0318	Return on Equity
Hawaiian Electric Company, Inc.	06/14	Hawaiian Electric Company, Inc.	Docket No. 2013-0373	Return on Equity
Hawai'i Electric Light Company, Inc.	08/12	Hawai'i Electric Light Company, Inc.	Docket No. 2012-0099	Return on Equity
Illinois Commerce Commission				
Ameren Illinois Company d/b/a Ameren Illinois	01/18	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 18-0463	Return on Equity
Ameren Illinois Company d/b/a Ameren Illinois	01/15	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 15-0142	Return on Equity



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT
Liberty Utilities (Midstates Natural Gas) Corp. d/b/a Liberty Utilities	04/14	Liberty Utilities (Midstates Natural Gas) Corp. d/b/a Liberty Utilities	Docket No. 14-0371	Return on Equity
Ameren Illinois Company d/b/a Ameren Illinois	01/13	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 13-0192	Return on Equity
Ameren Illinois Company d/b/a Ameren Illinois	02/11	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 11-0279	Return on Equity (electric)
Ameren Illinois Company d/b/a Ameren Illinois	02/11	Ameren Illinois Company d/b/a Ameren Illinois	Docket No. 11-0282	Return on Equity (gas)
Indiana Utility Regulatory Commission				
Duke Energy Indiana, Inc.	07/19	Duke Energy Indiana, Inc.	Cause No. 45253	Return on Equity
Indiana Michigan Power Company	05/19	Indiana Michigan Power Company	Cause No. 45235	Return on Equity
Indiana Michigan Power Company	07/17	Indiana Michigan Power Company	Cause No. 44967	Return on Equity
Duke Energy Indiana, Inc.	12/15	Duke Energy Indiana, Inc.	Cause No. 44720	Return on Equity
Duke Energy Indiana, Inc.	12/14	Duke Energy Indiana, Inc.	Cause No. 44526	Return on Equity
Northern Indiana Public Service Company	05/09	Northern Indiana Public Service Company	Cause No. 43894	Assessment of Valuation Approaches
Kansas Corporation Commission				
Empire District Electric Company	02/19	Empire District Electric Company	Docket No. 19-EPDE-223-RTS	Return on Equity
Empire District Electric Company	12/18	Empire District Electric Company	Docket No. 19-EPDE-223-RTS	Alternative Ratemaking Mechanisms
Kansas City Power & Light Company	05/18	Kansas City Power & Light Company	Docket No. 18-KCPE-480-RTS	Return on Equity
Westar Energy	02/18	Westar Energy	Docket No. 18-WSEE-328-RTS	Return on Equity
Great Plains Energy, Inc. and Kansas City Power & Light Company	01/17	Great Plains Energy, Inc. and Kansas City Power & Light Company	Docket No. 16-KCPE-593-ACQ	Response to Direct Testimony by Commission Staff related to the ratemaking capital structure processes
Kansas City Power & Light Company	01/15	Kansas City Power & Light Company	Docket No. 15-KCPE-116-RTS	Return on Equity
Maine Public Utilities Commission				
Northern Utilities, Inc.	06/19	Northern Utilities, Inc.	Docket No. 2019-00049	Return on Equity
Northern Utilities, Inc.	05/17	Northern Utilities, Inc.	Docket No. 2017-00065	Return on Equity



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT
Central Maine Power Company	06/11	Central Maine Power Company	Docket No. 2010-327	Response to Bench Analysis provided by Commission Staff relating to the Company's credit and collections processes
Maryland Public Service Commission				
Delmarva Power & Light Company	12/19	Delmarva Power & Light Company	Case No. 9630	Return on Equity
Washington Gas Light Company	04/19	Washington Gas Light Company	Case No. 9605	Return on Equity
Potomac Electric Power Company	01/19	Potomac Electric Power Company	Case No. 9602	Return on Equity
Washington Gas Light Company	05/18	Washington Gas Light Company	Case No. 9481	Return on Equity
Potomac Electric Power Company	01/18	Potomac Electric Power Company	Case No. 9472	Return on Equity
Delmarva Power & Light Company	07/17	Delmarva Power & Light Company	Case No. 9455	Return on Equity
Potomac Electric Power Company	03/17	Potomac Electric Power Company	Case No. 9443	Return on Equity
Delmarva Power & Light Company	06/16	Delmarva Power & Light Company	Case No. 9424	Return on Equity
Potomac Electric Power Company	06/16	Potomac Electric Power Company	Case No. 9418	Return on Equity
Potomac Electric Power Company	12/13	Potomac Electric Power Company	Case No. 9336	Return on Equity
Delmarva Power & Light Company	03/13	Delmarva Power & Light Company	Case No. 9317	Return on Equity
Potomac Electric Power Company	11/12	Potomac Electric Power Company	Case No. 9311	Return on Equity
Potomac Electric Power Company	12/11	Potomac Electric Power Company	Case No. 9286	Return on Equity
Delmarva Power & Light Company	12/11	Delmarva Power & Light Company	Case No. 9285	Return on Equity
Delmarva Power & Light Company	12/10	Delmarva Power & Light Company	Case No. 9249	Return on Equity
Massachusetts Department of Public Utilitie	s			
NSTAR Electric Company d/b/a Eversource Energy; Massachusetts Electric Company & Nantucket Electric Company, d/b/a National Grid; and Fitchburg Gas and Electric Light Company, d/b/a Unitil	02/20	NSTAR Electric Company d/b/a Eversource Energy; Massachusetts Electric Company & Nantucket Electric Company, d/b/a National Grid; and Fitchburg Gas and Electric Light Company, d/b/a Unitil	DPU 20-16/DPU 20-17/DPU 20-18	In Support of Request for Financial Remuneration
NSTAR Gas Company d/b/a Eversource Energy	11/19	NSTAR Gas Company d/b/a Eversource Energy	DPU 19-120	Return on Equity



Sponsor	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
NSTAR Electric Company d/b/a Eversource Energy; Massachusetts Electric Company & Nantucket Electric Company, d/b/a National Grid; and Fitchburg Gas and Electric Light Company, d/b/a Unitil	02/19	NSTAR Electric Company d/b/a Eversource Energy; Massachusetts Electric Company & Nantucket Electric Company, d/b/a National Grid; and Fitchburg Gas and Electric Light Company, d/b/a Unitil	DPU 18-64/DPU 18-65/DPU 18-66	Response to Direct Testimony by Attorney General Witness regarding Remuneration Rate Section 83D
National Grid	11/18	Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid	DPU 18-150	Return on Equity
NSTAR Electric Company d/b/a Eversource Energy	11/18	NSTAR Electric Company d/b/a Eversource Energy	DPU 18-76/DPU 18-77/DPU 18-78	Response to Direct Testimony by Attorney General Witness regarding Remuneration Rate Section 83C
Boston Gas Company, Colonial Gas Company each d/b/a National Grid	11/17	Boston Gas Company, Colonial Gas Company each d/b/a National Grid	DPU 17-170	Return on Equity
NSTAR Electric Company Western and Massachusetts Electric Company each d/b/a Eversource Energy	01/17	NSTAR Electric Company Western Massachusetts Electric Company each d/b/a Eversource Energy	DPU 17-05	Return on Equity
National Grid	11/15	Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid	DPU 15-155	Return on Equity
Fitchburg Gas and Electric Light Company d/b/a Unitil	06/15	Fitchburg Gas and Electric Light Company d/b/a Unitil	DPU 15-80	Return on Equity
NSTAR Gas Company	12/14	NSTAR Gas Company	DPU 14-150	Return on Equity
Fitchburg Gas and Electric Light Company d/b/a Unitil	07/13	Fitchburg Gas and Electric Light Company d/b/a Unitil	DPU 13-90	Return on Equity
Bay State Gas Company d/b/a Columbia Gas of Massachusetts	04/12	Bay State Gas Company d/b/a Columbia Gas of Massachusetts	DPU 12-25	Capital Cost Recovery
National Grid	08/09	Massachusetts Electric Company d/b/a National Grid	DPU 09-39	Revenue Decoupling and Return on Equity
National Grid	08/09	Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid	DPU 09-38	Return on Equity – Solar Generation
Bay State Gas Company	04/09	Bay State Gas Company	DPU 09-30	Return on Equity



Sponsor	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
NSTAR Electric	09/04	NSTAR Electric	DTE 04-85	Divestiture of Power Purchase Agreement
NSTAR Electric	08/04	NSTAR Electric	DTE 04-78	Divestiture of Power Purchase Agreement
NSTAR Electric	07/04	NSTAR Electric	DTE 04-68	Divestiture of Power Purchase Agreement
NSTAR Electric	07/04	NSTAR Electric	DTE 04-61	Divestiture of Power Purchase Agreement
NSTAR Electric	06/04	NSTAR Electric	DTE 04-60	Divestiture of Power Purchase Agreement
Unitil Corporation	01/04	Fitchburg Gas and Electric	DTE 03-52	Integrated Resource Plan; Gas Demand Forecast
Bay State Gas Company	01/93	Bay State Gas Company	DPU 93-14	Divestiture of Shelf Registration
Bay State Gas Company	01/91	Bay State Gas Company	DPU 91-25	Divestiture of Shelf Registration
Michigan Public Service Commission				
Indiana Michigan Power Company	06/19	Indiana Michigan Power Company	Case No. U-20359	Return on Equity
SEMCO Energy Gas Company	05/19	SEMCO Energy Gas Company	Case No. U-20479	Return on Equity
Indiana Michigan Power Company	05/17	Indiana Michigan Power Company	Case No. U-18370	Return on Equity
Minnesota Public Utilities Commission	-			
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas	08/17	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas	Docket No. G-008/GR-17-285	Return on Equity
ALLETE, Inc., d/b/a Minnesota Power Inc.	11/16	ALLETE, Inc., d/b/a Minnesota Power Inc.	Docket No. E015/GR-16-664	Return on Equity
Otter Tail Power Corporation	02/16	Otter Tail Power Company	Docket No. E017/GR-15-1033	Return on Equity
Minnesota Energy Resources Corporation	09/15	Minnesota Energy Resources Corporation	Docket No. G-011/GR-15-736	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas	08/15	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas	Docket No. G-008/GR-15-424	Return on Equity
Xcel Energy, Inc.	11/13	Northern States Power Company	Docket No. E002/GR-13-868	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas	08/13	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas	Docket No. G-008/GR-13-316	Return on Equity
Xcel Energy, Inc.	11/12	Northern States Power Company	Docket No. E002/GR-12-961	Return on Equity



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT			
Otter Tail Power Corporation	04/10	Otter Tail Power Company	Docket No. E-017/GR-10-239	Return on Equity			
Minnesota Power a division of ALLETE, Inc.	11/09	Minnesota Power	Docket No. E-015/GR-09-1151	Return on Equity			
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas	11/08	CenterPoint Energy Minnesota Gas	Docket No. G-008/GR-08-1075	Return on Equity			
Otter Tail Power Corporation	10/07	Otter Tail Power Company	Docket No. E-017/GR-07-1178	Return on Equity			
Xcel Energy, Inc.	11/05	Northern States Power Company -Minnesota	Docket No. E-002/GR-05-1428	Return on Equity (electric)			
Xcel Energy, Inc.	09/04	Northern States Power Company - Minnesota	Docket No. G-002/GR-04-1511	Return on Equity (gas)			
Mississippi Public Service Commission							
CenterPoint Energy Resources, Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Mississippi Gas	07/09	CenterPoint Energy Mississippi Gas	Docket No. 09-UN-334	Return on Equity			
Missouri Public Service Commission							
Empire District Electric Company	08/19	Empire District Electric Company	Case No. ER-2019-0374	Return on Equity			
Union Electric Company d/b/a Ameren Missouri	07/19	Union Electric Company d/b/a Ameren Missouri	Case No. ER-2019-0335	Return on Equity			
Union Electric Company d/b/a Ameren Missouri	12/18	Union Electric Company d/b/a Ameren Missouri	Case No. GR-2019-0077	Return on Equity			
KCP&L Greater Missouri Operations Company	01/18	KCP&L Greater Missouri Operations Company	Case No. ER-2018-0146	Return on Equity			
Kansas City Power & Light Company	01/18	Kansas City Power & Light Company	Case No. ER-2018-0145	Return on Equity			
Laclede Gas Company and Missouri Gas Energy	11/17	Laclede Gas Company and Missouri Gas Energy	Case No. GR-2017-0215 Case No. GR-2017-0216	Goodwill Adjustment on Capital Structure			
Liberty Utilities (Midstates Natural Gas) Corp. d/b/a/ Liberty Utilities	09/17	Liberty Utilities (Midstates Natural Gas) Corp. d/b/a/ Liberty Utilities	Case No. GR-2018-0013	New Ratemaking Mechanisms			
Union Electric Company d/b/a Ameren Missouri	07/16	Union Electric Company d/b/a Ameren Missouri	Case No. ER-2016-0179	Return on Equity (electric)			
Kansas City Power & Light Company	07/16	Kansas City Power & Light Company	Case No. ER-2016-0285	Return on Equity (electric)			
Kansas City Power & Light Company	02/16	Kansas City Power & Light Company	Case No. ER-2016-0156	Return on Equity (electric)			
Kansas City Power & Light Company	10/14	Kansas City Power & Light Company	Case No. ER-2014-0370	Return on Equity (electric)			



Sponsor	Date	Case/Applicant	DOCKET NO.	SUBJECT			
Union Electric Company d/b/a Ameren Missouri	07/14	Union Electric Company d/b/a Ameren Missouri	Case No. ER-2014-0258	Return on Equity (electric)			
Union Electric Company d/b/a Ameren Missouri	06/14	Union Electric Company d/b/a Ameren Missouri	Case No. EC-2014-0223	Return on Equity (electric)			
Liberty Utilities (Midstates Natural Gas) Corp. d/b/a Liberty Utilities	02/14	Liberty Utilities (Midstates Natural Gas) Corp. d/b/a Liberty Utilities	Case No. GR-2014-0152	Return on Equity			
Laclede Gas Company	12/12	Laclede Gas Company	Case No. GR-2013-0171	Return on Equity			
Union Electric Company d/b/a Ameren Missouri	02/12	Union Electric Company d/b/a Ameren Missouri	Case No. ER-2012-0166	Return on Equity (electric)			
Union Electric Company d/b/a AmerenUE	09/10	Union Electric Company d/b/a AmerenUE	Case No. ER-2011-0028	Return on Equity (electric)			
Union Electric Company d/b/a AmerenUE	06/10	Union Electric Company d/b/a AmerenUE	Case No. GR-2010-0363	Return on Equity (gas)			
Montana Public Service Commission							
Northwestern Corporation	09/12	Northwestern Corporation d/b/a Northwestern Energy	Docket No. D2012.9.94	Return on Equity (gas)			
Nevada Public Utilities Commission							
Southwest Gas Corporation	05/18	Southwest Gas Corporation	Docket No. 18-05031	Return on Equity (gas)			
Southwest Gas Corporation	04/12	Southwest Gas Corporation	Docket No. 12-04005	Return on Equity (gas)			
Nevada Power Company	06/11	Nevada Power Company	Docket No. 11-06006	Return on Equity (electric)			
New Hampshire Public Utilities Commission							
Northern Utilities, Inc.	06/17	Northern Utilities, Inc.	Docket No. DG 17-070	Return on Equity			
Liberty Utilities d/b/a EnergyNorth Natural Gas	04/17	Liberty Utilities d/b/a EnergyNorth Natural Gas	Docket No. DG 17-048	Return on Equity			
Unitil Energy Systems, Inc.	04/16	Unitil Energy Systems, Inc.	Docket No. DE 16-384	Return on Equity			
Liberty Utilities d/b/a Granite State Electric Company	04/16	Liberty Utilities d/b/a Granite State Electric Company	Docket No. DE 16-383	Return on Equity			
Liberty Utilities d/b/a EnergyNorth Natural Gas	08/14	Liberty Utilities d/b/a EnergyNorth Natural Gas	Docket No. DG 14-180	Return on Equity			
Liberty Utilities d/b/a Granite State Electric Company	03/13	Liberty Utilities d/b/a Granite State Electric Company	Docket No. DE 13-063	Return on Equity			
EnergyNorth Natural Gas d/b/a National Grid NH	02/10	EnergyNorth Natural Gas d/b/a National Grid NH	Docket No. DG 10-017	Return on Equity			


Sponsor	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Unitil Energy Systems, Inc., EnergyNorth Natural Gas, Inc. d/b/a National Grid NH, Granite State Electric Company d/b/a National Grid, and Northern Utilities, Inc. – New Hampshire Division	08/08	Unitil Energy Systems, Inc., EnergyNorth Natural Gas, Inc. d/b/a National Grid NH, Granite State Electric Company d/b/a National Grid, and Northern Utilities, Inc. – New Hampshire Division	Docket No. DG 07-072	Carrying Charge Rate on Cash Working Capital
New Jersey Board of Public Utilities				
Elizabethtown Gas Company	04/19	Elizabethtown Gas Company	Docket No. GR19040486	Return on Equity
Atlantic City Electric Company	10/18	Atlantic City Electric Company	Docket No. EO18020196	Return on Equity
Atlantic City Electric Company	08/18	Atlantic City Electric Company	Docket No. ER18080925	Return on Equity
Atlantic City Electric Company	06/18	Atlantic City Electric Company	Docket No. ER18060638	Return on Equity
Atlantic City Electric Company	03/17	Atlantic City Electric Company	Docket No. ER17030308	Return on Equity
Pivotal Utility Holdings, Inc.	08/16	Elizabethtown Gas	Docket No. GR16090826	Return on Equity
The Southern Company; AGL Resources Inc.; AMS Corp. and Pivotal Holdings, Inc. d/b/a Elizabethtown Gas	04/16	The Southern Company; AGL Resources Inc.; AMS Corp. and Pivotal Holdings, Inc. d/b/a Elizabethtown Gas	Docket No. GM15101196	Merger Approval
Atlantic City Electric Company	03/16	Atlantic City Electric Company	Docket No. ER16030252	Return on Equity
Pepco Holdings, Inc.	03/14	Atlantic City Electric Company	Docket No. ER14030245	Return on Equity
Orange and Rockland Utilities	11/13	Rockland Electric Company	Docket No. ER13111135	Return on Equity
Atlantic City Electric Company	12/12	Atlantic City Electric Company	Docket No. ER12121071	Return on Equity
Atlantic City Electric Company	08/11	Atlantic City Electric Company	Docket No. ER11080469	Return on Equity
Pepco Holdings, Inc.	09/06	Atlantic City Electric Company	Docket No. EM06090638	Divestiture and Valuation of Electric Generating Assets
Pepco Holdings, Inc.	12/05	Atlantic City Electric Company	Docket No. EM05121058	Market Value of Electric Generation Assets; Auction
Conectiv	06/03	Atlantic City Electric Company	Docket No. EO03020091	Market Value of Electric Generation Assets; Auction Process
New Mexico Public Regulation Commission				
Public Service Company of New Mexico	12/16	Public Service Company of New Mexico	Case No. 16-00276-UT	Return on Equity (electric)
Public Service Company of New Mexico	08/15	Public Service Company of New Mexico	Case No. 15-00261-UT	Return on Equity (electric)
Public Service Company of New Mexico	12/14	Public Service Company of New Mexico	Case No. 14-00332-UT	Return on Equity (electric)



Sponsor	DATE	Case/Applicant	DOCKET NO.	SUBJECT
Public Service Company of New Mexico	12/14	Public Service Company of New Mexico	Case No. 13-00390-UT	Cost of Capital and Financial Integrity
Southwestern Public Service Company	02/11	Southwestern Public Service Company	Case No. 10-00395-UT	Return on Equity (electric)
Public Service Company of New Mexico	06/10	Public Service Company of New Mexico	Case No. 10-00086-UT	Return on Equity (electric)
Public Service Company of New Mexico	09/08	Public Service Company of New Mexico	Case No. 08-00273-UT	Return on Equity (electric)
Xcel Energy, Inc.	07/07	Southwestern Public Service Company	Case No. 07-00319-UT	Return on Equity (electric)
New York State Public Service Commission				
Consolidated Edison Company of New York, Inc.	01/15	Consolidated Edison Company of New York, Inc.	Case No. 15-E-0050	Return on Equity (electric)
Orange and Rockland Utilities, Inc.	11/14	Orange and Rockland Utilities, Inc.	Case Nos. 14-E-0493 and 14-G- 0494	Return on Equity (electric and gas)
Consolidated Edison Company of New York, Inc.	01/13	Consolidated Edison Company of New York, Inc.	Case No. 13-E-0030	Return on Equity (electric)
Niagara Mohawk Corporation d/b/a National Grid for Electric Service	04/12	Niagara Mohawk Corporation d/b/a National Grid for Electric Service	Case No. 12-E-0201	Return on Equity (electric)
Niagara Mohawk Corporation d/b/a National Grid for Gas Service	04/12	Niagara Mohawk Corporation d/b/a National Grid for Gas Service	Case No. 12-G-0202	Return on Equity (gas)
Orange and Rockland Utilities, Inc.	07/11	Orange and Rockland Utilities, Inc.	Case No. 11-E-0408	Return on Equity (electric)
Orange and Rockland Utilities, Inc.	07/10	Orange and Rockland Utilities, Inc.	Case No. 10-E-0362	Return on Equity (electric)
Consolidated Edison Company of New York, Inc.	11/09	Consolidated Edison Company of New York, Inc.	Case No. 09-G-0795	Return on Equity (gas)
Consolidated Edison Company of New York, Inc.	11/09	Consolidated Edison Company of New York, Inc.	Case No. 09-S-0794	Return on Equity (steam)
Niagara Mohawk Power Corporation	07/01	Niagara Mohawk Power Corporation	Case No. 01-E-1046	Power Purchase and Sale Agreement; Standard Offer Service Agreement
North Carolina Utilities Commission				
Duke Energy Progress, LLC	10/19	Duke Energy Progress, LLC	Docket No. E-2, Sub 1219	Return on Equity
Duke Energy Carolinas, LLC	09/19	Duke Energy Carolinas, LLC	Docket No. E-7, Sub 1214	Return on Equity
Piedmont Natural Gas Company, Inc.	04/19	Piedmont Natural Gas Company, Inc.	Docket No. G-9, Sub 743	Return on Equity



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	Subject
Virginia Electric and Power Company d/b/a Dominion North Carolina Power	03/19	Virginia Electric and Power Company d/b/a Dominion North Carolina Power	Docket No. E-22, Sub 562	Return on Equity
Duke Energy Carolinas, LLC	08/17	Duke Energy Carolinas, LLC	Docket No. E-7, Sub 1146	Return on Equity
Duke Energy Progress, LLC	06/17	Duke Energy Progress, LLC	Docket No. E-2, Sub 1142	Return on Equity
Public Service Company of North Carolina, Inc.	03/16	Public Service Company of North Carolina, Inc.	Docket No. G-5, Sub 565	Return on Equity
Dominion North Carolina Power	03/16	Dominion North Carolina Power	Docket No. E-22, Sub 532	Return on Equity
Duke Energy Carolinas, LLC	02/13	Duke Energy Carolinas, LLC	Docket No. E-7, Sub 1026	Return on Equity
Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc.	10/12	Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc.	Docket No. E-2, Sub 1023	Return on Equity
Virginia Electric and Power Company d/b/a Dominion North Carolina Power	03/12	Virginia Electric and Power Company d/b/a Dominion North Carolina Power	Docket No. E-22, Sub 479	Return on Equity
Duke Energy Carolinas, LLC	07/11	Duke Energy Carolinas, LLC	Docket No. E-7, Sub 989	Return on Equity
North Dakota Public Service Commission				
Otter Tail Power Company	11/17	Otter Tail Power Company	Docket No. 17-398	Return on Equity (electric)
Otter Tail Power Company	11/08	Otter Tail Power Company	Docket No. 08-862	Return on Equity (electric)
Oklahoma Corporation Commission				
Empire District Electric Company	03/19	Empire District Electric Company	Cause No. PUD201800133	Return on Equity
CenterPoint Energy Resources Corp., d/b/a CenterPoint Energy Oklahoma Gas	03/16	CenterPoint Energy Resources Corp., d/b/a CenterPoint Energy Oklahoma Gas	Cause No. PUD201600094	Return on Equity
Oklahoma Gas & Electric Company	12/15	Oklahoma Gas & Electric Company	Cause No. PUD201500273	Return on Equity
Public Service Company of Oklahoma	07/15	Public Service Company of Oklahoma	Cause No. PUD201500208	Return on Equity
Oklahoma Gas & Electric Company	07/11	Oklahoma Gas & Electric Company	Cause No. PUD201100087	Return on Equity
CenterPoint Energy Resources Corp., d/b/a CenterPoint Energy Oklahoma Gas	03/09	CenterPoint Energy Oklahoma Gas	Cause No. PUD200900055	Return on Equity
Pennsylvania Public Utility Commission				
Pike County Light & Power Company	01/14	Pike County Light & Power Company	Docket No. R-2013-2397237	Return on Equity (electric & gas)
Veolia Energy Philadelphia, Inc.	12/13	Veolia Energy Philadelphia, Inc.	Docket No. R-2013-2386293	Return on Equity (steam)



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT		
Rhode Island Public Utilities Commission						
The Narragansett Electric Company d/b/a National Grid	02/19	The Narragansett Electric Company d/b/a National Grid	Docket No. 4929	Support for financial remuneration under new power purchase agreement		
The Narragansett Electric Company d/b/a National Grid	11/17	The Narragansett Electric Company d/b/a National Grid	Docket No. 4770	Return on Equity (electric & gas)		
The Narragansett Electric Company d/b/a National Grid	04/12	The Narragansett Electric Company d/b/a National Grid	Docket No. 4323	Return on Equity (electric & gas)		
National Grid RI – Gas	08/08	National Grid RI – Gas	Docket No. 3943	Revenue Decoupling and Return on Equity		
South Carolina Public Service Commission						
Duke Energy Carolinas, LLC	11/18	Duke Energy Carolinas, LLC	Docket No. 2018-319-E	Return on Equity		
Duke Energy Progress, LLC	11/18	Duke Energy Progress, LLC	Docket No. 2018-318-E	Return on Equity		
South Carolina Electric & Gas	08/18	South Carolina Electric & Gas	Docket No. 2017-370-E	Return on Equity		
South Carolina Electric & Gas	12/17	South Carolina Electric & Gas	Docket No. 2017-305-E	Return on Equity		
Duke Energy Progress, LLC	07/16	Duke Energy Progress, LLC	Docket No. 2016-227-E	Return on Equity		
Duke Energy Carolinas, LLC	03/13	Duke Energy Carolinas, LLC	Docket No. 2013-59-E	Return on Equity		
South Carolina Electric & Gas	06/12	South Carolina Electric & Gas	Docket No. 2012-218-E	Return on Equity		
Duke Energy Carolinas, LLC	08/11	Duke Energy Carolinas, LLC	Docket No. 2011-271-E	Return on Equity		
South Carolina Electric & Gas	03/10	South Carolina Electric & Gas	Docket No. 2009-489-E	Return on Equity		
South Dakota Public Utilities Commission						
Otter Tail Power Company	04/18	Otter Tail Power Company	Docket No. EL18-021	Return on Equity (electric)		
Otter Tail Power Company	08/10	Otter Tail Power Company	Docket No. EL10-011	Return on Equity (electric)		
Northern States Power Company	06/09	South Dakota Division of Northern States Power	Docket No. EL09-009	Return on Equity (electric)		
Otter Tail Power Company	10/08	Otter Tail Power Company	Docket No. EL08-030	Return on Equity (electric)		
Texas Public Utility Commission						
AEP Texas, Inc.	05/19	AEP Texas, Inc.	Docket No. 49494	Return on Equity		
CenterPoint Energy Houston Electric LLC	04/19	CenterPoint Energy Houston Electric LLC	Docket No. 49421	Return on Equity		
Texas-New Mexico Power Company	05/18	Texas-New Mexico Power Company	Docket No. 48401	Return on Equity		



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT
Entergy Texas, Inc.	05/18	Entergy Texas, Inc.	Docket No. 48371	Return on Equity
Southwestern Public Service Company	08/17	Southwestern Public Service Company	Docket No. 47527	Return on Equity
Oncor Electric Delivery Company, LLC	03/17	Oncor Electric Delivery Company, LLC	Docket No. 46957	Return on Equity
El Paso Electric Company	02/17	El Paso Electric Company	Docket No. 46831	Return on Equity
Southwestern Electric Power Company	12/16	Southwestern Electric Power Company	Docket No. 46449	Return on Equity (electric)
Sharyland Utilities, L.P.	04/16	Sharyland Utilities, L.P.	Docket No. 45414	Return on Equity
Southwestern Public Service Company	02/16	Southwestern Public Service Company	Docket No. 44524	Return on Equity (electric)
Wind Energy Transmission Texas, LLC	05/15	Wind Energy Transmission Texas, LLC	Docket No. 44746	Return on Equity
Cross Texas Transmission	12/14	Cross Texas Transmission	Docket No. 43950	Return on Equity
Southwestern Public Service Company	12/14	Southwestern Public Service Company	Docket No. 43695	Return on Equity (electric)
Sharyland Utilities, L.P.	05/13	Sharyland Utilities, L.P.	Docket No. 41474	Return on Equity
Wind Energy Texas Transmission, LLC	08/12	Wind Energy Texas Transmission, LLC	Docket No. 40606	Return on Equity
Southwestern Electric Power Company	07/12	Southwestern Electric Power Company	Docket No. 40443	Return on Equity
Oncor Electric Delivery Company, LLC	01/11	Oncor Electric Delivery Company, LLC	Docket No. 38929	Return on Equity
Texas-New Mexico Power Company	08/10	Texas-New Mexico Power Company	Docket No. 38480	Return on Equity (electric)
CenterPoint Energy Houston Electric LLC	06/10	CenterPoint Energy Houston Electric LLC	Docket No. 38339	Return on Equity
Xcel Energy, Inc.	05/10	Southwestern Public Service Company	Docket No. 38147	Return on Equity (electric)
Texas-New Mexico Power Company	08/08	Texas-New Mexico Power Company	Docket No. 36025	Return on Equity (electric)
Xcel Energy, Inc.	05/06	Southwestern Public Service Company	Docket No. 32766	Return on Equity (electric)
Texas Railroad Commission		-		
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex And CenterPoint Energy Texas Gas	10/19	CenterPoint Energy Resources Corp. D/B/A CenterPoint Energy Entex And CenterPoint Energy Texas Gas	GUD 10920	Return on Equity
Atmos Energy Corporation – Mid-Tex Division	10/18	Atmos Energy Corporation – Mid-Tex Division	GUD 10779	Return on Equity
Atmos Energy Corporation – West Texas Division	06/18	Atmos Energy Corporation – West Texas Division	GUD 10743	Return on Equity
Atmos Energy Corporation – Mid-Texas Division	06/18	Atmos Energy Corporation – Mid-Texas Division	GUD 10742	Return on Equity



Sponsor	Date	CASE/APPLICANT	DOCKET NO.	SUBJECT
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex And CenterPoint Energy Texas Gas	11/17	CenterPoint Energy Resources Corp. D/B/A CenterPoint Energy Entex And CenterPoint Energy Texas Gas	GUD 10669	Return on Equity
Atmos Pipeline - Texas	01/17	Atmos Pipeline - Texas	GUD 10580	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex And CenterPoint Energy Texas Gas	12/16	CenterPoint Energy Resources Corp. D/B/A CenterPoint Energy Entex And CenterPoint Energy Texas Gas	GUD 10567	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Texas Gas	03/15	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Texas Gas	GUD 10432	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Texas Gas	07/12	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Texas Gas	GUD 10182	Return on Equity
Atmos Energy Corporation – West Texas Division	06/12	Atmos Energy Corporation – West Texas Division	GUD 10174	Return on Equity
Atmos Energy Corporation – Mid-Texas Division	06/12	Atmos Energy Corporation – Mid-Texas Division	GUD 10170	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Texas Gas	12/10	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Texas Gas	GUD 10038	Return on Equity
Atmos Pipeline – Texas	09/10	Atmos Pipeline - Texas	GUD 10000	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Texas Gas	07/09	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Entex and CenterPoint Energy Texas Gas	GUD 9902	Return on Equity
CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Texas Gas	03/08	CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Texas Gas	GUD 9791	Return on Equity
Utah Public Service Commission				-
Dominion Energy Utah	07/19	Dominion Energy Utah	Docket No. 19-057-02	Return on Equity
Questar Gas Company	12/07	Questar Gas Company	Docket No. 07-057-13	Return on Equity
Vermont Public Service Board				
Central Vermont Public Service Corporation; Green Mountain Power	02/12	Central Vermont Public Service Corporation; Green Mountain Power	Docket No. 7770	Merger Policy



Sponsor	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Central Vermont Public Service Corporation	12/10	Central Vermont Public Service Corporation	Docket No. 7627	Return on Equity (electric)
Green Mountain Power	04/06	Green Mountain Power	Docket Nos. 7175 and 7176	Return on Equity (electric)
Vermont Gas Systems, Inc.	12/05	Vermont Gas Systems	Docket Nos. 7109 and 7160	Return on Equity (gas)
Virginia State Corporation Commission				
Virginia Electric and Power Company	03/19	Virginia Electric and Power Company	Case No. PUR-2019-00050	Return on Equity
Virginia Electric and Power Company	03/17	Virginia Electric and Power Company	Case No. PUR-2017-00038	Return on Equity
Virginia Natural Gas, Inc.	03/17	Virginia Natural Gas, Inc.	Case No. PUE-2016-00143	Return on Equity
Virginia Electric and Power Company	10/16	Virginia Electric and Power Company	Case No. PUE-2016-00112; PUE- 2016-00113; PUE-2016-00136	Return on Equity
Washington Gas Light Company	06/16	Washington Gas Light Company	Case No. PUE-2016-00001	Return on Equity
Virginia Electric and Power Company	06/16	Virginia Electric and Power Company	Case Nos. PUE-2016-00063; PUE-2016-00062; PUE-2016- 00061; PUE-2016-00060; PUE- 2016-00059	Return on Equity
Virginia Electric and Power Company	12/15	Virginia Electric and Power Company	Case Nos. PUE-2015-00058; PUE-2015-00059; PUE-2015- 00060; PUE-2015-00061; PUE- 2015-00075; PUE-2015-00089; PUE-2015-00102; PUE-2015- 00104	Return on Equity
Virginia Electric and Power Company	03/15	Virginia Electric and Power Company	Case No. PUE-2015-00027	Return on Equity
Virginia Electric and Power Company	03/13	Virginia Electric and Power Company	Case No. PUE-2013-00020	Return on Equity
Virginia Natural Gas, Inc.	02/11	Virginia Natural Gas, Inc.	Case No. PUE-2010-00142	Capital Structure
Columbia Gas of Virginia, Inc.	06/06	Columbia Gas of Virginia, Inc.	Case No. PUE-2005-00098	Merger Synergies
Dominion Resources	10/01	Virginia Electric and Power Company	Case No. PUE000584	Corporate Structure and Electric Generation Strategy
Wyoming Public Service Commission				
Questar Gas Company d/b/a Dominion Energy Wyoming	11/19	Questar Gas Company d/b/a Dominion Energy Wyoming	Docket No. 30010-187-GR-19	Return on Equity



Expert Reports

Matter of Arbitration, City of White Hall,	Arkansas			
Liberty Utilities Corporation, White Hall Water and White Hall Sewer	04/19	Liberty Utilities Corporation, White Hall Water and White Hall Sewer	AAA Case No. 01-18-0004-0072	Return on Equity
United States District Court, District of	South Carolin	a, Columbia Division		
South Carolina Electric & Gas Company	07/18	South Carolina Electric & Gas Company	Case No. 3:18-CV-01795-JMC	Return on Equity
United States District Court, Western Di	strict of Texa	s, Austin Division		
Southwestern Public Service Company	02/12	Southwestern Public Service Company	C.A. No. A-09-CA-917-SS	PURPA and FERC regulations
American Arbitration Association				
Confidential Client	11/14	Confidential Client	Confidential	Economic harm related to failure to perform

Constant Growth Discounted Cash Flow Model 30 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Company	Ticker	Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$2.30	\$113.12	2.03%	2.12%	7.20%	7.20%	7.50%	10.48%	8.09%	9.31%	10.21%	12.62%
New Jersey Resources Corporation	NJR	\$1.25	\$43.64	2.86%	2.94%	8.00%	6.00%	2.50%	4.38%	5.22%	5.40%	8.16%	10.98%
Northwest Natural Holding Company	NWN	\$1.91	\$73.43	2.60%	2.74%	5.00%	3.75%	27.00%	7.04%	10.70%	6.40%	13.44%	29.95%
ONE Gas, Inc.	OGS	\$2.16	\$93.65	2.31%	2.38%	6.00%	5.00%	8.00%	5.46%	6.12%	7.36%	8.49%	10.40%
Southwest Gas Holdings, Inc.	SWX	\$2.18	\$76.50	2.85%	2.96%	6.00%	8.20%	9.00%	7.81%	7.75%	8.94%	10.71%	11.98%
Spire Inc.	SR	\$2.49	\$83.25	2.99%	3.07%	5.10%	4.23%	5.50%	5.49%	5.08%	7.28%	8.15%	8.57%
Proxy Group Mean				2.61%	2.70%	6.22%	5.73%	9.92%	6.78%	7.16%	7.45%	9.86%	14.08%
Proxy Group Median				2.73%	2.84%	6.00%	5.50%	7.75%	6.26%	6.93%	7.32%	9.35%	11.48%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of January 31, 2020

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line

[8] Source: Schedule RBH-3, Value Line

[9] Equals Average([5], [6], [7], [8]) [10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Constant Growth Discounted Cash Flow Model 90 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Company	Ticker	Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$2.30	\$110.96	2.07%	2.16%	7.20%	7.20%	7.50%	10.48%	8.09%	9.35%	10.25%	12.66%
New Jersey Resources Corporation	NJR	\$1.25	\$43.32	2.89%	2.96%	8.00%	6.00%	2.50%	4.38%	5.22%	5.42%	8.18%	11.00%
Northwest Natural Holding Company	NWN	\$1.91	\$70.24	2.72%	2.86%	5.00%	3.75%	27.00%	7.04%	10.70%	6.52%	13.56%	30.09%
ONE Gas, Inc.	OGS	\$2.16	\$92.25	2.34%	2.41%	6.00%	5.00%	8.00%	5.46%	6.12%	7.40%	8.53%	10.44%
Southwest Gas Holdings, Inc.	SWX	\$2.18	\$80.78	2.70%	2.80%	6.00%	8.20%	9.00%	7.81%	7.75%	8.78%	10.56%	11.82%
Spire Inc.	SR	\$2.49	\$82.51	3.02%	3.09%	5.10%	4.23%	5.50%	5.49%	5.08%	7.31%	8.17%	8.60%
Proxy Group Mean				2.62%	2.72%	6.22%	5.73%	9.92%	6.78%	7.16%	7.46%	9.88%	14.10%
Proxy Group Median				2.71%	2.83%	6.00%	5.50%	7.75%	6.26%	6.93%	7.36%	9.39%	11.41%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of January 31, 2020

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line

[8] Source: Schedule RBH-3, Value Line

[9] Equals Average([5], [6], [7], [8]) [10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Constant Growth Discounted Cash Flow Model 180 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Company	Ticker	Annualized Dividend	Average Stock Price	Dividend Yield	Expected Dividend Yield	Zacks Earnings Growth	First Call Earnings Growth	Value Line Earnings Growth	Retention Growth Estimate	Average Earnings Growth	Low ROE	Mean ROE	High ROE
Atmos Energy Corporation	ATO	\$2.30	\$109.05	2.11%	2.19%	7.20%	7.20%	7.50%	10.48%	8.09%	9.39%	10.29%	12.70%
New Jersey Resources Corporation	NJR	\$1.25	\$45.55	2.74%	2.82%	8.00%	6.00%	2.50%	4.38%	5.22%	5.28%	8.04%	10.85%
Northwest Natural Holding Company	NWN	\$1.91	\$70.22	2.72%	2.87%	5.00%	3.75%	27.00%	7.04%	10.70%	6.52%	13.56%	30.09%
ONE Gas, Inc.	OGS	\$2.16	\$91.35	2.36%	2.44%	6.00%	5.00%	8.00%	5.46%	6.12%	7.42%	8.55%	10.46%
Southwest Gas Holdings, Inc.	SWX	\$2.18	\$84.87	2.57%	2.67%	6.00%	8.20%	9.00%	7.81%	7.75%	8.65%	10.42%	11.68%
Spire Inc.	SR	\$2.49	\$83.37	2.99%	3.06%	5.10%	4.23%	5.50%	5.49%	5.08%	7.28%	8.14%	8.57%
Proxy Group Mean				2.58%	2.67%	6.22%	5.73%	9.92%	6.78%	7.16%	7.42%	9.83%	14.06%
Proxy Group Median				2.64%	2.74%	6.00%	5.50%	7.75%	6.26%	6.93%	7.35%	9.42%	11.27%

Notes:

[1] Source: Bloomberg Professional

[2] Source: Bloomberg Professional, equals indicated number of trading day average as of January 31, 2020

[3] Equals [1] / [2]

[4] Equals [3] x (1 + 0.5 x [9])

[5] Source: Zacks

[6] Source: Yahoo! Finance

[7] Source: Value Line

[8] Source: Schedule RBH-3, Value Line

[9] Equals Average([5], [6], [7], [8]) [10] Equals [3] x (1 + 0.5 x Minimum([5], [6], [7], [8])) + Minimum([5], [6], [7], [8])

[11] Equals [4] + [9]

[12] Equals [3] x (1 + 0.5 x Maximum([5], [6], [7], [8])) + Maximum([5], [6], [7], [8])

Schedule RBH-3 Page 1 of 1

Retention Growth Estimate

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
			Projected					Projected	Projected										
		Projected	Dividend		Projected			Common	Common					Projected					
		Earnings per	Declared per		Book Value	Return on		Shares	Shares	Common				Book Value					
		share 2022-	share 2022-	Retention	per Share	Book Value		Outstanding	Outstanding	Shares	2019 High	2019 Low	2019 price	per Share	Market/				
Company	Ticker	2024	24	Ratio (B)	2022-24	(R)	BxR	2019	2022-24	Growth Rate	Price	Price	midpoint	2019	Book Ratio	"S"	"V"	SxV	BR + SV
Atmos Energy Corporation	ATO	5.60	2.80	50.00%	56.05	0.00%	5.00%	120.00	145.00	4 84%	¢ 115.20	\$ 80.20	\$ 102.20	47.05	2 13	10 33%	53 08%	5 48%	10 48%
New Jersey Resources Corporation	NJR	2.35	1.49	36.60%	21.30	11.03%	4.04%	89.24	90.00	0.21%	\$ 51.20	\$ 40.30	\$ 45.75	17.50	2.61	0.55%	61.75%	0.34%	4.38%
Northwest Natural Holding Company	NWN	3.50	1.97	43.71%	29.40	11.90%	5.20%	30.50	32.00	1.21%	\$ 73.50	\$ 57.20	\$ 65.35	25.90	2.52	3.05%	60.37%	1.84%	7.04%
ONE Gas, Inc.	OGS	4.75	2.65	44.21%	47.90	9.92%	4.38%	53.00	55.00	0.93%	\$ 96.70	\$ 75.80	\$ 86.25	39.90	2.16	2.01%	53.74%	1.08%	5.46%
Southwest Gas Holdings, Inc.	SWX	5.80	2.60	55.17%	57.25	10.13%	5.59%	56.00	62.00	2.58%	\$ 92.90	\$ 73.30	\$ 83.10	44.65	1.86	4.80%	46.27%	2.22%	7.81%
Spire Inc.	SR	5.00	2.67	46.60%	54.20	9.23%	4.30%	51.00	55.00	1.91%	\$ 88.00	\$ 71.70	\$ 79.85	49.20	1.62	3.09%	38.38%	1.19%	5.49%
																		Average	6.78%

Notes: [1] Source: Value Line [2] Source: Value Line [3] Equals 1 - [2] / [1] [4] Source: Value Line [5] Equals [3] x [5] [7] Source: Value Line [8] Source: Value Line [9] Equals ([8] / [7]) ^ 0.25 - 1 [10] Source: Value Line [11] Source: Value Line [12] Equals (Average ([10], [11]) [13] Source: Value Line [14] Equals [12] / [13] [15] Equals [12] / [13] [16] Equals 1 - (1 / [14]) [17] Equals [15] x [16] [18] Equals [6] + [17]

Ex-Ante Market Risk Premium Market DCF Method Based - Bloomberg

[1]	[2]	[3]
S&P 500	Current 30-Year	
Est. Required	Treasury (30-day	Implied Market
Market Return	average)	Risk Premium
13.44%	2.25%	11.18%

		[4]	[5]	[6]	[7]	[8]	[9]
_		Market		Estimated	Long-Term		Weighted
Company	Ticker	Capitalization	Weight in Index	Dividend Yield	Growth Est.	DCF Result	DCF Result
Agilent Technologies Inc	A	25,608.74	0.09%	0.87%	10.40%	11.32%	0.0105%
American Airlines Group Inc	AAL	11,757.48	0.04%	1.53%	6.23%	7.81%	0.0033%
Advance Auto Parts Inc	AAP	9,124.93	0.03%	0.18%	15.34%	15.54%	0.0051%
Apple Inc	AAPL	1,354,254.81	4.89%	1.04%	11.97%	13.07%	0.6392%
AbbVie Inc	ABBV	119,814.09	0.43%	5.30%	4.77%	10.19%	0.0441%
AmerisourceBergen Corp	ABC	17,616.10	0.06%	1.95%	12.35%	14.41%	0.0092%
ABIOMED Inc	ABMD	8,411.95	0.03%	0.00%	24.00%	24.00%	0.0073%
Abbott Laboratories	ABT	154,103.23	0.56%	1.60%	10.12%	11.80%	0.0657%
Accenture PLC	ACN	130,514.21	0.47%	1.56%	10.43%	12.07%	0.0569%
Adobe Inc	ADBE	169,295.47	0.61%	0.00%	16.22%	16.22%	0.0992%
Analog Devices Inc	ADI	40,492.75	0.15%	2.07%	12.53%	14.73%	0.0215%
Archer-Daniels-Iviidiand Co		24,917.28	0.09%	3.25%	9.20%	12.60%	0.0113%
Automatic Data Processing Inc	ADP	13,990.30	0.27%	1.99%	12.55%	14.00%	0.0392%
Alliance Data Systems Corp	ADS	4,734.12	0.02%	2.47%	10.44%	13.04%	0.0022%
Autodesk Inc	ADSK	43,313.50	0.16%	0.00%	40.89%	40.89%	0.0734%
Ameren Corp	AEE	20,180.74	0.07%	2.35%	5.76%	8.18%	0.0000%
American Electric Power Co Inc	AEP	51,479.00	0.19%	2.60%	0.03%	8.71%	0.0162%
AES CORP/VA	AES	13,184.91	0.05%	2.11%	8.47%	11.30%	0.0054%
	AFL	37,853.31	0.14%	2.10%	3.41%	5.55%	0.0076%
American Interneticanal Creven Inc.	AGN	01,209.08	0.22%	1.58%	5.50%	7.13%	0.0158%
American International Group Inc	AIG	43,723.77	0.16%	2.56%	11.00%	13.70%	0.0216%
Apartment Investment & Management Co	AIV	7,847.71	0.03%	3.08%	3.99%	7.14%	0.0020%
Assurant Inc	AIZ	7,916.61	N/A	1.90%	N/A	N/A	N/A
Arthur J Gallagher & Co	AJG	19,293.42	0.07%	1.74%	9.79%	11.62%	0.0081%
Akamai Technologies Inc	AKAM	15,085.47	0.05%	0.00%	13.20%	13.20%	0.0072%
Albemarle Corp	ALB	8,512.33	0.03%	1.79%	8.10%	9.96%	0.0031%
Align Technology Inc	ALGN	20,262.81	0.07%	0.00%	20.31%	20.31%	0.0149%
Alaska Air Group Inc	ALK	7,955.77	0.03%	2.31%	23.69%	26.28%	0.0076%
Allstate Corp/The	ALL	38,401.76	0.14%	1.63%	9.00%	10.71%	0.0149%
Allegion PLC	ALLE	12,015.97	0.04%	0.83%	10.63%	11.51%	0.0050%
Alexion Pharmaceuticals Inc	ALXN	21,994.08	0.08%	0.00%	11.72%	11.72%	0.0093%
Applied Materials Inc	AMAT	53,270.00	0.19%	1.54%	12.42%	14.05%	0.0270%
Amcor PLC	AMCR	17,157.30	0.06%	4.84%	8.60%	13.65%	0.0085%
Advanced Micro Devices Inc	AMD	52,340.49	0.19%	0.00%	17.67%	17.67%	0.0334%
	AIVIE	22,207.80	0.08%	0.58%	10.50%	11.11%	0.0089%
Amgen Inc	AMGN	127,085.55	0.46%	2.92%	7.88%	10.91%	0.0503%
Ameriprise Financial Inc		20,950.72	0.08%	2.48%	0.00%	8.00%	0.0005%
		102,047.02	0.37 %	1.02%	20.34%	22.13%	0.0021%
Amazon.com inc		999,961.80	3.01%	0.00%	33.19%	33.19%	1.1987%
Arista Networks Inc	ANET	17,062.96	0.06%	0.00%	17.95%	17.95%	0.0111%
	ANSS	23,479.83	0.08%	0.00%	10.05%	10.05%	0.0090%
	ANTIV	67,200.30	0.24%	1.42%	10.00%	14.55%	0.0353%
AON PLC	AON	51,109.34	0.18%	0.86%	10.99%	11.90%	0.0220%
AD Smith Corp	AUS	0,903.20	0.03%	2.40%	8.00%	10.50%	0.0027%
Apache Corp		10,310.44	0.04%	3.04%	-29.00%	-20.00%	-0.0090%
Amphanal Carp		32,078.10	0.19%	2.13%	0.910/	14.94 /0	0.0204 /0
		29,492.03	0.11%	0.99%	9.01%	7 100/	0.0110%
Apuv PLC Alexandria Bast Estata Equitias Inc.	APIV	21,040.00	0.06%	1.13%	0.90%	7.10%	0.0050%
		12 066 59	0.00%	2.45%	4.1370	0.03 //	0.0031%
Atmos Energy Corp	ARING	14 209 01	0.05%	0.20%	00.40%	00.79%	0.0376%
Activision Blizzard Inc.	ATU	14,300.01	0.05%	1.90%	1.15%	9.10%	0.0047%
		44,927.00	0.10%	0.04%	6.01%	0.100/	0.0173%
Readcom Inc	AVGO	121 200 20	0.11%	2.00 %	10 220/	9.1070	0.0099%
Aver Dennison Corn	AVGO	121,390.29	0.44 /0	4.20 /0	E 2E0/	7 0 4 0/	0.0049%
Avery Dennison Corp		10,958.92	0.04%	1.84%	0.30%	1.24%	0.0029%
American Express Co		24,021.71	0.09%	1.43%	0.32%	10.03%	0.0009%
American Express Co	AAP	100,200.03	0.36%	1.30%	9.39%	10.03%	0.0410%
	AZU PA	24,900.14	0.09%	0.00%	10.00%	10.00%	0.0097%
Boeing GU/ Me Bank of Amorica Corn	BA	119,234.45	0.05%	2.03%	29.38%	32.4U%	0.2097%
Darik Of America Colp Paytor International Inc.		290,090.77	1.05%	∠.41% 1.000/	9.10%	12.20%	0.1280%
		40,001.79	0.10%	1.00%	7 7 9 0/	12.09%	0.0212%
Best Duy CO IIIC Restan Diskingen and Ca		21,913.80	0.00%	2.30%	1.1070	10.2370	0.000170
		14,511.01	0.21%	1.31%	10.42%	11.60%	0.0318%
Frankill Resources IIC Brown Forman Corn		12,5/1.51	0.05%	4.20% 1.00%	7 090/	14.49%	0.0000%
		31,/31.84	0.11%	1.02%	7.08%	0.13%	0.0093%
Diugert IIIC Bank of New York Mellon Corn/The	DIID	40,011.00	0.10%	0.00%	2.02%	2.02%	0.0035%
Darik of New Tork Wellon Corp/The Rocking Holdings Inc.	BKNC	40,332.58	0.15%	2.91%	0.30%	9.30%	0.0130%
BOOKING HOIDINGS INC	DKING	10,010.95	0.20%	0.00%	10.37%	10.31%	0.0403%

		[4]	[5]	[6]	[7]	[8]	[9]
Company	Ticker	Capitalization	Weight in Index	Estimated Dividend Yield	Long-Term Growth Est.	DCF Result	DCF Result
Baker Hughes Co	BKR	22,251.25	0.08%	3.37%	30.98%	34.87%	0.0280%
BlackRock Inc Ball Corp	BLK	81,917.15	0.30%	2.68%	9.76%	12.58%	0.0372%
Bristol-Myers Squibb Co	BMY	147,365.90	0.53%	2.61%	14.78%	17.59%	0.0936%
Broadridge Financial Solutions Inc	BR	13,678.72	0.05%	1.82%	7.50%	9.39%	0.0046%
Berkshire Hathaway Inc	BRK/B	548,282.67	N/A	0.00%	N/A	N/A	N/A
Boston Scientific Corp BorgWarner Inc	BWA	58,359.39	0.21%	0.00%	7.00% 4.90%	7.00% 6.94%	0.0148%
Boston Properties Inc	BXP	22,189.19	0.08%	2.88%	2.17%	5.08%	0.0041%
Citigroup Inc	С	157,310.18	0.57%	2.91%	13.50%	16.61%	0.0944%
Conagra Brands Inc	CAG	16,025.91	0.06%	2.58%	7.97%	10.65%	0.0062%
Caterpillar Inc	CAH	14,978.33 72 591 68	0.05%	3.95%	1.37%	5.35% 12 29%	0.0029%
Chubb Ltd	CB	68,882.22	0.25%	1.98%	10.73%	12.82%	0.0319%
Cboe Global Markets Inc	CBOE	13,660.33	0.05%	1.08%	5.91%	7.03%	0.0035%
CBRE Group Inc	CBRE	20,436.59	0.07%	0.00%	11.00%	11.00%	0.0081%
Carnival Corp	CCL	29.392.75	0.23%	4.66%	8.31%	21.03%	0.0140%
Cadence Design Systems Inc	CDNS	20,233.56	0.07%	0.00%	9.35%	9.35%	0.0068%
CDW Corp/DE	CDW	18,743.14	0.07%	0.96%	13.10%	14.12%	0.0096%
Celanese Corp	CE	12,510.47	0.05%	2.67%	4.08%	6.80%	0.0031%
Cerner Corp CE Industries Holdings Inc	CERN	22,561.62	0.08%	0.36%	15.49%	15.88%	0.0129%
Citizens Financial Group Inc	CFG	16,206.32	0.06%	4.15%	5.74%	10.01%	0.0059%
Church & Dwight Co Inc	CHD	18,213.73	0.07%	1.32%	8.17%	9.54%	0.0063%
CH Robinson Worldwide Inc	CHRW	9,767.79	0.04%	2.89%	6.90%	9.89%	0.0035%
Charter Communications Inc	CHIR	125,037.91	0.45%	0.00%	34.30%	34.30%	0.1549%
Cincinnati Financial Corp	CINF	17.146.10	N/A	2.25%	N/A	N/A	N/A
Colgate-Palmolive Co	CL	63,232.72	0.23%	2.44%	3.39%	5.86%	0.0134%
Clorox Co/The	CLX	19,742.95	0.07%	2.69%	3.44%	6.17%	0.0044%
Comerica Inc	CMA	8,816.48	0.03%	4.62%	9.15%	13.98%	0.0045%
CME Group Inc	CME	77.804.34	0.28%	2.42%	9.34 % 8.65%	11.17%	0.0314%
Chipotle Mexican Grill Inc	CMG	24,091.77	0.09%	0.00%	28.57%	28.57%	0.0249%
Cummins Inc	CMI	24,507.98	0.09%	3.07%	4.71%	7.85%	0.0070%
CMS Energy Corp	CMS	19,446.05	0.07%	2.39%	7.16%	9.63%	0.0068%
CenterPoint Energy Inc	CNP	13.271.27	0.05%	4.38%	4.66%	9.13%	0.0044%
Capital One Financial Corp	COF	45,568.68	0.16%	1.65%	5.97%	7.67%	0.0126%
Cabot Oil & Gas Corp	COG	5,747.66	0.02%	2.48%	27.68%	30.50%	0.0063%
Cooper Cos Inc/The	COD	17,019.24	0.06%	0.03%	5.90%	5.93%	0.0036%
Costco Wholesale Corp	COST	134 965 79	0.24%	0.89%	0.80%	3.04% 9.84%	0.0071%
Coty Inc	COTY	7,775.97	0.03%	4.20%	8.64%	13.02%	0.0037%
Campbell Soup Co	CPB	14,597.10	0.05%	2.93%	7.07%	10.10%	0.0053%
Capri Holdings Ltd	CPRI	4,543.00	0.02%	0.00%	4.07%	4.07%	0.0007%
salesforce com Inc	CRM	23,364.60	0.58%	0.00%	22.38%	22.38%	0.1307%
Cisco Systems Inc	CSCO	195,016.81	0.70%	3.13%	5.40%	8.61%	0.0607%
CSX Corp	CSX	59,723.57	0.22%	1.35%	13.40%	14.84%	0.0320%
Cintas Corp	CTAS	28,943.36	0.10%	0.91%	10.25%	11.21%	0.0117%
CenturyLink Inc Cognizant Technology Solutions Corp	CTSH	14,892.53	0.05%	7.32%	3.97%	11.43%	0.0061%
Corteva Inc	CTVA	21,648.85	0.08%	1.88%	16.20%	18.23%	0.0143%
Citrix Systems Inc	CTXS	15,785.25	0.06%	1.15%	9.17%	10.37%	0.0059%
CVS Health Corp	CVS	88,231.38	0.32%	2.95%	5.35%	8.37%	0.0267%
Concho Resources Inc	CXO	202,588.05	0.73%	4.67%	7.89%	6.60% 8.57%	0.0483%
Dominion Energy Inc	D	71,086.75	0.26%	4.27%	4.56%	8.92%	0.0229%
Delta Air Lines Inc	DAL	36,049.45	0.13%	2.97%	11.25%	14.38%	0.0187%
DuPont de Nemours Inc	DD	37,799.74	0.14%	2.44%	5.25%	7.75%	0.0106%
Deere & Co Discover Financial Services	DE	49,922.25	0.18%	2.09%	0.08% 11 17%	8.24% 13.69%	0.0148%
Dollar General Corp	DG	39,058.21	0.14%	0.84%	11.03%	11.91%	0.0168%
Quest Diagnostics Inc	DGX	14,906.93	0.05%	2.04%	6.42%	8.52%	0.0046%
DR Horton Inc	DHI	21,688.73	0.08%	1.18%	14.54%	15.81%	0.0124%
Dananer Corp Walt Disney Co/The		111,885.09 249 685 43	0.40% 0.90%	0.44% 1.34%	13.01% 6.40%	13.48% 7 79%	0.0545%
Discovery Inc	DISCA	20,130.70	0.07%	1.20%	11.50%	12.77%	0.0093%
DISH Network Corp	DISH	19,221.67	0.07%	0.00%	5.40%	5.40%	0.0037%
Digital Realty Trust Inc	DLR	26,778.76	0.10%	3.51%	41.20%	45.43%	0.0439%
Dollar Tree Inc		20,606.19	0.07%	0.00%	6.42% 10.80%	6.42% 12 70%	0.0048%
Dow Inc	DOW	34.239.78	0.00%	6.25%	-1.28%	4.93%	0.0061%
Duke Realty Corp	DRE	13,346.49	0.05%	2.58%	4.80%	7.44%	0.0036%
Darden Restaurants Inc	DRI	14,147.42	0.05%	3.03%	8.10%	11.25%	0.0057%
DTE Energy Co	DTE	25,475.05	0.09%	2.89%	5.87%	8.84%	0.0081%
DaVita Inc	DVA	10,232.29	0.20%	0.00%	4.70%	14.20%	0.0052%

		[4]	[5]	[6]	[7]	[8]	[9]
Company	Ticker	Market	Weight in Index	Estimated	Long-Term Growth Est	DCE Result	Weighted
Company	TICKCI	Capitalization	Weight in index	Dividend Field	Growin Est.	Dor Result	Dor Result
Devon Energy Corp	DVN	8,342.65	0.03%	1.61%	11.40%	13.10%	0.0039%
DXC Technology Co	DXC	8,161.20	0.03%	2.60%	-1.44%	1.15%	0.0003%
eBay Inc	EA FRAV	31,510.36	0.11%	0.00%	7.79% 12.25%	7.79% 14.25%	0.0089%
Ecolab Inc	ECL	56,527.61	0.20%	0.94%	12.37%	13.36%	0.0273%
Consolidated Edison Inc	ED	31,248.46	0.11%	3.15%	3.58%	6.78%	0.0077%
Equifax Inc	EFX	18,150.40	0.07%	1.04%	11.67%	12.78%	0.0084%
Edison International Estee Lauder Cos Inc/The	EIX	27,450.92	0.10%	3.23%	5.29%	8.60%	0.0085%
Eastman Chemical Co	FMN	9 691 24	0.25%	3 73%	5.87%	9 71%	0.0320%
Emerson Electric Co	EMR	43,633.69	0.16%	2.80%	8.03%	10.94%	0.0172%
EOG Resources Inc	EOG	42,416.42	0.15%	1.40%	6.00%	7.44%	0.0114%
Equinix Inc	EQIX	50,291.50	0.18%	1.67%	18.00%	19.82%	0.0360%
Equity Residential Eversource Epergy	EQR	30,878.42	0.11%	2.87%	8.78% 6.67%	9.06%	0.0131%
Essex Property Trust Inc	ESS	20,469.45	0.07%	2.65%	8.22%	10.98%	0.0081%
E*TRADE Financial Corp	ETFC	9,488.16	0.03%	1.36%	3.38%	4.76%	0.0016%
Eaton Corp PLC	ETN	39,053.90	0.14%	2.99%	8.44%	11.55%	0.0163%
Entergy Corp	ETR	26,185.91	0.09%	2.80%	-0.94%	1.85%	0.0017%
Evergy Inc Edwards Lifesciences Corp	EVRG	45 856 20	0.06%	2.07%	14.32%	9.27%	0.0055%
Exelon Corp	EXC	46,160.02	0.17%	3.04%	2.97%	6.06%	0.0101%
Expeditors International of Washington I	EXPD	12,438.80	0.04%	1.35%	9.73%	11.15%	0.0050%
Expedia Group Inc	EXPE	15,712.92	0.06%	1.22%	12.35%	13.65%	0.0077%
Extra Space Storage Inc	EXR	14,334.22	0.05%	3.22% 6.80%	4.88%	8.18% 10.51%	0.0042%
Diamondback Energy Inc.	FANG	11 937 08	0.13%	0.90%	24.41%	25.42%	0.0133%
Fastenal Co	FAST	20,025.62	0.07%	2.70%	14.25%	17.15%	0.0124%
Facebook Inc	FB	575,534.49	2.08%	0.00%	22.27%	22.27%	0.4629%
Fortune Brands Home & Security Inc	FBHS	9,561.08	0.03%	1.35%	8.96%	10.38%	0.0036%
Freeport-McMoRan Inc		16,105.14	0.06%	1.80%	-1.93%	-0.15%	-0.0001%
FirstEneray Corp	FE	27.442.43	0.10%	2.99%	0.69%	3.69%	0.0037%
F5 Networks Inc	FFIV	7,425.26	0.03%	0.00%	8.50%	8.50%	0.0023%
Fidelity National Information Services I	FIS	88,293.48	0.32%	0.98%	11.94%	12.98%	0.0414%
	FISV	80,642.35	0.29%	0.00%	17.36%	17.36%	0.0506%
FITTEN I NITO BANCORP	FLIB	20,168.66	0.07%	3.84% 1.31%	3.80%	7.71% 14.50%	0.0056%
Flowserve Corp	FLS	6,108.55	0.02%	1.65%	11.39%	13.13%	0.0029%
FleetCor Technologies Inc	FLT	27,356.03	0.10%	0.00%	15.57%	15.57%	0.0154%
FMC Corp	FMC	12,389.93	0.04%	1.68%	10.20%	11.97%	0.0054%
Fox Corp	FOXA	22,815.36	0.08%	1.12%	6.02%	7.18%	0.0059%
Federal Realty Investment Trust	FRT	9 441 86	0.03%	3.32%	5 70%	9 11%	0.0075%
TechnipFMC PLC	FTI	7,381.04	0.03%	3.28%	7.00%	10.39%	0.0028%
Fortinet Inc	FTNT	19,730.45	0.07%	0.00%	16.82%	16.82%	0.0120%
Fortive Corp	FTV	25,161.81	0.09%	0.39%	8.57%	8.97%	0.0082%
General Electric Co	GD	50,755.80 108 732 69	0.18%	2.51%	7.78%	8 47%	0.0190%
Gilead Sciences Inc	GILD	79,957.20	0.29%	3.97%	1.27%	5.26%	0.0152%
General Mills Inc	GIS	31,583.53	0.11%	3.75%	6.50%	10.38%	0.0118%
Globe Life Inc	GL	11,290.14	0.04%	0.65%	8.07%	8.75%	0.0036%
Corning Inc Conoral Motors Co	GLW	20,337.78	0.07%	3.43%	8.48%	12.06%	0.0089%
Alphabet Inc	GOOGI	988 702 25	3.57%	4.59%	15.76%	15.34%	0.0204%
Genuine Parts Co	GPC	13,595.08	0.05%	3.23%	4.47%	7.77%	0.0038%
Global Payments Inc	GPN	58,742.11	0.21%	0.14%	18.27%	18.42%	0.0391%
Gap Inc/The	GPS	6,499.14	0.02%	5.59%	4.63%	10.36%	0.0024%
Garmin Llu Goldman Sachs Group Inc/The	GRIMIN	18,430.49	0.07%	∠.30% 2.20%	0.70% 7.78%	9.07% 10.07%	0.0060%
WW Grainger Inc	GWW	16.303.70	0.06%	1.97%	9.28%	11.33%	0.0067%
Halliburton Co	HAL	19,144.91	0.07%	3.33%	12.26%	15.80%	0.0109%
Hasbro Inc	HAS	13,939.21	0.05%	2.65%	10.93%	13.73%	0.0069%
Huntington Bancshares Inc/OH	HBAN	13,841.45	0.05%	4.56%	5.84%	10.53%	0.0053%
HCA Healthcare Inc	НСА	4,976.95	0.02%	4.30%	4.94% 9.72%	9.41%	0.0017%
Home Depot Inc/The	HD	248,818.56	0.90%	2.37%	9.38%	11.87%	0.1067%
Hess Corp	HES	17,237.23	0.06%	1.83%	4.40%	6.27%	0.0039%
HollyFrontier Corp	HFC	7,249.63	0.03%	2.99%	-4.59%	-1.66%	-0.0004%
Haritora Financial Services Group Inc/Th	HIG HII	21,365.77	0.08%	2.05%	9.50%	11.65%	0.0090%
Hilton Worldwide Holdinas Inc	HLT	30.417.17	0.11%	0.56%	12.00%	12.59%	0.0138%
Harley-Davidson Inc	HOG	5,153.37	0.02%	4.56%	7.70%	12.44%	0.0023%
Hologic Inc	HOLX	14,091.92	0.05%	0.00%	10.37%	10.37%	0.0053%
Honeywell International Inc	HON	123,771.49	0.45%	2.08%	7.24%	9.39%	0.0420%
neimench & Payne Inc Hewlett Packard Enterprise Co	HPE HPE	4,444.45	0.02%	0.0U% 3.47%	4.47% 5.41%	11.11% 8 0.8%	0.0018%
HP Inc	HPQ	30.981.96	0.11%	3.30%	-1.30%	1.98%	0.0022%
H&R Block Inc	HRB	4,529.71	0.02%	4.44%	10.00%	14.66%	0.0024%
Hormel Foods Corp	HRL	25,271.66	0.09%	1.96%	4.62%	6.62%	0.0060%

		[4]	[5]	[6]	[7]	[8]	[9]
Company	Ticker	Market Capitalization	Weight in Index	Estimated Dividend Yield	Long-Term Growth Est	DCE Result	Weighted DCF Result
Company	TICKCI	Capitalization	Weight in index	Dividend Heid	Growin Est.	Dor Result	Dor Result
Henry Schein Inc	HSIC	10,116.27	0.04%	0.00%	3.21%	3.21%	0.0012%
Host Hotels & Resorts Inc	HST	11,718.69	0.04%	5.04%	16.32%	21.78%	0.0092%
Hershey Co/The	HSY	32,418.33	0.12%	2.05%	7.90%	10.03%	0.0117%
Humana Inc International Business Machines Corn	IBM	44,526.93 127 292 67	0.16%	0.65%	13.52%	9.34%	0.0229%
Intercontinental Exchange Inc	ICE	55.540.17	0.20%	1.12%	9.80%	10.97%	0.0220%
IDEXX Laboratories Inc	IDXX	23,247.93	0.08%	0.00%	19.19%	19.19%	0.0161%
IDEX Corp	IEX	12,462.41	0.05%	1.27%	12.23%	13.58%	0.0061%
International Flavors & Fragrances Inc	IFF	13,999.43	0.05%	2.23%	9.57%	11.90%	0.0060%
Illumina Inc	ILMN	42,640.29	0.15%	0.00%	13.96%	13.96%	0.0215%
Incyte Corp	INCY	15,739.08	0.06%	0.00%	40.60%	40.60%	0.0231%
Intel Corp	INFO	273 428 61	0.11%	2.04%	6 22%	8.32%	0.0141%
Intuit Inc	INTU	72,984.77	0.26%	0.74%	13.96%	14.75%	0.0389%
International Paper Co	IP	15,966.98	0.06%	5.05%	6.10%	11.31%	0.0065%
Interpublic Group of Cos Inc/The	IPG	8,801.52	0.03%	4.14%	6.11%	10.37%	0.0033%
IPG Photonics Corp	IPGP	6,775.45	0.02%	0.00%	-10.17%	-10.17%	-0.0025%
IQVIA Holdings Inc	IQV	30,124.33	0.11%	0.00%	17.60%	17.60%	0.0191%
Ingersoll-Rand PLC		31,750.95	0.11%	1.70%	8.97%	10.75%	0.0123%
Intuitive Surgical Inc	ISRG	64 695 74	0.03%	0.00%	12 24%	12.37 %	0.0286%
Gartner Inc	IT	14,382.25	0.05%	0.00%	12.77%	12.77%	0.0066%
Illinois Tool Works Inc	ITW	56,239.64	0.20%	2.33%	6.87%	9.28%	0.0188%
Invesco Ltd	IVZ	7,852.36	0.03%	7.41%	6.09%	13.72%	0.0039%
Jacobs Engineering Group Inc	J	12,329.57	0.04%	0.78%	11.99%	12.81%	0.0057%
JB Hunt Transport Services Inc	JBHI	11,502.95	0.04%	1.00%	11.83%	12.90%	0.0054%
Johnson Controis International pic	IKHA JCI	30,141.00	0.11%	2.79%	9.07%	12.09%	0.0137%
Johnson & Johnson	JNJ	391 806 84	1 42%	2.69%	5 55%	8.32%	0.1177%
Juniper Networks Inc	JNPR	7,678.18	0.03%	3.43%	8.66%	12.24%	0.0034%
JPMorgan Chase & Co	JPM	415,145.14	1.50%	2.84%	6.80%	9.74%	0.1460%
Nordstrom Inc	JWN	5,722.63	0.02%	4.02%	6.00%	10.14%	0.0021%
Kellogg Co	К	23,266.03	0.08%	3.32%	1.65%	5.00%	0.0042%
KeyCorp	KEY	18,428.56	0.07%	4.18%	11.45%	15.87%	0.0106%
Keysight Lechnologies Inc	KEYS	17,523.74	0.06%	0.00%	8.19%	8.19%	0.0052%
Kinco Realty Corp	KIM	30,007.09 8 226 07	0.13%	5.40%	-2.00%	2.52%	0.0033%
KLA Corp	KLAC	26,152,86	0.09%	1.98%	13.90%	16.02%	0.0151%
Kimberly-Clark Corp	KMB	49,103.47	0.18%	2.98%	5.09%	8.15%	0.0145%
Kinder Morgan Inc/DE	KMI	47,269.83	0.17%	5.97%	3.10%	9.16%	0.0156%
CarMax Inc	KMX	15,854.89	0.06%	0.00%	10.31%	10.31%	0.0059%
Coca-Cola Co/The	KO	250,214.30	0.90%	2.86%	8.20%	11.18%	0.1010%
Kroger Co/The	KR	21,503.78	0.08%	2.24%	5.07%	7.38%	0.0057%
Koni's Corp Kansas City Southarn	KSS	6,693.28 16.210.70	0.02%	0.38%	8.00%	14.64%	0.0035%
Loews Corp	1	15 303 24	N/A	0.49%	N/A	N/A	N/A
L Brands Inc	LB	6,403.15	0.02%	5.19%	11.50%	16.98%	0.0039%
Leidos Holdings Inc	LDOS	14,222.92	0.05%	1.34%	10.00%	11.40%	0.0059%
Leggett & Platt Inc	LEG	6,262.98	0.02%	3.32%	10.00%	13.49%	0.0031%
Lennar Corp	LEN	20,437.69	0.07%	0.50%	12.59%	13.11%	0.0097%
Laboratory Corp of America Holdings	LH	17,031.34	0.06%	0.00%	5.32%	5.32%	0.0033%
		40,920.24	N/A 0.39%	1.30%	9.50%	11 34%	0.0447%
	LKQ	10.016.70	0.04%	0.00%	14.20%	14.20%	0.0051%
Eli Lilly & Co	LLY	134,072.66	0.48%	2.06%	10.49%	12.65%	0.0613%
Lockheed Martin Corp	LMT	120,760.42	0.44%	2.29%	8.89%	11.27%	0.0492%
Lincoln National Corp	LNC	10,805.05	0.04%	2.76%	9.00%	11.89%	0.0046%
Alliant Energy Corp	LNT	14,487.99	0.05%	2.40%	5.78%	8.24%	0.0043%
Lowe's Cos Inc		89,095.10	0.32%	1.81%	14.88%	10.83%	0.0341%
Southwest Airlines Co		28 934 66	0.15%	1.36%	7 70%	9 11%	0.0242 %
Las Vegas Sands Corp	LVS	50,160,47	0.18%	4.85%	4.45%	9.41%	0.0170%
Lamb Weston Holdings Inc	LW	13,339.67	0.05%	0.95%	8.97%	9.96%	0.0048%
LyondellBasell Industries NV	LYB	25,959.37	0.09%	5.81%	6.40%	12.40%	0.0116%
Live Nation Entertainment Inc	LYV	14,566.85	N/A	0.00%	N/A	N/A	N/A
Macy's Inc	M	4,928.00	0.02%	9.46%	-1.93%	17.04%	0.0013%
Mid-America Apartment Communities Inc		318,151.58	1.15% N/A	0.40% 2.02%	17.42% NI/A	17.91% N/A	U.2058%
Marriott International Inc/MD	MAR	45 790 83	0.17%	1.32%	7 32%	8 69%	0.0144%
Masco Corp	MAS	13,594.21	0.05%	1.01%	9.60%	10.66%	0.0052%
McDonald's Corp	MCD	161,139.38	0.58%	2.37%	8.99%	11.47%	0.0667%
Microchip Technology Inc	MCHP	23,295.54	0.08%	1.50%	9.31%	10.88%	0.0092%
McKesson Corp	MCK	25,696.60	0.09%	1.16%	-15.55%	-14.49%	-0.0134%
Moody's Corp	MCO	48,481.95	0.18%	0.82%	11.33%	12.20%	0.0214%
wondelez international Inc		02,017.12 157 722 49	0.30%	∠.U7% 1.84%	0.32% 7.62%	10.48%	0.0313%
Mett ife Inc	MET	45 714 87	0.00%	3.50%	9.02%	13 64%	0.0333 %
MGM Resorts International	MGM	15.995.41	0.06%	1.67%	1.97%	3.66%	0.0021%
Mohawk Industries Inc	MHK	9,431.22	0.03%	0.00%	8.35%	8.35%	0.0028%
McCormick & Co Inc/MD	MKC	21,719.80	0.08%	1.50%	5.00%	6.54%	0.0051%

		[4]	[5]	[6]	[7]	[8]	[9]
Company	Ticker	Market	Weight in Index	Estimated	Long-Term Growth Est		Weighted
Company	TICKEI	Capitalization	weight in index	Dividend Heid	Glowin Est.	DCF Result	DCF Result
MarketAxess Holdings Inc	MKTX	13,431.76	N/A	0.67%	N/A	N/A	N/A
Martin Marietta Materials Inc	MLM	16,487.64	0.06%	0.78%	13.85%	14.69%	0.0087%
Marsh & McLennan Cos Inc	MMC	56,452.19	0.20%	1.71%	11.17%	12.98%	0.0265%
3M CO Monster Beverage Corp	MIMM	91,237.54	0.33%	3.75%	0.05% 12.50%	10.53%	0.0347%
Altria Group Inc	MO	88 309 86	0.13%	7 29%	7 23%	14 79%	0.0472%
Mosaic Co/The	MOS	7,514.65	0.03%	0.97%	4.45%	5.44%	0.0015%
Marathon Petroleum Corp	MPC	35,388.03	0.13%	4.28%	11.58%	16.10%	0.0206%
Merck & Co Inc	MRK	217,528.89	0.79%	2.58%	10.44%	13.15%	0.1033%
Marathon Oil Corp	MRO	9,095.19	0.03%	1.76%	0.20%	1.96%	0.0006%
Morgan Stanley	MS	84,587.93	0.31%	2.88%	10.85%	13.88%	0.0424%
MISCI INC Microsoft Corp	MSCI	24,209.34	0.09%	1.00%	13.75%	14.82%	0.0130%
Motorola Solutions Inc	MSI	30.326.48	0.11%	1.30%	7.10%	8.44%	0.0092%
M&T Bank Corp	MTB	22,237.91	0.08%	2.69%	5.46%	8.22%	0.0066%
Mettler-Toledo International Inc	MTD	18,440.51	0.07%	0.00%	11.79%	11.79%	0.0079%
Micron Technology Inc	MU	58,976.28	0.21%	0.00%	6.19%	6.19%	0.0132%
Maxim Integrated Products Inc	MXIM	16,195.98	0.06%	3.20%	6.73%	10.03%	0.0059%
Mylan NV Noble Epergy Inc	NBI	11,055.56	0.04%	0.00%	2.90%	2.90%	0.0012%
Norwegian Cruise Line Holdings Ltd	NCI H	11 456 99	0.03%	0.10%	8 21%	8.32%	0.0034%
Nasdaq Inc	NDAQ	19,089.55	0.07%	1.70%	7.83%	9.60%	0.0066%
NextEra Energy Inc	NEE	131,089.70	0.47%	2.10%	7.97%	10.15%	0.0481%
Newmont Corp	NEM	37,590.79	0.14%	1.83%	7.70%	9.60%	0.0130%
Netflix Inc	NFLX	151,427.79	0.55%	0.00%	29.57%	29.57%	0.1617%
		10,948.57	0.04%	2.74%	4.68%	7.48%	0.0030%
NIKE IIIC Nortoni ifel ock inc		149,975.00	0.54%	1 41%	4.25%	6 11%	0.0828%
Nielsen Holdings PLC	NLSN	7.258.53	0.03%	5.48%	8.75%	14.47%	0.0038%
Northrop Grumman Corp	NOC	62,791.84	0.23%	1.49%	16.49%	18.11%	0.0411%
National Oilwell Varco Inc	NOV	7,952.00	0.03%	0.98%	54.53%	55.77%	0.0160%
ServiceNow Inc	NOW	63,790.18	0.23%	0.00%	36.26%	36.26%	0.0835%
NRG Energy Inc	NRG	9,281.31	0.03%	0.33%	37.98%	38.37%	0.0129%
NetApp lpc	NTAD	12 187 28	0.19%	3.50%	5 54%	0.22%	0.0255%
Northern Trust Corp	NTRS	20 724 14	0.04%	2.97%	9 42%	12 53%	0.0041%
Nucor Corp	NUE	14,399.69	0.05%	3.39%	6.80%	10.31%	0.0054%
NVIDIA Corp	NVDA	144,695.16	0.52%	0.27%	9.17%	9.46%	0.0494%
NVR Inc	NVR	13,866.18	0.05%	0.00%	12.23%	12.23%	0.0061%
Newell Brands Inc	NWL	8,269.00	0.03%	4.71%	-12.53%	-8.11%	-0.0024%
News Corp Realty Income Corp	NVSA	8,080.98	0.03%	1.42%	-1.25%	0.17%	0.0000%
Old Dominion Freight Line Inc	ODEI	15 663 77	0.09%	0.34%	4.95%	13 23%	0.0075%
ONEOK Inc	OKE	30.927.65	0.11%	4.76%	12.31%	17.36%	0.0194%
Omnicom Group Inc	OMC	16,397.40	0.06%	3.45%	4.16%	7.68%	0.0045%
Oracle Corp	ORCL	168,241.19	0.61%	1.78%	8.18%	10.04%	0.0610%
O'Reilly Automotive Inc	ORLY	30,725.08	0.11%	0.00%	11.95%	11.95%	0.0133%
Occidental Petroleum Corp	OXY	35,482.57	0.13%	7.82%	4.80%	12.81%	0.0164%
Paycom Sollware Inc Paychey Inc	PATC	18,580.23	0.07%	0.00%	26.00%	20.00%	0.0174%
People's United Financial Inc	PBCT	6.835.29	0.02%	4.65%	2.00%	6.70%	0.0017%
PACCAR Inc	PCAR	25,698.92	0.09%	3.56%	4.47%	8.11%	0.0075%
Healthpeak Properties Inc	PEAK	18,353.23	0.07%	4.11%	3.64%	7.83%	0.0052%
Public Service Enterprise Group Inc	PEG	29,939.01	0.11%	3.17%	5.22%	8.48%	0.0092%
PepsiCo Inc	PEP	198,037.71	0.72%	2.67%	5.08%	7.81%	0.0559%
Pfizer Inc Principal Einancial Group Inc	PFE	206,090.72	0.74%	3.99%	2.77%	6.81%	0.0507%
Procter & Gamble Co/The	PG	307 743 22	1 11%	2 40%	7 44%	9.93%	0.0008%
Progressive Corp/The	PGR	47,171.37	0.17%	3.33%	6.23%	9.67%	0.0165%
Parker-Hannifin Corp	PH	25,139.26	0.09%	1.74%	7.82%	9.62%	0.0087%
PulteGroup Inc	PHM	12,054.39	0.04%	1.08%	11.97%	13.10%	0.0057%
Packaging Corp of America	PKG	9,063.50	0.03%	3.39%	10.00%	13.56%	0.0044%
PerkinElmer Inc	PKI	10,274.60	0.04%	0.30%	7.67%	7.98%	0.0030%
Prologis Inc Philip Morris International Inc	PLD	58,079.20 128.670.83	0.21%	2.41%	6.04%	9.87%	0.0209%
PNC Financial Services Group Inc/The	PNC	64.322.15	0.23%	3.26%	7.57%	10.96%	0.0255%
Pentair PLC	PNR	7,216.23	0.03%	1.76%	7.96%	9.79%	0.0026%
Pinnacle West Capital Corp	PNW	10,981.41	0.04%	3.09%	4.67%	7.83%	0.0031%
PPG Industries Inc	PPG	28,337.75	0.10%	1.78%	5.52%	7.35%	0.0075%
PPL Corp	PPL	26,166.57	0.09%	4.56%	1.38%	5.97%	0.0056%
Perrigo Co PLC Prudential Einancial Inc	PRGO	7,763.69	0.03%	1.41%	-1.60%	-0.20%	-0.0001%
Public Storage	PRU PSA	30,000.12	0.13%	4.40%	9.00% 3.51%	7 15%	0.0100%
Phillips 66	PSX	40.600.95	0.15%	4.21%	-0.04%	4.17%	0.0061%
PVH Corp	PVH	6,359.78	0.02%	0.17%	6.27%	6.45%	0.0015%
Quanta Services Inc	PWR	5,589.83	0.02%	0.33%	14.50%	14.85%	0.0030%
Pioneer Natural Resources Co	PXD	22,362.28	0.08%	0.62%	20.13%	20.81%	0.0168%
PayPal Holdings Inc	PYPL	133,592.97	0.48%	0.00%	18.81%	18.81%	0.0908%
		97,451.84 12 246 27	0.35%	3.00%	12.20%	15.44% 13.40%	0.0544%
		12,240.37	0.0470	0.2470	10.24 /0	10.4970	0.000070

Lower Company Lower Company Design of the company <thdesign company<="" of="" th="" the=""> Design of th</thdesign>			[4]	[5]	[6]	[7]	[8]	[9]
Company Company <t< th=""><th>Company</th><th>Ticker</th><th>Market</th><th>Weight in Index</th><th>Estimated Dividend Vield</th><th>Long-Term Growth Est</th><th>DCE Result</th><th>Weighted</th></t<>	Company	Ticker	Market	Weight in Index	Estimated Dividend Vield	Long-Term Growth Est	DCE Result	Weighted
Royal Gorban Chulse Ld PCL 24 (5432 0.09% 2.49% 10.05% 12.27% 0.00404 Regenser Theor Council Inter PEG 17.104.38 0.15% 0.007% 9.57% 0.00404 Regenser Theor Council Inter PEG 17.104.38 0.15% 0.007% 9.57% 0.00404 Robert Hartmanuscular Inter PEG 17.104.38 0.015% 2.007% 1.35% 0.00426 Robert Hartmanuscular Inter PER 0.578.39 0.0016% 0.00116% 0.0016% 0.0016	Company	TICKEI	Capitalization	weight in index	Dividend Tield	Glowin Est.	Der Result	DOI Result
Evenest Revolution Link Process Proces	Royal Caribbean Cruises Ltd	RCL	24,543.62	0.09%	2.49%	10.06%	12.68%	0.0112%
Indigets Questers Log Indigets	Everest Re Group Ltd	RE	11,279.11	0.04%	2.07%	10.00%	12.17%	0.0050%
Regions Francial Corp IRF 10.019.43 0.00% 4.10% 7.10% 10.00% 0.002% Reprinted James Financial Inc R.F 12.269.23 0.01% 12.69% 8.86% 11.11% 0.002% Readbed Inc R.M 12.269.23 0.01% 12.69% 8.86% 11.11% 0.002% Readbed Inc RMD 22.989.76 0.08% 10.01% 12.46% N.N	Regency Centers Corp Regeneron Pharmaceuticals Inc	REG	10,405.95	0.04%	3.77%	4.78%	8.64%	0.0032%
Refer Int International Inc. Ref. 11 Ref. 12 Ref. 1	Regions Financial Corp	RF	15,019.43	0.05%	4.19%	7.16%	11.50%	0.0062%
Exprend James Francial Into RJF 12,000,005% 12,05% 0.85% 11,51% 0.0025% Reckwell Automation Inc RD 12,248,41 0.05% 21,05% 0.05% 10,05% 0.05% 0.05% 0.05% 0.05% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.005% <	Robert Half International Inc	RHI	6,753.34	0.02%	2.23%	1.83%	4.08%	0.0010%
Paged Latin Corp Tub 2 Add Stress 0.04 Stress 2 Add Stress 0.04 Stress	Raymond James Financial Inc	RJF	12,699.63	0.05%	1.58%	9.85%	11.51%	0.0053%
Deckwair Laboration Inc. NOK L2 287, 7 O.08% L1 25% L.0.6% Int. Anno. NA Reger Exchancinges inc ROD 30,744,75 0.14% 0.54% 13,10% 13,38% 0.0167% Regering Construct Regering Construct Regering Construct 15% 0.47% 10,10% 0.26% Regering Construct Regering Construct 16% 0.47% 10,07% 0.017% Regering Construct REGO 30,071 0.11% 0.26% 24,067 0.01% 0.26% 24,007 0.017% 0.022% State Construct 0.012% 0.012% State Construct 0.0022% State Construct 0.022% State Construct 0.022% State Construct 0.0024% 0.0012% 0.0012% State Construct 0.0025% 0.0025% 0.0012% 0.0025% 0.0012% 0.0	Ralph Lauren Corp	RL	8,468.96	0.03%	2.40%	6.05% 12.61%	8.52%	0.0026%
Rolline Inc. INO. 12.428.41 INA. 1.40% INA. NA NA Roses Torthonologies Inc. FOOT 40.283.01 0.14% 0.64% 13.01% 13.88% 0.0149% Roses Stores Inc. FOOT 40.283.01 0.14% 0.24% 13.24% 0.0149% 0.0147% Roses Stores Inc. FRIT 0.012% 0.22% 1.24% 0.24% 0.24% 0.24% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.022% 0.24% 0.24% 0.24% 0.027% 0.022% 0.04% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.027% 0.0264% 0.007% 0.027% 0.0264% 0.0027% 0.027% 0.0264% 0.027% 0.0264% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0025% 0.0	Rockwell Automation Inc	ROK	22,303.70	0.08%	2.13%	8.08%	10.30%	0.0083%
Roym Technologies Inc. ROP 337.47.5 0.14% 0.54% 13.10% 13.85% 0.0195% 0.0197% Section Constance ROP 10.15% 0.015% 0.025% 13.74% 0.0257% 13.85% 0.017% 14.22% 10.71% 0.22% 15.74% 0.0257% 15.85% 0.74% 0.0257% 15.85% 0.74% 0.0257% 15.85% 0.74% 0.0257% 15.85% 0.74% 0.0257% 15.85% 0.74% 0.0257% 15.85% 0.74% 0.0257% 15.85% 0.74% 0.0256% 0.22% 15.95% 0.74% 0.025% 15.74% 0.0256% 0.22% 15.95% 0.22% 0.74% 15.55% 0.27% 15.95% 0.27% 15.95% 0.27% 15.95% 0.27% 15.95% 0.27% 15.95% 0.27% 15.95% 0.27% 15.95% 0.27% 15.95% 0.27% 15.95% 0.27% 15.95% 0.26% 0.27% 15.95% 0.26% 0.27% 15.95% 0.26% 0.27% 15.95% 0.26% 0.27% 15.95% 0.26% 0.27% 15.95% 0.26% 0.27% 15.95% 0.26% 0.27% 15.95% 0.26% 0.27% 15.95% 0.26% 0.25% 15.95% 0.26% 0.25% 15.95% 0.26% 0.25% 15.95% 0.26% 0.25% 15.95% 0.26% 0.25% 15.95% 0.26% 0.25	Rollins Inc	ROL	12,426.41	N/A	1.40%	N/A	N/A	N/A
Acids Stores inc HOSI 40.28.01 0.19% 0.94% 9.83% 10.74% 0.197% SBA Communications Corp SBAC 2.21% 1.65% 7.41% 0.31% 0.007% SBA Communications Corp SBAC 2.810071 0.10% 0.26% 1.26% 7.41% 0.31% 0.0027% Sandwals CorpThe SCHW 68.612.99 0.21% 1.64% 3.63% 6.20% 0.00114% SVB Financial Group Inte SCHW 68.612.94 0.02% 1.64% 3.63% 6.20% 0.00114% SVB Financial Group Inte SEE 6.446.31 0.04% 0.02% 1.150% 1.157% 0.0015% SVB Financial Group Inte SLB 4.63.851 0.035% 2.41% 6.02% 0.015% SAL Green Really Corp SLE 4.41.97 0.03% 2.41% 6.02% 0.015% Sandern Cirb SD 7.78.517 0.33% 2.41% 6.02% 0.015% Sander Cirb SD 7.78.517 0.035% <t< td=""><td>Roper Technologies Inc</td><td>ROP</td><td>39,714.75</td><td>0.14%</td><td>0.54%</td><td>13.10%</td><td>13.68%</td><td>0.0196%</td></t<>	Roper Technologies Inc	ROP	39,714.75	0.14%	0.54%	13.10%	13.68%	0.0196%
Paperbare Co. PTN 61/57/15 0.22% 1.85% 7.41% 0.037% 0.037% SBA Communications Corp SBA Communications Corp SBA Cortan 0.049% 2.24/07.1 0.049% 2.24/07.1 0.049% 2.24/07.1 0.049% 2.37% 0.039% 0.039% 0.039% 0.039% 0.039% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.049% 0.022% 0.049% 0.022% 0.049% 0.022% 0.049% 0.022% 0.049% 0.022% 0.044% 0.022% 0.044% 0.022% 0.044% 0.022% 0.044% 0.044% 0.044% 0.044% 0.044% 0.044% 0.044% 0.022% 0.044%	Ross Stores Inc	ROST	40,263.01	0.15%	0.91%	9.83%	10.79%	0.0157%
SBA Communications Corp SBAC 281 Or 7 0.10% 0.28% 284 Ors 0.272% 0.0322% Charles Schwab CopThe SCHW 56,542.97 0.21% 1.64% 3.63% 5.37% 0.0322% Seleta Af CopThe SCHW 56,452.31 0.24% 1.64% 3.63% 5.30% 0.0114% SWB Finnal Group The SWB Finnal Group The </td <td>Republic Services Inc Raytheon Co</td> <td>RTN</td> <td>61 527 15</td> <td>0.11%</td> <td>1.64%</td> <td>0.30% 7.41%</td> <td>9.31%</td> <td>0.0111%</td>	Republic Services Inc Raytheon Co	RTN	61 527 15	0.11%	1.64%	0.30% 7.41%	9.31%	0.0111%
Starbuck Corp SBUX 99.564.97 0.35% 1.95% 1.55% 5.04% 0.012% Sealed AL Corp SEE 5.486.31 0.02% 1.81% 5.05% 0.0014% Sealed AL Corp SEE 5.486.31 0.02% 1.81% 5.05% 0.0015% VIS Financial Corp SEE 5.486.31 0.02% 1.81% 5.05% 0.0025% VIS Financial Corp SLG 7.481.07 0.03% 3.29% 1.27% 0.0025% Schumberger Lt SLG 7.481.07 0.03% 3.89% 7.55% 0.064% Schumberger Lt SLG 7.481.07 0.03% 3.89% 7.55% 0.11%% Schumberger Lt SLG 7.481.07 0.03% 3.29% 1.07% 0.002% Samon Property Group Inc SPG 2.226.417 0.28% 0.27% 1.47% 0.011% S2.35% 0.025% 0.011% S2.25% 0.025% 0.011% S2.3% 0.011% S2.25% 0.0215% S2.25% 0.0215%	SBA Communications Corp	SBAC	28,100.71	0.10%	0.28%	28.40%	28.72%	0.0292%
Charles Schwab Corp. The SCHW 58.512.59 0.21% 1.44% 3.65% 5.30% 0.0112% Sandar Ar Corp. The SCHW 58.512.59 0.21% 1.61% 5.05% 0.0014% 0.02% SCHW 51.44.43 0.02% 1.51% 1.60% 0.02% 1.22% 4.61% 0.0022% SCHW 51.44.43 0.04% 0.02% 1.22% 4.61% 0.0022% SCHW 51.42% 0.003% SCHW 53.22% 0.11% 0.022% SCHW 53.22% 0.01% SCHW 55.22% SCHW 55.22% 0.01% SCHW 55.22% 0.01% SCHW 55.22% SCH	Starbucks Corp	SBUX	99,564.97	0.36%	1.95%	13.65%	15.74%	0.0566%
Setter Mit Mark Setter bit 12, 12, 12, 12, 12, 12, 12, 12, 12, 12,	Charles Schwab Corp/The	SCHW	58,512.59	0.21%	1.64%	3.63%	5.30%	0.0112%
SVB Financial Group SIVE 12/44/39 0.04% 0.02% 11.50% 11.52% 0.0022% Schlumberger Ld SLB 46,385.11 0.17% 5.32% 1.27% 4.61% 0.0022% Schlumberger Ld SLB 46,385.11 0.17% 5.37% 28.04% 0.022% Schumberger Ld SLB 22.026.10 0.33% 2.44% 6.8.2% 1.16% 0.002% Singer Property Group Inc SPC 0.048% 0.60% 1.17% 1.27% 0.019% Simon Property Group Inc SPC 40.085% 0.015% 4.30% 1.147% 12.25% 0.0219% Sempar Energy SPE 40.85% 0.016% 2.42% 10.00% 11.6% 0.0219% Sempar Technology PLC STT 2.750.83 0.10% 2.48% 8.61% 11.6% 0.0219% Sempar Technology PLC STT 2.750.83 0.00% 1.78% 1.65% 0.42% 0.015% 0.028% 0.020% SinteSthenerclogy PLC STT	Sealed Air Corp Sherwin-Williams Co/The	SEE	5,485.31	0.02%	0.96%	5.08%	0.93% 12.26%	0.0014%
JM Smucker Col ^{The} SJM 11,117.38 0.04% 3.32% 1.27% 4.61% 0.0029% SL Green Realty Corp SLG 7.481.07 0.03% 3.89% 7.68% 11.62% 0.003% SL Green Realty Corp SLG 7.481.07 0.03% 3.89% 7.68% 11.62% 0.003% Synopsyn Inc SNPS 22.205.40 0.05% 0.07% 13.77% 13.77% 0.0110% Synopsyn Inc SNPS 22.205.40 0.05% 0.05% 0.05% 0.05% 0.05% 0.05% 0.038% 0.0318% Synopsyn Inc 0.0318% 0.0318% 0.0318% Synopsyn Inc 0.0318% 0.0318% 0.0318% 0.0318% 0.0318% 0.0318% 0.0318% 0.0318% 0.005% 0.055% 0.010% 1.101% 0.0015% Synopsyn Inc 0.0318% 0.005% Synopsyn Inc 0.0318% 0.005% Synopsyn Inc 0.005% Synopsyn Inc 0.0318% 0.005% Synopsyn Inc 0.005% Synopsyn Inc 0.005% Synopsyn Inc	SVB Financial Group	SIVB	12,414.39	0.04%	0.02%	11.50%	11.52%	0.0052%
Schlumberger Lid SLB 46,385.11 0.17% 5.57% 26,04% 32,78% 0.0549% Singo-on Inc SNA 8,755.12 0.03% 2.41% 6,62% 9,11% 0.002% Southern CorThe SN 73,380,80 0.27% 3.59% 4.10% 7,63% 0.002% Southern CorThe SO 7,380,87 0.27% 3.59% 4.10% 7,63% 0.0205% Southern CorThe SO 7,380,87 0.27% 3.59% 4.10% 0.0205% Service Corp STE 22,75% 0.05% 4.10% 0.0205% 0.0205% Service Torp STE 12,750,83 0.10% 2.88% 8.01% 1.10% 0.0205% State Street Corp STT 2,760,83 0.10% 2.48% 8.01% 1.10% 0.0005% State Street Corp STZ 36,138,73 0.13% 1.59% 5.17% 6.80% 0.0005% State Street Corp Street Corp Street Corp Street Corp 3.17%	JM Smucker Co/The	SJM	11,817.38	0.04%	3.32%	1.27%	4.61%	0.0020%
SL Green Really Corp SLG 7.481.07 0.03% 3.84% 7.84% 11.82% 0.0031% Syncaps Inc SNP 3.2208.40 0.05% 0.241% 6.62% 0.11% 0.0029% Syncaps Inc SNP 3.2208.40 0.05% 0.05% 0.62% 1.37% 1.37% 0.0110% Syncaps Inc SNP 3.2208.40 0.05% 0.05% 0.62% 4.37% 0.065% 0.015% SSP Global Inc SPG 40.85% 0.015% 0.25% 0.47% 11.47% 1.22% 0.031% SSP Global Inc SPG 40.85% 0.015% 0.25% 0.05% 0.05% 0.005% 0.010% 11.10% 0.0015% SSP Global Inc STE 1.27% 0.05% 0.05% 0.05% 0.010% 11.10% 0.0015% STERIS PLC STE 1.27% 0.05% 0.05% 0.05% 0.05% 0.010% 11.10% 0.0015% STERIS PLC STX 14.477.91 0.05% 0.28% 0.015% 0.10% 11.05% 0.005% 0.005% 0.010% 0.005% 0.007% 0.37% 0.22% 0.007% 0.37% 0.22% 0.007% 0.37% 0.005% 0.007% 0.37% 0.007% 0.37% 0.005% 0.007% 0.37% 0.007% 0.37% 0.005% 0.007% 0.37% 0.005% 0.007% 0.37% 0.005% 0.007% 0.37% 0.007% 0.37% 0.005% 0.007% 0.37% 0.007% 0.38% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.38% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.38% 0.007% 0.37% 0.007% 0.37% 0.007% 0.38% 0.007% 0.37% 0.007% 0.37% 0.007% 0.38% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.37% 0.007% 0.007% 0.37% 0.0005% 0.007% 0.007% 0.007% 0.007% 0.005% 0.000% 0.007% 0.000% 0.003%	Schlumberger Ltd	SLB	46,395.11	0.17%	5.97%	26.04%	32.78%	0.0549%
Shapen Inc SNA B, 155, 12 U.03% 2,41% D, 2,7% 9,11% U.0,02% Syncaps Inorb SNA 3,155, 12 U.03% 2,41% D, 21% 0,11% 0,21% 0,1	SL Green Realty Corp	SLG	7,481.07	0.03%	3.89%	7.58%	11.62%	0.0031%
Shana Pura Stop 23333.87 0.27% 0.59% 1.0% 1.6% 0.0025% Stron Program Group Inc SPGI 71.787.61 0.29% 0.77% 11.47% 12.29% 0.0315% SAP Global Inc SPGI 71.787.61 0.29% 0.77% 11.47% 12.29% 0.0315% SAP Global Inc SPGI 71.787.61 0.29% 10.10% 11.10% 0.0205% STEINS PLC STE 12.775.97 0.05% 2.89% 8.61% 11.01% 0.0005% State Street Corp STT 14.971.91 0.05% 4.50% 5.37% 9.99% 0.0025% Stymork Sciultures Inc SWK 2.420.40 0.09% 1.77% 8.66% 10.50% 0.0028% Stymork Sciultures Inc SWK 2.420.40 0.09% 1.77% 8.66% 10.51% 0.0228% Stymork Sciultures Inc SWK 2.420.40 0.09% 1.57% 0.243% 0.013% Strate Street Corp SYF 7.99.61.32 0.07%	Snap-on Inc	SNA	8,755.12	0.03%	2.41%	6.62%	9.11%	0.0029%
Simon Property Group Inc SPG 40,855.60 0.15% E.25% 4.30% 10.89% 0.015% Sempta Energy SRE 45,283.76 0.26% 0.777.87 0.26% 0.778 0.26% 0.771.778 0.26% 0.771.778 0.026% 5757.87 0.05% 0.95% 10.10% 12.83% 0.0026% 0.0054% 0.0017% 0.13% 1.59% 5.17% 6.86% 0.0009% Skyortcs Solutions inc SWKKS 19,250.06 0.07% 1.37% 17.22% 0.0107% 2.47% 0.0107% 2.47% 0.0107% 2.47% 0.0107% 2.47% 0.0107% 2.47% 0.0107% 2.47% 0.0107% 1.37% 17.22% 0.0115% 2.06% 9.96% 1.01115%	Southern Co/The	SO	22,205.40 73 830 87	0.08%	3 50%	4 10%	7.68%	0.0110%
SAP Global Inc SPGI 71,787.61 0.28% 0.77% 11.47% 12.29% 0.0319% STERIS PLC STE 45,283.76 0.16% 2.42% 10.00% 11.10% 0.0205% STERIS PLC STE 12,775.97 0.05% 0.95% 8.61% 11.10% 0.004% Constellation Findmain Inc STZ 36,737 0.13% 1.59% 6.77% 9.99% 0.0064% Constellation Findmain Inc SWK 2.420.4 0.09% 1.77% 8.65% 10.57% 0.0069% Synchros Notions Inc SWK 2.420.4 0.09% 1.27% 8.65% 10.57% 0.0026% Synchros Notions Inc SWK 2.421.0 0.07% 2.441% 0.43% 2.041% 0.017% Synchros Notions Inc SWK 12.07% 0.017% 2.01% 0.017% 1.17% 0.006% Synchros Notions Inc TDG 3.446.58 0.12% 0.006% 1.36% 0.0134% Transolig Cop TFC 69.215.0	Simon Property Group Inc	SPG	40,859.60	0.15%	6.25%	4.30%	10.68%	0.0158%
Sempta Energy SRE 45,283,76 0.16% 2.42% 10.00% 11.05% 0.0265% State Street Corp STT 27,500.83 0.10% 2.88% 10.01% 11.05% 0.0054% State Street Corp STT 14,971.91 0.05% 4.59% 5.37% 9.99% 0.0064% Constellation Brands Inc STZ 38,138,73 0.13% 1.59% 8.65% 10.00% 0.0064% Skynoths Solutions Inc SWKS 19,230.40 0.07% 1.37% 18.72% 0.1017% Styntery Financial SWK 19,233.10 0.26% 1.10% 9.04% 1.10% 0.017% Stryter Corp SK 72,879.30 0.26% 1.10% 9.04% 1.10% 0.017% Stryter Corp SK 72,879.30 0.26% 1.66% 4.54% 1.10% 0.014% 1.86% 0.113% Machine Darge Cor TAP 12,194.45 0.04% 1.53% 0.024% 0.014% 1.13% 1.13% 1.013% <td< td=""><td>S&P Global Inc</td><td>SPGI</td><td>71,787.61</td><td>0.26%</td><td>0.77%</td><td>11.47%</td><td>12.29%</td><td>0.0319%</td></td<>	S&P Global Inc	SPGI	71,787.61	0.26%	0.77%	11.47%	12.29%	0.0319%
STERISPLC STE 12,775.97 0.05% 0.99% 10.10% 11.10% 0.0051% State Street Corp ST 14,971.91 0.05% 4.50% 5.37% 9.99% 0.0054% Constellation Enrands inc STZ 36,138.73 0.13% 1.59% 5.17% 6.80% 0.0089% Stariey Black & Decker Inc SWK 24,220.04 0.09% 1.77% 17.23% 18.72% 0.0107% Synchrony Financial SYF 19.961.32 0.07% 2.84% 0.03% 1.05% 0.0022% Synchrony Financial SYF 19.961.32 0.07% 2.84% 1.05% 0.017% Synchrony Corp SYF 74.970.06 0.26% 1.05% 2.05% 5.93% 1.12% 0.1175% MoteoDor Group Inc TCG 2.4448.58 0.04% 0.00% 9.89% 1.05% 1.029% 0.0144% Traieffax Inc TTG 56.160.77 0.26% 1.27% 0.0144% 0.0144% 1.014% 0.00144% 1.014% <td>Sempra Energy</td> <td>SRE</td> <td>45,283.76</td> <td>0.16%</td> <td>2.42%</td> <td>10.00%</td> <td>12.53%</td> <td>0.0205%</td>	Sempra Energy	SRE	45,283.76	0.16%	2.42%	10.00%	12.53%	0.0205%
State Street Corp S11 27,900,83 0.10% 2.88% 8.81% 11.61% 0.0115% Constellation Brands Inc STZ 38,138,73 0.13% 1.59% 5.17% 6.80% 0.0084% Constellation Brands Inc SWK 22,204 0.09% 1.7%% 8.85% 10.50% 0.0028% Skynoths Solutions Inc SWK 12,253,06 0.07% 1.37% 17.23% 18.72% 0.0130% Stynethory Financial SYK 78,873,08 0.28% 1.10% 9.44% 0.43% 1.01% 0.029% Stynethory Financial SYK 78,873,08 0.28% 1.10% 9.44% 1.29% 0.117% Stynethory Financial SYK 78,873,08 0.28% 1.10% 9.44% 1.29% 0.017% Stynethory Financial SYK 78,719,09 0.02% 3.445,51 0.017% 2.44% 1.29% 0.113% Dison Coros Baverage Co TAP 12,70,40 0.006% 1.38% 11.64% 0.16%	STERIS PLC	STE	12,775.97	0.05%	0.95%	10.10%	11.10%	0.0051%
Segar Houmody FLD ST2 ST2 0.03% 4.59% ST7% 0.03% 2.26% 0.0089% Staniely stark & Decker Inc SWK 2.2500 0.09% 1.78% 8.77% 0.009% Staniely stark & Decker Inc SWK 2.2530 0.09% 1.78% 8.72% 0.0017% Synchrony Financial SYK 1.96132 0.07% 2.24% 1.04% 2.40% 0.017% Stryter Corp SYK 1.91003 0.07% 2.24% 1.04% 0.017% Stryter Corp SYK 1.91003 0.09% 5.55% 9.43% 11.12% 0.0175% AT81 Inc T 272,93310 0.99% 5.55% 4.74% 1.29% 0.0006% TransDigm Group Inc TDG 3.44658 0.11% 0.00% 9.99% 12.08% 0.0144% Trueletax Inc TFC 69.215.50 0.25% 3.63% 4.74% 0.77% 6.77% 0.0144% Trueletax Inc TFE 1.014.00 0.06% <	State Street Corp	SII	27,500.83	0.10%	2.88%	8.61%	11.61%	0.0115%
Stanley Black & Deckar Inc SVMC 24/22D 40 0.00% 1.78% 8.65% 10.69% 0.0092% Syndex Southons Inc SVMCS 10.253 06 0.07% 1.24% 9.43% 10.69% 0.0017% Syndex Corp SYK 78.870 80 0.28% 1.10% 9.38% 10.61% 0.0029% Syndex Corp SYK 78.870 80 0.28% 1.01% 9.38% 10.61% 0.0029% Syndex Corp SYY 41.910.03 0.15% 2.05% 5.58% 11.26% 0.113% Molson Core Beverage Co TAP 17.29.331.0 0.09% 5.65% 5.58% 11.28% 0.0148% Teaching Inc TDG 34.446.58 0.04% 3.63% 8.93% 12.28% 0.0148% Teaching Inc TEC 60.215.50 0.25% 8.63% 12.63% 0.028% 15.47% 0.0089% Traget Corp TFC 162.215.50 0.28% 15.43% 0.066% 1.74% 0.28% 15.47% 0.028%	Constellation Brands Inc	STZ	36 138 73	0.03%	4.50%	5.37 %	9.99 <i>%</i> 6.80%	0.0034 %
Slyworks Solutions Inc SWKS 19.253.06 0.07% 1.37% 17.23% 18.72% 0.0130% Snyherory Financial SYK 78.879.08 0.28% 1.10% 9.38% 10.61% 0.0299% Snyherory Financial T 272.933.10 0.99% 5.55% 9.43% 11.15% 0.0175% AT&T Inc T 272.933.10 0.99% 5.55% 4.74% 1.29% 0.0006% Moleon Coors Beverage Co TAP 12.19.45 0.04% 5.83% 4.74% 1.29% 0.0143% Te Connectivity Lid TEC 30.801.22 0.11% 2.00% 9.99% 12.08% 0.0143% Trielders Inc TFC 69.215.50 0.25% 3.63% 4.74% 1.27% 0.0314% Trielders Inc TFC 56.116.07 0.20% 2.99% 12.65% 0.024% Trielders Inc TMO 125.686.44 0.45% 12.57% 12.65% 0.0328% Taxer Sola Inc/The TRV 71.10.86 0.33%	Stanley Black & Decker Inc	SWK	24,220.04	0.09%	1.78%	8.65%	10.50%	0.0092%
Synchrony Financial SYF 19,961.32 0.07% 2.44% -0.43% 2.40% 0.017% Styker Corp SYY 74,970.00 0.28% 1.10% 9.36% 10.51% 0.0299% Syco Corp SYY 74,970.00 0.15% 2.05% 5.58% 11.25% 0.0175% AT&T Inc T 272,933.10 0.099% 5.55% 5.58% 11.26% 0.0108% Tranabigm Group Inc TDG 34,446.58 0.012% 0.00% 11.86% 0.0148% Tristel Financial Corp TFC 69,215.50 0.25% 3.63% 8.93% 12.72% 0.0318% Target Corp TGT 56,116.07 0.20% 2.39% 9.55% 10.05% 0.024% TMX Co sinc/The TJX TN 71,035.97 0.24% 0.26% 1.27% 0.0328% Tarder Suppl Co TROW 31,022.99 0.14% 0.27% 1.27% 0.045% Trader Supply Co TROW 31,022.99 0.14% 0.27%	Skyworks Solutions Inc	SWKS	19,253.06	0.07%	1.37%	17.23%	18.72%	0.0130%
Stryker Corp SYK 78,79.08 0.28% 1.0% 9.36% 10.51% 0.0299% Sysec Corp SYY 41.910.03 0.15% 2.05% 9.43% 11.57% 0.0175% AT&T Inc T 272,933.10 0.99% 5.55% 5.58% 11.29% 0.01173% Molson Coors Beverage Co TAP 12.194.50 0.04% 3.53% 4.74% 1.29% 0.0114% E Connectivity Ltd TEL 30.801.22 0.04% 3.63% 8.93% 12.72% 0.0314% Treelefax Inc TFX 17.199.40 0.06% 0.36% 15.48% 0.0029% Target Cop TG 56.16.07 0.26% 12.67% 12.05% 0.0050% TAK Cos IncThe TJX 71.058.07 0.26% 12.67% 12.48% 0.0288% T-Mobile US Inc TMU 25.586.44 0.43% 5.27% 10.44% 0.0165% Tapesity Inc TRV 31.02.83 0.113% 2.43% 0.0660% 12.45%	Synchrony Financial	SYF	19,961.32	0.07%	2.84%	-0.43%	2.40%	0.0017%
Systo Corp SY 4 1,910,13 0.13% 2.0% 9.43% 11.5/% 0.01175% Molson Coors Beverage Co TAP 12,109,45 0.04% 3.53% 4.74% -1.29% -0.0008% Tranabigm Group Inc TDG 3.446.58 0.02% 9.99% 12.08% 0.014% Tricis Financial Corp TFC 0.9215.50 0.25% 3.63% 8.39% 12.08% 0.0134% Teidefiex Inc TFX 17,199.40 0.06% 0.36% 15.48% 0.0029% Target Corp TGT 56.16.07 0.29% 2.39% 9.55% 12.05% 0.0044% TJX Cos InorThe TJX 17.10.35.97 0.26% 12.57% 12.84% 0.0058% Tarweler Scientific Inc TMO 125.568.44 0.45% 0.28% 12.57% 12.84% 0.038% Taweler Scientific Inc TMU 125.568.44 0.45% 0.28% 0.014% 13.22% 0.0149% Taweler Scientific Inc TMU 125.06.013% 5.27% 13.06%<	Stryker Corp	SYK	78,879.08	0.28%	1.10%	9.36%	10.51%	0.0299%
Harm TAP 12.00.00 0.00% 0.00% 11.00% 11.20% 0.1110% Molson Coors Beverage Co TAP 12.109.45 0.04% 3.53% 4.74% 1.20% 0.0148% TransDigm Group inc TDG 34.446.58 0.11% 2.00% 9.98% 12.08% 0.0134% Truist Financial Corp TFC 69.215.50 0.25% 3.63% 8.93% 12.72% 0.0318% Target Corp TGT 66.116.07 0.20% 2.39% 9.55% 12.05% 0.0244% Thermo Fisher Scientific Inc TIMO 125.586.44 0.45% 0.25% 12.57% 0.0328% Tagestry Inc TPR 7,110.86 0.03% 5.27% 9.30% 14.81% 0.038% Tractor Supply Co TSCO 11.04.00 0.04% 1.55% 14.04% 0.014% Tractor Supply Co TSCO 1.004.00 0.04% 1.55% 10.75% 0.046% Tractor Supply Co TSCO 0.03% 0.00% 7.60%		SYY	41,910.03	0.15%	2.05%	9.43%	11.57%	0.0175%
TransDign Group Inc. TDG 34.446.58 0.12% 0.00% 11.86% 11.86% 0.0148% TE Connectivity Ltd TEL 30.801.22 0.13% 2.00% 9.98% 12.02% 0.0134% Traist Financial Corp TFC 69.215.50 0.25% 3.63% 8.93% 12.72% 0.0318% Target Corp TGT 56.116.07 0.20% 2.39% 15.46% 15.67% 0.0099% Tiffany & Co TIF 16.234.06 0.00% 1.74% 6.77% 8.57% 0.0050% Tyx Cos Inor/The TJX 7.103.59 0.26% 12.57% 12.24% 0.0038% Taractor Supply Co TROW 710.86 0.03% 5.27% 9.30% 14.81% 0.0038% Tractor Supply Co TSCO 1.040 0.04% 1.59% 10.78% 10.42% 0.017% Tractor Supply Co TSCO 1.024% 0.73% 6.00% 7.00% 0.038% Tractor Supply Co TSCO 1.18% 0.17%	Molson Coors Beverage Co	TAP	12,109.45	0.04%	3.53%	-4.74%	-1.29%	-0.0006%
TE Connectivity Ltd TEL 30.801.22 0.11% 2.00% 9.98% 12.08% 0.0134% Truist Financial Corp TFC 69.215.50 0.25% 3.63% 8.93% 12.08% 0.0018% Target Corp TGT 56.116.07 0.20% 2.39% 9.55% 12.05% 0.0024% Target Corp TGT 56.116.07 0.20% 2.39% 9.55% 0.0244% Trany & Co TIF 16.234.00 0.06% 1.74% 6.77% 0.0050% TAC Cos Inc/The TJX 71.035.97 0.24% 0.73% 6.00% 6.75% 0.0028% T-Mobile US Inc TMUS 67.752.97 0.24% 0.73% 6.00% 6.75% 0.0165% Travelers Cos Inc/The TRV 31.202.93 0.11% 2.43% 10.66% 13.22% 0.0149% Travelers Cos Inc/The TSN 30.191.01 0.11% 2.04% 10.33% 12.45% 0.0149% Travelers Cos Inc/The TSN 30.191.01 0.11%	TransDigm Group Inc	TDG	34,446.58	0.12%	0.00%	11.86%	11.86%	0.0148%
Truits Financial Corp TFC 69,215.50 0.25% 3.63% 8.93% 12.72% 0.0318% Teleflex Inc TFX 17,199.40 0.06% 0.36% 15.48% 15.87% 0.0099% Triffany & Co TF 16,304.60 0.06% 1.74% 6.77% 8.57% 0.0099% TAX Cos IncThe TJX 71,035.97 0.26% 1.56% 11.13% 12.78% 0.0328% T-Mobile US Inc TMU 125,586.44 0.45% 0.26% 12.57% 12.84% 0.0638% Tables Inc TMU 67,752.97 0.24% 0.73% 6.00% 6.75% 0.016% Taset Sup Inc TRN 7,110.86 0.03% 5.27% 9.30% 14.81% 0.0038% Tractor Supply Co TSCO 11,04.00 0.04% 1.59% 10.76% 12.45% 0.014% Textor Supply Co TSN 30,191.01 0.11% 2.04% 10.33% 12.46% 0.0138% Textors Inc TWN 12,780.66	TE Connectivity Ltd	TEL	30,801.22	0.11%	2.00%	9.98%	12.08%	0.0134%
leteletx inc IFX 17,199,40 0.009% 2.39% 15.48% 15.87% 0.0099% Target Corp TGT 56,116.07 0.20% 2.39% 9.55% 12.05% 0.00244% TIM cos Inc/The TJX 71.035.97 0.26% 1.56% 11.13% 12.78% 0.0328% Thermo Fisher Scientific Inc TMO 125.586.44 0.45% 0.26% 12.57% 12.84% 0.0638% Tapestry Inc TRC 7,110.86 0.03% 5.27% 9.30% 14.81% 0.0038% Travelers Cos Inc/The TRVW 31.202.93 0.11% 2.43% 10.66% 13.22% 0.014% Travelers Cos Inc/The TRV 33.028.91 0.12% 2.57% 11.75% 14.47% 0.014% Tyson Foods Inc TSN 33.0191.0 0.11% 2.04% 10.33% 12.48% 0.004% Taker No Interactive Software Inc TWTO 14.127.56 0.05% 0.00% 7.60% 7.60% 0.038% Texas Instruments Inc </td <td>Truist Financial Corp</td> <td>TFC</td> <td>69,215.50</td> <td>0.25%</td> <td>3.63%</td> <td>8.93%</td> <td>12.72%</td> <td>0.0318%</td>	Truist Financial Corp	TFC	69,215.50	0.25%	3.63%	8.93%	12.72%	0.0318%
Indiget Colp TG1 36,116.07 0.20% 2.39% 9.39% 12.03% 0.0244% Triffany & Co Tif 16,224.06 0.06% 1.74% 6.77% 8.57% 0.0050% T.X Cos Inc/The TJX T/1,035.97 0.26% 1.25% 12.57% 12.84% 0.0328% T-Mobile US Inc TMUS 67,752.97 0.24% 0.73% 6.00% 6.75% 0.0165% Tapestry Inc TRV 31,202.93 0.11% 2.43% 10.66% 13.22% 0.0149% Tractor Supply Co TSCO 11,040 0.04% 1.59% 10.78% 12.45% 0.0149% Tyson Foods Inc TSCO 11,040 0.11% 2.43% 10.66% 0.03% Twater Two Intractive Software Inc TWTR 252/16.07 0.09% 0.00% 7.60% 0.039% Texton Inc TXN 112,780.66 0.41% 3.01% 8.12% 0.048% United Aritines Holdings Inc UAA 8.566.16 0.03% 0.00% 12.25% 0.048% United Aritines Holdings Inc UAA 8.	l eleflex Inc		17,199.40	0.06%	0.36%	15.48%	15.87%	0.0099%
Third Go Th TO254.05 CO30.0 CO30.00 CO30.00 TAX Cos Inc/The TJX TO, 125,586.44 0.45% 0.26% 1.56% 11.13% 12.78% 0.0328% Thermo Fisher Scientific Inc TMU 125,586.44 0.45% 0.73% 6.00% 6.75% 0.166% Tapesty Inc TPR 7,110.86 0.03% 5.27% 9.30% 14.81% 0.0038% Travelers Cos Inc/The TROW 31,202.93 0.11% 2.43% 10.66% 13.22% 0.0149% Travelers Cos Inc/The TRV 33,628.91 0.12% 2.57% 11.75% 14.47% 0.017% Tyson Foods Inc TSN 30,191.01 0.11% 2.04% 10.33% 12.48% 0.0039% Texts Instruments Inc TXN 112,780.66 0.41% 3.01% 8.12% 0.0458% Under Armour Inc UAA 8.566.16 0.03% 0.00% 2.88% 0.009% United Alriines Holdings Inc UAL 18.927.67 0.07%	Target Corp	TIF	50,110.07 16,234.06	0.20%	2.39%	9.55%	12.05%	0.0244%
Thermo Fisher Scientific Inc TMO 125,586.44 0.45% 0.26% 12.57% 12.84% 0.0583% T-Mobile US Inc TPR 7,110.86 0.03% 5.27% 9.30% 6.00% 6.75% 0.0165% Tapestry Inc TPR 7,110.86 0.03% 5.27% 9.30% 14.81% 0.003% T Rowe Price Group Inc TROW 31,202.93 0.11% 2.43% 10.66% 13.22% 0.0149% Travelers Cos Inc/The TRV 33,628.91 0.12% 2.57% 11.75% 14.47% 0.0176% Tractor Supply Co TSCO 11,004.00 0.04% 1.59% 10.78% 12.48% 0.0039% Take-Two Interactive Software Inc TVW 14,127.56 0.05% 0.00% 42.67% 42.67% 0.0389% Texas Instruments Inc TXT 10.484.11 0.04% 0.17% 11.12% 11.23% 0.0077% Under Armour Inc UAA 8,566.16 0.03% 0.00% 18.88% 2.88% 0.043% <t< td=""><td>TJX Cos Inc/The</td><td>TJX</td><td>71.035.97</td><td>0.26%</td><td>1.56%</td><td>11.13%</td><td>12.78%</td><td>0.0328%</td></t<>	TJX Cos Inc/The	TJX	71.035.97	0.26%	1.56%	11.13%	12.78%	0.0328%
T-Mobile US Inc TMUS 67,752.97 0.24% 0.73% 6.00% 6.75% 0.0165% Tapestry Inc TROW 31,202.93 0.01% 5.27% 9.30% 14.81% 0.0038% Tractor Supply Co TSC 11,004.00 0.04% 1.59% 11.75% 14.47% 0.0149% Tractor Supply Co TSC 11,004.00 0.04% 1.59% 10.78% 12.48% 0.0138% Take-Two Interactive Software Inc TTWO 14,127.56 0.05% 0.00% 7.60% 7.60% 0.0389% Textas Instruments Inc TXN 112,780.66 0.41% 3.01% 8.12% 11.25% 0.0438% Under Armour Inc UAA 8,566.16 0.03% 0.00% 12.88% 28.88% 0.0089% United Airlines Holdings Inc UAL 18,927.67 0.07% 0.00% 11.17% 11.35% 0.0042% UnitedHaith Group Inc UIR 14,040.19 0.05% 2.86% 5.31% 8.25% 0.0042% United Parc	Thermo Fisher Scientific Inc	TMO	125,586.44	0.45%	0.26%	12.57%	12.84%	0.0583%
Tapestry Inc TPR 7,110.86 0.03% 5.27% 9.30% 14.81% 0.0038% Travelers Cos Inc/The TRV 33,628.91 0.12% 2.57% 11.75% 14.47% 0.0149% Travelers Cos Inc/The TRV 33,628.91 0.12% 2.57% 11.75% 14.47% 0.0149% Tyson Foods Inc TSCO 11.004.00 0.04% 1.59% 10.78% 12.45% 0.0039% Twitter Inc TSCO 14.127.56 0.05% 0.00% 7.60% 7.60% 0.0039% Texts Instruments Inc TNT 12.780.66 0.41% 3.01% 8.12% 11.25% 0.0445% Under Armour Inc UA 8.566.16 0.03% 0.00% 28.88% 28.88% 0.0089% United Airlines Holdings Inc UAL 18.297.67 0.07% 0.00% 11.23% 11.23% 0.0024% Universal Health Services Inc UIR 12.084.0 0.04% 0.44% 6.15% 6.60% 0.0029% Ulita Beauty Inc ULA 15.314.10 0.06% 0.28% 5.31% 8.25% <	T-Mobile US Inc	TMUS	67,752.97	0.24%	0.73%	6.00%	6.75%	0.0165%
I Kowe Price Group Inc IROW 31,222.93 0.11% 2.43% 10.66% 13.22% 0.0149% Travelers Cos Inc/The TRV 33,628.91 0.12% 2.57% 11.75% 14.47% 0.0149% Tractor Supply Co TSCO 11,004.00 0.04% 15.99% 10.78% 12.45% 0.0049% Tyson Foods Inc TSN 30,191.01 0.11% 2.04% 10.33% 12.48% 0.0039% Twitter Inc TWTR 25.216.07 0.09% 0.00% 42.67% 42.67% 0.0389% Textron Inc TXT 11.2780.66 0.41% 3.01% 8.12% 11.25% 0.043% Under Armour Inc UAA 8,566.16 0.03% 0.00% 28.88% 0.089% 0.007% UDR Inc UDR 14,040.19 0.05% 2.86% 5.31% 8.25% 0.0029% United Atilines Holdings Inc ULTA 15.314.10 0.06% 0.44% 6.15% 6.66% 0.029% United eath Group Inc UNH	Tapestry Inc	TPR	7,110.86	0.03%	5.27%	9.30%	14.81%	0.0038%
Tractor Suppl CoTKV33,022.910.12%2.17%11.75%14.47%0.0170%Tractor Suppl CoTSCOT1,004.000.04%1.59%10.78%12.45%0.004%Take-Two Interactive Software IncTKW14,127.560.05%0.00%7.60%7.60%0.0039%Twitter IncTWTR25,216.070.09%0.00%42.67%42.67%0.0389%Texas Instruments IncTXN112,780.660.41%3.01%8.12%11.25%0.0488%Textron IncUAA8,566.160.03%0.00%28.88%28.88%0.0089%Under Armour IncUAA8,566.160.03%0.00%28.88%28.88%0.0089%Under Armour IncUAA8,566.160.03%0.00%28.68%5.31%8.25%0.0042%Universal Health Services IncUHS12,008.400.04%0.44%6.15%6.60%0.0029%United Health Group IncUHS12,008.400.04%0.44%6.15%6.60%0.0029%United Health Group IncUNH258,123.200.93%1.73%13.53%15.38%0.1434%United Parcel Service IncUPS88,801.800.32%3.87%7.95%11.97%0.0384%United Rentals IncURI10.092.010.04%0.00%10.80%10.80%0.0039%United Texnologies CorpUTX129,662.990.47%2.04%8.90%11.03%0.026%Valan Medical Systems IncVAR	I Rowe Price Group Inc	TROW	31,202.93	0.11%	2.43%	10.66%	13.22%	0.0149%
Tyson Fords IncTSN30,191.010.11%2.04%10.33%12.48%0.0138%Take-Two Interactive Software IncTTWO14,127.560.05%0.00%7.60%7.60%0.0039%Twitter IncTWTR25,216.070.09%0.00%42.67%42.67%0.0389%Texas Instruments IncTXN112,780.660.41%3.01%8.12%11.25%0.0458%Textron IncUAA8.566.160.03%0.00%28.88%28.88%0.0089%Under Armour IncUAA8.566.160.03%0.00%11.23%11.23%0.0077%UDR IncUAL18,927.670.07%0.00%11.23%11.23%0.0029%Universal Health Services IncUHS12,008.400.04%0.44%6.15%6.60%0.0029%United Health Group IncUNH258,123.200.93%1.73%13.53%15.38%0.1434%Unum GroupUNM5.505.310.02%4.11%9.00%10.68%0.046%United Parcel Service IncUPS88,801.800.32%3.87%7.95%11.97%0.038%United Parcel Service IncUR10.092.010.04%0.00%10.80%10.68%0.048%United Parcel Service IncUR10.092.010.04%0.00%10.80%10.68%0.048%United Technologies CorpUTX129,662.990.47%2.04%8.90%11.03%0.0516%Visa IncVAR12.779.100.05% <t< td=""><td>Tractor Supply Co</td><td>TSCO</td><td>11 004 00</td><td>0.12%</td><td>1.59%</td><td>10.78%</td><td>12 45%</td><td>0.0049%</td></t<>	Tractor Supply Co	TSCO	11 004 00	0.12%	1.59%	10.78%	12 45%	0.0049%
Take-Two Interactive Software IncTTWO14,127.560.05%0.00%7.60%7.60%7.60%0.0039%Twitter IncTXN112,780.660.01%3.01%8.12%11.25%0.0458%Texts Instruments IncTXN112,780.660.41%3.01%8.12%11.25%0.0438%Textron IncUAA8.566.160.03%0.00%28.88%28.88%0.0089%United Arinour IncUAA8.566.160.07%0.00%21.83%11.23%0.0077%UDR IncUDR14,040.190.05%2.86%5.31%8.25%0.0042%United Arinos IncULTA15,314.100.06%0.00%16.68%6.60%0.0029%Ulta Beauty IncULTA15,314.100.06%0.00%16.68%16.68%0.0028%United Fleath Group IncUNH258,123.200.93%1.73%13.53%15.38%0.1434%United Parcel Service IncUPS88,801.800.32%3.87%7.55%11.97%0.0384%United Rentals IncURI10.092.010.45%2.18%8.40%0.68%0.039%Us BancorpUSB81,639.480.29%3.29%6.40%9.79%0.0289%United Rentals IncURI10.092.010.45%2.18%8.53%10.80%0.039%Us BancorpUSB81,639.480.29%3.29%6.40%9.79%0.0289%Vias IncVAR12.791.010.05%19.05%19.99% </td <td>Tyson Foods Inc</td> <td>TSN</td> <td>30,191.01</td> <td>0.11%</td> <td>2.04%</td> <td>10.33%</td> <td>12.48%</td> <td>0.0136%</td>	Tyson Foods Inc	TSN	30,191.01	0.11%	2.04%	10.33%	12.48%	0.0136%
Twitter IncTWTR25,216.070.09%0.00%42.67%42.67%0.0389%Texas Instruments IncTXN112,780.660.41%3.01%8.12%11.25%0.0458%Under Armour IncUAA8,566.160.03%0.00%28.88%28.88%0.0089%Unided Airlines Holdings IncUAL18,927.670.07%0.00%11.23%11.23%0.007%UDR IncUDR14,040.190.05%2.86%5.31%8.25%0.0042%Universal Health Services IncUHS12,008.400.04%0.44%6.15%6.60%0.0029%United Health Group IncULTA15,314.100.06%0.00%16.68%16.68%0.0029%United Health Group IncUNH258,123.200.93%1.73%13.53%15.38%0.1434%Uninon Pacific CorpUNN5.505.310.02%4.11%9.00%13.30%0.0026%United Parcel Service IncUPS88,801.800.32%3.87%7.95%11.97%0.0384%United Rentals IncURI10.092.010.04%0.00%10.80%10.80%0.0039%US BancorpUS BalcospUTX129,662.990.47%2.04%8.90%11.03%0.028%Visa IncVAR12.779.100.05%0.00%10.63%10.63%0.0049%Visa IncVAR12.779.100.05%0.00%10.63%10.63%0.0286%Vican Medical Systems IncVAR21.270.06	Take-Two Interactive Software Inc	TTWO	14,127.56	0.05%	0.00%	7.60%	7.60%	0.0039%
Lexas Instruments IncIXN112,780.660.41%3.01%8.12%11.25%0.0488%Textron IncTXT10,484.110.04%0.17%11.17%11.35%0.0043%Under Armour IncUAA8,566.160.03%0.00%28.88%28.88%0.0089%Unted Airlines Holdings IncUAL18,927.670.07%0.00%11.23%11.23%0.0077%UDR IncUDR14,040.190.05%2.86%5.31%8.25%0.0042%Universal Health Services IncUHS12,008.400.04%0.44%6.15%6.60%0.0029%Ulta Beauty IncULTA15,314.100.06%0.00%16.68%16.68%0.0092%Unitersal Fleatith Group IncUNH258,123.200.93%1.73%13.53%15.38%0.1434%Union Pacific CorpUNP124,553.340.45%2.18%8.40%10.68%0.0480%United Parcel Service IncUPS88,801.800.32%3.87%7.95%11.97%0.0384%United Rentals IncURI10,092.010.04%8.90%11.03%0.0516%Uss BancorpUSS81,639.480.29%3.29%6.40%9.79%0.0289%Varian Medical Systems IncVAR12,9662.990.47%2.04%8.90%11.03%0.0516%Varian Medical Systems IncVAR12,129.0060.08%2.02%7.00%9.09%0.007%Valero Energy CorpVLO34,622.130.13%	Twitter Inc	TWTR	25,216.07	0.09%	0.00%	42.67%	42.67%	0.0389%
Text Ind10,494,110.494,110.04%0.17%11.17%11.53%0.004%Under Armour IncUAA8,566,160.03%0.00%28,88%28,88%0.0089%United Airlines Holdings IncUAL18,927,670.07%0.00%11.23%11.23%0.0077%UDR IncUDR14,040,190.05%2.86%5.31%8.25%0.0042%Universal Health Services IncUHS12,008,400.04%0.44%6.15%6.60%0.0092%United Health Group IncULTA15,314,100.06%0.00%16,86%16,68%0.0092%United Health Group IncUNH258,123,200.93%1.73%13,53%15,38%0.1434%Unine GroupUNM5,505,310.02%4.11%9.00%13,30%0.0026%United Parcel Service IncUPS88,801.800.32%3.87%7.95%11,97%0.0384%United Technologies CorpUTX129,662.990.47%2.04%8.90%11.03%0.0218%United Technologies CorpUTX129,662.990.47%2.04%8.90%11.03%0.0218%Varian Medical Systems IncVAR12,779,100.05%0.00%10.63%10.63%0.049%Viacom CBS IncVIAC21,200.060.08%2.02%7.00%9.09%0.0147%Varian Medical Systems IncVAR12,779,100.05%0.00%10.63%10.63%0.0248%Viacom CBS IncVIAC21,200	Lexas Instruments Inc		112,780.66	0.41%	3.01%	8.12%	11.25%	0.0458%
Onited Airlines Holdings Inc UA 16,000. 0.00% 10.00% 11.23% 11.23% 0.007% UDR Inc UDR 14,040.19 0.05% 2.86% 5.31% 8.25% 0.0042% Universal Health Services Inc UHS 12,008.40 0.04% 0.44% 6.15% 6.60% 0.0029% Universal Health Services Inc ULTA 15,314.10 0.06% 0.00% 16.68% 0.68% 0.0029% United Health Group Inc UNH 258,123.20 0.93% 1.73% 13.53% 15.38% 0.1434% Unime Group UNM 5,505.31 0.02% 4.11% 9.00% 13.30% 0.0026% United Parcel Service Inc UPS 8.801.80 0.32% 3.87% 7.95% 11.97% 0.038% United Rentals Inc URI 10,092.01 0.04% 0.00% 10.80% 10.039% 0.028% United Technologies Corp UTX 129,662.99 0.47% 2.04% 8.90% 11.03% 0.028% Unite	Linder Armour Inc		8 566 16	0.04%	0.17%	28.88%	28.88%	0.0043%
UDR IncUDR14,040.190.05%2.86%5.31%8.25%0.0042%Universal Health Services IncUHS12,008.400.04%0.44%6.15%6.60%0.0029%Ulta Beauty IncULTA15,314.100.06%0.00%16.68%16.68%0.0029%UnitedHealth Group IncUNH258,123.200.93%1.73%13.53%15.38%0.1434%Unum GroupUNM5,505.310.02%4.11%9.00%13.30%0.0226%United Parcel Service IncUPS88,801.800.32%3.87%7.95%11.97%0.0384%United Parcel Service IncURI10.092.010.04%0.00%10.80%10.68%0.028%United Pentals IncURI10.092.010.04%3.29%6.40%9.79%0.028%United Technologies CorpUTX129,662.990.47%2.04%8.90%11.03%0.028%ViacomCBS IncVAR12,779.100.05%0.00%10.63%10.63%0.0049%Valero Energy CorpVLO34,622.130.13%4.65%17.78%22.84%0.0286%Vulcan Materials CoVMC18,745.380.07%0.86%19.05%19.99%0.0135%Verisk Analytics IncVRSK26,623.930.10%0.54%9.90%10.46%0.004%Verisk Analytics IncVRSK26,623.930.10%0.54%9.90%10.46%0.0011%Versik Analytics IncVRSK26,623.930.10% <td>United Airlines Holdings Inc</td> <td>UAL</td> <td>18.927.67</td> <td>0.07%</td> <td>0.00%</td> <td>11.23%</td> <td>11.23%</td> <td>0.0077%</td>	United Airlines Holdings Inc	UAL	18.927.67	0.07%	0.00%	11.23%	11.23%	0.0077%
Universal Health Services IncUHS12,008.400.04%0.44%6.15%6.60%0.0029%Ulta Beauty IncULTA15,314.100.06%0.00%16.68%16.68%0.0092%UnitedHealth Group IncUNH258,123.200.93%1.73%13.53%15.38%0.1434%Unum GroupUNM5,505.310.02%4.11%9.00%13.30%0.026%United Parcel Service IncUPS88,801.800.32%3.87%7.95%11.97%0.0384%United Parcel Service IncURI10,092.010.04%0.00%10.80%10.80%0.028%United Rentals IncURI10,092.010.04%0.00%10.80%10.80%0.028%United Technologies CorpUTX129,662.990.47%2.04%8.90%11.03%0.028%Visa IncV390,480.011.41%0.58%15.53%16.15%0.2278%Varian Medical Systems IncVAR12,779.100.05%0.00%10.63%10.63%0.0049%ViacomCBS IncVIAC21,200.060.08%2.02%7.00%9.09%0.0147%Valero Energy CorpVLO34,622.130.13%4.65%17.78%22.84%0.0286%Vulcan Materials CoVMC18,745.380.07%0.86%19.05%19.99%0.0135%Veriak Analytics IncVRSK26,623.930.10%0.86%19.05%19.99%0.0135%Verisk Analytics IncVRSN24,437.51 <t< td=""><td>UDR Inc</td><td>UDR</td><td>14,040.19</td><td>0.05%</td><td>2.86%</td><td>5.31%</td><td>8.25%</td><td>0.0042%</td></t<>	UDR Inc	UDR	14,040.19	0.05%	2.86%	5.31%	8.25%	0.0042%
Ulta Beauty Inc ULTA 15,314.10 0.06% 0.00% 16.68% 16.68% 0.0092% UnitedHealth Group Inc UNH 258,123.20 0.93% 1.73% 13.53% 15.38% 0.1434% Unum Group UNM 5,505.31 0.02% 4.11% 9.00% 13.30% 0.0480% United Parcel Service Inc UPS 88,801.80 0.32% 3.87% 7.95% 11.97% 0.0384% United Parcel Service Inc URI 10.092.01 0.04% 0.00% 10.80% 0.028% United Technologies Corp UTX 129,662.99 0.47% 2.04% 8.90% 11.03% 0.028% Viaian Medical Systems Inc VAR 12,779.10 0.05% 0.00% 10.63% 0.0049% ViacomCBS Inc VIAC 21,200.06 0.08% 2.02% 7.00% 9.09% 0.017% Valero Energy Corp VLO 34,622.13 0.13% 4.65% 17.78% 22.84% 0.0286% Vulcan Materials Co VMC 18,7	Universal Health Services Inc	UHS	12,008.40	0.04%	0.44%	6.15%	6.60%	0.0029%
United Preating Group Inc UNH 258,12.2,20 0.93% 1.73% 13.35% 15.35% 17.43% Unum Group UNM 5,505.31 0.02% 4.11% 9.00% 13.30% 0.0426% Uning Pacific Corp UNP 124,553.34 0.45% 2.18% 8.40% 10.68% 0.0480% United Parcel Service Inc UPS 88,801.80 0.32% 3.87% 7.95% 11.97% 0.0384% United Rentals Inc URI 10.092.01 0.04% 0.00% 10.80% 0.028% United Technologies Corp UTX 129,662.99 0.47% 2.04% 8.90% 11.03% 0.0216% Visa Inc V 390,480.01 1.41% 0.58% 15.53% 16.15% 0.2278% Varian Medical Systems Inc VAR 12,779.10 0.05% 0.00% 10.63% 0.0049% ViacomCBS Inc VIAC 21,200.06 0.08% 2.02% 7.00% 9.09% 0.0170% Valero Energy Corp VLO 34,622.13	Ulta Beauty Inc	ULTA	15,314.10	0.06%	0.00%	16.68%	16.68%	0.0092%
Online Order ONM 0,0001 0,0001 0,000 10,000 0,0000 10,000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,0000 0,00000 0,0000 0,0000 0,0000 0,0000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,00000 0,000000 0,000000 0,000000 0,000000 0,000000 0,000000 0,000000 0,000000 0,0000000 0,0000000 0,0000000 0,0000000 0,0000000 0,0000000 0,0000000 0,0000000 0,0000000 0,0000000 0,00000000 0,00000000 0,00000000 0,0000000000000 0,0000000000000000000000000 0,00000000000000000000000000000000000	United Health Group Inc		208,123.20	0.93%	1.73%	9.00%	13.38%	0.1434%
United Parcel Service Inc UPS 88,801.80 0.32% 3.87% 7.95% 11.97% 0.0384% United Rentals Inc URI 10,092.01 0.04% 0.00% 10.80% 10.80% 0.039% US Bancorp USB 81,639.48 0.29% 3.29% 6.40% 9.79% 0.028% United Technologies Corp UTX 129,662.99 0.47% 2.04% 8.90% 11.03% 0.0516% Visa Inc V 300,480.01 1.41% 0.58% 15.53% 16.15% 0.2278% Varian Medical Systems Inc VAR 12,779.10 0.05% 0.00% 10.63% 10.63% 0.0049% VFC orp VFC 33,136.03 0.12% 2.14% 10.05% 12.29% 0.0147% Valero Energy Corp VLO 34,622.13 0.13% 4.65% 17.78% 22.84% 0.0286% Vulcan Materials Co VMC 18,745.38 0.07% 0.86% 19.05% 19.99% 0.0135% Vornado Realty Trust	Union Pacific Corp	UNP	124,553.34	0.45%	2.18%	8.40%	10.68%	0.0480%
United Rentals IncURI10,092.010.04%0.00%10.80%10.80%0.0039%US BancorpUSB81,639.480.29%3.29%6.40%9.79%0.0289%United Technologies CorpUTX129,662.990.47%2.04%8.90%11.03%0.0516%Visa IncV390,480.011.41%0.58%15.53%16.15%0.2278%Varian Medical Systems IncVAR12,779.100.05%0.00%10.63%10.63%0.0049%VF CorpVFC33,136.030.12%2.14%10.05%12.29%0.0147%ViacomCBS IncVIAC21,200.060.08%2.02%7.00%9.09%0.0070%Valero Energy CorpVLO34,622.130.13%4.65%17.78%22.84%0.0286%Vulcan Materials CoVMC18,745.380.07%0.86%19.05%19.99%0.0135%Vornado Realty TrustVNO12,552.330.10%0.54%9.90%10.46%0.0101%Verisk Analytics IncVRSK26,623.930.10%0.54%9.90%10.46%0.0101%Verisk In IncVRSN24,437.510.09%0.00%10.30%10.030%0.0014%	United Parcel Service Inc	UPS	88,801.80	0.32%	3.87%	7.95%	11.97%	0.0384%
US Bancorp USB 81,639.48 0.29% 3.29% 6.40% 9.79% 0.0289% United Technologies Corp UTX 129,662.99 0.47% 2.04% 8.90% 11.03% 0.0516% Visa Inc V 390,480.01 1.41% 0.58% 15.53% 16.15% 0.2278% Varian Medical Systems Inc VAR 12,779.10 0.05% 0.00% 10.63% 10.63% 0.0049% VF Corp VFC 33,136.03 0.12% 2.14% 10.05% 12.29% 0.0147% ViacomCBS Inc VIAC 21,200.06 0.08% 2.02% 7.00% 9.09% 0.0070% Valero Energy Corp VLO 34,622.13 0.13% 4.65% 17.78% 22.84% 0.0286% Vulcan Materials Co VMC 18,745.38 0.07% 0.86% 19.05% 19.99% 0.0135% Vornado Realty Trust VNO 12,552.23 0.05% 4.77% 5.15% 10.05% 0.0046% Verisk Analytics Inc VRSK	United Rentals Inc	URI	10,092.01	0.04%	0.00%	10.80%	10.80%	0.0039%
United recnologies Corp UTX 129,662.99 0.47% 2.04% 8.90% 11.03% 0.0516% Visa Inc V 390,480.01 1.41% 0.58% 15.53% 16.15% 0.2278% Varian Medical Systems Inc VAR 12,779.10 0.05% 0.00% 10.63% 10.63% 0.0049% VF Corp VFC 33,136.03 0.12% 2.14% 10.05% 12.29% 0.0147% ViacomCBS Inc VIAC 21,200.06 0.08% 2.02% 7.00% 9.09% 0.0070% Valero Energy Corp VLO 34,622.13 0.13% 4.65% 17.78% 22.84% 0.0286% Vulcan Materials Co VMC 18,745.38 0.07% 0.86% 19.05% 19.99% 0.0135% Vornado Realty Trust VNO 12,552.23 0.05% 4.77% 5.15% 10.05% 0.0046% Verisk Analytics Inc VRSK 26,623.93 0.10% 0.54% 9.90% 10.46% 0.0111% VerSing Inc VRSN <td>US Bancorp</td> <td>USB</td> <td>81,639.48</td> <td>0.29%</td> <td>3.29%</td> <td>6.40%</td> <td>9.79%</td> <td>0.0289%</td>	US Bancorp	USB	81,639.48	0.29%	3.29%	6.40%	9.79%	0.0289%
Viscaine V 350,4001 1.41% 0.55% 15.35% 16.15% 0.2278% Varian Medical Systems Inc VAR 12,779.10 0.05% 0.00% 10.63% 10.63% 0.0049% VF Corp VFC 33,136.03 0.12% 2.14% 10.05% 12.29% 0.0147% ViacomCBS Inc VIAC 21,200.06 0.08% 2.02% 7.00% 9.09% 0.0070% Valero Energy Corp VLO 34,622.13 0.13% 4.65% 17.78% 22.84% 0.0286% Vulcan Materials Co VMC 18,745.38 0.07% 0.86% 19.05% 19.99% 0.0135% Vornado Realty Trust VNO 12,552.23 0.05% 4.77% 5.15% 10.05% 0.0046% Verisk Analytics Inc VRSK 26,623.93 0.10% 0.54% 9.90% 10.46% 0.0111% Verisign Inc VRSN 24.437.51 0.09% 0.00% 10.30% 0.0091%	United Technologies Corp		129,662.99	U.47%	2.04%	8.90%	11.03%	0.0516%
Vinc Vinc <th< td=""><td>Visa inc Varian Medical Systems Inc</td><td>V VAR</td><td>390,480.01 12 779 10</td><td>0.05%</td><td>0.58%</td><td>10.03%</td><td>10.15%</td><td>0.2278%</td></th<>	Visa inc Varian Medical Systems Inc	V VAR	390,480.01 12 779 10	0.05%	0.58%	10.03%	10.15%	0.2278%
ViacomCBS Inc VIAC 21,200.06 0.08% 2.02% 7.00% 9.09% 0.0070% Valero Energy Corp VLO 34,622.13 0.13% 4.65% 17.78% 22.84% 0.0286% Vulcan Materials Co VMC 18,745.38 0.07% 0.86% 19.05% 19.99% 0.0135% Vornado Realty Trust VNO 12,552.23 0.05% 4.77% 5.15% 10.05% 0.0046% Verisk Analytics Inc VRSK 26,623.93 0.10% 0.54% 9.90% 10.46% 0.0101% VeriSkin Inc VRSN 24.437.51 0.09% 0.00% 10.30% 0.0091%	VF Corp	VFC	33.136.03	0.12%	2.14%	10.05%	12.29%	0.0147%
Valero Energy Corp VLO 34,622.13 0.13% 4.65% 17.78% 22.84% 0.0286% Vulcan Materials Co VMC 18,745.38 0.07% 0.86% 19.05% 19.99% 0.0135% Vornado Realty Trust VNO 12,552.23 0.05% 4.77% 5.15% 10.05% 0.0046% Verisk Analytics Inc VRSK 26,623.93 0.10% 0.54% 9.90% 10.46% 0.0101% VeriSign Inc VRSN 24.437.51 0.09% 0.00% 10.30% 0.0091%	ViacomCBS Inc	VIAC	21,200.06	0.08%	2.02%	7.00%	9.09%	0.0070%
Vulcan Materials Co VMC 18,745.38 0.07% 0.86% 19.05% 19.99% 0.0135% Vornado Realty Trust VNO 12,552.23 0.05% 4.77% 5.15% 10.05% 0.0046% Verisk Analytics Inc VRSK 26,623.93 0.10% 0.54% 9.90% 10.46% 0.0101% VeriSign Inc VRSN 24,437.51 0.09% 0.00% 10.30% 0.0091%	Valero Energy Corp	VLO	34,622.13	0.13%	4.65%	17.78%	22.84%	0.0286%
vornado Realty Irust VNO 12,552.23 0.05% 4.77% 5.15% 10.05% 0.0046% Verisk Analytics Inc VRSK 26,623.93 0.10% 0.54% 9.90% 10.46% 0.0101% Veriskin Inc VRSN 24,437.51 0.09% 0.00% 10.30% 0.0091%	Vulcan Materials Co	VMC	18,745.38	0.07%	0.86%	19.05%	19.99%	0.0135%
VeriSign Inc VRSN 24.437.51 0.09% 0.00% 10.30% 10.40% 0.0101%	vomado Realty Trust	VNO	12,552.23	0.05%	4.//%	5.15%	10.05%	0.0046%
	VeriSign Inc	VRSN	24,437.51	0.09%	0.00%	10.30%	10.30%	0.0091%

		[4]	[5]	[6]	[7]	[8]	[9]
		Market		Estimated	Long-Term		Weighted
Company	Ticker	Capitalization	Weight in Index	Dividend Yield	Growth Est.	DCF Result	DCF Result
Vertex Pharmaceuticals Inc	VRTX	58,804.36	0.21%	0.00%	38.78%	38.78%	0.0824%
Ventas Inc	VTR	21,566.51	0.08%	5.49%	4.23%	9.84%	0.0077%
Verizon Communications Inc	VZ	245,843.84	0.89%	4.12%	2.84%	7.02%	0.0623%
Westinghouse Air Brake Technolog	ies Corp WAB	14,157.67	0.05%	0.66%	11.42%	12.12%	0.0062%
Waters Corp	WAT	14,419.77	0.05%	0.00%	9.32%	9.32%	0.0049%
Walgreens Boots Alliance Inc	WBA	45,046.06	0.16%	3.63%	8.23%	12.00%	0.0195%
Western Digital Corp	WDC	19,480.00	0.07%	3.05%	2.77%	5.87%	0.0041%
WEC Energy Group Inc	WEC	31,508.86	0.11%	2.52%	6.69%	9.30%	0.0106%
Welltower Inc	WELL	34,456.44	0.12%	4.10%	2.87%	7.03%	0.0087%
Wells Fargo & Co	WFC	194,068.74	0.70%	4.47%	10.31%	15.00%	0.1051%
Whirlpool Corp	WHR	9,237.91	0.03%	3.41%	4.73%	8.22%	0.0027%
Willis Towers Watson PLC	WLTW	27,166.13	0.10%	1.21%	10.00%	11.27%	0.0111%
Waste Management Inc	WM	51,630.15	0.19%	1.68%	7.50%	9.24%	0.0172%
Williams Cos Inc/The	WMB	25,077.29	0.09%	7.35%	5.00%	12.53%	0.0113%
Walmart Inc	WMT	324,828.16	1.17%	1.88%	4.18%	6.10%	0.0716%
WR Berkley Corp	WRB	13,486.28	0.05%	1.55%	6.95%	8.56%	0.0042%
Westrock Co	WRK	10,079.79	0.04%	5.52%	4.45%	10.09%	0.0037%
Western Union Co/The	WU	11,277.99	0.04%	2.97%	4.22%	7.26%	0.0030%
Weyerhaeuser Co	WY	21,571.87	0.08%	4.70%	3.80%	8.59%	0.0067%
Wynn Resorts Ltd	WYNN	13,543.86	0.05%	2.97%	13.10%	16.27%	0.0080%
Cimarex Energy Co	XEC	4,468.45	0.02%	1.69%	19.35%	21.20%	0.0034%
Xcel Energy Inc	XEL	36,282.41	0.13%	2.46%	5.78%	8.31%	0.0109%
Xilinx Inc	XLNX	21,021.71	0.08%	1.75%	9.05%	10.88%	0.0083%
Exxon Mobil Corp	XOM	262,836.31	0.95%	5.76%	6.33%	12.28%	0.1165%
DENTSPLY SIRONA Inc	XRAY	12,455.17	0.04%	0.63%	12.72%	13.39%	0.0060%
Xerox Holdings Corp	XRX	7,689.82	N/A	2.82%	N/A	N/A	N/A
Xylem Inc/NY	XYL	14,705.24	0.05%	1.18%	12.28%	13.52%	0.0072%
Yum! Brands Inc	YUM	31,991.42	0.12%	1.59%	11.67%	13.35%	0.0154%
Zimmer Biomet Holdings Inc	ZBH	30,420.72	0.11%	0.65%	6.39%	7.06%	0.0078%
Zebra Technologies Corp	ZBRA	12,888.31	0.05%	0.00%	11.80%	11.80%	0.0055%
Zions Bancorp NA	ZION	7,508.44	0.03%	3.13%	5.24%	8.45%	0.0023%
Zoetis Inc	ZTS	63,924.12	0.23%	0.49%	11.40%	11.91%	0.0275%
Total I	Market Capitalization:	27,688,228.26					13.44%
NI. C.		. ,					

 Total Market Capitalization:
 21

 Notes:
 [1] Equals sum of Col. [9]

 [2] Source: Bloomberg Professional
 [3] Equals [1] - [2]

 [4] Source: Bloomberg Professional
 [5] Equals weight in S&P 500 based on market capitalization

 [6] Source: Bloomberg Professional
 [7] Source: Bloomberg Professional

 [7] Source: Bloomberg Professional
 [8] Equals ([6] x (1 + (0.5 x [7]))) + [7]

 [9] Equals Col. [5] x Col. [8]
 [8]

Ex-Ante Market Risk Premium Market DCF Method Based - Value Line

[1]	[2]	[3]
S&P 500	Current 30-Year	
Est. Required	Treasury (30-day	Implied Market
Market Return	average)	Risk Premium
14.51%	2.25%	12.25%

		[4]	[5]	[6]	[7]	[8]	[9]
2	T 1.1	Market		Estimated	Long-Term		Weighted
Company	Ticker	Capitalization	weight in Index	Dividend Yield	Growth Est.	DCF Result	DCF Result
Agilent Technologies Inc	Δ	27 575 81	0 10%	0.81%	11 00%	11 85%	0.0121%
American Airlines Group Inc	AAL	12.615.41	0.05%	1.39%	7.00%	8.44%	0.0040%
Advance Auto Parts Inc	AAP	10,372.55	0.04%	0.16%	14.00%	14.17%	0.0055%
Apple Inc	AAPL	1,418,414.00	5.26%	1.01%	12.50%	13.57%	0.7146%
AbbVie Inc	ABBV	126,095.80	0.47%	5.54%	10.50%	16.33%	0.0764%
AmerisourceBergen Corp	ABC	18,995.92	0.07%	1.84%	8.00%	9.91%	0.0070%
ABIOMED Inc	ABMD	8,344.79	0.03%	0.00%	12.50%	12.50%	0.0039%
Abbott Laboratories	ABT	160,452.00	0.60%	1.59%	10.00%	11.67%	0.0695%
Accenture PLC	ACN	133,905.90	0.50%	1.52%	9.00%	10.59%	0.0526%
Adobe Inc	ADBE	170,569.50	0.63%	0.00%	21.00%	21.00%	0.1329%
Analog Devices Inc		44,512.98	0.17%	1.79%	9.00%	10.87%	0.0180%
Automatic Data Processing Inc.		25,046.29	0.09%	2.29%	9.50%	12.95%	0.0120%
Alliance Data Systems Corp		5 153 98	0.23%	2.05%	9.00%	11 35%	0.0449%
Autodesk Inc	ADSK	43 698 55	N/A	0.00%	N/A	N/A	N/A
Ameren Corp	AEE	19,753.80	0.07%	2.50%	6.50%	9.08%	0.0067%
American Electric Power Co Inc	AEP	49,872.72	0.19%	2.81%	4.00%	6.87%	0.0127%
AES Corp/VA	AES	13,649.64	N/A	2.77%	N/A	N/A	N/A
Aflac Inc	AFL	38,638.43	0.14%	2.13%	8.00%	10.22%	0.0146%
Allergan PLC	AGN	62,535.86	0.23%	1.55%	3.00%	4.57%	0.0106%
American International Group Inc	AIG	44,898.07	N/A	2.48%	N/A	N/A	N/A
Apartment Investment & Management Co	AIV	8,211.35	0.03%	2.90%	-3.00%	-0.14%	0.0000%
Assurant Inc	AIZ	7,918.72	0.03%	1.93%	8.50%	10.51%	0.0031%
Arthur J Gallagher & Co	AJG	18,088.64	0.07%	1.77%	14.50%	16.40%	0.0110%
Akamai Technologies Inc	AKAM	15,590.49	0.06%	0.00%	18.00%	18.00%	0.0104%
Albemarle Corp	ALB	8,683.94	0.03%	1.80%	5.50%	7.35%	0.0024%
Align Technology Inc	ALGN	21,339.90	0.08%	0.00%	25.00%	25.00%	0.0198%
Alaska Ali Gloup IIIC	ALK	0,201.02	0.03%	2.00%	0.00%	0.1470	0.0025%
		12 073 74	0.14%	0.83%	0.50%	10.37%	0.01/5%
Alexion Pharmaceuticals Inc		24 022 12	0.04%	0.00%	42 00%	42 00%	0.0040%
Applied Materials Inc	AMAT	58.523.24	0.22%	1.36%	7.50%	8.91%	0.0194%
Amcor PLC	AMCR	17.371.87	N/A	4.47%	N/A	N/A	N/A
Advanced Micro Devices Inc	AMD	57,604.94	0.21%	0.00%	34.00%	34.00%	0.0727%
AMETEK Inc	AME	23,037.60	0.09%	0.56%	15.50%	16.10%	0.0138%
Amgen Inc	AMGN	140,130.90	0.52%	2.72%	7.50%	10.32%	0.0537%
Ameriprise Financial Inc	AMP	21,834.67	0.08%	2.26%	12.50%	14.90%	0.0121%
American Tower Corp	AMT	105,319.40	0.39%	1.86%	7.50%	9.43%	0.0369%
Amazon.com Inc	AMZN	932,867.10	3.46%	0.00%	39.00%	39.00%	1.3503%
Arista Networks Inc	ANET	17,569.22	0.07%	0.00%	12.00%	12.00%	0.0078%
ANSYS Inc	ANSS	23,373.19	0.09%	0.00%	12.00%	12.00%	0.0104%
		11,200.04	0.29%	1.05%	18.50%	19.00%	0.0003%
AOI PLC	AON	49,000.71	0.19%	2.06%	6 50%	8.63%	0.0220%
Anache Corp	ADS	11 382 19	0.03%	3.30%	46.00%	50.06%	0.002470
Air Products & Chemicals Inc	APD	52 288 04	0.19%	2 26%	10.50%	12.88%	0.0250%
Amphenol Corp	APH	31.604.25	0.12%	0.94%	9.50%	10.48%	0.0123%
Aptiv PLC	APTV	23,604.63	0.09%	0.95%	11.00%	12.00%	0.0105%
Alexandria Real Estate Equities Inc	ARE	18,362.49	N/A	2.50%	N/A	N/A	N/A
Arconic Inc	ARNC	12,784.75	N/A	0.27%	N/A	N/A	N/A
Atmos Energy Corp	ATO	13,814.75	0.05%	1.99%	7.50%	9.56%	0.0049%
Activision Blizzard Inc	ATVI	46,187.41	0.17%	0.67%	9.00%	9.70%	0.0166%
AvalonBay Communities Inc	AVB	30,262.61	0.11%	2.93%	2.50%	5.47%	0.0061%
Broadcom Inc	AVGO	127,220.70	0.47%	4.07%	33.50%	38.25%	0.1806%
Avery Dennison Corp	AVY	10,934.59	0.04%	1.91%	11.00%	13.02%	0.0053%
American water works Co Inc	AVVK	24,456.38	0.09%	1.51%	9.50%	11.08%	0.0101%
American Express Co	AXP	107,854.80	0.40%	1.31%	10.00%	11.38%	0.0400%
Autozone inc Boeing Co/The	AZO BA	27,301.73	0.10%	2.50%	13.50%	13.50%	0.0130%
Bank of America Corp	BAC	309 784 60	1 15%	2.39%	10.50%	12 85%	0.0375%
Baxter International Inc	BAX	46 480 95	0.17%	0.97%	10.50%	11.52%	0.0199%
Best Buy Co Inc	BBY	23.353.20	0.09%	2.45%	10.50%	13.08%	0.0113%
Becton Dickinson and Co	BDX	75.376.11	0.28%	1.13%	9.50%	10.68%	0.0299%
Franklin Resources Inc	BEN	12.822.10	0.05%	4.52%	7.50%	12.19%	0.0058%
Brown-Forman Corp	BF/B	34,355.11	0.13%	0.97%	14.50%	15.54%	0.0198%
Biogen Inc	BIIB	51,697.80	0.19%	0.00%	8.00%	8.00%	0.0154%
Bank of New York Mellon Corp/The	BK	43,361.79	0.16%	2.64%	7.00%	9.73%	0.0157%
Booking Holdings Inc	BKNG	83,883.82	0.31%	0.00%	12.00%	12.00%	0.0374%

		[4]	[5]	[6]	[7]	[8]	[9]
Company	Ticker	Market Capitalization	Weight in Index	Estimated Dividend Yield	Long-Term Growth Est	DCE Result	Weighted DCF Result
Company	TICKET	Capitalization	Weight in index	Dividend Heid	Growth Est.	Dor Result	Dor Result
Baker Hughes Co	BKR	14,901.04	N/A	3.14%	N/A	N/A	N/A
BlackRock Inc	BLK	83,648.43	0.31%	2.44%	9.00%	11.55%	0.0359%
Ball Corp Bristol-Myers Squibb Co	BLL BMY	23,059.31	0.09%	0.84%	25.00%	25.95%	0.0228%
Broadridge Financial Solutions Inc	BR	15,042.40	0.06%	1.65%	11.00%	12.74%	0.0071%
Berkshire Hathaway Inc	BRK/B	-	N/A	0.00%	N/A	N/A	N/A
Boston Scientific Corp	BSX	60,726.82	0.23%	0.00%	15.50%	15.50%	0.0349%
Borgwarner Inc Boston Properties Inc	BWA	8,375.36	0.03%	1.68%	4.50%	6.22% 7.85%	0.0019%
Citigroup Inc	C	174,218.90	0.65%	2.63%	10.00%	12.76%	0.0825%
Conagra Brands Inc	CAG	15,913.95	0.06%	2.66%	5.50%	8.23%	0.0049%
Cardinal Health Inc	CAH	16,076.91	0.06%	3.50%	10.50%	14.18%	0.0085%
Caterpillar Inc	CAI	78,891.93	0.29%	2.89%	12.00%	15.06%	0.0441%
Choe Global Markets Inc	CBOE	13.308.32	0.05%	1.20%	14.50%	15.79%	0.0078%
CBRE Group Inc	CBRE	20,427.33	0.08%	0.00%	11.00%	11.00%	0.0083%
Crown Castle International Corp	CCI	62,308.48	0.23%	3.21%	12.50%	15.91%	0.0368%
Carnival Corp	CCL	26,062.87	0.10%	4.04%	10.00%	14.24%	0.0138%
CDW Corp/DF	CDNS	19 963 25	0.08%	1 10%	10.50%	12.50%	0.0098%
Celanese Corp	CE	14,023.67	0.05%	2.35%	8.50%	10.95%	0.0057%
Cerner Corp	CERN	23,757.31	0.09%	0.95%	9.00%	9.99%	0.0088%
CF Industries Holdings Inc	CF	9,258.24	N/A	3.06%	N/A	N/A	N/A
Citizens Financial Group Inc	CFG	17,694.37	0.07%	3.91%	9.50%	13.60%	0.0089%
CH Robinson Worldwide Inc	CHRW	10 785 13	0.06%	2.56%	9.00%	10.34%	0.0007%
Charter Communications Inc	CHTR	110.212.20	0.41%	0.00%	17.50%	17.50%	0.0716%
Cigna Corp	CI	79,427.50	0.29%	0.02%	14.50%	14.52%	0.0428%
Cincinnati Financial Corp	CINF	17,317.13	0.06%	2.11%	9.50%	11.71%	0.0075%
Colgate-Palmolive Co	CL	60,515.88	0.22%	2.44%	5.50%	8.01%	0.0180%
Clorox Co/ I ne	CLX	19,962.49	0.07%	2.67%	3.50%	6.22% 13.75%	0.0046%
Comcast Corp	CMCSA	207.673.30	0.77%	1.84%	13.50%	15.46%	0.1192%
CME Group Inc	CME	74,435.38	0.28%	1.44%	3.00%	4.46%	0.0123%
Chipotle Mexican Grill Inc	CMG	24,460.43	0.09%	0.00%	26.50%	26.50%	0.0241%
Cummins Inc	CMI	26,298.31	0.10%	3.05%	8.00%	11.17%	0.0109%
CMS Energy Corp	CMS	19,012.26	0.07%	2.43%	7.00%	9.52%	0.0067%
CenterPoint Energy Inc	CNP	13.525.19	0.05%	4.42%	10.50%	15.15%	0.0076%
Capital One Financial Corp	COF	49,380.40	0.18%	1.51%	6.00%	7.56%	0.0138%
Cabot Oil & Gas Corp	COG	6,212.68	0.02%	2.63%	46.50%	49.74%	0.0115%
Cooper Cos Inc/The	CO0	17,635.80	0.07%	0.02%	14.50%	14.52%	0.0095%
ConocoPhillips Castao Whalesala Corp	COP	69,281.56 129.222.50	0.26%	2.66%	37.00%	40.15%	0.1032%
Costo Wholesale Corp	COTY	8.107.47	0.03%	4.67%	5.00%	9.79%	0.0029%
Campbell Soup Co	CPB	15,814.08	0.06%	2.86%	2.00%	4.89%	0.0029%
Capri Holdings Ltd	CPRI	5,534.61	0.02%	0.00%	10.50%	10.50%	0.0022%
Copart Inc	CPRT	23,220.15	0.09%	0.00%	16.00%	16.00%	0.0138%
salestorce.com Inc	CRM	163,006.30	0.61%	0.00%	30.00%	30.00%	0.1815%
CSX Corp	CSX	59.958.31	0.22%	1.25%	14.50%	15.84%	0.0353%
Cintas Corp	CTAS	29,661.13	0.11%	0.89%	15.50%	16.46%	0.0181%
CenturyLink Inc	CTL	16,191.34	0.06%	6.73%	1.00%	7.76%	0.0047%
Cognizant Technology Solutions Corp	CTSH	34,402.50	0.13%	1.28%	6.00%	7.32%	0.0093%
Correva Inc Citrix Systems Inc	CTVA	21,291.70	N/A 0.06%	2.11%	N/A 7.00%	N/A 8.13%	N/A 0.0050%
CVS Health Corp	CVS	95.662.53	0.36%	2.72%	6.50%	9.31%	0.0331%
Chevron Corp	CVX	213,857.60	0.79%	4.29%	16.50%	21.14%	0.1678%
Concho Resources Inc	CXO	16,921.87	0.06%	0.59%	21.00%	21.65%	0.0136%
Dominion Energy Inc	D	69,189.62	0.26%	4.47%	6.50%	11.12%	0.0285%
Delta Air Lines Inc DuPont de Nemours Inc		38,979.20	0.14%	2.87%	10.00%	13.01% N/A	0.0188% N/A
Deere & Co	DE	54,177.05	0.20%	1.77%	13.50%	15.39%	0.0309%
Discover Financial Services	DFS	27,041.12	0.10%	2.05%	7.50%	9.63%	0.0097%
Dollar General Corp	DG	39,498.65	0.15%	0.83%	12.00%	12.88%	0.0189%
Quest Diagnostics Inc	DGX	14,578.65	0.05%	1.96%	9.00%	11.05%	0.0060%
DR Horton Inc Danaber Corp		21,733.74	0.08%	1.19%	7.00%	8.23%	0.0066%
Walt Disney Co/The	DIS	256.244 40	0.95%	1.24%	7.50%	8.79%	0.0836%
Discovery Inc	DISCA	16,047.15	0.06%	0.00%	18.00%	18.00%	0.0107%
DISH Network Corp	DISH	18,188.91	0.07%	0.00%	-2.00%	-2.00%	-0.0014%
Digital Realty Trust Inc	DLR	26,238.81	0.10%	3.62%	7.00%	10.75%	0.0105%
Dollar Tree Inc		20,815.40	0.08%	0.00%	10.00%	10.00%	0.0077%
Dow Inc	WOD	37 260 18	N/A	5.97%	N/A	N/A	N/A
Duke Realty Corp	DRE	12,904.28	0.05%	2.67%	4.50%	7.23%	0.0035%
Darden Restaurants Inc	DRI	14,292.01	0.05%	3.03%	11.00%	14.20%	0.0075%
DTE Energy Co	DTE	24,556.86	0.09%	3.03%	4.50%	7.60%	0.0069%
Duke Energy Corp	DUK	70,042.32	0.26%	3.98%	6.00%	10.10%	0.0263%
	DVA	10,778.07	0.04%	0.00%	11.30%	11.00%	0.0040%

		[4]	[5]	[6]	[7]	[8]	[9]
Company	Ticker	Market Capitalization	Weight in Index	Estimated Dividend Yield	Long-Term Growth Est	DCE Result	Weighted DCF Result
Company		oupituization	Trongine in Indox	Difficient field	Cronal Edu	Dor Hoodat	Der Hobalt
Devon Energy Corp	DVN	9,435.48	0.04%	1.48%	18.00%	19.61%	0.0069%
DXC Technology Co		9,089.42	0.03%	2.36%	10.00%	12.48%	0.0042%
eBay Inc	EBAY	29,164.59	0.12%	1.66%	10.00%	11.74%	0.0127%
Ecolab Inc	ECL	57,150.05	0.21%	0.95%	10.00%	11.00%	0.0233%
Consolidated Edison Inc	ED	30,799.64	0.11%	3.30%	3.00%	6.35%	0.0073%
Equitax Inc	EFX	18,764.45	0.07%	1.01%	8.50%	9.55%	0.0067%
Estee Lauder Cos Inc/The	EL	75.339.83	0.28%	0.92%	14.00%	14.98%	0.0419%
Eastman Chemical Co	EMN	10,066.83	0.04%	3.57%	5.00%	8.66%	0.0032%
Emerson Electric Co	EMR	47,407.49	0.18%	2.58%	11.00%	13.72%	0.0241%
EOG Resources Inc	EOG	47,606.81	0.18%	1.41%	31.50%	33.13%	0.0585%
Equity Residential	EQIX	50,827.14 30,690,17	0.19%	2.83%	23.50%	20.48% -10.86%	-0.0481%
Eversource Energy	ES	29,537.40	0.11%	2.44%	5.50%	8.01%	0.0088%
Essex Property Trust Inc	ESS	20,591.28	0.08%	2.61%	-0.50%	2.10%	0.0016%
E*TRADE Financial Corp	ETFC	10,448.45	0.04%	1.22%	17.50%	18.83%	0.0073%
Eaton Corp PLC	EIN	40,471.86	0.15%	2.90%	7.00%	10.00%	0.0150%
Everay Inc	EVRG	15 998 72	N/A	2.00 %	2.00 % N/A	4.9170 N/A	0.0047 // N/A
Edwards Lifesciences Corp	EW	48,219.79	0.18%	0.00%	16.50%	16.50%	0.0295%
Exelon Corp	EXC	46,607.40	0.17%	3.17%	9.00%	12.31%	0.0213%
Expeditors International of Washington I	EXPD	12,592.88	0.05%	1.35%	9.00%	10.41%	0.0049%
Expedia Group Inc	EXPE	16,546.58	0.06%	1.20%	24.00%	25.34%	0.0156%
Exita Space Storage Inc Ford Motor Co	F	35 591 57	0.05%	5.57% 6.57%	4.00%	10 18%	0.0039%
Diamondback Energy Inc	FANG	13,648.73	0.05%	0.89%	17.00%	17.97%	0.0091%
Fastenal Co	FAST	20,681.35	0.08%	2.77%	8.50%	11.39%	0.0087%
Facebook Inc	FB	627,195.10	2.33%	0.00%	17.50%	17.50%	0.4074%
Fortune Brands Home & Security Inc	FBHS	9,818.49	0.04%	1.36%	8.50%	9.92%	0.0036%
Freeport-MichioRan Inc	FDX	17,368.47 40 442 11	0.06%	1.67%	22.50%	24.30%	0.0157%
FirstEnergy Corp	FE	27,204.71	0.10%	3.18%	6.50%	9.78%	0.0099%
F5 Networks Inc	FFIV	8,086.76	0.03%	0.00%	12.50%	12.50%	0.0038%
Fidelity National Information Services I	FIS	91,492.15	0.34%	0.94%	23.50%	24.55%	0.0834%
	FISV	83,214.18	0.31%	0.00%	15.00%	15.00%	0.0463%
Filth Third Bancorp	FLIB	21,097.60	0.08%	3.41%	12 00%	10.53%	0.0082%
Flowserve Corp	FLS	6,418.03	0.02%	1.55%	13.50%	15.15%	0.0036%
FleetCor Technologies Inc	FLT	27,480.38	0.10%	0.00%	16.50%	16.50%	0.0168%
FMC Corp	FMC	12,550.62	0.05%	1.82%	15.00%	16.96%	0.0079%
Fox Corp	FOXA	23,268.13	N/A	1.23%	N/A 10.50%	N/A 11 10%	N/A
Federal Realty Investment Trust	FRT	9,525.04	0.07%	3.22%	3.00%	6 27%	0.0081%
TechnipFMC PLC	FTI	N/A	N/A	0.00%	N/A	N/A	N/A
Fortinet Inc	FTNT	20,396.69	0.08%	0.00%	28.00%	28.00%	0.0212%
Fortive Corp	FTV	26,046.96	0.10%	0.36%	10.00%	10.38%	0.0100%
General Dynamics Corp	GD	53,411.67	0.20%	2.21%	6.00%	8.28%	0.0164%
Gilead Sciences Inc	GILD	80.948.05	0.30%	3.94%	-1.50%	2.41%	0.0072%
General Mills Inc	GIS	32,793.50	0.12%	3.61%	4.50%	8.19%	0.0100%
Globe Life Inc	GL	11,361.68	0.04%	0.66%	9.50%	10.19%	0.0043%
Corning Inc	GLW	22,694.40	0.08%	2.71%	14.50%	17.41%	0.0147%
General Motors Co	GM	48,832.00 N/Δ	0.18% N/A	4.47%	2.00% N/A	6.51% N/A	0.0118% N/A
Genuine Parts Co	GPC	14,554.00	0.05%	3.05%	8.00%	11.17%	0.0060%
Global Payments Inc	GPN	60,042.88	0.22%	0.39%	20.50%	20.93%	0.0466%
Gap Inc/The	GPS	6,643.13	0.02%	5.45%	3.00%	8.53%	0.0021%
Garmin Ltd	GRMN	19,116.76	0.07%	2.27%	10.50%	12.89%	0.0091%
Goldman Sachs Group Inc/The	GWW	87,797.05	0.33%	2.04%	10.00%	12.14%	0.0396%
Halliburton Co	HAL	20.656.08	0.08%	3.05%	19.50%	22.85%	0.0175%
Hasbro Inc	HAS	13,317.17	0.05%	2.58%	9.50%	12.20%	0.0060%
Huntington Bancshares Inc/OH	HBAN	14,737.41	0.05%	4.35%	10.50%	15.08%	0.0082%
Hanesbrands Inc	HBI	5,221.68	0.02%	4.16%	3.00%	7.22%	0.0014%
HCA Healincare Inc Home Depot Inc/The		49,882.38	0.19%	2.74%	9.00%	13.00%	0.0253%
Hess Corp	HES	20,134.04	N/A	1.50%	N/A	N/A	N/A
HollyFrontier Corp	HFC	7,478.07	0.03%	3.03%	17.00%	20.29%	0.0056%
Hartford Financial Services Group Inc/Th	HIG	21,229.41	0.08%	2.07%	12.50%	14.70%	0.0116%
Huntington Ingalls Industries Inc	HII UU T	11,361.10	0.04%	1.49%	7.00%	8.54%	0.0036%
Harley-Davidson Inc	HOG	5 438 70	0.12%	0.54% 4.26%	8.50%	12.09%	0.0205%
Hologic Inc	HOLX	14,372.74	0.05%	0.00%	12.00%	12.00%	0.0064%
Honeywell International Inc	HON	128,315.80	0.48%	2.01%	8.50%	10.60%	0.0505%
Helmerich & Payne Inc	HP	4,670.60	N/A	6.65%	N/A	N/A	N/A
Hewlett Packard Enterprise Co	HPE	19,622.63	0.07%	3.17%	8.00%	11.30%	0.0082%
H&R Block Inc	HPQ	32,221.80 1 756 10	0.12%	3.17% 4.35%	7.00%	10.28%	0.0123%
Hormel Foods Corp	HRL	25,115.59	0.09%	1.98%	10.50%	12.58%	0.0117%

		[4]	[5]	[6]	[7]	[8]	[9]
Company	Ticker	Market Capitalization	Weight in Index	Estimated Dividend Yield	Long-Term Growth Est	DCE Result	Weighted DCF Result
Company	TICKCI	Odpitalization	Weight in index	Dividend Heid	Growin Est.	Dor Result	Dor Result
Henry Schein Inc	HSIC	10,384.11	0.04%	0.00%	7.00%	7.00%	0.0027%
Host Hotels & Resorts Inc	HST	12,919.98	0.05%	4.76%	-1.50%	3.22%	0.0015%
Hershey Co/The	HSY	32,184.31	0.12%	2.08%	7.00%	9.15%	0.0109%
Humana Inc International Business Machines Corn	IBM	49,301.45	0.18%	0.63%	12.00%	12.07% 5.62%	0.0232%
Intercontinental Exchange Inc	ICE	54.293.40	0.20%	1.13%	10.50%	11.69%	0.0236%
IDEXX Laboratories Inc	IDXX	24,555.38	0.09%	0.00%	13.00%	13.00%	0.0118%
IDEX Corp	IEX	13,210.67	0.05%	1.15%	9.50%	10.70%	0.0052%
International Flavors & Fragrances Inc	IFF	14,526.87	0.05%	2.27%	8.00%	10.36%	0.0056%
Illumina Inc	ILMN	48,069.00	0.18%	0.00%	14.00%	14.00%	0.0250%
Incyte Corp	INCY	16,850.86	N/A 0.12%	0.00%	N/A 19.00%	N/A 19.02%	N/A
Intel Corp	INFO	275 442 00	1 02%	1 99%	10.50%	12 59%	0.0222 %
Intuit Inc	INTU	75,133.25	0.28%	0.74%	14.50%	15.29%	0.0426%
International Paper Co	IP	17,511.19	0.06%	4.59%	9.00%	13.80%	0.0090%
Interpublic Group of Cos Inc/The	IPG	9,107.63	0.03%	3.99%	11.00%	15.21%	0.0051%
IPG Photonics Corp	IPGP	7,787.81	0.03%	0.00%	8.00%	8.00%	0.0023%
IQVIA Holdings Inc	IQV	31,216.54	0.12%	0.00%	12.50%	12.50%	0.0145%
Ingersoll-Rand PLC		31,090.29	0.12%	1.60%	12.50%	14.20%	0.0167%
Intuitive Surgical Inc	ISRG	71 094 00	0.05%	0.00%	14 00%	14 00%	0.0369%
Gartner Inc	IT	14,430.12	0.05%	0.00%	13.50%	13.50%	0.0072%
Illinois Tool Works Inc	ITW	57,723.44	0.21%	2.38%	9.50%	11.99%	0.0257%
Invesco Ltd	IVZ	8,383.42	0.03%	6.71%	3.50%	10.33%	0.0032%
Jacobs Engineering Group Inc	J	13,049.66	0.05%	0.79%	14.50%	15.35%	0.0074%
JB Hunt Transport Services Inc	JBHT	12,416.34	0.05%	0.94%	9.50%	10.48%	0.0048%
Johnson Controls International plc	JCI	32,466.09	0.12%	2.49%	8.00%	10.59%	0.0128%
Jack Henry & Associates Inc		11,724.00	0.04%	1.05%	12.00%	13.11%	0.0057%
Juniper Networks Inc	JNPR	8 351 09	0.03%	3 19%	5 50%	8 78%	0.0027%
JPMorgan Chase & Co	JPM	428.255.70	1.59%	2.71%	8.50%	11.33%	0.1800%
Nordstrom Inc	JWN	6,105.57	0.02%	3.76%	5.00%	8.85%	0.0020%
Kellogg Co	к	24,026.66	0.09%	3.29%	3.50%	6.85%	0.0061%
KeyCorp	KEY	19,602.71	0.07%	3.78%	10.50%	14.48%	0.0105%
Keysight Technologies Inc	KEYS	19,561.25	0.07%	0.00%	21.50%	21.50%	0.0156%
Kraft Heinz Co/The	KHC	37,460.28	N/A	5.22%	N/A	N/A	N/A
Kimco Realty Corp	KIM	8,617.41	0.03%	5.53%	5.00%	10.67%	0.0034%
Kimberly-Clark Corp	KMB	20,005.29	0.11%	2.85%	7 50%	12.90%	0.0139%
Kinder Morgan Inc/DE	KMI	49.284.39	0.18%	4.60%	35.50%	40.92%	0.0748%
CarMax Inc	KMX	16,069.93	0.06%	0.00%	10.50%	10.50%	0.0063%
Coca-Cola Co/The	KO	247,743.70	0.92%	2.87%	6.50%	9.46%	0.0870%
Kroger Co/The	KR	22,808.88	0.08%	2.39%	4.00%	6.44%	0.0055%
Kohl's Corp	KSS	7,256.54	0.03%	6.40%	6.50%	13.11%	0.0035%
Kansas City Southern	KSU	16,524.78	0.06%	0.96%	12.00%	13.02%	0.0080%
Loews Corp		15,398.17	0.06%	0.49%	14.00%	14.52%	0.0083%
Leidos Holdings Inc		14 470 83	0.02 %	1.33%	9.00%	10.39%	0.0007 %
Leggett & Platt Inc	LEG	6.752.55	0.03%	3.12%	9.00%	12.26%	0.0031%
Lennar Corp	LEN	21,366.23	0.08%	0.74%	8.50%	9.27%	0.0074%
Laboratory Corp of America Holdings	LH	17,509.60	0.06%	0.00%	8.00%	8.00%	0.0052%
L3Harris Technologies Inc	LHX	N/A	N/A	0.00%	N/A	N/A	N/A
Linde PLC	LIN	112,745.60	N/A	1.81%	N/A	N/A	N/A
	LKQ	10,524.91	0.04%	0.00%	10.00%	10.00%	0.0039%
Ell Lilly & CO Lockbeed Martin Corp		130,008.10	0.50%	2.10%	12.00%	14.23%	0.0716%
Lincoln National Corp	LNC	11.568.41	0.04%	2.79%	9.00%	11.92%	0.0051%
Alliant Energy Corp	LNT	14,050.45	0.05%	2.60%	6.50%	9.18%	0.0048%
Lowe's Cos Inc	LOW	94,241.28	0.35%	1.92%	11.50%	13.53%	0.0473%
Lam Research Corp	LRCX	45,260.59	0.17%	1.47%	9.00%	10.54%	0.0177%
Southwest Airlines Co	LUV	29,155.69	0.11%	1.30%	10.50%	11.87%	0.0128%
Las Vegas Sands Corp	LVS	53,337.60	0.20%	4.55%	7.50%	12.22%	0.0242%
Lamb Weston Holdings Inc		13,270.21	0.05%	1.01%	5 50%	12.07%	0.0059%
Live Nation Entertainment Inc	LTD	15 889 79	N/A	0.00%	N/A	N/A	N/A
Macy's Inc	M	5,274.03	0.02%	8.85%	2.00%	10.94%	0.0021%
Mastercard Inc	MA	328,229.80	1.22%	0.49%	16.00%	16.53%	0.2014%
Mid-America Apartment Communities Inc	MAA	15,529.46	0.06%	2.93%	1.00%	3.94%	0.0023%
Marriott International Inc/MD	MAR	47,387.42	0.18%	1.33%	11.50%	12.91%	0.0227%
Masco Corp	MAS	14,134.87	0.05%	1.09%	9.50%	10.64%	0.0056%
Microshin Technology, Inc.	MCD	160,726.60	0.60%	2.34%	8.50%	10.94%	0.0653%
McKesson Corp	MCK	20,320.01	0.10%	1.33%	9.50%	10.89%	0.0106%
Mondy's Corp	MCO	21,940.90 48 526 00	0.10%	0.78%	11.50%	12 32%	0.0120%
Mondelez International Inc	MDLZ	79.871.08	0.30%	2.13%	8.50%	10.72%	0.0318%
Medtronic PLC	MDT	162,145.30	0.60%	1.79%	8.50%	10.37%	0.0624%
MetLife Inc	MET	47,635.39	0.18%	3.40%	7.50%	11.03%	0.0195%
MGM Resorts International	MGM	16,609.70	0.06%	1.61%	14.00%	15.72%	0.0097%
Mohawk Industries Inc	MHK	10,332.03	0.04%	0.00%	1.50%	1.50%	0.0006%
McCormick & Co Inc/MD	MKC	22,963.21	0.09%	1.44%	8.00%	9.50%	0.0081%

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Company	Ticker	Market	Weight in Index	Estimated	Long-Term Growth Est		Weighted
Company	TICKEI	Capitalization	weight in index	Dividend Heid	Glowin Est.	DCF Result	DCF Result
MarketAxess Holdings Inc	MKTX	13,876.21	0.05%	0.56%	14.50%	15.10%	0.0078%
Martin Marietta Materials Inc	MLM	16,741.88	0.06%	0.83%	9.50%	10.37%	0.0064%
Marsh & McLennan Cos Inc	MMC	57,685.92	0.21%	1.61%	9.00%	10.68%	0.0229%
3M CO Monster Beverage Corp	MNST	36 635 86	0.38%	3.24%	6.00% 14.50%	9.34%	0.0354%
Altria Group Inc	MO	94.452.40	0.35%	6.65%	8.50%	15.43%	0.0541%
Mosaic Co/The	MOS	7,581.92	0.03%	1.25%	18.00%	19.36%	0.0054%
Marathon Petroleum Corp	MPC	35,964.50	0.13%	3.83%	11.00%	15.04%	0.0201%
Merck & Co Inc	MRK	225,906.70	0.84%	2.76%	9.00%	11.88%	0.0996%
Marathon Oil Corp	MRO	9,788.22	N/A	1.64%	N/A 10.00%	N/A	N/A
Morgan Stanley MSCI Inc	MSCI	23 645 96	0.33%	2.52%	18.50%	12.05%	0.0423%
Microsoft Corp	MSFT	1,272,741.00	4.72%	1.22%	14.00%	15.31%	0.7230%
Motorola Solutions Inc	MSI	30,273.84	0.11%	1.45%	10.50%	12.03%	0.0135%
M&T Bank Corp	MTB	22,532.45	0.08%	2.58%	9.50%	12.20%	0.0102%
Mettler-Toledo International Inc	MID	20,241.10	0.08%	0.00%	10.00%	10.00%	0.0075%
Micron Technology Inc Maxim Integrated Products Inc	MXIM	17 208 03	0.24%	3.02%	5.50%	8 60%	0.0341%
Mylan NV	MYL	11,427.36	0.04%	0.00%	3.50%	3.50%	0.0015%
Noble Energy Inc	NBL	10,689.96	N/A	2.15%	N/A	N/A	N/A
Norwegian Cruise Line Holdings Ltd	NCLH	12,386.77	0.05%	0.00%	16.00%	16.00%	0.0074%
Nasdaq Inc	NDAQ	17,967.70	0.07%	1.72%	8.00%	9.79%	0.0065%
NextEra Energy Inc	NEE	127,120.90	0.47%	2.11%	10.50%	12.72%	0.0600%
Netflix Inc		153 212 50	0.13%	0.00%	32.00%	32.00%	0.0171%
NiSource Inc	NI	10,900.92	0.04%	2.74%	12.50%	15.41%	0.0062%
NIKE Inc	NKE	160,608.20	0.60%	0.95%	17.50%	18.53%	0.1105%
NortonLifeLock Inc	NLOK	17,693.20	0.07%	1.76%	7.00%	8.82%	0.0058%
Nielsen Holdings PLC	NLSN	7,603.66	0.03%	1.12%	45.50%	46.87%	0.0132%
Northrop Grumman Corp	NOC	64,359.81	0.24%	1.38%	9.50%	10.95%	0.0261%
ServiceNow Inc	NOW	58 728 59	N/A N/A	0.88%	N/A N/A	N/A N/A	N/A N/A
NRG Energy Inc	NRG	9,794.70	N/A	3.09%	N/A	N/A	N/A
Norfolk Southern Corp	NSC	54,394.43	0.20%	1.80%	14.00%	15.93%	0.0322%
NetApp Inc	NTAP	13,870.53	0.05%	3.17%	10.00%	13.33%	0.0069%
Northern Trust Corp	NTRS	22,050.56	0.08%	2.69%	8.50%	11.30%	0.0093%
		15,639.63	0.06%	3.11%	13.00%	10.31%	0.0095%
NVR Inc	NVR	14.896.43	0.06%	0.00%	13.50%	13.50%	0.0075%
Newell Brands Inc	NWL	8,533.73	0.03%	4.56%	4.00%	8.65%	0.0027%
News Corp	NWSA	8,439.55	N/A	1.39%	N/A	N/A	N/A
Realty Income Corp	0	23,461.03	0.09%	3.63%	4.50%	8.21%	0.0072%
	ODFL	16,405.78	0.06%	0.35%	9.50%	9.87%	0.0060%
Omnicom Group Inc	OMC	17 146 39	0.12%	3.56%	6.50%	10 18%	0.0202 %
Oracle Corp	ORCL	176,705.70	0.66%	1.75%	10.00%	11.84%	0.0776%
O'Reilly Automotive Inc	ORLY	33,021.19	0.12%	0.00%	12.00%	12.00%	0.0147%
Occidental Petroleum Corp	OXY	37,983.84	0.14%	7.46%	24.50%	32.87%	0.0463%
Paycom Software Inc	PAYC	18,153.30	0.07%	0.00%	25.50%	25.50%	0.0172%
People's United Financial Inc	PBCT	6 401 52	0.12%	4 48%	8.00%	12.66%	0.0030%
PACCAR Inc	PCAR	26,826.32	0.10%	4.61%	7.50%	12.28%	0.0122%
Healthpeak Properties Inc	PEAK	17,681.68	0.07%	4.00%	-3.50%	0.43%	0.0003%
Public Service Enterprise Group Inc	PEG	31,116.96	0.12%	3.14%	6.00%	9.23%	0.0107%
PepsiCo Inc	PEP	200,535.40	0.74%	2.75%	6.50%	9.34%	0.0695%
Prizer Inc Principal Financial Group Inc	PFE	225,294.10	0.84%	3.73%	5.50%	9.592%	0.1164%
Procter & Gamble Co/The	PG	308,656.90	1.15%	2.38%	9.00%	11.49%	0.1316%
Progressive Corp/The	PGR	44,622.52	0.17%	0.52%	15.50%	16.06%	0.0266%
Parker-Hannifin Corp	PH	25,925.52	0.10%	1.74%	9.50%	11.32%	0.0109%
PulteGroup Inc	PHM	11,882.08	0.04%	1.10%	9.50%	10.65%	0.0047%
Packaging Corp of America	PKG	10,138.58	0.04%	2.95%	6.00%	9.04%	0.0034%
Prologis Inc	PLD	60 254 25	0.04%	2.38%	6.50%	8.96%	0.0040%
Philip Morris International Inc	PM	135,484.30	0.50%	5.37%	6.00%	11.53%	0.0580%
PNC Financial Services Group Inc/The	PNC	67,039.69	0.25%	3.01%	8.00%	11.13%	0.0277%
Pentair PLC	PNR	7,863.39	0.03%	1.63%	6.00%	7.68%	0.0022%
Pinnacle West Capital Corp	PNW	10,767.24	0.04%	3.36%	4.00%	7.43%	0.0030%
	PPG PPI	29,000.02	0.11%	1.02% 4.52%	0.00%	% ۵۲.۱ 6 ۵5%	0.0085%
Perrigo Co PLC	PRGO	8.095.82	0.03%	1.51%	2.00%	3.53%	0.0011%
Prudential Financial Inc	PRU	38,048.36	0.14%	4.19%	6.50%	10.83%	0.0153%
Public Storage	PSA	38,866.04	0.14%	3.76%	4.50%	8.34%	0.0120%
Phillips 66	PSX	45,360.07	0.17%	3.82%	10.00%	14.01%	0.0236%
PVH Corp Quanta Services Inc	PVND	7,102.33	0.03%	0.16%	9.00%	9.17% 17.52%	0.0024%
Quanta Services IIIC Pioneer Natural Resources Co	PYN	0,040.00 23.261.24	0.02%	0.49%	35.00%	36 47%	0.0036%
PayPal Holdings Inc	PYPL	138,402.90	0.51%	0.00%	20.00%	20.00%	0.1027%
QUALCOMM Inc	QCOM	112,056.00	0.42%	2.70%	10.50%	13.34%	0.0555%
Qorvo Inc	QRVO	13,801.77	0.05%	0.00%	62.50%	62.50%	0.0320%

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Company	Ticker	Market	Weight in Index	Estimated	Long-Term Growth Est	DCE Result	Weighted
Company	TICKEI	Capitalization	Weight in Index	Dividend Heid	Glowal Est.	Der Result	DOI Result
Royal Caribbean Cruises Ltd	RCL	27,162.97	0.10%	2.41%	12.50%	15.06%	0.0152%
Everest Re Group Ltd	RE	11,444.96	0.04%	2.23%	18.50%	20.94%	0.0089%
Regency Centers Corp Regeneron Pharmaceuticals Inc	REG	10,759.35	0.04%	3.65%	16.00%	19.94%	0.0080%
Regions Financial Corp	RF	15,595.49	0.06%	4.08%	10.50%	14.79%	0.0086%
Robert Half International Inc	RHI	7,260.71	0.03%	2.11%	9.00%	11.20%	0.0030%
Raymond James Financial Inc	RJF	12,576.71	0.05%	1.64%	8.00%	9.71%	0.0045%
Ralph Lauren Corp	RL	8,804.29	0.03%	2.33%	8.00%	10.42%	0.0034%
Rockwell Automation Inc	ROK	23,202.00	0.09%	2.03%	8.00%	10.11%	0.0088%
Rollins Inc	ROL	11,987.65	0.04%	1.15%	13.00%	14.22%	0.0063%
Roper Technologies Inc	ROP	39,381.79	0.15%	0.54%	11.50%	12.07%	0.0176%
Ross Stores Inc	ROST	42,482.07	0.16%	0.95%	9.50%	10.50%	0.0165%
Republic Services Inc Raytheon Co	RTN	53,355.05 64 003 94	0.12%	1.75%	10.00%	11 72%	0.0105%
SBA Communications Corp	SBAC	28,715.15	0.11%	0.58%	29.50%	30.17%	0.0321%
Starbucks Corp	SBUX	113,109.40	0.42%	1.80%	13.50%	15.42%	0.0647%
Charles Schwab Corp/The	SCHW	62,410.09	0.23%	1.55%	12.00%	13.64%	0.0316%
Sealed Air Corp Sherwin-Williams Co/The	SEE	5,887.14 55.066.02	0.02%	0.87%	22.50%	24.37%	0.0053%
SVB Financial Group	SIVB	13,357.13	0.05%	0.00%	15.00%	15.00%	0.0074%
JM Smucker Co/The	SJM	12,361.82	0.05%	3.29%	3.50%	6.85%	0.0031%
Schlumberger Ltd	SLB	50,433.29	0.19%	5.49%	15.00%	20.90%	0.0391%
SL Green Realty Corp	SLG	7,971.40	0.03%	3.81%	5.50%	9.41%	0.0028%
Snap-on Inc Synopsys Inc	SNA	9,238.26	0.03%	2.57%	6.00% 12.00%	8.65%	0.0030%
Southern Co/The	SO	72.320.70	0.27%	3.68%	3.50%	7.24%	0.0194%
Simon Property Group Inc	SPG	45,501.57	0.17%	5.98%	4.50%	10.61%	0.0179%
S&P Global Inc	SPGI	72,633.23	0.27%	0.85%	11.00%	11.90%	0.0321%
Sempra Energy	SRE	45,136.92	0.17%	2.62%	11.00%	13.76%	0.0231%
STERIS PLC State Street Corp	SIE	12,873.03	0.05%	0.98%	10.00%	11.03%	0.0053%
Seagate Technology PLC	STX	16 482 35	0.06%	4 14%	4 00%	8 22%	0.0050%
Constellation Brands Inc	STZ	37,013.16	0.14%	1.62%	8.50%	10.19%	0.0140%
Stanley Black & Decker Inc	SWK	29,804.62	0.11%	1.66%	9.00%	10.73%	0.0119%
Skyworks Solutions Inc	SWKS	21,840.37	0.08%	1.37%	8.00%	9.42%	0.0076%
Synchrony Financial	SYF	23,662.38	0.09%	2.49%	9.50%	12.11%	0.0106%
Svsco Corp	SYY	42 703 12	0.30%	2 15%	10.50%	14.13%	0.0425%
AT&T Inc	Т	282,129.30	1.05%	5.38%	5.50%	11.03%	0.1155%
Molson Coors Beverage Co	TAP	12,272.86	0.05%	4.02%	2.50%	6.57%	0.0030%
TransDigm Group Inc	TDG	37,018.43	0.14%	0.00%	11.50%	11.50%	0.0158%
Truiet Financial Corn	TEL	33,765.47	0.13%	1.83%	6.50%	8.39%	0.0105%
Teleflex Inc	TFX	43,100.04	0.16%	0.35%	15 00%	15.38%	0.0103%
Target Corp	TGT	58,536.51	0.22%	2.29%	9.50%	11.90%	0.0259%
Tiffany & Co	TIF	16,091.78	0.06%	1.77%	10.50%	12.36%	0.0074%
TJX Cos Inc/The	TJX	75,138.84	0.28%	1.47%	13.50%	15.07%	0.0420%
Thermo Fisher Scientific Inc		145,564.30	0.54%	0.23%	10.00%	10.24%	0.0553%
Tapestry Inc	TPR	7.708.65	0.03%	4.83%	10.50%	15.58%	0.0045%
T Rowe Price Group Inc	TROW	31,264.65	0.12%	2.37%	10.00%	12.49%	0.0145%
Travelers Cos Inc/The	TRV	34,634.44	0.13%	2.44%	9.00%	11.55%	0.0148%
Tractor Supply Co	TSCO	11,096.84	0.04%	1.62%	11.50%	13.21%	0.0054%
Take Two Interactive Software Inc	TSN	32,193.36	0.12%	1.91%	8.00%	9.99%	0.0119%
Twitter Inc	TWTR	26.289.08	N/A	0.00%	N/A	N/A	N/A
Texas Instruments Inc	TXN	125,547.60	0.47%	2.68%	6.00%	8.76%	0.0408%
Textron Inc	TXT	10,293.40	0.04%	0.18%	13.00%	13.19%	0.0050%
Under Armour Inc	UAA	9,586.02	0.04%	0.00%	17.50%	17.50%	0.0062%
United Airlines Holdings Inc	UAL	21,527.61	0.08%	0.00%	12.00%	12.00%	0.0096%
Universal Health Services Inc	UHS	12 942 87	0.05%	0.54%	11 00%	11 57%	0.0041%
Ulta Beauty Inc	ULTA	15,592.43	0.06%	0.00%	13.00%	13.00%	0.0075%
UnitedHealth Group Inc	UNH	283,588.70	1.05%	1.44%	13.50%	15.04%	0.1583%
Unum Group	UNM	5,912.59	0.02%	3.98%	7.50%	11.63%	0.0026%
Union Pacific Corp	UNP	130,189.90	0.48% 0.37%	2.07%	13.00% 8.00%	15.20%	0.0735%
United Rentals Inc	UPS	11 752 77	0.37 %	0.00%	14 50%	14 50%	0.0429%
US Bancorp	USB	86,224.32	0.32%	3.13%	6.00%	9.22%	0.0295%
United Technologies Corp	UTX	132,770.80	0.49%	1.91%	9.00%	11.00%	0.0542%
Visa Inc	V	410,148.70	1.52%	0.58%	18.00%	18.63%	0.2836%
varian Medical Systems Inc	VAR	13,566.43	0.05%	0.00%	10.50%	10.50%	0.0053%
VF COIP ViacomCBS Inc		34,007.15 13,871.25	0.13%	∠.∠ວ% 2.60%	12 00%	9.33% 14 76%	0.0118%
Valero Energy Corp	VLO	36.771.60	0.14%	4.19%	11.50%	15.93%	0.0217%
Vulcan Materials Co	VMC	18,867.82	0.07%	0.87%	14.50%	15.43%	0.0108%
Vornado Realty Trust	VNO	13,094.22	0.05%	3.85%	-1.50%	2.32%	0.0011%
Verisk Analytics Inc	VRSK	27,018.95	0.10%	0.61%	10.00%	10.64%	0.0107%
venoign mu	VKSN	∠ວ,308.93	0.09%	0.00%	11.00%	11.00%	0.0103%

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		Market		Estimated	Long-Term		Weighted
Company	Ticker	Capitalization	Weight in Index	Dividend Yield	Growth Est.	DCF Result	DCF Result
	VDTV	CO 47C 0C	0.000/	0.000/	50.000/	50.000/	0 44470/
Vertex Pharmaceuticals Inc	VRIX	60,176.86	0.22%	0.00%	50.00%	50.00%	0.1117%
Ventas Inc	VIR	20,852.33	0.08%	5.54%	4.00%	9.65%	0.0075%
Verizon Communications Inc	VZ	250,256.30	0.93%	4.07%	4.00%	8.15%	0.0757%
Westinghouse Air Brake Technologie	s Corp WAB	15,330.25	0.06%	0.60%	13.50%	14.14%	0.0080%
Waters Corp	WAI	15,753.75	0.06%	0.00%	13.00%	13.00%	0.0076%
Walgreens Boots Alliance Inc	WBA	47,335.20	0.18%	3.43%	9.00%	12.58%	0.0221%
Western Digital Corp	WDC	21,137.14	0.08%	2.82%	1.00%	3.83%	0.0030%
WEC Energy Group Inc	WEC	31,133.53	0.12%	2.56%	6.00%	8.64%	0.0100%
Welltower Inc	WELL	33,472.25	0.12%	4.13%	10.50%	14.85%	0.0184%
Wells Fargo & Co	WFC	205,858.00	0.76%	4.27%	5.50%	9.89%	0.0755%
Whirlpool Corp	WHR	9,495.36	0.04%	3.19%	6.50%	9.79%	0.0035%
Willis Towers Watson PLC	WLTW	26,565.52	0.10%	1.26%	17.50%	18.87%	0.0186%
Waste Management Inc	WM	51,382.74	0.19%	1.69%	8.50%	10.26%	0.0196%
Williams Cos Inc/The	WMB	27,197.28	0.10%	6.77%	20.00%	27.45%	0.0277%
Walmart Inc	WMT	328,784.60	1.22%	1.87%	7.50%	9.44%	0.1152%
WR Berkley Corp	WRB	13,110.65	0.05%	0.62%	12.00%	12.66%	0.0062%
Westrock Co	WRK	10,840.49	0.04%	4.42%	8.00%	12.60%	0.0051%
Western Union Co/The	WU	11,652.22	0.04%	2.88%	6.50%	9.47%	0.0041%
Weverhaeuser Co	WY	22,963.09	0.09%	4.41%	15.00%	19.74%	0.0168%
Wynn Resorts Ltd	WYNN	14,935,26	0.06%	2.88%	14.50%	17.59%	0.0098%
Cimarex Energy Co	XEC	4,900.60	0.02%	1.66%	8.50%	10.23%	0.0019%
Xcel Energy Inc	XEL	35.081.29	0.13%	2.57%	5.50%	8.14%	0.0106%
Xilinx Inc	XLNX	25,752,63	0.10%	1.45%	8.00%	9.51%	0.0091%
Exxon Mobil Corp	XOM	282,503,90	1.05%	5.27%	11.00%	16.56%	0.1736%
DENTSPLY SIRONA Inc	XRAY	13.262.42	0.05%	0.59%	4.50%	5.10%	0.0025%
Xerox Holdings Corp	XRX	7.933.03	0.03%	2.76%	12.50%	15.43%	0.0045%
Xvlem Inc/NY	XYL	14.824.80	0.06%	1.17%	14.00%	15.25%	0.0084%
Yum! Brands Inc	YUM	32,111,94	0.12%	1.64%	12.00%	13.74%	0.0164%
Zimmer Biomet Holdings Inc	ZBH	30,739,26	0.11%	0.66%	4.50%	5.17%	0.0059%
Zebra Technologies Corp	ZBRA	13.747.39	0.05%	0.00%	15.50%	15.50%	0.0079%
Zions Bancorp NA	ZION	8 142 13	0.03%	2 85%	9.50%	12 49%	0.0038%
Zoetis Inc	ZTS	65,953.04	0.24%	0.58%	13.50%	14.12%	0.0346%
Total Ma	arket Capitalization	26 942 730 24	0.2.170	0.0070			14 51%
Neter		20,012,100.24					1.1.5176

 Total Market Capitalization:
 26

 Notes:
 [1] Equals sum of Col. [9]

 [2] Source: Bloomberg Professional
 [3] Equals [1] - [2]

 [4] Source: Value Line
 [5] Equals weight in S&P 500 based on market capitalization

 [6] Source: Value Line
 [7] Source: Value Line

 [8] Equals ([6] x (1 + (0.5 x [7]))) + [7]
 [9] Equals Col. [5] x Col. [8]

Bloomberg and Value Line Beta Coefficients

		[1]	[2]
Company	Ticker	Bloomberg	Value Line
Atmos Energy Corporation	ATO	0.503	0.600
New Jersey Resources Corporation	NJR	0.657	0.700
Northwest Natural Holding Company	NWN	0.569	0.600
ONE Gas, Inc.	OGS	0.540	0.650
Southwest Gas Holdings, Inc.	SWX	0.572	0.700
Spire Inc.	SR	0.536	0.650
Mean		0.563	0.650

Notes:

[1] Source: Bloomberg Professional

[2] Source: Value Line

Capital Asset Pricing Model Results Bloomberg and Value Line Derived Market Risk Premium

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
			Ex-Ante Marke	t Risk Premium	CAPM	Result	ECAPN	1 Result
			Bloomberg	Value Line	Bloomberg	Value Line	Bloomberg	Value Line
		Average Beta	Market DCF	Market DCF	Market DCF	Market DCF	Market DCF	Market DCF
	Risk-Free Rate	Coefficient	Derived	Derived	Derived	Derived	Derived	Derived
PROXY GROUP AVERAGE BLOOMBERG BETA	COEFFICIENT							
Current 30-Year Treasury [9]	2.25%	0.563	11.18%	12.25%	8.55%	9.15%	9.77%	10.49%
Near Term Projected 30-Year Treasury [10]	2.42%	0.563	11.18%	12.25%	8.71%	9.31%	9.93%	10.65%
Long-Term Projected 30-Year Treasury [11]	3.45%	0.563	11.18%	12.25%	9.74%	10.35%	10.97%	11.69%
Mean					9.00%	9.60%	10.22%	10.94%

			Ex-Ante Marke	t Risk Premium	CAPM	Result	FCAP	A Result
			Bloomberg	Value Line	Bloomberg	Value Line	Bloomberg	Value Line
		Average Beta	Market DCF	Market DCF	Market DCF	Market DCF	Market DCF	Market DCF
	Risk-Free Rate	Coefficient	Derived	Derived	Derived	Derived	Derived	Derived
PROXY GROUP AVERAGE VALUE LINE AVERA	AGE BETA COEFFIC	IENT						
Current 30-Year Treasury [9]	2.25%	0.650	11.18%	12.25%	9.52%	10.22%	10.50%	11.29%
Near Term Projected 30-Year Treasury [10]	2.42%	0.650	11.18%	12.25%	9.69%	10.38%	10.66%	11.45%
Long-Term Projected 30-Year Treasury [11]	3.45%	0.650	11.18%	12.25%	10.72%	11.42%	11.70%	12.49%
Mean					9.98%	10.67%	10.96%	11.74%

Notes:

[1] See Notes [9], [10], and [11]
[2] Source: Schedule RBH-5
[3] Source: Schedule RBH-4
[4] Source: Schedule RBH-4
[5] Equals Col. [1] + (Col. [2] x Col. [3])
[6] Equals Col. [1] + (Col. [2] x Col. [4])
[7] Equals Col. [1] + (0.75 x Col. [2] x Col. [3]) + (0.25 x Col. [3])
[8] Equals Col. [1] + (0.75 x Col. [2] x Col. [4]) + (0.25 x Col. [4])
[9] Source: Bloomberg Professional

[10] Source: Blue Chip Financial Forecasts, Vol. 39, No. 2, February 1, 2020, at 2.

[11] Source: Blue Chip Financial Forecasts, Vol. 38, No. 12, December 1, 2019, at 14.

[1] [5] [2] [3] [4] 30-Year Treasury Risk Return on Constant Slope Yield Premium Equity -2.70% -2.73% Current 30-Year Treasury 2.25% 7.64% 9.90% Near Term Projected 30-Year Treasury 2.42% 7.45% 9.87% Long Term Projected 30-Year Treasury 3.45% 6.48% 9.93%

Bond Yield Plus Risk Premium



Notes:

- [1] Constant of regression equation
- [2] Slope of regression equation
- [3] Source: Current = Bloomberg Professional Near Term Projected = Blue Chip Financial Forecasts, Vol. 39, No. 2, February 1, 2020, at 2 Long Term Projected = Blue Chip Financial Forecasts, Vol. 38, No. 12, December 1, 2019, at 14
- [4] Equals [1] + ln([3]) x [2]
- [5] Equals [3] + [4]
- [6] Source: S&P Global Market Intelligence
- [7] Source: S&P Global Market Intelligence
- [8] Source: Bloomberg Professional, equals 187-trading day average (i.e. lag period)
- [9] Equals [7] [8]

[6] Date of	[7]	[8] 30-Vear	[9]
Natural Gas	Return on	Tressury	Rick
Rate Case	Equity	Vield	Premium
1/3/1980	12 55%	9.30%	3 16%
1/4/1980	13 75%	9.0970	4 35%
1/1/1080	13.20%	9.40%	3 76%
1/18/1080	14 00%	9.44%	1 53%
1/31/1980	12 61%	9.56%	3.05%
2/8/1980	14 50%	9.63%	4 87%
2/14/1980	13.00%	9.67%	3 33%
2/15/1980	13.00%	9.69%	3.31%
2/29/1980	14 00%	9.86%	4 14%
3/5/1980	14.00%	9.00%	4.14%
3/7/1980	13 50%	9.95%	3 55%
3/14/1980	14 00%	10.04%	3.96%
3/27/1980	12 69%	10.04 %	2 49%
4/1/1980	14 75%	10.26%	4 49%
4/29/1980	12 50%	10.51%	1.99%
5/7/1980	14 27%	10.56%	3 71%
5/8/1980	13 75%	10.56%	3 19%
5/19/1980	15 50%	10.62%	4 88%
5/27/1980	14 60%	10.65%	3 95%
5/29/1980	16.00%	10.00%	5.33%
6/10/1980	13 78%	10.01 %	3.07%
6/25/1980	14 25%	10.71%	3 51%
7/9/1980	14.51%	10.74%	3 74%
7/17/1980	12 90%	10.79%	2 11%
7/18/1980	13.80%	10.79%	3.01%
7/22/1980	14 10%	10.79%	3.31%
7/23/1980	14 19%	10.79%	3 40%
8/1/1980	12 50%	10.80%	1 70%
8/11/1980	14 85%	10.81%	4 04%
8/21/1980	13 03%	10.84%	2 19%
8/28/1980	13.61%	10.87%	2 74%
8/28/1980	14 00%	10.87%	3 13%
9/4/1980	14.00%	10.07 %	3 10%
9/24/1980	15.00%	10.98%	4 02%
10/9/1980	14 50%	11.05%	3 45%
10/9/1980	14.50%	11.05%	3 45%
10/24/1980	14 00%	11.09%	2.91%
10/27/1980	15 20%	11 10%	4 10%
10/27/1980	15.20%	11.10%	4.10%
10/28/1980	12.00%	11.10%	0.90%
10/28/1980	13 00%	11 10%	1.90%
10/31/1980	14.50%	11.12%	3.38%
11/4/1980	15.00%	11.12%	3.88%
11/6/1980	14 35%	11 13%	3 22%
11/10/1980	13.25%	11.14%	2.11%
11/17/1980	15.50%	11.15%	4.35%
11/19/1980	13.50%	11.14%	2.36%
12/5/1980	14.60%	11.13%	3.47%
12/8/1980	16.40%	11.13%	5.27%
12/12/1980	15.45%	11.15%	4.30%
12/17/1980	14,20%	11,16%	3.04%
12/17/1980	14.40%	11,16%	3.24%
12/18/1980	14.00%	11.16%	2.84%

[6] Data of	[7]	[8] 20 Voor	[9]
Natural Cas	Poturn on	July Troopuny	Pick
Poto Coco	Equity	Viold	Dromium
12/22/1080	13 45%	11 16%	2 20%
12/22/1900	14 00%	11.10%	2.29%
12/20/1900	14.50%	11 14%	3 36%
12/30/1900	14.50%	11.14%	3 42%
1/7/1981	14.30%	11 13%	3 17%
1/12/1981	14.00%	11 14%	3.81%
1/26/1981	15 25%	11 20%	4.05%
1/30/1981	13 25%	11.23%	2 02%
2/11/1981	14.50%	11.33%	3.17%
2/20/1981	14.50%	11.40%	3.10%
3/12/1981	15.65%	11.60%	4.05%
3/25/1981	15.30%	11.74%	3.56%
4/1/1981	15.30%	11.82%	3.48%
4/9/1981	15.00%	11.91%	3.09%
4/29/1981	13.50%	12.12%	1.38%
4/29/1981	14.25%	12.12%	2.13%
4/30/1981	13.60%	12.14%	1.46%
4/30/1981	15.00%	12.14%	2.86%
5/21/1981	14.00%	12.37%	1.63%
6/3/1981	14.67%	12.46%	2.21%
6/22/1981	16.00%	12.57%	3.43%
6/25/1981	14.75%	12.60%	2.15%
7/2/1981	14.00%	12.64%	1.36%
7/10/1981	16.00%	12.69%	3.31%
7/14/1981	16.90%	12.71%	4.19%
7/21/1981	15.78%	12.78%	3.00%
7/27/1981	13.77%	12.82%	0.95%
7/27/1981	15.50%	12.82%	2.68%
7/31/1981	13.50%	12.86%	0.64%
7/31/1981	14.20%	12.86%	1.34%
8/12/1981	13.72%	12.93%	0.79%
8/12/1981	13.72%	12.93%	0.79%
8/12/1981	14.41%	12.93%	1.48%
8/25/1981	15.45%	13.02%	2.43%
8/27/1981	14.43%	13.04%	1.39%
8/28/1981	15.00%	13.05%	1.95%
9/23/1981	14.34%	13.24%	1.10%
9/24/1981	10.25%	13.20%	2.99%
9/29/1901	14.50%	10.0170	1.1970
9/30/1901	13.94%	13.32%	2.0270
10/2/1901	16.00%	13.30%	1.44 /0
10/12/1901	15.25%	13.43%	2.02 /0
10/20/1901	16 50%	13.50%	3.00%
10/20/1981	17.00%	13 50%	3 50%
10/23/1981	15 50%	13 54%	1.96%
10/26/1981	13 50%	13 56%	-0.06%
10/29/1981	16.50%	13.60%	2.90%
11/4/1981	15.33%	13.62%	1.71%
11/6/1981	15.17%	13.64%	1.53%
11/12/1981	15.00%	13.65%	1.35%
11/25/1981	15.25%	13.66%	1.59%
11/25/1981	16.10%	13.66%	2.44%

[6] Dete of	[7]	[8] 20 Voor	[9]
Date of	Daturn on		Diak
Natural Gas		Viold	RISK Dramium
11/25/1001		12 66%	
11/20/1901	10.10%	13.00%	2.44%
12/1/1021	10.75%	13.00%	3.09%
12/1/1901	16.00%	13.66%	2.04%
12/1/1901	15.81%	13.60%	2.34%
12/13/1901	14 75%	13.09%	1.05%
12/17/1901	15 70%	13.70%	1.00%
12/22/1901	16.00%	13.72%	2.28%
12/22/1001	16.00%	13.72%	2.20%
12/30/1981	16.25%	13 74%	2.20%
1/4/1982	15 50%	13 75%	1 75%
1/14/1982	11.95%	13.80%	-1.85%
1/25/1982	16 25%	13.84%	2 41%
1/27/1982	16.84%	13 85%	2.99%
1/31/1982	14 00%	13 86%	0.14%
2/2/1982	16 24%	13 86%	2.38%
2/8/1982	15 50%	13 87%	1.63%
2/9/1982	14.95%	13.88%	1.07%
2/9/1982	15.75%	13.88%	1.87%
2/11/1982	16.00%	13.89%	2.11%
3/1/1982	15.96%	13.91%	2.05%
3/3/1982	15.00%	13.91%	1.09%
3/8/1982	17.10%	13.92%	3.18%
3/26/1982	16.00%	13.97%	2.03%
3/31/1982	16.25%	13.98%	2.27%
4/1/1982	16.50%	13.98%	2.52%
4/6/1982	15.00%	13.99%	1.01%
4/9/1982	16.50%	13.99%	2.51%
4/12/1982	15.10%	13.99%	1.11%
4/12/1982	16.70%	13.99%	2.71%
4/18/1982	14.70%	13.99%	0.71%
4/27/1982	15.00%	13.97%	1.03%
5/10/1982	14.57%	13.94%	0.63%
5/14/1982	15.80%	13.92%	1.88%
5/20/1982	15.82%	13.91%	1.91%
5/21/1982	15.50%	13.90%	1.60%
5/25/1982	16.25%	13.90%	2.35%
6/2/1982	14.50%	13.87%	0.63%
6/7/1982	16.00%	13.85%	2.15%
6/23/1982	15.50%	13.81%	1.69%
6/25/1982	16.50%	13.81%	2.69%
7/1/1982	15.55%	13.79%	1.76%
7/1/1982	16.00%	13.79%	2.21%
7/2/1982	15.10%	13.79%	1.31%
7/13/1982	16.80%	13.75%	3.05%
7/22/1982	14.50%	13.71%	0.79%
7/28/1982	16.10%	13.68%	2.42%
7/30/1982	14.82%	13.66%	1.16%
8/4/1982	15.58%	13.64%	1.94%
8/6/1982	16.50%	13.63%	2.87%
8/11/1982	17.11%	13.62%	3.49%
8/25/1982	16.00%	13.59%	2.41%
8/30/1982	16.25%	13.58%	2.67%

[6] Date of	[7]	[8] 30-Year	[9]
Natural Gas	Return on	Treasury	Risk
Rate Case	Equity	Vield	Premium
9/3/1982	15 50%	13 57%	1 93%
9/9/1982	16.04%	13 55%	2 49%
9/15/1982	16.04%	13 52%	2.10%
9/17/1982	15 25%	13 51%	1 74%
9/29/1982	14 50%	13 43%	1.07%
9/30/1982	14 74%	13 42%	1.32%
9/30/1982	15 50%	13 42%	2.08%
9/30/1982	16.50%	13.42%	3.08%
9/30/1982	16.70%	13.42%	3.28%
10/1/1982	16.50%	13.41%	3.09%
10/8/1982	15.00%	13.33%	1.67%
10/15/1982	15.90%	13.26%	2.64%
10/19/1982	15.90%	13.22%	2.68%
10/27/1982	17.00%	13.12%	3.88%
10/28/1982	14.75%	13.11%	1.64%
11/2/1982	16.25%	13.07%	3.18%
11/4/1982	15.75%	13.03%	2.72%
11/5/1982	14.73%	13.01%	1.72%
11/17/1982	16.00%	12.86%	3.14%
11/23/1982	15.50%	12.79%	2.71%
11/24/1982	14.50%	12.77%	1.73%
11/24/1982	16.02%	12.77%	3.25%
11/30/1982	12.98%	12.72%	0.26%
11/30/1982	15.50%	12.72%	2.78%
11/30/1982	15.50%	12.72%	2.78%
11/30/1982	15.65%	12.72%	2.93%
11/30/1982	16.00%	12.72%	3.28%
11/30/1982	16.10%	12.72%	3.38%
12/3/1982	15.33%	12.68%	2.65%
12/8/1982	15.75%	12.63%	3.12%
12/13/1982	16.00%	12.58%	3.42%
12/14/1982	16.40%	12.57%	3.83%
12/17/1982	16.25%	12.52%	3.73%
12/20/1982	15.00%	12.51%	2.49%
12/21/1982	15.70%	12.49%	3.21%
12/28/1982	15.25%	12.42%	2.83%
12/28/1982	15.25%	12.42%	2.83%
12/29/1982	16.25%	12.41%	3.84%
12/29/1982	16.25%	12.41%	3.84%
1/11/1983	15.90%	12.26%	3.64%
1/12/1983	15.50%	12.24%	3.26%
1/18/1983	15.00%	12.18%	2.82%
1/24/1983	15.50%	12.13%	3.37%
1/24/1983	16.00%	12.13%	3.87%
1/28/1983	14.90%	12.08%	2.82%
1/31/1983	15.00%	12.07%	2.93%
2/10/1983	15.00%	11.97%	3.03%
2/25/1983	15.70%	11.84%	3.86%
3/2/1983	15.25%	11.79%	3.46%
3/16/1983	16.00%	11.62%	4.38%
3/21/1983	14.96%	11.57%	3.39%
3/23/1983	15.40%	11.53%	3.87%
3/23/1983	16.10%	11.53%	4.57%

[6] Date of	[7]	[8] 30-Year	[9]
Natural Gas	Return on	Treasury	Risk
Rate Case	Fauity	Yield	Premium
3/24/1983	15 00%	11 51%	3 49%
4/12/1983	13.25%	11.30%	1.95%
4/29/1983	15.05%	11 09%	3.96%
5/3/1983	15.40%	11.06%	4.34%
5/9/1983	15.50%	11.00%	4.50%
5/19/1983	14.85%	10.90%	3.95%
5/31/1983	14.00%	10.84%	3.16%
6/2/1983	14.50%	10.82%	3.68%
6/7/1983	14.50%	10.80%	3.70%
6/9/1983	14.85%	10.79%	4.06%
6/20/1983	14.15%	10.74%	3.41%
6/20/1983	16.50%	10.74%	5.76%
6/27/1983	14.50%	10.71%	3.79%
6/30/1983	14.80%	10.70%	4.10%
6/30/1983	15.90%	10.70%	5.20%
7/1/1983	14 80%	10 70%	4 10%
7/5/1983	15.00%	10.69%	4.31%
7/8/1983	15.50%	10.69%	4.81%
7/19/1983	15 00%	10.70%	4 30%
7/19/1983	15 10%	10.70%	4 40%
8/18/1983	15 30%	10.81%	4 49%
8/19/1983	15 79%	10.82%	4 97%
8/29/1983	16.00%	10.85%	5 15%
8/31/1983	14 75%	10.87%	3.88%
8/31/1983	15 25%	10.87%	4.38%
9/8/1983	14 75%	10.89%	3.86%
9/16/1983	15 51%	10.93%	4 58%
9/26/1983	14 50%	10.96%	3 54%
9/28/1983	14 25%	10.97%	3 28%
9/30/1983	16 15%	10.98%	5 17%
9/30/1983	16 25%	10.98%	5 27%
10/1/1983	16 25%	10.98%	5 27%
10/13/1983	15 52%	11 02%	4 50%
10/19/1983	15 20%	11.04%	4 16%
10/26/1983	14 75%	11.06%	3 69%
10/27/1983	14 88%	11.07%	3.81%
10/27/1983	15.33%	11.07%	4.26%
11/9/1983	14 82%	11 10%	3 72%
11/9/1983	16.51%	11.10%	5.41%
11/9/1983	16.51%	11.10%	5.41%
12/1/1983	14.50%	11.17%	3.33%
12/8/1983	15.90%	11.20%	4.70%
12/9/1983	15.30%	11.21%	4.09%
12/12/1983	14 50%	11 22%	3 28%
12/12/1983	15.50%	11.22%	4.28%
12/20/1983	15.40%	11.26%	4.14%
12/20/1983	16.00%	11.26%	4.74%
12/22/1983	15.75%	11.27%	4,48%
12/29/1983	15.00%	11.30%	3.70%
12/30/1983	15.00%	11.30%	3.70%
1/10/1984	15.90%	11.34%	4.56%
1/13/1984	15.50%	11.36%	4,14%
1/18/1984	15.53%	11.38%	4.15%

[6]	[7]	[8]	[9]
Date of	Deturne	SU-Year	Diale
Natural Gas		Viold	RISK
1/26/109/	15 00%	11 4 20/	
2/14/1084	14 25%	11.4270	4.40%
2/14/1904	14.25%	11.51%	2.74%
2/20/1904	16.00%	11.30%	2.9270
3/23/1984	15 50%	11.70%	4.30%
4/0/1084	15 20%	11.7270	3 39%
4/18/1984	16 20%	11.86%	4 34%
4/27/1984	15.85%	11.00%	3 95%
5/15/1984	13 35%	11 99%	1.36%
5/16/1984	15.00%	12 00%	3.00%
5/22/1984	14 40%	12.00%	2.36%
6/13/1984	15 50%	12 18%	3 32%
7/10/1984	16.00%	12.37%	3.63%
8/7/1984	16.69%	12.51%	4.18%
8/9/1984	15.33%	12.51%	2.82%
8/17/1984	14.82%	12.54%	2.28%
8/21/1984	14.64%	12.54%	2.10%
8/27/1984	14.52%	12.56%	1.96%
8/28/1984	14.75%	12.57%	2.18%
8/30/1984	15.60%	12.58%	3.02%
9/12/1984	15.60%	12.60%	3.00%
9/12/1984	15.90%	12.60%	3.30%
9/25/1984	16.25%	12.61%	3.64%
10/2/1984	14.80%	12.62%	2.18%
10/9/1984	14.75%	12.63%	2.12%
10/10/1984	15.50%	12.63%	2.87%
10/18/1984	15.00%	12.65%	2.35%
10/24/1984	15.50%	12.65%	2.85%
11/7/1984	15.00%	12.64%	2.36%
11/20/1984	15.92%	12.63%	3.29%
11/30/1984	15.50%	12.60%	2.90%
12/18/1984	15.00%	12.55%	2.45%
12/20/1984	15.00%	12.54%	2.46%
12/28/1984	15.75%	12.51%	3.24%
12/28/1984	16.25%	12.51%	3.74%
1/2/1985	16.00%	12.50%	3.50%
1/31/1985	14.75%	12.37%	2.38%
2/7/1985	14.85%	12.33%	2.52%
2/15/1985	15.00%	12.27%	2.73%
2/20/1985	14.50%	12.25%	2.25%
2/22/1985	14.86%	12.25%	2.61%
3/14/1985	15.50%	12.16%	3.34%
3/28/1985	14.80%	12.08%	2.72%
4/9/1985	15.50%	12.02%	3.48%
4/16/1985	15.70%	11.96%	3.74%
6/10/1985	15.75%	11.58%	4.17%
0/20/1905	14.82% 15.00%	11.40%	3.30% 3.60%
1/9/1900 7/26/1005	10.00%	11.00%	J.0∠% 2 240/
1/20/1900 9/20/1005	14.30%	II.∠0% 11.110/	J.24%
0/29/1900 8/30/1005	14.30%	11.11%0	3.39% 3.770/
0/30/1903	14.30%	11.1170	J.Z170 1 190/
9/23/1985	15.30%	11 0.3%	4 27%

[6] Dete of	[7]	[8] 20 Voor	[9]
Date of	Doturn on	Ju-real	Diek
Poto Coco	Equity	Viold	Dromium
0/25/1085	14 50%	11 02%	3 / 8%
9/26/1985	13.80%	11.02 %	2 78%
9/26/1985	14 50%	11.02%	3 48%
10/25/1985	15 25%	10.02%	1 34%
11/8/1985	12 94%	10.91%	2 09%
11/20/1985	14 90%	10.00%	4 09%
11/25/1985	13 30%	10.01%	2 51%
12/6/1985	12.00%	10.73%	1 29%
12/11/1985	14 90%	10.68%	4 22%
12/20/1985	14 88%	10.59%	4 29%
12/20/1985	15.00%	10.59%	4 41%
12/20/1985	15 00%	10.59%	4 41%
12/30/1985	15 75%	10.53%	5 22%
12/31/1985	14.00%	10.51%	3.49%
12/31/1985	14 50%	10.51%	3.99%
1/17/1986	14 50%	10.38%	4 12%
2/11/1986	12.50%	10.20%	2.30%
2/12/1986	15.20%	10.19%	5.01%
3/11/1986	14.00%	9.98%	4.02%
4/2/1986	12.90%	9.76%	3.14%
4/28/1986	13.01%	9.47%	3.54%
5/21/1986	13.25%	9.18%	4.07%
5/28/1986	14.00%	9.12%	4.88%
5/29/1986	13.90%	9.10%	4.80%
6/2/1986	13.00%	9.08%	3.92%
6/11/1986	14.00%	8.97%	5.03%
6/13/1986	13.55%	8.94%	4.61%
6/27/1986	11.88%	8.77%	3.11%
7/14/1986	12.60%	8.59%	4.01%
7/30/1986	13.30%	8.38%	4.92%
8/14/1986	13.50%	8.22%	5.28%
9/5/1986	13.30%	8.02%	5.28%
9/23/1986	12.75%	7.91%	4.84%
10/30/1986	13.00%	7.67%	5.33%
10/31/1986	13.75%	7.66%	6.09%
11/10/1986	14.00%	7.61%	6.39%
11/19/1986	13.75%	7.56%	6.19%
11/25/1986	13.15%	7.54%	5.61%
12/22/1986	13.80%	7.47%	6.33%
12/30/1986	13.90%	7.47%	6.43%
1/20/1987	12.75%	7.47%	5.28%
1/23/1987	13.55%	7.47%	6.08%
1/27/1987	12.16%	7.47%	4.69%
2/13/1987	12.60%	7.47%	5.13%
2/24/1987	12.00%	7.47%	4.53%
3/30/1987	12.20%	7.46%	4.74%
3/31/1987	13.00%	7.47%	5.53%
5/5/1987	12.85%	7.60%	5.25%
5/28/1987	13.50%	7.73%	5.77%
6/15/1987	13.20%	7.80%	5.40%
6/30/1987	12.60%	7.85%	4.75%
7/10/1987	12.90%	7.88%	5.02%
7/27/1987	13.50%	7.93%	5.57%
[6]	[7]	[8]	[9]
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Date of	Detume	SU-Year	Diale
Natural Gas	Return on	Treasury	RISK
			Premium
0/20/1907	11.40%	0.09%	3.31%
9/10/1907	13.00%	0.2170	4.73%
10/20/1907	12.00%	0.00%	4.03%
10/20/1907	12.90%	0.00%	4.43%
11/12/1907	12.75%	8.68%	4.07%
11/13/1907	12.75%	8 73%	4.07 %
12/8/1987	12.50%	8.81%	3.69%
12/0/1007	12.00%	8 90%	3 10%
12/31/1987	12.00%	8 94%	3 91%
12/31/1987	13 25%	8 94%	4.31%
1/15/1988	13 15%	8.99%	4 16%
1/20/1988	12 75%	8.99%	3 76%
1/29/1988	13.20%	8.99%	4.21%
2/4/1988	12.60%	8.99%	3.61%
3/23/1988	13.00%	8.95%	4.05%
5/27/1988	13.18%	9.02%	4.16%
6/14/1988	13.50%	9.00%	4.50%
6/17/1988	11.72%	8.99%	2.73%
6/24/1988	11.50%	8.97%	2.53%
7/1/1988	12.75%	8.95%	3.80%
7/8/1988	12.00%	8.93%	3.07%
7/18/1988	12.00%	8.91%	3.09%
7/20/1988	13.40%	8.90%	4.50%
8/8/1988	12.74%	8.90%	3.84%
9/20/1988	12.90%	8.93%	3.97%
9/26/1988	12.40%	8.93%	3.47%
9/27/1988	13.65%	8.93%	4.72%
9/30/1988	13.25%	8.94%	4.31%
10/13/1988	13.10%	8.93%	4.17%
10/21/1988	12.80%	8.94%	3.86%
10/25/1988	13.25%	8.94%	4.31%
10/26/1988	13.50%	8.94%	4.56%
10/27/1988	12.95%	8.94%	4.01%
10/28/1988	13.00%	8.95%	4.05%
11/15/1988	12.00%	8.98%	3.02%
11/29/1988	12.75%	9.01%	3.74%
12/19/1988	13.00%	9.05%	3.95%
12/21/1988	12.90%	9.05%	3.85%
12/22/1988	13.50%	9.05%	4.45%
1/20/1989	12.00%	9.06%	3.54%
1/27/1909	13.00%	9.00%	3.94%
2/0/1909	13.37%	9.05%	4.32%
5/0/1909	13.00%	9.04%	3.90%
6/8/1020	13.00%	9.04 /0 8 06%	J.50%
7/10/1020	11 80%	8 81%	2 96%
7/25/1080	12 80%	8 82%	3 98%
7/31/1989	13 00%	8 81%	4 19%
8/14/1989	12 50%	8 76%	3 74%
8/22/1989	12.80%	8 73%	4 07%
8/23/1989	12.90%	8 72%	4,18%
9/21/1989	12.10%	8.62%	3.48%

[6] Data of	[7]	[8] 20 Voor	[9]
Natural Cas	Poturn on	July Troopuny	Dick
Rata Casa	Equity	Viold	Dromium
	12 00%	9.59%	
10/0/1909	12.00%	8.50%	4.4270
10/18/1080	13 25%	8 54%	1 71%
10/20/1909	12 00%	8 53%	4.71%
10/20/1909	13.60%	8 50%	5 10%
11/3/1989	12 93%	8 48%	4 45%
11/5/1989	13 20%	8 48%	4 72%
11/9/1989	12 60%	8 45%	4 15%
11/9/1989	13.00%	8.45%	4.55%
11/28/1989	12.75%	8.37%	4.38%
12/7/1989	13.25%	8.32%	4.93%
12/15/1989	13.00%	8.28%	4.72%
12/20/1989	12.90%	8.26%	4.64%
12/21/1989	12.80%	8.25%	4.55%
12/21/1989	12.90%	8.25%	4.65%
12/27/1989	12.50%	8.23%	4.27%
1/9/1990	13.00%	8.19%	4.81%
1/18/1990	12.50%	8.16%	4.34%
1/26/1990	12.10%	8.14%	3.96%
3/21/1990	12.80%	8.15%	4.65%
3/28/1990	13.00%	8.16%	4.84%
4/5/1990	12.20%	8.17%	4.03%
4/12/1990	13.25%	8.19%	5.06%
4/30/1990	12.45%	8.24%	4.21%
5/31/1990	12.40%	8.31%	4.09%
6/15/1990	13.20%	8.33%	4.87%
6/27/1990	12.90%	8.34%	4.56%
6/29/1990	13.25%	8.35%	4.90%
7/6/1990	12.10%	8.36%	3.74%
7/19/1990	11.70%	8.38%	3.32%
8/31/1990	12.50%	8.53%	3.97%
8/31/1990	12.50%	8.53%	3.97%
9/13/1990	12.50%	8.58%	3.92%
9/18/1990	12.75%	8.60%	4.15%
9/20/1990	12.50%	8.61%	3.89%
10/2/1990	13.00%	8.65%	4.35%
10/17/1990	11.90%	8.68%	3.22%
10/31/1990	12.95%	8.70%	4.25%
11/9/1990	13.23%	0.70%	4.00%
11/19/1990	13.00%	8.70%	4.30%
11/21/1990	12.10%	0.70% 9.70%	3.40%
11/21/1990	12.50%	8.70%	3.00%
11/20/1990	12.75%	870%	4.05%
12/18/1990	12.75%	8.68%	4.05%
12/10/1990	12 50%	8.67%	3 83%
12/20/1000	12.50%	8.67%	3.83%
12/21/1990	13 00%	8 67%	4.33%
12/21/1990	13 60%	8.67%	4 93%
1/3/1991	13 02%	8 66%	4.36%
1/16/1991	13.25%	8.63%	4.62%
1/25/1991	11.70%	8.61%	3.09%
2/15/1991	12.70%	8.56%	4.14%

[6] Data of	[7]	[8] 20 Voor	[9]
Date Of	Daturn on	JU-real	Diak
Natural Gas		Viold	Dramium
2/13/1991	12.00%	0.30%	4.24%
4/3/1991	12.00%	8 / 8%	4.49%
4/30/1991	12.45%	8 48%	1 52%
4/30/1991 6/25/1001	13.00%	834%	4.52%
6/28/1001	12 50%	8 34%	1 16%
7/1/1001	12.30%	8 34%	4.10%
7/10/1001	12 10%	8 31%	3 70%
7/10/1001	12.10%	8 31%	3.00%
7/22/1001	12.00%	8 30%	1 60%
8/15/1001	12.90 %	8.28%	4.00%
8/20/1001	13 30%	8 26%	5.01%
0/23/1331	12 50%	8 23%	1 27%
9/2//1991	12.30%	8.23%	4.27 /0
10/3/1001	11 30%	8 22%	3 08%
10/0/1001	11.30%	8 21%	3 /0%
10/5/1991	13 /0%	8 20%	5.49%
11/1/1001	12 00%	8 20%	1 70%
11/8/1001	12.30%	8 20%	4.70%
11/26/1991	11 60%	8 18%	3 4 2 %
11/26/1001	12.00%	8 18%	3 82%
11/20/1001	12.00%	8 18%	4 52%
12/6/1001	12.70%	8 16%	4.52%
12/0/1001	11 75%	8 15%	3.60%
12/10/1001	12 60%	8 14%	4 46%
12/10/1001	12.00%	8 14%	4 66%
12/30/1991	12.00%	8 11%	3 99%
1/22/1992	12.10%	8.05%	4 79%
1/31/1992	12.04%	8.03%	3 97%
2/20/1992	13.00%	8.00%	5.00%
2/27/1992	11 75%	7 98%	3 77%
3/18/1992	12 50%	7.94%	4 56%
5/15/1992	12.50%	7.86%	4.80%
6/24/1992	12.70%	7.85%	4.35%
6/29/1992	11.00%	7.85%	3 15%
7/14/1992	12 00%	7.83%	4 17%
7/22/1992	11 20%	7.82%	3.38%
8/10/1992	12 10%	7 79%	4.31%
8/26/1992	12.10%	7 75%	4 68%
9/30/1992	11 60%	7 72%	3.88%
10/6/1992	12 25%	7 72%	4 53%
10/13/1992	12.20%	7 71%	5.04%
10/23/1992	11 65%	7 71%	3.94%
10/28/1992	12 25%	7 71%	4 54%
10/29/1992	12.75%	7.70%	5.05%
10/30/1992	11 40%	7 70%	3 70%
11/9/1992	10.60%	7 70%	2 90%
11/25/1992	11.00%	7.68%	3,32%
11/25/1992	12.00%	7.68%	4,32%
12/3/1992	11.85%	7.66%	4.19%
12/16/1992	11.90%	7.64%	4.26%
12/22/1992	12.30%	7.62%	4.68%
12/22/1992	12.40%	7.62%	4.78%

[6] [7] [8] [9]	
Natural Case Patura an Trassury Pick	
Rate Coop Equity Viold Promit	m
12/30/1002 12 00% 7 61% 4 30%	<u></u>
12/30/1992 12:00/0 7:01/0 4:39/	0 /a
1/12/1003 12:00% 7:01% 4:00%	6
1/12/1993 12:00% 7:59% 4.41%	6
2/2/1993 11 40% 7 53% 3 879	6
2/22/1993 11.60% 7.48% 4.129	6
<u>4/23/1993</u> 11 75% 7 27% <u>4 489</u>	6
5/3/1993 11 50% 7 25% 4 25%	6
5/3/1993 11.75% 7.25% 4.50%	6
6/3/1993 12.00% 7.20% 4.80%	6
6/7/1993 11.50% 7.20% 4.30%	6
6/22/1993 11.75% 7.16% 4.59%	6
7/21/1993 11.78% 7.06% 4.72%	6
7/21/1993 11.90% 7.06% 4.84%	6
7/23/1993 11.50% 7.05% 4.45%	6
7/29/1993 11.50% 7.03% 4.47%	6
8/12/1993 10.75% 6.97% 3.78%	6
8/24/1993 11.50% 6.92% 4.58%	6
8/31/1993 11.90% 6.88% 5.02%	6
9/1/1993 11.25% 6.87% 4.38%	6
9/1/1993 11.47% 6.87% 4.60%	6
9/27/1993 10.50% 6.74% 3.76%	6
9/29/1993 11.00% 6.72% 4.28%	6
9/30/1993 11.60% 6.72% 4.88%	6
10/8/1993 11.50% 6.67% 4.83%	6
10/14/1993 11.20% 6.65% 4.55%	6
10/15/1993 11.75% 6.64% 5.11%	6
10/25/1993 11.55% 6.60% 4.95%	6
10/28/1993 11.50% 6.58% 4.92%	6
10/29/1993 10.10% 6.57% 3.53%	6
10/29/1993 10.20% 6.57% 3.63%	6
10/29/1993 11.25% 6.57% 4.68%	6
11/2/1993 10.80% 6.56% 4.24%	6
11/12/1993 11.80% 6.53% 5.27%	6
11/23/1993 12.50% 6.51% 5.99%	6
11/26/1993 11.00% 6.50% 4.50%	6
12/1/1993 11.45% 6.49% 4.96%	6
12/16/1993 10.60% 6.45% 4.15%	6
12/16/1993 11.20% 6.45% 4.75%	6
12/21/1993 11.30% 6.44% 4.86%	6
12/22/1993 11.00% 6.44% 4.56%	6
12/23/1993 10.10% 6.44% 3.66%	′o ,
1/5/1994 11.50% 6.41% 5.09%	6
1/10/1994 11.00% 6.40% 4.60%	′o ⁄
1/25/1994 12.00% 6.37% 5.63%	′o ⁄
2/2/1994 IU.40% 0.35% 4.05% 2/0/1004 10.70% 0.24% 4.00%	'0 /
2/9/1994 IU./U% 0.34% 4.36%	'0 /
4/0/1994 11.24% 0.35% 4.89%	0 /-
4/20/1994 II.00% 0.39% 4.01%	0 /-
6/23/100/ 10:00% 0.03% 3.8/%	0 6
7/10/100/ 10.70% 6.920/ 2.970	6
9/29/1994 10.00% 7.20% 3.07/	6

[6] Data of	[7]	[8] 20 Voor	[9]
Date Of	Poturn on	July Transum	Diak
Natural Gas	Equity	Viold	Dromium
	11 00%	7 20%	
9/29/1994 10/7/100/	11.00 %	7.20%	3.00 % 4.61%
10/18/100/	11.07 %	7.20%	4.01%
10/18/1994	11.50%	7 32%	4.10%
10/24/1994	11.00%	7 35%	3 65%
11/22/1994	12 12%	7.52%	4 60%
11/29/1994	11.30%	7.55%	3 75%
12/1/1994	11.00%	7.56%	3.44%
12/8/1994	11.50%	7.59%	3.91%
12/8/1994	11.70%	7.59%	4.11%
12/12/1994	11.82%	7.60%	4.22%
12/14/1994	11.50%	7.61%	3.89%
12/19/1994	11.50%	7.62%	3.88%
4/19/1995	11.00%	7.72%	3.28%
9/11/1995	11.30%	7.16%	4.14%
9/15/1995	10.40%	7.13%	3.27%
9/29/1995	11.50%	7.06%	4.44%
10/13/1995	10.76%	6.98%	3.78%
11/7/1995	12.50%	6.86%	5.64%
11/8/1995	11.10%	6.85%	4.25%
11/8/1995	11.30%	6.85%	4.45%
11/17/1995	10.90%	6.81%	4.09%
11/20/1995	11.40%	6.80%	4.60%
11/27/1995	13.60%	6.77%	6.83%
12/14/1995	11.30%	6.68%	4.62%
12/20/1995	11.60%	6.65%	4.95%
1/31/1996	11.30%	6.45%	4.85%
3/11/1996	11.60%	6.40%	5.20%
4/3/1996	11.13%	6.41%	4.72%
4/15/1996	10.50%	6.41%	4.09%
4/1//1996	10.77%	6.40%	4.37%
4/26/1996	10.60%	6.40%	4.20%
5/10/1996	11.00%	6.40%	4.60%
5/13/1996	11.25%	6.41%	4.84%
7/3/1990	11.25%	0.49% 6.54%	4.70%
10/2/1990	10.00%	0.34 % 6 77%	4.7170
10/3/1990	11.00%	6.84%	5.25%
11/26/1990	11.30%	0.04 % 6 86%	4.40%
11/20/1990	11.30%	6.86%	4.44%
11/20/1006	11.00%	6.86%	4 14%
12/12/1996	11.96%	6.85%	5 11%
12/17/1996	11.50%	6.85%	4 65%
1/22/1997	11.30%	6.83%	4 47%
1/27/1997	11.25%	6.83%	4.42%
1/31/1997	11.25%	6.83%	4.42%
2/13/1997	11.00%	6.82%	4.18%
2/13/1997	11.80%	6.82%	4.98%
2/20/1997	11.80%	6.81%	4.99%
3/27/1997	10.75%	6.79%	3.96%
4/29/1997	11.70%	6.81%	4.89%
7/17/1997	12.00%	6.77%	5.23%
10/29/1997	10.75%	6.70%	4.05%

[6]	[7]	[8]	[9]
Date of	Determinen	30-Year	Dist
Natural Gas	Return on	Treasury	
Rate Case			Premium
10/31/1997	11.25%	0.70%	4.55%
12/24/1997	10.75%	0.00%	4.22%
4/20/1990	10.90%	0.11%	4.79%
4/30/1990	12.20%	0.10% 5.04%	0.10% 5.06%
0/30/1990	11.00%	5.94%	5.00%
0/20/1990	10.93%	J.02 %	5.11% 5.60%
9/3/1990	11.40%	5.00%	5.00%
9/15/1990	11.90 %	5.77%	0.13% 5.26%
10/7/1990	11.00%	5.70%	5.30%
12/10/1008	12 20%	5.03%	5.77%
12/10/1990	12.20%	5 / 0%	6.61%
2/10/1000	11 15%	5 32%	5.83%
2/13/1333	10.65%	5 31%	5 34%
3/1/1000	10.65%	5 31%	5 34%
6/8/1999	11 25%	5 35%	5 90%
11/12/1999	10.25%	5.92%	4.33%
12/14/1999	10.20%	5 99%	4.50%
1/28/2000	10.00%	6 16%	4.51%
2/17/2000	10.60%	6.20%	4 40%
5/25/2000	10.80%	6 19%	4 61%
6/19/2000	11.05%	6 18%	4 87%
6/22/2000	11 25%	6 18%	5.07%
7/17/2000	11.06%	6 15%	4 91%
7/20/2000	12 20%	6 14%	6.06%
8/11/2000	11 00%	6 11%	4 89%
9/27/2000	11.00%	6.00%	5 25%
9/29/2000	11 16%	6.00%	5 16%
10/5/2000	11 30%	5.98%	5 32%
11/28/2000	12.90%	5.87%	7.03%
11/30/2000	12.10%	5.86%	6.24%
2/5/2001	11.50%	5.75%	5.75%
3/15/2001	11.25%	5.66%	5.59%
5/8/2001	10.75%	5.61%	5.14%
10/24/2001	10.30%	5.54%	4.76%
10/24/2001	11.00%	5.54%	5.46%
1/9/2002	10.00%	5.50%	4.50%
1/30/2002	11.00%	5.47%	5.53%
1/31/2002	11.00%	5.47%	5.53%
4/17/2002	11.50%	5.44%	6.06%
4/29/2002	11.00%	5.45%	5.55%
6/11/2002	11.77%	5.48%	6.29%
6/20/2002	12.30%	5.48%	6.82%
8/28/2002	11.00%	5.49%	5.51%
9/11/2002	11.20%	5.45%	5.75%
9/12/2002	12.30%	5.45%	6.85%
10/28/2002	11.30%	5.35%	5.95%
10/30/2002	10.60%	5.34%	5.26%
11/1/2002	12.60%	5.34%	7.26%
11/7/2002	11.40%	5.33%	6.07%
11/8/2002	10.75%	5.33%	5.42%
11/20/2002	10.00%	5.30%	4.70%
11/20/2002	10.50%	5.30%	5.20%

[6] Data of	[7]	[8] 20 Voor	[9]
Date Of	Daturn on	JU-real	Diale
Natural Gas		Viold	RISK
12/4/2002	10.75%	5.27% 5.10%	0.40% 6.01%
12/30/2002	11.20%	5.19% 5.16%	0.01% 6.00%
1/0/2003	11.20%	5.10%	0.09%
2/20/2003	12.30%	5.01%	1.29%
3/1/2003	9.90%	4.99%	4.97%
3/12/2003	11.40%	4.97%	0.43%
3/20/2003	12.00%	4.95%	7.05%
4/3/2003	12.00%	4.92%	7.08%
5/2/2003	11.40%	4.88%	0.52%
5/15/2003	11.05%	4.87%	6.18%
6/26/2003	11.00%	4.80%	6.20%
7/1/2003	11.00%	4.80%	6.20%
7/29/2003	11.71%	4.78%	6.93%
8/22/2003	10.20%	4.81%	5.39%
9/17/2003	9.90%	4.85%	5.05%
9/25/2003	10.25%	4.85%	5.40%
10/1//2003	10.54%	4.87%	5.67%
10/22/2003	10.46%	4.87%	5.59%
10/22/2003	10.71%	4.87%	5.84%
10/30/2003	11.00%	4.88%	6.12%
10/31/2003	10.20%	4.88%	5.32%
10/31/2003	10.75%	4.88%	5.87%
11/10/2003	10.60%	4.89%	5.71%
12/9/2003	10.50%	4.93%	5.57%
12/18/2003	10.50%	4.94%	5.56%
12/19/2003	12.00%	4.94%	7.06%
12/19/2003	12.00%	4.94%	7.06%
1/13/2004	10.25%	4.95%	5.30%
1/13/2004	12.00%	4.95%	7.05%
2/9/2004	11.25%	4.98%	6.27%
3/16/2004	10.90%	5.05%	5.85%
3/16/2004	10.90%	5.05%	5.85%
5/25/2004	10.00%	5.06%	4.94%
6/2/2004	11.22%	5.07%	6.15%
6/30/2004	10.50%	5.10%	5.40%
7/8/2004	10.00%	5.10%	4.90%
7/22/2004	10.25%	5.10%	5.15%
8/26/2004	10.50%	5.10%	5.40%
8/26/2004	10.50%	5.10%	5.40%
9/9/2004	10.40%	5.10%	5.30%
9/21/2004	10.50%	5.09%	5.41%
9/27/2004	10.30%	5.09%	5.21%
9/27/2004	10.50%	5.09%	5.41%
10/20/2004	10.20%	5.08%	5.12%
11/30/2004	10.60%	5.08%	5.52%
12/8/2004	9.90%	5.09%	4.81%
12/21/2004	11.50%	5.09%	6.41%
12/22/2004	11.50%	5.09%	6.41%
12/28/2004	10.25%	5.09%	5.16%
2/18/2005	10.30%	4.95%	5.35%
3/29/2005	11.00%	4.86%	6.14%
4/13/2005	10.60%	4.84%	5.76%
4/28/2005	11.00%	4.80%	6.20%

[6] Data of	[7]	[8] 20 Voor	[9]
Natural Cas	Poturn on	July Troopuny	Dick
Rata Casa	Equity	Viold	Dromium
5/17/2005	10 00%	/ 77%	5 23%
6/8/2005	10.00%	4.77%	5.23%
6/10/2005	10.10%	4.71%	5.47 % 6 10%
7/6/2005	10.50%	4.7170	0.19% 5.85%
7/10/2005	11.50%	4.05%	5.85% 6.87%
8/11/2005	10.40%	4.03%	0.07 /0 5 90%
0/10/2005	0.40%	4.00%	J.00 %
9/19/2005	9.45%	4.53%	4.92 /0
10/4/2005	0.00%	4.52 /0	5.39%
10/4/2005	9.90 /0 10 75%	4.52 /0	6.23%
10/4/2005	10.75%	4.52%	0.23% 5.99%
10/14/2005	10.40 %	4.52%	5.00%
11/2/2005	0.20%	4.55%	J.12/0 5 170/
11/2/2005	9.70%	4.33%	5.17% 5.47%
12/0/2005	0.70%	4.55%	5.47 /0 5 170/
12/9/2003	9.70%	4.33%	5.17% 6.47%
12/12/2005	11.00%	4.53%	0.47%
12/20/2005	10.13%	4.33%	5.00%
12/21/2005	10.40%	4.52%	0.00% C 40%
12/21/2005	11.00%	4.52%	0.40%
12/22/2005	10.20%	4.52%	0.00%
12/22/2005	11.00%	4.52%	0.48%
12/28/2005	10.00%	4.52%	5.48%
1/5/2006	11.00%	4.52%	6.48%
1/25/2006	11.20%	4.52%	0.68%
1/25/2006	11.20%	4.52%	6.68%
2/3/2006	10.50%	4.52%	5.98%
2/15/2006	9.50%	4.53%	4.97%
4/26/2006	10.60%	4.65%	5.95%
7/24/2006	9.60%	4.87%	4.73%
7/24/2006	10.00%	4.87%	5.13%
9/20/2006	11.00%	4.93%	6.07%
9/26/2006	10.75%	4.93%	5.82%
10/20/2006	9.80%	4.96%	4.84%
11/2/2006	9.71%	4.97%	4.74%
11/9/2006	10.00%	4.97%	5.03%
11/21/2006	11.00%	4.98%	6.02%
12/5/2006	10.20%	4.97%	5.23%
1/5/2007	10.40%	4.95%	5.45%
1/9/2007	11.00%	4.94%	6.06%
1/11/2007	10.90%	4.94%	5.96%
1/19/2007	10.80%	4.93%	5.87%
1/26/2007	10.00%	4.92%	5.08%
2/8/2007	10.40%	4.91%	5.49%
3/14/2007	10.10%	4.86%	5.24%
3/20/2007	10.25%	4.84%	5.41%
3/21/2007	11.35%	4.84%	6.51%
3/22/2007	10.50%	4.84%	5.66%
3/29/2007	10.00%	4.83%	5.17%
6/13/2007	10.75%	4.81%	5.94%
6/29/2007	9.53%	4.84%	4.69%
6/29/2007	10.10%	4.84%	5.26%
//3/2007	10.25%	4.85%	5.40%
7/13/2007	9.50%	4.86%	4.64%

[6] Data of	[7]	[8] 20 Voor	[9]
Date of	Daturn an	JU-Year	Diale
Natural Gas		Viold	Dramium
		1 970/	
0/1/24/2007	10.40%	4.07%	5.53% 5.27%
8/20/2007	10.15%	4.00 %	5.27 %
0/29/2007	0.71%	4.9170	J.59%
9/10/2007	9.71%	4.91%	4.00%
9/19/2007	10.00%	4.91%	5.09%
9/23/2007	9.70%	4.92%	4.70%
10/8/2007	10.48%	4.92%	5.50%
10/19/2007	10.50%	4.91%	5.59%
10/25/2007	9.05%	4.91%	4.74%
11/15/2007	10.00%	4.89%	5.11%
11/20/2007	9.90%	4.89%	5.01%
11/27/2007	10.00%	4.88%	5.12%
11/29/2007	10.90%	4.88%	6.02%
12/14/2007	10.80%	4.87%	5.93%
12/18/2007	10.40%	4.86%	5.54%
12/19/2007	9.80%	4.86%	4.94%
12/19/2007	9.80%	4.86%	4.94%
12/19/2007	10.20%	4.86%	5.34%
12/21/2007	9.10%	4.86%	4.24%
1/8/2008	10.75%	4.83%	5.92%
1/17/2008	10.75%	4.81%	5.94%
1/17/2008	10.75%	4.81%	5.94%
2/5/2008	9.99%	4.78%	5.21%
2/5/2008	10.19%	4.78%	5.41%
2/13/2008	10.20%	4.76%	5.44%
3/31/2008	10.00%	4.63%	5.37%
5/28/2008	10.50%	4.53%	5.97%
6/24/2008	10.00%	4.52%	5.48%
6/27/2008	10.00%	4.52%	5.48%
7/31/2008	10.70%	4.50%	6.20%
7/31/2008	10.82%	4.50%	6.32%
8/27/2008	10.25%	4.50%	5.75%
9/2/2008	10.25%	4.50%	5.75%
9/19/2008	10.70%	4.48%	6.22%
9/24/2008	10.68%	4.48%	6.20%
9/24/2008	10.68%	4.48%	6.20%
9/24/2008	10.68%	4.48%	6.20%
9/30/2008	10.20%	4.48%	5.72%
10/3/2008	10.30%	4.48%	5.82%
10/8/2008	10.15%	4.47%	5.68%
10/20/2008	10.06%	4.47%	5.59%
10/24/2008	10.60%	4.46%	6.14%
10/24/2008	10.60%	4.46%	6.14%
11/21/2008	10.50%	4.42%	6.08%
11/21/2008	10.50%	4.42%	6.08%
11/21/2008	10.50%	4.42%	6.08%
11/24/2008	10.50%	4.41%	6.09%
12/3/2008	10.39%	4.37%	6.02%
12/24/2008	10.00%	4.26%	5.74%
12/26/2008	10.10%	4.24%	5.86%
12/29/2008	10.20%	4.23%	5.97%
1/13/2009	10.45%	4.14%	6.31%
2/2/2009	10.05%	4.04%	6.01%

[6] Date of	[7]	[8] 30-Year	[9]
Natural Gas	Return on	Treasury	Risk
Rate Case	Fauity	Yield	Premium
3/9/2009	10.30%	3.89%	6 41%
3/25/2009	10.17%	3.84%	6.33%
4/2/2009	10 75%	3.81%	6.94%
5/5/2009	10 75%	3 71%	7 04%
5/15/2009	10.20%	3.70%	6.50%
5/29/2009	9 54%	3 70%	5 84%
6/3/2009	10 10%	3 71%	6.39%
6/22/2009	10.00%	3.73%	6.27%
6/29/2009	10.21%	3.74%	6.47%
6/30/2009	9.31%	3.74%	5.57%
7/17/2009	9.26%	3.75%	5.51%
7/17/2009	10.50%	3.75%	6.75%
10/16/2009	10.40%	4.09%	6.31%
10/26/2009	10.10%	4.11%	5.99%
10/28/2009	10.15%	4.12%	6.03%
10/28/2009	10.15%	4.12%	6.03%
10/30/2009	9.95%	4.12%	5.83%
11/20/2009	9.45%	4.18%	5.27%
12/14/2009	10.50%	4.24%	6.26%
12/16/2009	10.75%	4.25%	6.50%
12/17/2009	10.30%	4.26%	6.04%
12/18/2009	10.40%	4.26%	6.14%
12/18/2009	10.40%	4.26%	6.14%
12/18/2009	10.50%	4.26%	6.24%
12/22/2009	10.20%	4.27%	5.93%
12/22/2009	10.40%	4.27%	6.13%
12/28/2009	10.85%	4.29%	6.56%
12/29/2009	10.38%	4.30%	6.08%
1/11/2010	10.24%	4.34%	5.90%
1/21/2010	10.23%	4.37%	5.86%
1/21/2010	10.33%	4.37%	5.96%
1/26/2010	10.40%	4.37%	6.03%
2/10/2010	10.00%	4.39%	5.61%
2/23/2010	10.50%	4.40%	6.10%
3/9/2010	9.60%	4.40%	5.20%
3/24/2010	10.13%	4.42%	5.71%
3/31/2010	10.70%	4.43%	6.27%
4/1/2010	9.50%	4.43%	5.07%
4/2/2010	10.10%	4.44%	5.66%
4/8/2010	10.35%	4.44%	5.91%
4/29/2010	9.19%	4.46%	4.73%
4/29/2010	9.40%	4.46%	4.94%
4/29/2010	9.40%	4.46%	4.94%
5/17/2010	10.55%	4.46%	6.09%
5/24/2010	10.05%	4.46%	5.59%
6/3/2010	11.00%	4.46%	6.54%
6/16/2010	10.00%	4.46%	5.54%
6/18/2010	10.30%	4.46%	5.84%
8/9/2010	12.55%	4.41%	8.14%
8/17/2010	10.10%	4.40%	5.70%
9/16/2010	9.60%	4.31%	5.29%
9/16/2010	10.00%	4.31%	5.69%
9/16/2010	10.00%	4.31%	5.69%

[6] Date of	[7]	[8] 30-Vear	[9]
Natural Gas	Return on	Treasury	Risk
Rate Case	Fauity	Yield	Premium
9/16/2010	10.30%	4.31%	5 99%
10/21/2010	10.00%	4 20%	6 20%
11/2/2010	9 75%	4 17%	5.58%
11/2/2010	9 75%	4 17%	5 58%
11/3/2010	10.75%	4.17%	6.58%
11/19/2010	10.20%	4.15%	6.05%
12/1/2010	10.00%	4.13%	5.87%
12/6/2010	9.56%	4.12%	5.44%
12/6/2010	10.09%	4.12%	5.97%
12/9/2010	10.25%	4.12%	6.13%
12/14/2010	10.33%	4.11%	6.22%
12/17/2010	10.10%	4.11%	5.99%
12/20/2010	10.10%	4.11%	5.99%
12/23/2010	9.92%	4.10%	5.82%
1/6/2011	10.35%	4.09%	6.26%
1/12/2011	10.30%	4.09%	6.21%
1/13/2011	10.30%	4.09%	6.21%
3/10/2011	10.10%	4.16%	5.94%
3/31/2011	9.45%	4.20%	5.25%
4/18/2011	10.05%	4.23%	5.82%
5/26/2011	10.50%	4.32%	6.18%
6/21/2011	10.00%	4.36%	5.64%
6/29/2011	8.83%	4.38%	4.45%
8/1/2011	9.20%	4.41%	4.79%
9/1/2011	10.10%	4.33%	5.77%
11/14/2011	9.60%	3.93%	5.67%
12/13/2011	9.50%	3.76%	5.74%
12/20/2011	10.00%	3.72%	6.28%
12/22/2011	10.40%	3.70%	6.70%
1/10/2012	9.06%	3.59%	5.47%
1/10/2012	9.45%	3.59%	5.86%
1/10/2012	9.45%	3.59%	5.86%
1/23/2012	10.20%	3.53%	6.67%
1/31/2012	10.00%	3.49%	6.51%
4/24/2012	9.50%	3.16%	6.34%
4/24/2012	9.75%	3.16%	6.59%
5/7/2012	9.80%	3.13%	6.67%
5/22/2012	9.60%	3.10%	6.50%
5/24/2012	9.70%	3.09%	6.61%
6/7/2012	10.30%	3.06%	7.24%
6/15/2012	10.40%	3.05%	7.35%
6/18/2012	9.60%	3.05%	6.55%
7/2/2012	9.75%	3.04%	6.71%
10/24/2012	10.30%	2.92%	7.38%
10/26/2012	9.50%	2.92%	6.58%
10/31/2012	9.30%	2.92%	6.38%
10/31/2012	9.90%	2.92%	6.98%
10/31/2012	10.00%	2.92%	7.08%
11/1/2012	9.45%	2.91%	6.54%
11/8/2012	10.10%	2.91%	7.19%
11/9/2012	10.30%	2.90%	7.40%
11/26/2012	10.00%	2.89%	7.11%
11/28/2012	10.40%	2.88%	7.52%

[6] Date of	[7]	[8] 30 Vear	[9]
Natural Cas	Poturn on		Dick
Pate Case	Equity	Vield	Dromium
11/28/2012	10 50%	2.88%	7.62%
12///2012	10.00%	2.00%	7.02%
12/4/2012	10.00%	2.07%	7.13%
12/9/2012	9.50%	2.07 %	6.66%
12/20/2012	10 10%	2.04%	7 26%
12/20/2012	10.10%	2.04%	7.20%
12/20/2012	10.20%	2.04%	7.41%
12/20/2012	10.00%	2.04%	7.56%
12/20/2012	10.40%	2.84%	7.66%
12/26/2012	9.80%	2.83%	6.97%
2/22/2013	9.60%	2.86%	6 74%
3/14/2013	9.30%	2 89%	6 41%
3/27/2013	9.80%	2.92%	6.88%
4/23/2013	9.80%	2.96%	6.84%
5/10/2013	9.25%	2.96%	6.29%
6/13/2013	9.40%	3.01%	6.39%
6/18/2013	9.28%	3.02%	6.26%
6/18/2013	9.28%	3.02%	6.26%
6/25/2013	9.80%	3.04%	6.76%
9/23/2013	9.60%	3.33%	6.27%
11/6/2013	10.20%	3.42%	6.78%
11/13/2013	9.84%	3.44%	6.40%
11/14/2013	10.25%	3.44%	6.81%
11/22/2013	9.50%	3.47%	6.03%
12/5/2013	10.20%	3.50%	6.70%
12/13/2013	9.60%	3.52%	6.08%
12/16/2013	9.73%	3.53%	6.20%
12/17/2013	10.00%	3.53%	6.47%
12/18/2013	9.08%	3.53%	5.55%
12/23/2013	9.72%	3.55%	6.17%
12/30/2013	10.00%	3.57%	6.43%
1/21/2014	9.65%	3.66%	5.99%
1/22/2014	9.18%	3.66%	5.52%
2/20/2014	9.30%	3.71%	5.59%
2/21/2014	9.85%	3.72%	6.13%
2/28/2014	9.55%	3.73%	5.82%
3/16/2014	9.72%	3.74%	5.98%
4/21/2014	9.50%	3.73%	5.77%
4/22/2014	9.80%	3.73%	6.07%
5/8/2014	9.10%	3.71%	5.39%
5/8/2014	9.59%	3.71%	5.88%
6/6/2014	10.40%	3.66%	6.74%
6/12/2014	10.10%	3.66%	6.44%
6/12/2014	10.10%	3.66%	6.44%
6/12/2014	10.10%	3.66%	6.44%
7/7/2014	9.30%	3.63%	5.67%
7/25/2014	9.30%	3.60%	5.70%
7/31/2014	9.90%	3.59%	6.31%
9/4/2014	9.10%	3.50%	5.60%
9/24/2014	9.35%	3.46%	5.89%
9/30/2014	9.75%	3.44%	6.31%
10/29/2014	10.80%	3.37%	7.43%
11/6/2014	10.20%	3.35%	6.85%

[6] Data of	[7]	[8] 20 Veer	[9]
Date Of	Daturn on	JU-real	Diak
Rata Casa	Equity	Viold	Dromium
	10 20%	2 2 2 2 %	6 97%
11/14/2014	10.20%	3.33%	0.07 % 6.07%
11/26/2014	10.30%	3 30%	6.90%
12/3/2014	10.20%	3.20%	6.71%
1/13/2014	10.00%	3.2970	0.71%
1/21/2015	Q 05%	3 13%	5 02%
1/21/2015	9.05%	3 13%	5.92%
1/2//2015	9.00%	2.88%	6.62%
5/11/2015	0.00%	2.00%	6.08%
6/17/2015	9.00%	2.0270	6.21%
8/21/2015	9.00%	2.73%	6.97%
10/7/2015	9.55%	2.70%	6 73%
10/13/2015	9.55%	2.0270	6.02%
10/15/2015	9.70%	2.0370	6 16%
10/30/2015	9.00%	2.04%	6.03%
11/10/2015	10 00%	2.07 /0	7 11%
12/2/2015	10.00%	2.09%	7.11%
12/0/2015	0.60%	2.91/0	6 69%
12/9/2015	9.00%	2.92 /0	6.08%
12/11/2013	9.90%	2.92%	0.90%
12/10/2013	9.50%	2.94%	0.00%
1/0/2010	9.50%	2.97%	0.03%
1/0/2010	9.50%	2.97%	0.53%
1/28/2016	9.40%	2.97%	0.43%
2/10/2016	9.60%	2.95%	0.05%
2/16/2016	9.50%	2.94%	0.50%
2/29/2016	9.40%	2.92%	0.48%
4/29/2016	9.80%	2.83%	6.97%
5/5/2016	9.49%	2.82%	6.67%
6/1/2016	9.55%	2.80%	6.75%
6/3/2016	9.65%	2.79%	6.86%
6/15/2016	9.00%	2.77%	6.23%
6/15/2016	9.00%	2.77%	6.23%
9/2/2016	9.50%	2.56%	6.94%
9/23/2016	9.75%	2.52%	7.23%
9/27/2016	9.50%	2.51%	6.99%
9/29/2016	9.11%	2.50%	6.61%
10/13/2016	10.20%	2.48%	7.72%
10/28/2016	9.70%	2.47%	7.23%
11/9/2016	9.80%	2.47%	7.33%
11/18/2016	10.00%	2.49%	7.51%
12/9/2016	10.10%	2.51%	7.59%
12/15/2016	9.00%	2.53%	6.47%
12/15/2016	9.00%	2.53%	6.47%
12/20/2016	9.75%	2.53%	7.22%
12/22/2016	9.50%	2.54%	6.96%
1/24/2017	9.00%	2.59%	6.41%
2/21/2017	10.55%	2.63%	7.92%
3/1/2017	9.25%	2.65%	6.60%
4/11/2017	9.50%	2.77%	6.73%
4/20/2017	8.70%	2.79%	5.91%
4/28/2017	9.50%	2.81%	6.69%
5/23/2017	9.60%	2.88%	6.72%
6/6/2017	9.70%	2.91%	6.79%

[6] Date of	[7]	[8] 30-Year	[9]
Natural Gas	Return on	Treasury	Risk
Rate Case	Equity	Yield	Premium
6/22/2017	9.70%	2.93%	6.77%
6/30/2017	9.60%	2.94%	6.66%
7/20/2017	9.55%	2.97%	6.58%
7/31/2017	10.10%	2.98%	7.12%
9/13/2017	9.40%	2.93%	6.47%
9/19/2017	9.70%	2.92%	6.78%
9/22/2017	11.88%	2.92%	8.96%
9/27/2017	10.20%	2.92%	7.28%
10/20/2017	9.60%	2.90%	6.70%
10/26/2017	10.20%	2.90%	7.30%
10/30/2017	10.05%	2.90%	7.15%

[6] Date of	[7]	[8] 30 Vear	[9]
Natural Gas	Return on	Treasury	Riek
Pate Case	Equity	Vield	Dromium
12/5/2017	9 50%	2.86%	6.64%
12/3/2017	9.80%	2.86%	6 94%
12/13/2017	9.25%	2.85%	6 40%
12/28/2017	9.50%	2.84%	6 66%
1/31/2018	9.80%	2.83%	6.97%
2/21/2018	9.80%	2.86%	6.96%
2/21/2018	9.80%	2.84%	6.96%
2/28/2018	9.50%	2.85%	6.65%
3/15/2018	9.00%	2.80%	6 13%
3/26/2018	10 19%	2.88%	7.31%
4/26/2018	9.50%	2.00%	6.59%
4/27/2018	9.30%	2.01%	6.39%
5/2/2018	9.50%	2.01%	6.59%
5/3/2018	9 70%	2.01%	6 79%
5/29/2018	9 40%	2.95%	6 45%
6/6/2018	9.80%	2.00%	6.84%
6/14/2018	8 80%	2.00%	5.83%
7/16/2018	9.60%	2.98%	6.62%
7/20/2018	9 40%	2.00%	6.41%
8/24/2018	9.28%	3.02%	6.26%
8/28/2018	10.00%	3.03%	6.97%
9/13/2018	10.00%	3.04%	6.96%
9/14/2018	10.00%	3.05%	6.95%
9/19/2018	9.85%	3.05%	6.80%
9/20/2018	9.80%	3.05%	6 75%
9/26/2018	9.40%	3.06%	6.34%
9/26/2018	10.20%	3.06%	7.14%
9/28/2018	9.50%	3.07%	6.43%
9/28/2018	9.50%	3.07%	6.43%
10/5/2018	9.61%	3.08%	6.53%
10/15/2018	9.80%	3.09%	6.71%
10/26/2018	9.40%	3.11%	6.29%
10/29/2018	9.60%	3.11%	6.49%
11/1/2018	9.87%	3.11%	6.76%
11/8/2018	9.70%	3.12%	6.58%
11/8/2018	9.70%	3.12%	6.58%
12/11/2018	9.70%	3.14%	6.56%
12/12/2018	9.30%	3.14%	6.16%
12/13/2018	9.60%	3.14%	6.46%
12/19/2018	9.30%	3.14%	6.16%
12/21/2018	9.35%	3.14%	6.21%
12/24/2018	9.25%	3.14%	6.11%
12/24/2018	9.25%	3.14%	6.11%
1/4/2019	9.80%	3.14%	6.66%
1/18/2019	9.70%	3.14%	6.56%
3/14/2019	9.00%	3.12%	5.88%
3/27/2019	9.70%	3.12%	6.58%
4/30/2019	9.73%	3.11%	6.62%
5/7/2019	9.65%	3.10%	6.55%
5/21/2019	9.80%	3.10%	6.70%
9/4/2019	10.00%	2.76%	7.24%
9/26/2019	9.90%	2.69%	7.21%
10/2/2019	9.73%	2.67%	7.06%

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[6]	[7]	[8] 20 Xeer	[9]
Date of		30-Year	D: 1
Natural Gas	Return on	Treasury	RISK
Rate Case	Equity	Yield	Premium
10/8/2019	9.40%	2.64%	6.76%
10/15/2019	9.70%	2.62%	7.08%
10/21/2019	9.40%	2.60%	6.80%
10/31/2019	9.70%	2.57%	7.13%
10/31/2019	10.00%	2.57%	7.43%
10/31/2019	10.00%	2.57%	7.43%
10/31/2019	10.20%	2.57%	7.63%
11/7/2019	9.35%	2.55%	6.80%
11/13/2019	9.60%	2.54%	7.06%
11/13/2019	9.60%	2.54%	7.06%
12/6/2019	9.87%	2.47%	7.40%
12/11/2019	9.40%	2.46%	6.94%
12/17/2019	9.75%	2.44%	7.31%
12/18/2019	9.60%	2.44%	7.16%
12/18/2019	9.60%	2.44%	7.16%
12/19/2019	10.05%	2.44%	7.61%
12/19/2019	10.20%	2.44%	7.76%
12/19/2019	10.25%	2.44%	7.81%
12/20/2019	9.20%	2.44%	6.76%
12/26/2019	9.75%	2.42%	7.33%
1/15/2020	9.35%	2.37%	6.98%
1/16/2020	8.80%	2.37%	6.43%
1/24/2020	9.44%	2.35%	7.09%
		Average:	4.76%
		Count:	1,147

,	1.147
	.,

Expected Earnings Analysis

		[1] Expected	[2]	[3]	[4]	[5]	[6]
		ROE	Sh	ares Outstan	ding	Adjustment	Adjusted
Company	Ticker	2022-24	2019	2022-24	% Increase	Factor	ROE
Atmos Energy Corporation	ATO	10.0%	120.00	145.00	4.84%	1.024	10.24%
New Jersey Resources Corporation	NJR	11.0%	89.24	90.00	0.21%	1.001	11.01%
Northwest Natural Holding Company	NWN	11.5%	30.50	32.00	1.21%	1.006	11.57%
ONE Gas, Inc.	OGS	10.0%	53.00	55.00	0.93%	1.005	10.05%
Southwest Gas Holdings, Inc.	SWX	10.0%	56.00	62.00	2.58%	1.013	10.13%
Spire Inc.	SR	9.0%	51.00	55.00	1.91%	1.009	9.08%
						Median	10.18%
						Average	10.35%

Notes: [1] Source: Value Line [2] Source: Value Line

[2] Source: Value Line [3] Source: Value Line [4] Equals = $([3] / [2])^{(1/4)-1}$ [5] Equals (2 x (1 + [4])) / (2 + [4]) [6] Equals [1] x [5]

Small Size Premium

	[1]	[2]
	Customers (Mil)	(\$Mil)
South Jersey Gas Equity	0.39	\$1,191.96
Median Market to Book for Comp Group		2.35
South Jersey Gas Implied Market Cap		\$2,799.55

		[3]	[4]	[5]
			Market Cap	Market to Book
Company Name	Ticker	Customers (Mil)	(\$Mil)	Ratio
Atmos Energy Corporation	ATO	3.26	\$13,809.03	2.35
New Jersey Resources Corporation	NJR	0.54	\$4,183.29	2.53
Northwest Natural Holding Company	NWN	0.75	\$2,233.69	2.65
ONE Gas, Inc.	OGS	2.18	\$4,938.72	2.35
Southwest Gas Holdings, Inc.	SWX	2.05	\$4,062.66	1.72
Spire Inc.	SR	1.69	\$4,244.01	1.84
MEDIAN		1.87	\$4,213.65	2.35
MEAN		1.74	\$5,578.56	2.24

Market Capitalization (\$Mil) [6]									
Decile		Low		High	Size Premium				
2	\$	13,512.960	\$	29,022.867	0.52%				
3	\$	7,275.967	\$	13,455.802	0.81%				
4	\$	4,504.066	\$	7,254.230	0.85%				
5	\$	2,996.003	\$	4,503.549	1.28%				
6	\$	1,961.831	\$	2,992.251	1.50%				
7	\$	1,292.791	\$	1,960.201	1.58%				
8	\$	730.047	\$	1,292.224	1.80%				
9	\$	325.360	\$	727.843	2.46%				
10	\$	2.455	\$	321.578	5.22%				
Proxy Group	Media	an	\$	4,213.647	1.28%				
6th Decile Siz	ze Pre	emium	\$	2,799.550	1.50%				
Difference fro	om Pro	oxy Group Me	dian		0.22%				

Notes:

[1] Source: South Jersey Gas Company, Annual Report for the year ended December 31, 2018

[2] South Jersey Gas rate base of \$2.20 billion mutiplied by the proposed common equity ratio of 54.18%

[3] Source: S&P Global Market Intelligence

[4] Source: Bloomberg Professional, 30-day average

[5] Source: Bloomberg Professional, 30-day average

[6] Source: Ibbotson Associates, 2019 Ibbotson SBBI Market Report

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Two most recent open market common stock issuances per company, if available

						Net		Gross Equity		
		Shares	Offering	Underwriting	Offering	Proceeds Per	Total Flotation	Issue Before		Flotation Cost
Company	Date	Issued	Price	Discount	Expense	Share	Costs	Costs	Net Proceeds	Percentage
South Jersey Industries Inc.	4/18/2018	12,669,491	\$29.50	\$1.0325	\$700,000	\$28.41	\$13,781,249	\$373,749,985	\$359,968,735	3.687%
South Jersey Industries Inc.	5/12/2016	8,050,000	\$26.25	\$0.9188	\$330,000	\$25.29	\$7,725,938	\$211,312,500	\$203,586,563	3.656%
Atmos Energy Corporation	11/28/2018	8,059,300	\$92.75	\$0.9769	\$1,000,000	\$91.65	\$8,873,130	\$747,500,075	\$738,626,945	1.187%
Atmos Energy Corporation	11/28/2017	4,558,404	\$88.56	NA	NA	NA	NA	\$403,692,258	NA	NA
New Jersey Resources Corporation	12/4/2019	6,545,454	\$41.25	\$1.2375	\$500,000	\$39.94	\$8,599,999	\$269,999,978	\$261,399,978	3.185%
Northwest Natural Gas Company	6/4/2019	1,437,500	\$67.00	\$2.1775	\$400,000	\$64.54	\$3,530,156	\$96,312,500	\$92,782,344	3.665%
Northwest Natural Gas Company	11/10/2016	1,012,000	\$54.63	\$2.0500	\$250,000	\$52.33	\$2,324,600	\$55,285,560	\$52,960,960	4.205%
Southwest Gas Corporation	11/27/2018	3,565,000	\$75.50	\$2.5481	\$600,000	\$72.78	\$9,683,977	\$269,157,500	\$259,473,524	3.598%
Spire Inc.	5/7/2018	2,300,000	\$68.75	\$2.1094	\$325,000	\$66.50	\$5,176,574	\$158,125,000	\$152,948,426	3.274%
Spire Inc.	5/12/2016	2,185,000	\$63.05	\$2.0491	\$300,000	\$60.86	\$4,777,284	\$137,764,250	\$132,986,967	3.468%
Mean							\$7,163,656	\$272,289,961		
							WEIGH	ITED AVERAGE FL	OTATION COSTS:	2.631%

Constant Growth Discounted Cash Flow Model Adjusted for Flotation Costs - 30 Day Average Stock Price

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
			Average		Expected [Dividend Yield	Zacks	First Call	Value Line	Value Line	Average		Flotation
		Annualized	Stock	Dividend		Adjusted for	Earnings	Earnings	Earnings	Retention	Earnings		Adjusted
Company	Ticker	Dividend	Price	Yield	Current	Flot. Costs	Growth	Growth	Growth	Growth	Growth	DCF k(e)	DCF k(e)
Atmos Energy Corporation	ATO	\$2.30	\$113.12	2.03%	2.12%	2.17%	7.20%	7.20%	7.50%	10.48%	8.09%	10.21%	10.27%
New Jersey Resources Corporation	NJR	\$1.25	\$43.64	2.86%	2.94%	3.02%	8.00%	6.00%	2.50%	4.38%	5.22%	8.16%	8.24%
Northwest Natural Holding Company	NWN	\$1.91	\$73.43	2.60%	2.74%	2.81%	5.00%	3.75%	27.00%	7.04%	10.70%	13.44%	13.51%
ONE Gas, Inc.	OGS	\$2.16	\$93.65	2.31%	2.38%	2.44%	6.00%	5.00%	8.00%	5.46%	6.12%	8.49%	8.56%
Southwest Gas Holdings, Inc.	SWX	\$2.18	\$76.50	2.85%	2.96%	3.04%	6.00%	8.20%	9.00%	7.81%	7.75%	10.71%	10.79%
Spire Inc.	SR	\$2.49	\$83.25	2.99%	3.07%	3.15%	5.10%	4.23%	5.50%	5.49%	5.08%	8.15%	8.23%

PROXY GROUP MEAN

Notes:

The proxy group DCF result is adjusted for flotation costs by dividing each company's expected dividend yield by (1 - flotation cost). The flotation cost adjustment is derived as the difference between the unadjusted DCF result and the DCF result adjusted for flotation costs. [1] Source: Bloomberg Professional [2] Source: Bloomberg Professional DCF Result Adjusted For Flotation Costs: 9.93% DCF Result Unadjusted For Flotation Costs: 9.86%

9.86%

9.93%

Difference (Flotation Cost Adjustment): 0.07% [13]

[1] Source: Bloomberg Professional [2] Source: Bloomberg Professional [3] Equals [1] / [2] [4] Equals [3] x (1 + 0.5 x [10]) [5] Equals [4] / (1 - 2.631%) [6] Source: Zacks [7] Source: Yahoo! Finance [8] Source: Schedule RBH-2, Value Line [10] Equals Average([6], [7], [8], [9]) [11] Equals [4] + [10] [12] Equals [4] + [10] [13] Equals [5] + [10]

Proxy Group Capital Structure

% Common Equity										
Company	Ticker	2019Q3	2019Q2	2019Q1	2018Q4	2018Q3	2018Q2	2018Q1	2017Q4	Average
Atmos Energy Corporation	ATO	61.97%	60.69%	60.12%	59.37%	60.85%	60.80%	60.61%	59.80%	60.53%
New Jersey Resources Corporation	NJR	49.89%	54.05%	54.61%	53.34%	52.11%	53.49%	55.77%	53.59%	53.36%
Northwest Natural Holding Company	NWN	48.29%	48.92%	51.67%	50.88%	47.67%	50.03%	50.45%	48.78%	49.59%
ONE Gas, Inc.	OGS	61.40%	61.44%	61.38%	61.38%	62.81%	62.88%	62.87%	62.16%	62.04%
Southwest Gas Holdings, Inc.	SWX	48.47%	49.42%	51.58%	51.27%	47.43%	48.29%	48.16%	49.87%	49.31%
Spire Inc.	SR	52.02%	51.78%	51.60%	51.32%	52.08%	51.42%	49.70%	49.33%	51.16%
Mean		53.67%	54.39%	55.16%	54.59%	53.83%	54.49%	54.60%	53.92%	54.33%

			% Long	g-Term Deb	t					
Company	Ticker	2019Q3	2019Q2	2019Q1	2018Q4	2018Q3	2018Q2	2018Q1	2017Q4	Average
Atmos Energy Corporation	ATO	38.03%	39.31%	39.88%	40.63%	39.15%	39.20%	39.39%	40.20%	39.47%
New Jersey Resources Corporation	NJR	50.11%	45.95%	45.39%	46.66%	47.89%	46.51%	44.23%	46.41%	46.64%
Northwest Natural Holding Company	NWN	51.71%	51.08%	48.33%	49.12%	52.33%	49.97%	49.55%	51.22%	50.41%
ONE Gas, Inc.	OGS	38.60%	38.56%	38.62%	38.62%	37.19%	37.12%	37.13%	37.84%	37.96%
Southwest Gas Holdings, Inc.	SWX	51.53%	50.58%	48.42%	48.73%	52.57%	51.71%	51.84%	50.13%	50.69%
Spire Inc.	SR	47.98%	48.22%	48.40%	48.68%	47.92%	48.58%	50.30%	50.67%	48.84%
Mean		46.33%	45.61%	44.84%	45.41%	46.17%	45.51%	45.40%	46.08%	45.67%

Source: S&P Global Market Intelligence

INSERT TAB:

T. LYONS

.

IN THE MATTER OF THE PETITION OF SOUTH JERSEY GAS COMPANY FOR APPROVAL OF INCREASED BASE TARIFF RATES AND CHARGES FOR GAS SERVICE, CHANGES TO DEPRECIATION RATES AND OTHER TARIFF REVISIONS

BPU DOCKET NO. GR20_____

DIRECT TESTIMONY

OF

TIMOTHY S. LYONS

Cash Working Capital

On Behalf Of South Jersey Gas Company

Exhibit P-8

March 13, 2020

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SOUTH JERSEY GAS COMPANY DIRECT TESTIMONY OF TIMOTHY S. LYONS

1 I. INTRODUCTION AND QUALIFICATIONS

2 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

- 3 A. My name is Timothy S. Lyons. My business address is 1900 West Park Drive, Suite 250,
- 4 Westborough, Massachusetts 01581.

5 Q. PLEASE DESCRIBE YOUR CURRENT POSITION.

6 A. I am a Partner at ScottMadden, Inc. ("ScottMadden").

7 Q. PLEASE DESCRIBE YOUR WORK EXPERIENCE AND QUALIFICATIONS.

8 A. I have more than 30 years of experience in the energy industry. I started my career in 1985

9 at Boston Gas Company, eventually becoming Director of Rates and Revenue Analysis.

- 10 In 1993, I moved to Providence Gas Company, eventually becoming Vice President of
- 11 Marketing and Regulatory Affairs. Starting in 2001, I held a number of management
- 12 consulting positions in the energy industry first at KEMA and then at Quantec, LLC. In
- 13 2005, I became Vice President of Sales and Marketing at Vermont Gas Systems, Inc. before
- 14 joining Sussex Economic Advisors, LLC ("Sussex") in 2013. Sussex was acquired by
- 15 ScottMadden on June 1, 2016.
- 16 Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

I hold a Bachelor's degree from St. Anselm College, a Master's degree in Economics from
 The Pennsylvania State University, and a Master's degree in Business Administration from
 Babson College.

1	Q.	HAVE YOU PREVIOUSLY SPONSORED TESTIMONY BEFORE THE NEW
2		JERSEY BOARD OF PUBLIC UTILITIES ("BPU" OR "BOARD")?
3	А.	Yes, I previously sponsored testimony before the Board. A summary of my testimony
4		experience along with my professional and educational experience is included in Schedule
5		TSL-1.
6	Q.	WHAT IS THE PURPOSE OF YOUR TESTIMONY?
7	А.	The purpose of my testimony is to sponsor the results of the lead-lag study conducted on
8		behalf of South Jersey Gas Company ("South Jersey" or the "Company"), a subsidiary of
9		South Jersey Industries, Inc. The lead-lag study is submitted as part of the Company's
10		March 2020 base rate filing with the Board. The lead-lad study was used to determine the
11		Company's Cash Working Capital ("CWC") requirement, which is included in the
12		Company's rate base.
13	Q.	ARE YOU SPONSORING ANY SCHEDULES IN CONNECTION WITH YOUR
14		TESTIMONY?
15	A.	Yes. I am sponsoring the following schedules that were prepared by me or under my
16		direction:
17		• Schedule TSL-1 – Curriculum Vitae;
18		• Schedule TSL-2 – South Jersey Gas Company – Summary of the Cash Working
19		Capital Requirement; and
20		• Schedule TSL-3 – South Jersey Gas Company – Workpapers supporting the Lead-
21		Lag Study.

1 II. OVERVIEW OF TESTIMONY

2 Q. PLEASE DEFINE THE TERM "WORKING CAPITAL" AS A RATE BASE 3 COMPONENT.

A. The term "working capital" refers to the net funds required by the Company to finance
goods and services used to provide service to customers from the time those goods and
services are paid for by the Company to the time that payment is received from customers.
Goods and services considered in the lead-lag study include: operations and maintenance
("O&M") expenses, including labor and non-labor expenses; federal, state, and local taxes;
and employment taxes.

10 Q. HOW WAS THE COMPANY'S CASH WORKING CAPITAL REQUIREMENT 11 DETERMINED?

12 A. The Company's cash working capital requirement was determined by applying the results 13 of the lead-lag study to post-test year adjusted expenses. The lead-lag study compares 14 differences between the Company's revenue lag and expense leads. The revenue lag 15 represents the number of days from the time customers receive their natural gas service to 16 the time customers pay for their natural gas service, *i.e.*, when the funds are available to 17 the Company. The longer the revenue lag, the more cash the Company needs to finance 18 its day-to-day operations. The expense lead represents the number of days from the time 19 the Company receives goods and services used to provide natural gas service to the time 20 payments are made for those goods and services, *i.e.*, when the funds are no longer 21 available to the Company. The longer the expense lead, the less cash the Company needs 22 to fund its day-to-day operations. Together, the revenue lag and expense leads are used to measure the lead-lag days. The lead-lag days are then applied to the Company's post test 23

year adjusted expenses to determine the CWC requirement. To that amount, there are
 several working capital adjustments to be included in rate base.

3 Unless otherwise indicated, the approach to calculate the CWC requirement in this
4 rate case filing is consistent with the approach used in the prior rate case filing.¹

5

III. LEAD-LAG STUDY APPROACH

6 Q. PLEASE DESCRIBE THE APPROACH USED TO DEVELOP THE LEAD-LAG 7 STUDY.

8 The lead-lag study compares differences between the Company's revenue lag and expense A. 9 leads. The revenue lag measures the number of days from the time natural gas service is 10 provided to customers to the time payment is received from customers. The expense leads 11 measure the number of days from the time goods and services used to provide natural gas service are provided to the Company to the time payments are made by the Company for 12 13 those goods and services. The leads are measured in days for individual expenses, 14 converted to "dollar-days" that reflect a weighting by expense amount, and then summed 15 across all expenses.

16 Q. PLEASE DESCRIBE THE FINANCIAL DATA USED IN THE LEAD-LAG 17 STUDY.

A. The lead-lag study was based on data from October 1, 2018 through September 30, 2019
(the "study period"). The data included: customer meter reading and billing schedules;
O&M expenses; federal, state, local, and employment taxes; service periods; billing and
payment dates; and billing and payment amounts.

¹ In the Matter of the Petition of South Jersey Gas Company for Approval of Increased Base Tariff Rates And Charges for Gas Service and Other Tariff Revisions, BPU Docket No. GR17010071.

Exhibit P-8

1 A. Revenue Lag

2 Q. PLEASE DESCRIBE DEVELOPMENT OF THE REVENUE LAG.

A. The revenue lag measures the number of days from the time natural gas service is provided
 to customers to the time payment is received from customers. There are three categories
 of revenues that comprise the revenue lag: retail and industrial sales; off-system sales; and
 capacity release.

7 The largest revenue category is retail and industrial sales. This category includes 8 revenues from firm, non-firm and transportation customers. The revenue lag for retail and 9 industrial sales was measured as the sum of three components: (1) the service lag; (2) the 10 billing lag; and (3) the collection lag.

11 Q. WHAT IS THE SERVICE LAG?

A. The service lag measures the average number of days in the service period; *i.e.*, the time
between the start and end of the billing month (which is when meters are read). The service
lag in this lead-lag study was based on the midpoint of the service period, which reflects
an assumption that natural gas is delivered evenly over the service period.

16 **O**.

. WHAT IS THE BILLING LAG?

A. The billing lag measures the number of days from the time meters are read to the time bills
are recorded and sent to customers. The billing lag in this lead-lag study was based on the
Company's meter reading schedule.

The Company has twenty meter reading cycles per month, and allows three days to complete the billing process. However, only one-half day is typically required (*i.e.*, meters are read during the day and bills are processed in the evening). The billing lag in this leadlag study was based on a one-half day billing lag, which is a conservative assumption.

Q. WHAT IS THE COLLECTION LAG?

A. The collection lag measures the number of days from the time bills are recorded and sent
to customers to the time customer payments are received (i.e., funds are available to the
Company). The collection lag in this lead-lag study was based on monthly accounts
receivable balances and billed revenue data. This information was used to calculate the
average time to receive customer payments.

However, the accounts receivable balance on the Company's books reflects two amounts: (1) amounts related to Company billings to customers; and (2) amounts related to marketer (or third-party, residential service suppliers) billings to customers. The amounts related to marketer billings reflect the Company's purchase of accounts receivable from marketers. To determine the collection lag associated with the Company's billings to customers, the accounts receivable balance was adjusted to remove the amount related to the purchase of accounts receivable from marketers.

14 The adjustment is consistent with the approach in the prior lead-lag study, and 15 reduces the collection lag.

16 Q. WHAT IS THE REVENUE LAG ASSOCIATED WITH OFF-SYSTEM SALES 17 AND CAPACITY RELEASE?

A. The revenue lag for off-system sales and capacity release was measured for each bill as the
number of days from the midpoint of the service period to the payment date, converted to
"dollar-days" that reflects a weighting of the billed amounts, and then summed across all
the billings.

1	Q.	WHAT IS THE TOTAL REVENUE LAG USED IN THE LEAD-LAG STUDY?
2	А.	The total revenue lag used in the lead-lag study is based on the revenue lags associated
3		with retail and industrial sales, off-system sales and capacity release, converted to "dollar-
4		days" that reflects a weighting of the revenue amounts, and then summed across all
5		revenues. The derivation of the revenue lag is shown in Schedule TSL-3 at page 1.
6		B. Expense Leads
7		1. Operation and Maintenance Expenses
8	Q.	PLEASE DESCRIBE DEVELOPMENT OF LEAD DAYS FOR O&M EXPENSES.
9	A.	Lead days for O&M expenses were measured separately for the following categories: (1)
10		purchased gas costs; (2) regular payroll; (3) variable compensation; (4) pension; (5)
11		employee benefits; (6) uncollectible expenses; (7) affiliate services; (8) New Jersey Clean
12		Energy Program; (9) select O&M expenses; and (10) other O&M expenses.
13	Q.	HOW WERE LEAD DAYS DETERMINED FOR PURCHASED GAS EXPENSES?
14	A.	Lead days for purchased gas costs were measured separately for the following categories:
15		(a) flowing gas purchases; (b) LNG expenses; (c) Net LNG inventory withdrawals; (d) gas
16		used by the Company; (e) capacity release and hedges.
17		Lead days for flowing gas purchases were based on a review of the Company's
18		invoices. Lead days were measured as the number of days from the midpoint of the service
19		period to the payment date.
20		The lead days associated with LNG expenses were based on the lead days
21		associated with O&M expenses (as described below) because LNG expenses are primarily
22		related to labor and electricity expenses, which are included in O&M expenses. This
23		approach is a change to the study filed in the prior rate case because the Company now

1		produces LNG through a liquefaction process that requires labor and electricity instead of
2		purchasing LNG.
3		There are no lead days associated with LNG inventory withdrawals because LNG
4		is deducted from inventory and charged to expense at the time LNG is withdrawn from
5		storage.
6		Lead days associated with gas used by the Company was based on lead days for
7		flowing gas purchases.
8		Lead days associated with capacity release and hedging expenses were measured
9		as the number of days from the midpoint of the service period to the payment date. Since
10		capacity release is a credit to the pipeline invoice, the lead days associated with the capacity
11		release expenses offset the revenue lag associated with capacity release revenues discussed
12		earlier.
13	Q.	HOW WERE LEAD DAYS DETERMINED FOR REGULAR PAYROLL
14		EXPENSES?
15	A.	Lead days for regular payroll expenses were based on the Company's payroll process,
16		which pays employees on a bi-weekly basis. Lead days were measured as the number of
17		days from the midpoint of each pay period to the payment date.
18	Q.	DID THE STUDY ADJUST FOR VARIABLE COMPENSATION EXPENSES?
19	A.	Yes. Lead days for the Company's variable compensation expenses were measured as the
20		number of days from the midpoint of the performance period when the variable
21		compensation was earned to the payment dates.

Q. HOW WERE LEAD DAYS DETERMINED FOR PENSION PLAN PAYMENTS?

A. Lead days for the pension plan payments were based on the timing of the Company's
contributions to the pension plan. Lead days were measured as the number of days from
the midpoint of the service period to the contribution dates.

5

Q. HOW WERE LEAD DAYS DETERMINED FOR EMPLOYEE BENEFITS?

A. Lead days for employee benefit expenses were based on a review of the Company's payments related to fourteen benefit items, including medical, dental and 401(k) plans.
Lead days were measured for each benefit item as the number of days from the midpoint of the service period to the payment date, converted to "dollar-days" to reflect a weighting
of the expense amounts, and then summed across all benefit expenses.

11 Q. HOW WERE LEAD DAYS DETERMINED FOR UNCOLLECTIBLE EXPENSES?

A. Lead days for uncollectible expenses were based on the Company's approach to create a
 reserve account for uncollectible expenses prior to the actual write-off. Lead days were
 measured as the average uncollectible reserve balance over the past five quarters divided
 by the actual write-off expenses during the study period.

16 Q. HOW WERE LEAD DAYS DETERMINED FOR SOUTH JERSEY INDUSTRIES,

17 INC. SERVICES COMPANY (AFFILIATE) EXPENSES?

A. Lead days for Services Company (Affiliate) expenses were based on the payment schedule.
 Services Company (Affiliate) payments are made in the month following the service
 period. Lead days for Services Company (Affiliate) expenses were measured as the
 number of days from midpoint of the service period to the payment date.

9

Q.

HOW WERE LEAD DAYS DETERMINED FOR NEW JERSEY CLEAN ENERGY PROGRAM EXPENSES?

A. Lead days for New Jersey Clean Energy Program expenses were based on the payment
 schedule. New Jersey Clean Energy Program payments are made following the service
 period. Lead days for New Jersey Clean Energy Program expenses were measured as the
 number of days from midpoint of the service period to the payment date.

7 Q. HOW WERE LEAD DAYS DETERMINED FOR SELECT O&M EXPENSES?

8 A. The lead-lag study determined lead days for eight O&M items based on a review and 9 analysis of the service periods and payment dates. The eight O&M items were similarly 10 analyzed in the lead-lag study filed in the prior rate case. The O&M items are discussed 11 below.

- Materials and supplies this item was assigned zero lead days because materials
 and supplies are deducted from inventory at the time the expense is recorded. The
 payment occurs at the time of purchase and addition to inventory.
- Membership dues lead days were measured as the number of days from midpoint
 of the service period to the payment date.
- Utility location markout services lead days were measured as the number of days
 from midpoint of the service period to the payment date.
- Bank service fees lead days were measured as the average monthly balance
 divided by the average daily expense.
- Motor vehicles this item includes depreciation expense, which was assigned zero
 lead days (as discussed below), labor expenses, which were assigned payroll lead

1		days, and other miscellaneous expenses, which were assigned other O&M lead
2		days.
3		• Outside services (audit) – lead days were measured as the average monthly balance
4		divided by the average daily expense.
5		• Meter reading services - lead days were measured as the number of days from
6		midpoint of the service period to the payment date.
7		• Insurance prepayment – this item was assigned zero lead days because insurance is
8		deducted from a prepayment account at the time expenses are recorded.
9		FASB 106 expenses are included in Other O&M Expenses rather than measured separately
10		as in the prior rate case. The Company believes the expenses are not unique and can be
11		included in Other O&M expenses.
12	Q.	HOW WERE LEAD DAYS DETERMINED FOR OTHER O&M EXPENSES?
13	А.	Lead days for other O&M expenses were based on a stratified sample of invoices paid by
14		the Company during the study period. Lead days were measured for each invoice as the
14 15		the Company during the study period. Lead days were measured for each invoice as the number of days from the midpoint of the service period to the payment date, converted to
14 15 16		the Company during the study period. Lead days were measured for each invoice as the number of days from the midpoint of the service period to the payment date, converted to "dollar-days" that reflect a weighting of the expense amounts, and then summed across all
14 15 16 17		the Company during the study period. Lead days were measured for each invoice as the number of days from the midpoint of the service period to the payment date, converted to "dollar-days" that reflect a weighting of the expense amounts, and then summed across all expenses. The lead days reflect an adjustment to the timing of a large contractor's invoice.
14 15 16 17 18		the Company during the study period. Lead days were measured for each invoice as the number of days from the midpoint of the service period to the payment date, converted to "dollar-days" that reflect a weighting of the expense amounts, and then summed across all expenses. The lead days reflect an adjustment to the timing of a large contractor's invoice. The invoice is an outlier due to the contractor's unusual delay in providing a correct
14 15 16 17 18 19		the Company during the study period. Lead days were measured for each invoice as the number of days from the midpoint of the service period to the payment date, converted to "dollar-days" that reflect a weighting of the expense amounts, and then summed across all expenses. The lead days reflect an adjustment to the timing of a large contractor's invoice. The invoice is an outlier due to the contractor's unusual delay in providing a correct invoice. The lead days reflect the date of the corrected invoice rather than the initial

2. Current Income Tax Expense

2 Q. HOW WERE LEAD DAYS DETERMINED FOR FEDERAL INCOME TAXES?

A. Lead days for federal income taxes were based on due dates for tax payments: April 15;
 June 15; September 15; and December 15. Lead days for federal income taxes were
 measured as the number of days from the midpoint of the taxing period (*i.e.*, the calendar
 year) to the due dates. The study assumes the tax payments reflect equal installments.

7 Q. HOW WERE LEAD DAYS DETERMINED FOR STATE INCOME TAXES?

- 8 A. Lead days for state income taxes were based on due dates for tax payments: April 15; May
- 9 15; and June 15. Lead days for state income taxes were measured as the number of days 10 from the midpoint of the taxing period (*i.e.*, the calendar year) to the due dates. The study 11 assumes the tax payments reflect the following installments: 25.0 percent in on April 15; 12 50.0 percent due on May 15; and 25.0 percent due on June 15.
- 13

3. Taxes Other than Income Taxes

14 Q. PLEASE DESCRIBE DEVELOPMENT OF LEAD DAYS FOR TAXES OTHER

15 TI

THAN INCOME TAXES?

A. Lead days for Taxes Other Than Income Taxes were measured separately for the following
 categories: (1) payroll-related taxes (FICA, federal unemployment, and state
 unemployment); (2) real estate; (3) federal excise and sales and use taxes; and (4) New
 Jersey Public Utility Assessment and Ratepayer Advocate Assessment.

20 Q. HOW WERE LEAD DAYS DETERMINED FOR EACH OF THESE TAXES?

A. Lead days for FICA taxes were measured as the number of days from the midpoint of the
applicable pay period to the payment date.

1		Lead days for federal and state unemployment taxes were measured as the number
2		of days from liability date at the end of each quarter to the due date.
3		Lead days for real estate taxes were measured as the number of days from the
4		midpoint of the taxing period to the payment date.
5		Lead days for federal excise and sales and use taxes were measured as the number
6		of days from the midpoint of the taxing period to the payment date.
7		Lead days for New Jersey Public Utility Assessment and Ratepayer Advocate
8		Assessment were measured as the number of days from the midpoint of the assessment
9		period to the payment date.
10		
10		4. Return on Invested Capital and Interest Expenses
10	Q.	4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON
11 11 12	Q.	4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON INVESTED CAPITAL AND INTEREST PAYMENTS?
10 11 12 13	Q. A.	4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON INVESTED CAPITAL AND INTEREST PAYMENTS? Yes. Consistent with the Board's practice, the return on invested capital is included in the
10 11 12 13 14	Q. A.	 4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON INVESTED CAPITAL AND INTEREST PAYMENTS? Yes. Consistent with the Board's practice, the return on invested capital is included in the lead-lag study.² A zero expense lead was assigned to the return on common equity,
 11 12 13 14 15 	Q. A.	 4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON INVESTED CAPITAL AND INTEREST PAYMENTS? Yes. Consistent with the Board's practice, the return on invested capital is included in the lead-lag study.² A zero expense lead was assigned to the return on common equity, recognizing returns are earned and become the property of the utility's investors at the time
10 11 12 13 14 15 16	Q.	 4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON INVESTED CAPITAL AND INTEREST PAYMENTS? Yes. Consistent with the Board's practice, the return on invested capital is included in the lead-lag study.² A zero expense lead was assigned to the return on common equity, recognizing returns are earned and become the property of the utility's investors at the time services are rendered.
10 11 12 13 14 15 16 17	Q.	 4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON INVESTED CAPITAL AND INTEREST PAYMENTS? Yes. Consistent with the Board's practice, the return on invested capital is included in the lead-lag study.² A zero expense lead was assigned to the return on common equity, recognizing returns are earned and become the property of the utility's investors at the time services are rendered. Lead days for interest payments related to long-term debt, short term debt, and
11 11 12 13 14 15 16 17 18	Q.	 4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON INVESTED CAPITAL AND INTEREST PAYMENTS? Yes. Consistent with the Board's practice, the return on invested capital is included in the lead-lag study.² A zero expense lead was assigned to the return on common equity, recognizing returns are earned and become the property of the utility's investors at the time services are rendered. Lead days for interest payments related to long-term debt, short term debt, and customer deposits were measured as the number of days from the midpoint of the service
 11 12 13 14 15 16 17 18 19 	Q.	 4. Return on Invested Capital and Interest Expenses DID YOU CALCULATE AN EXPENSE LEAD ASSOCIATED WITH RETURN ON INVESTED CAPITAL AND INTEREST PAYMENTS? Yes. Consistent with the Board's practice, the return on invested capital is included in the lead-lag study.² A zero expense lead was assigned to the return on common equity, recognizing returns are earned and become the property of the utility's investors at the time services are rendered. Lead days for interest payments related to long-term debt, short term debt, and customer deposits were measured as the number of days from the midpoint of the service period to the payment date for the study period, October 1, 2018 through September 30,

² See In the Matter of the Verified Petition of Jersey Central Power & Light Company for Review and Approval of Increases in and Other Adjustments to Its Rates And Charges For Electric Service, and for Approval of Other Proposed Tariff Revisions in Connection Therewith; and for Approval of an Accelerated Reliability Enhancement Program ("2012 Base Rate Filing"), BPU Docket No. ER12111052 "Order Adopting Initial Decision with Modifications and Clarifications," (Mar. 26, 2015) at 14.
1

5. Deferred Income Taxes

2 Q. DID YOU INCLUDE DEFERRED INCOME TAXES IN THE LEAD-LAG STUDY?

A. No. It has been the Board's practice to exclude deferred taxes from lead-lag studies.³ As
such, no deferred income taxes are included in the analysis. However, the Company has
included excess deferred tax amortization with a zero expense lag because this item is
deducted from rate base when the amortization amount is recognized.

7

Depreciation and Other Expense Items

8 Q. PLEASE DESCRIBE HOW YOU CALCULATED THE LAG ASSOCIATED WITH 9 DEPRECIATION EXPENSES.

- A. Depreciation expenses are included with a zero expense lead because these items are
 deducted from rate base when the expenses are recorded. This is consistent with the prior
 practice of the Board.⁴
- 13 C. Working Capital Adjustments

6.

14 Q. PLEASE DESCRIBE THE WORKING CAPITAL ADJUSTMENTS.

A. There were twelve working capital adjustments to be included in rate base. The
adjustments were consistent with those in the study filed in the prior rate case. The amounts
are discussed below:

Cash Balance and Working Funds – this item represents cash on hand to pay
 expenses. The amount reflects a thirteen-month average of cash and working fund
 balances.

³ See id. at 13-14.

⁴ See id. at 13.

- General Prepayments this item represents payments in advance of when they are
 charged to expenses. The amount reflects a thirteen-month average of prepaid
 account balances.
- Prepaid Energy Sales and Use Tax this item represents tax payments in advance
 of collection from customers. The amount reflects a thirteen-month average of
 prepaid energy sales and use tax balances.
- Universal Service Fund ("USF")/ Lifeline reserve this item represents payments
 in advance of collection from customers. The amount reflects a thirteen-month
 average of USF/ Lifeline reserves.
- Prepaid Pension and Postretirement Healthcare this item represents payments to
 a reserve in advance of when they are charged to expense. The amount reflects a
 thirteen-month average of prepaid pension and postretirement healthcare reserves.
- Accrued Invoices and Accrued Payroll Related to Plant this item represents
 materials and labor capitalized prior to the date it is actually paid. The amount
 reflects a thirteen-month average of material and labor expenses accrued but not
 yet paid.
- Vacation Accrual and Uninsured Risk Reserve this item represents expenses
 recovered from customers but not yet paid out. Vacation accrual reflects a four quarter average of accrued vacation. Uninsured risk reserve reflects a thirteen month average of the reserve account.

15

- Marketer Payment Reserve this item represents funds received from customers
 but not yet paid to marketers. The amount reflects a thirteen-month average of
 payments that are due marketers.
- 4 Q. PLEASE EXPLAIN TREATMENT OF EMPLOYEE DEDUCTIONS IN THE
- 5
 - CALCULATION OF THE CASH WORKING CAPITAL REQUIREMENT.
- A. Employee deductions associated with the employee portion of payroll withholdings are a
 source of cash working capital to the Company from the time the employee deductions are
 withheld from employee payroll to the time employee deductions are used to pay for the
 items for which they were withheld. Therefore, miscellaneous employee deductions are
 deducted from the cash working capital requirement.

11 IV. <u>CONCLUSION</u>

12 Q. WHAT WERE THE RESULTS OF THE LEAD-LAG STUDY?

13 A. The results of the lead-lag study are included in Schedule TSL-2.

14 Q. ARE THE RESULTS OF THIS LEAD-LAG STUDY REASONABLE?

- A. Yes, the study provides an accurate assessment of the Company's actual cash working
 capital requirements. The resulting cash working capital requirement should be included
 in the Company's rate base.
- 18 Q. DOES THIS CONCLUDE YOUR TESTIMONY?
- 19 A. Yes, it does.



Summary

Tim Lyons is a partner with ScottMadden with more than 30 years of experience in the energy industry. Tim has held senior positions at several gas utilities and energy consulting firms. His experience includes rate and regulatory support, sales and marketing, customer service and strategy development. Prior to joining ScottMadden, Tim was Vice President of Sales and Marketing for Vermont Gas. He has also served as Vice President of Marketing and Regulatory Affairs for Providence Gas Company, Director of Rates at Boston Gas Company, and Project Director at Quantec, LLC, an energy consulting firm.

Tim has sponsored testimony before 18 state regulatory commissions. Tim holds a B.A. from St. Anselm College, an M.A. in Economics from The Pennsylvania State University, and an M.B.A. from Babson College.

Areas of Specialization

- Regulation and Rates
- Retail Energy
- Utilities
- Natural Gas

Capabilities

- Regulatory Strategy and Rate Case Support
- Strategic and Business Planning
- Capital Project Planning
- Process Improvements

Articles and Speeches

- "Country Strong: Vermont Gas shares its comprehensive effort to expand natural gas service into rural communities." *American Gas Association*, June 2011 (with Don Gilbert).
- "Talking Safety With Vermont Gas." *American Gas Association*, February 2009 (with Dave Attig).
- "Consumers Say 'Act Now' To Stabilize Prices." *Power & Gas Marketing*, September/ October 2001 (with Jim DeMetro and Gerry Yurkevicz).
- "Rate Reclassification: Who Buys What and When." *Public Utilities Fortnightly*, October 15, 1991 (with John Martin).

Recent Assignments

- Sponsored cost of service/rate design testimony for a Mid-Atlantic gas utility. Testimony included a proposal for new residential and commercial rate classes and introduction of a block break rate design.
- Sponsored cost of service/rate design testimony for a Midwest gas utility. Testimony included a proposal for new commercial rate classes and a revenue decoupling mechanism.
- Sponsored cost of service/ rate design and lead-lag testimony for a Midwest gas utility. The testimony included proposals for Revenue Decoupling/ Weather Normalization Mechanism and Tracker Accounts for certain O&M expenses and capital costs.
- Sponsored rate design testimony for a Northeast gas utility. The testimony included: a proposal for zonal rates to promote expansion of natural gas service in the state; market analysis; and financial modeling.
- Led a study for the Massachusetts Department of Energy Resources to evaluate the benefits, costs and policies options associated with natural gas expansion by Massachusetts gas utilities. The study included: (a) research on state regulatory policies; (b) financial modeling and analysis of the economic and environmental impacts of pursuing various policy options; and (c) a survey of Massachusetts homeowners on their opinion of home heating fuels.
- Prepared a transmission and distribution (T&D) avoided cost study and report for a Midwest electric utility. The study was used to support the utility's energy efficiency programs.
- Prepared a review and evaluation of cost of service/ rate design studies for an electric utility. The assignment included review of proposed rate designs that address cost shifting concerns with serving residential distribution generation customers through introduction of higher customer charges, a demand charge and time-of-use energy charges.



- Assisted in the development of an electric portfolio of cost of service, rate design, and rate planning tools. The tools were used to evaluate the impact of future rate filings and resource portfolio decisions on individual rate classes.
- Prepared a market analysis for a utility to evaluate natural gas expansion into new areas, including:
 (a) survey of homes and businesses; (b) estimate of construction and operating costs; (c) analysis of alternative supply options (including pipeline, LNG and CNG); and (d) financial modeling.
- Directed a process review of natural gas expansion projects for a gas utility. The assignment included a review, evaluation and recommendations related to: (a) policies and procedures; (b) process steps and personnel; (c) financial models and analysis; (d) project decisions and schedules; and (e) post-construction review and evaluation.
- Sponsored lead-lag testimony for several electric and gas utilities.



Sponsor	Date	Docket No.	Subject	
Regulatory Commission of A	laska			
ENSTAR Natural Gas	06/16	Docket No. U-16-066	Adopted testimony and sponsored Lead/Lag	
Company			study for a general rate case proceeding.	
Arkansas Public Service Com	mission			
Liberty Utilities (Pine Bluff	10/18	Docket No. 18-027-U	Sponsored testimony supporting the cost of	
water)			service, rate design and bill impact studies for a	
California Public Utilities Con	mission		j general rate case proceeding.	
Southwest Gas Corporation	8/19	Docket No. A 19-08-015	Sponsored testimony on behalf of three senarate	
(Southern California, Northern	0/17		rate iurisdictions related to: revenue	
California and South Lake			requirements, lead-lag/ cash working capital, and	
Tahoe jurisdictions)			class cost of service, rate design and bill impact	
			analysis for a general rate case proceeding.	
Connecticut Public Utilities R	egulatory Auth	ority		
Yankee Gas Company	0//14	Docket No. 13-06-02	Sponsored report and testimony supporting the	
			review and evaluation of gas expansion policies,	
Illinois Commerce Commissi	n	1		
Liberty Utilities (Midstates	07/16	Docket No. 16-0401	Sponsored testimony supporting the cost of	
Natural Gas)			service, rate design and bill impact studies for a	
			general rate case proceeding. The testimony	
			includes proposal for new commercial classes	
			and a decoupling mechanism.	
Iowa Utilities Board	07/1/	Desket No. DDU 2017 0002	Changered testimony symparting the cost of	
Natural Gas)	07/10	DUCKELINU. RPU-2016-0003	service rate design and hill impact studies for a	
Natural Gasj			general rate case proceeding. The testimony	
			includes proposal for new commercial classes.	
Kansas Corporation Commis	sion			
The Empire District Electric	12/18	Docket No. 19-EPDE-223-RTS	Sponsored testimony supporting cost of service.	
Company			rate design, bill impact and lead-lag studies for a	
			general rate case proceeding.	
Maine Public Utilities Commis	ssion			
Northern Utilities, Inc. d/b/a	06/19	Docket No. 2019-00092	Sponsored testimony supporting a proposed	
Unitil			capital investment cost recovery mechanism.	
Northern Utilities, Inc. d/b/a	06/15	Docket No. 2015-00146	Sponsored testimony supporting the proposed	
Unitil			gas expansion program, including a zone area	
Manuland Dublic Convice Com	mission	l	surcharge.	
Sandniner Enorgy	12/15		Sponsored testimony supporting the cost of	
Chesapeake Utilities company	12/10		service rate design and hill impact studies for a	
anosapoano otinitos company			general rate case proceeding. The testimony	
			includes proposal for new residential and	
			commercial classes.	
Massachusetts Department o	f Public Utilities			
Liberty Utilities (New England	07/18	Docket No. DPU 18-68	Sponsored the Long-Range Forecast and Supply	
Gas Company)			Plan filing for the five-year forecast period	
Liberty Utilities (Now England	07/16	Docket No. DPU 16 100	2010/2017 III000/II 2022/2023.	
Gas Company)	07/10	DOCKET NO. DE O 10-107	Plan filing for the five-year forecast period	
			2016/2017 through 2020/2021.	



Sponsor	Date	Docket No.	Subject
Boston Gas	10/93	Docket No. DPU 92-230	Sponsored testimony describing the Company's position regarding rate treatment of vehicular natural gas investments and expenses.
Boston Gas	03/90	Docket No. DPU 90-55	Sponsored testimony supporting the weather and other cost of service adjustments, rate design and customer bill impact studies for a general rate case proceeding.
Boston Gas	03/88	Docket No. DPU 88-67-II	Sponsored testimony supporting the rate reclassification of commercial and industrial customers for a rate design proceeding.
Michigan Public Service Com	mission		
Lansing Board of Water & Light and Michigan State University	04/19	Docket No. U-20322	Sponsored testimony evaluating Consumer Energy's cost of service and rate design proposals.
Midland Cogeneration Ventures, LLC	09/18	Docket No. U-18010	Sponsored testimony evaluating Consumer Energy's cost of service and rate design proposals.
Missouri Public Service Com	mission	-	
The Empire District Electric Company	08/19	Docket No. ER-2019-0374	Sponsored testimony supporting the cost of service, rate design, bill impact and lead-lag studies for a general rate case proceeding. The testimony also included proposals for a weather normalization mechanism.
Liberty Utilities (Midstates Natural Gas)	09/17	Docket No. GR-2018-0013	Sponsored testimony supporting the cost of service, rate design, bill impact and lead-lag studies for a general rate case proceeding. The testimony also included proposals for a revenue decoupling/ weather normalization mechanism as well as tracker accounts for certain O&M expenses and capital costs.
Missouri Gas Energy	04/17	Docket No. GR-2017-0216	Sponsored testimony supporting the cost of service, rate design, bill impact and Lead/Lag studies for a general rate case proceeding. The testimony included support for a decoupling mechanism.
Laclede Gas Company	04/17	Docket No. GR-2017-0215	Sponsored testimony supporting the cost of service, rate design, bill impact and Lead/Lag studies for a general rate case proceeding. The testimony included support for a decoupling mechanism.
New Hampshire Public Utilitie	es Commission	1	
Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities	11/17	Docket No. DG 17-198	Sponsored testimony supporting a levelized cost analysis for approval of firm supply and transportation agreements.
Liberty Utilities d/b/a Granite State Electric Company	04/16	Docket No. DE 16-383	Adopted testimony and sponsored Lead/Lag study for a general rate case proceeding.
New Jersey Board of Public L	Jtilities	•	
Elizabethtown Gas Company	04/19	Docket No. GR19040486	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.



Sponsor	Date	Docket No.	Subject
Pivotal Utility Holdings, Inc. d/b/a Elizabethtown Gas	08/16	Docket No. GR16090826	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
Corporation Commission of (Oklahoma	I	
The Empire District Electric Company	03/19	Cause No. PUD 201800133	Sponsored testimony supporting the cost of service, rate design, bill impact and Lead/Lag studies for a general rate case proceeding.
The Empire District Electric Company	04/17	Cause No. PUD 201600468	Adopted direct testimony and sponsored rebuttal testimony supporting the revenue requirements for a general rate case proceeding. The testimony included proposals for alternative ratemaking mechanisms.
Rhode Island Public Utilities	Commission		
Providence Gas Company	08/01 09/00 08/96	Docket No. 1673	Sponsored testimony supporting the changes in cost of gas adjustment factor related to projected under-recovery of gas costs; Filed testimony and witness for pilot hedging program to mitigate price risks to customers; Filed testimony and witness for changes in cost of gas adjustment factor related to extension of rate plan.
Providence Gas Company	08/00	Docket No. 2581	Sponsored testimony supporting the extension of a rate plan that began in 1997 and included certain modifications, including a weather normalization clause.
Providence Gas Company	03/00	Docket No. 3100	Sponsored testimony supporting the de-tariff and deregulation of appliance repair service, enabling the Company to have needed pricing flexibility.
Providence Gas Company	06/97	Docket No. 2581	Sponsored testimony supporting a rate plan that fixed all billing rates for three-year period; included funding for critical infrastructure investments in accelerated replacement of mains and services, digitized records system, and economic development projects.
Providence Gas Company	04/97	Docket No. 2552	Sponsored testimony supporting the rate design, customer bill impact studies and retail access tariffs for commercial and industrial customers, including redesign of cost of gas adjustment clause, for a rate design proceeding.
Providence Gas Company	02/96	Docket No. 2374	Sponsored testimony supporting the rate design, customer bill impact studies and retail access tariffs for largest commercial and industrial customers for a rate design proceeding.
Providence Gas Company	01/96	Docket No. 2076	Sponsored testimony supporting the rate reclassification of customers into new rate classes, rate design (including introduction of demand charges), and customer bill impact studies for a rate design proceeding.
Providence Gas Company	11/92	Docket No. 2025	Sponsored testimony supporting the Integrated Resource Plan filing, including a performance- based incentive mechanism.



Sponsor	Date	Docket No.	Subject
Railroad Commission of Texa	IS	•	
Texas Gas Service Company – Central Texas and Gulf Coast Service Areas	12/19	GUD No. 10928	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
CenterPoint Energy – Beaumont/ East Texas Division	11/19	GUD No. 10920	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
Texas Gas Service Company – Borger/ Skellytown Service Area	08/18	GUD No. 10766	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
Texas Gas Service Company – North Texas Service Area	06/18	GUD No. 10739	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
CenterPoint Energy – South Texas Division	11/17	GUD No. 10669	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
Texas Gas Service Company – Rio Grande Valley Service Area	06/17	GUD No. 10656	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
Atmos Pipeline – Texas	01/17	GUD No. 10580	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
CenterPoint Energy – Texas Gulf Division	11/16	GUD No. 10567	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
Public Utility Commission of	Texas		
CenterPoint Energy Houston Electric, LLC	04/19	Docket No. 49421	Sponsored testimony supporting the Lead/Lag study for a general rate case proceeding.
Vermont Public Utilities Com	mission		
Vermont Gas Systems	12/12	Docket No. 7970	Sponsored testimony describing the market served by \$90 million natural gas expansion project to Addison County, VT. Also described the terms and economic benefits of a special contract with International Paper.
Vermont Gas Systems	02/11	Docket No. 7712	Sponsored testimony supporting the market evaluation and analysis for a system expansion and reliability regulatory fund.

South Jersey Gas Company Lead-Lag Study Working Capital Requirement

Line	Description	Post Test Year Adjusted Expenses	Av	erage Daily Expenses	Revenue Lag	Ref.	Expense Lead	Ref.	Net (Lead)/Lag Days	Working Capital Requirement
1	Operations and Maintenance Expenses									
2	Purchased Gas Costs	\$ 231,934,651	\$	635.437	66.29	А	(36.51)	В	29.77	18.920.037
3	Payroll	24,642,848		67.515	66.29	А	(11.92)	C-1	54.36	3.670.367
4	Variable Compensation	683,228		1.872	66.29	А	(238.97)	C-2	(172.68)	(323,234)
5	Pension	3.262.085		8.937	66.29	А	31.44	C-3	97.73	873.395
6	Employee Benefits	6.633.385		18,174	66.29	А	(33.53)	C-4	32.76	595.367
7	Uncollectible Expense	4,964,368		13.601	66.29	A	(653.47)	A	(587.18)	(7.986.252)
8	Affiliate Services	29 077 798		79 665	66 29	A	(42.86)	C-5	23 43	1 866 172
9	New Jersey Clean Energy Program	11 496 700		31 498	66.29	A	(67 15)	C-6	(0.86)	(27 149)
10	Materials & Supplies Issues	378 692		1 038	66.29	A	0.00	C-7	66 29	68 774
11	Membership Dues	218.063		597	66.29	A	(23.46)	C-7	42.83	25,586
12	Utility Location Markout Services	3 272 763		8 966	66.29	A	(41.60)	C-7	24.69	20,000
13	Bank Service Fees	1 541 200		4 222	66.29	Δ	(36.04)	C-7	30.25	127 716
14	Motor Vehicle	3 660 638		10.054	66.20	Δ	(18 18)	C-7	48.10	127,710
15	Outside Services (Audit)	1 257 303		3 445	66.29	Δ	(30.00)	C-7	26.20	90,571
16	Motor Roading Sonvices	2 201 220		9 770	66.20	~	(37.06)	C 7	20.23	256 220
17	Insurance	1 999 019		5 172	66.20	~	(37.00)	C-7	29.23	242 990
10	Other OSM Expenses	67 072 016		104 210	66.20	~	(61.14)	0-7	15 14	2 701 147
10		© 205 204 094		164,310	00.29	A	(51.14)	0-0	15.14	2,791,147
19	Total O&M Expenses	\$ 395,394,984					•			21,996,711
20	Income Taxes	(0.000.504		(0,000)	CC 00		0.00	D 4	66 20	(100.001)
21	Excess Deterred Tax Amortization	\$ (2,223,581) \$	(6,092)	66.29	A	0.00	D-1	66.29	(403,821)
22	Pederal Income Taxes	32,110,348		87,974	66.29	A	(37.00)	D-1	29.29	2,576,489
23	State Income Tax	15,122,613		41,432	66.29	A	47.25	D-2	113.54	4,704,047
24	Total Income Taxes	\$ 45,009,380								6,876,715
25	Taxes Other Than Income Taxes									
26	PUA and Ratepayer Advocate	\$ 1,304,740	\$	3,575	66.29	А	(394.50)	E-7	(328.21)	(1,173,239)
27	Other Taxes Other Than Income Taxes	3,936,705		10,785	66.29	А	(18.36)	E	47.92	516,877
28	Total Taxes Other Than Income Taxes	\$ 5,241,445								(656,362)
29	Depreciation and Amortization Expense	\$ 78,634,560		215,437	66.29	А	0.00		66.29	14,280,700
30	Interest Expense		•				(=0 = 4)			
31	Interest on Long-Term Debt	\$ 37,331,824	\$	102,279	66.29	A	(59.51)	F-1	6.77	692,781
32	Interest on Short-Term Debt	\$ -		-	66.29	A	(6.91)	F-2	59.38	-
33	Interest on Customer Deposits	\$ 163,179		447	66.29	A	(246.39)	F-3	(180.10)	(80,518)
34	I otal Interest Expense	\$ 37,495,003								612,263
35	Return	\$ 123,047,051		337,115	66.29	А	0.00		66.29	22,346,383
36	Other Working Capital Requirements / (Source	es)								
37	Employee Deductions									(1.000.161)
38	Cash Balance									290 164
39	Working Funds									301 750
40	General Prenavments									4 706 834
40	Prenaid Energy Sales and Lise Tax									10 536 917
42	LISE/Lifeline Reserve									755 201
13	Prenaid Pension									35 641 494
44	Prenaid Postretirement Healthcare									8 215 /71
45	Accrued Invoiced Related to Plant									(21 821 110)
46	Accrued Payroll Related to Plant									(31,031,110)
40	Vacation Accrual Pacation									(1,107,103)
47	Vacation Accided Reserve									(1,127,898)
48	Marketer Doumant Basania									(/ 18,226)
49 50	Total Other Working Capital									23,394.706
51	Total Working Capital Requirement	\$ 684,822,423								88,851,116

South Jersey Gas Company Lead-Lag Study Revenue and Collection Lag

Line	Description	Revenue	Revenue Lag	Dollar Days	Reference
1	Retail & Industrial Sales				
2	Service Period Lag		15.21		(365 / 12) / 2
3	Billing Lag		0.50		WP A-1
4	Collection Lag		53.89		WP A-2
5	Retail & Industrial Sales	\$ 512,938,700	69.60	\$ 35,702,005,083	
6	Off System Sales	58,176,900	40.55	2,359,348,959	WP A-3
7	Capacity Release	5,761,577	30.92	178,149,993	WP A-4
8	Composite Revenue Lag	\$ 576,877,177	66.29	\$ 38,239,504,034	

South Jersey Gas Company Lead-Lag Study Purchased Gas

Line	Description Pa		Payments	Expense Lead Lead / Lag Dollars			Supporting Schedule
1	Natural Gas Purchases	\$	207,440,578	(37.77)	\$	(7,835,390,761)	WP B-1
2	Net NG inventory withdrawal		(397,419)	0.00		-	
3	LNG Expenses - Labor		969,626	(11.92)		(11,560,931)	WP C-1
4	LNG Expenses - Non-Labor		507,920	(51.14)		(25,976,689)	WP C-8
5	Net LNG inventory withdrawal		(2,040,960)	0.00		-	
6	Gas Used by Company		(191,104)	(37.77)		7,218,317	WP B-1
7	BSC Purchases		-	0.00		-	
8	OSS Capacity Release		5,761,577	(30.92)		(178,149,993)	WP A-4
9	Hedges		5,820,645	15.27		88,903,125	
10	Total	\$	217,870,863	(36.51)	\$	(7,954,956,931)	

South Jersey Gas Company Lead-Lag Study O&M Expenses Summary

		(Lead)/Lag	
Line	Description	Days	Reference
1	Regular Payroll		
2	Regular Payroll	(11.92)	WP C-1
3	Variable Compensation	(238.97)	WP C-2
4	Pension	31.44	WP C-3
5	Employee Benefits	(33.53)	WP C-4
6	Affiliate Services	(42.86)	WP C-5
7	New Jersey Clean Energy Program	(67.15)	WP C-6
8	O&M Expenses	See C-7	WP C-7
9	Other O&M Expenses	(51.14)	WP C-8

South Jersey Gas Company Lead-Lag Study Income Taxes

		(Lead)/Lag
Line	Description	Days Ref.
1	Income Taxes	
2	Current Federal Income Taxes	(37.00) D-1
3	State Income Tax	47.25 D-2
4	Total Federal Income Taxes	

South Jersey Gas Company Lead-Lag Study Taxes Other Than Income Taxes

				(Lead)/Lag		
Line	Description	Expense	Percent	Days	Reference	Dollar Days
1	Payroll Taxes					
2	FICA	\$ 2,077,559	95.52%	(12.96)	E-1	\$ (26,928,355)
2	Federal Unemployment	14,311	0.66%	(75.63)	E-2	(1,082,235)
3	State Unemployment	83,128	3.82%	(75.63)	E-3	(6,286,539)
4	Total Payroll Taxes	\$ 2,174,997	100.00%	(15.77)		\$ (34,297,129)
5	Real Estate Taxes	\$ 528,146		13.88	E-4	\$ 7,328,027
6	Federal Excise Tax	\$ 7,556		(38.14)	E-5	\$ (288,206)
7	Sales and Use Tax	858,019		(44.61)	E-6	(38,277,600)
8	Taxes Other Than Income (Lead)/Lag Days	\$ 3,568,718		(18.36)		\$ (65,534,908)

South Jersey Gas Company Lead-Lag Study Interest Expense

		(Lead)/Lag	
Line	Description	Days I	Ref.
1	Long-Term Debt	(59.51)	F-1
2	Short-Term Debt	(6.91)	F-2
3	Interest on Customer Deposits	(246.39)	F-3