Company: Southern California Gas Company (U 904 G)
Proceeding: 2019 General Rate Case
Application: A.17-10-___
Exhibit: SCG-07

SOCALGAS

JOINT DIRECT TESTIMONY OF MICHAEL A. BERMEL AND BETH MUSICH

(GAS TRANSMISSION)

October 6, 2017

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

317171

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SUMMARY

GAS TRANSMISSION (In 2016 $)				
	2016 Adjusted-Recorded (000s)	Estimated 2017 (000s)	Estimated 2018 (000s)	Estimated 2019 (000s)
TOTAL CAPITAL	**71,768**	**135,413**	**181,837**	**178,776**

GAS TRANSMISSION (In 2016 $)		
	2016 Adjusted-Recorded (000s)	Estimated 2019 (000s)
TOTAL EXPENSE	**0**	**7,162**

SoCalGas requests the Commission to adopt its forecast for capital expenditures in 2017, 2018, and 2019 of $135,413,000, $181,837,000, and $178,776,000, respectively, in furtherance of promoting the safety and reliability of delivering natural gas on its transmission system. Approval of the forecasts in this testimony will further SoCalGas' continued objective of providing safe and reliable delivery of natural gas to customers at a reasonable cost. The requests are reasonable and justified in that:

- The activities are consistent with applicable laws, codes, and standards established by local, state, and federal authorities;
- The activities maintain the safety and reliability of the gas transmission system;
- The activities respond to operations, maintenance, and construction needs; and
- The activities support SoCalGas' commitment to mitigate risks associated with hazards to public and employee safety, infrastructure integrity, and system reliability.

Specific capital projects for gas transmission lines and appurtenances and projects associated with compressor stations that help move gas to support the larger gas transmission operations encompass the following:

- Construction of new pipeline;
- Pipeline replacements due to high consequence area class location changes;
- Freeway and franchise pipeline relocations;
- Capital improvements to compressor stations;

- Cathodic protection installation and monitoring;
- Meter and regulator replacement and/or improvements; and
- Upgrading and/or replacing auxiliary equipment.

These capital projects will safeguard the long-term safety and integrity of the system. SoCalGas anticipates this type of work to continue to increase as it manages aging infrastructure and responds to changing regulatory and legislative requirements.

SoCalGas also seeks recovery for costs reasonably incurred in conceiving and pursuing the North-South Project proposed to address a recognized reliability risk. SoCalGas proposes cost recovery be spread across the three-year General Rate Case period with one-third of the total incurred expenses, $7,162,000, to be implemented annually.

SOCALGAS JOINT DIRECT TESTIMONY OF MICHAEL A. BERMEL AND BETH MUSICH

(GAS TRANSMISSION)

I. INTRODUCTION

A. Summary of Gas Transmission Capital Costs and Activities

Our testimony supports the Test Year (TY) 2019 forecasts for capital costs for the years 2017, 2018, and 2019 associated with the Gas Transmission area for SoCalGas. Table JGT-1 summarizes our sponsored costs.

TABLE JGT-1

TY 2019 Summary of Total Capital Costs

GAS TRANSMISSION (In 2016 $)				
	2016 Adjusted-Recorded (000s)	Estimated 2017 (000s)	Estimated 2018 (000s)	Estimated 2019 (000s)
TOTAL CAPITAL	**71,768**	**135,413**	**181,837**	**178,776**

Our testimony also supports the request for recovery of the expense[1] associated with the development and presentation to the Commission of the North-South Project.[2] These costs are further supported in the O&M workpapers of Beth Musich in Exhibit SCG-06-WP.[3] As described in Section IV, SoCalGas proposes a cost-recovery mechanism during the rate case period 2019-2021 of the amount shown in Table JGT-2 for each of the Test Year and post-test years.

[1] The North-South Project was initiated as a capital project and upon abandonment, in accordance with standard accounting practices, the costs were moved to O&M expense. *See* FASB Statement of Financial Accounting Standards No. 90, Regulated Enterprises—Accounting for Abandonments and Disallowances of Plant Costs, and FASB Accounting Standards Codification ASC 980-360-35.
[2] Application (A.) 13-12-013.
[3] Ex. SCG-06, SCG/Musich at §III, pt. C (2GT002.000).

TABLE JGT-2

TY 2019 Summary of the North-South Project Costs

GAS TRANSMISSION (In 2016 $)		
	2016 Adjusted-Recorded (000s)	Estimated 2019 (000s)
TOTAL EXPENSE	**0**	**7,162**

The capital investments described in greater detail herein support the safety, reliability and operational effectiveness of the natural gas transmission system while maintaining compliance with applicable regulatory and environmental regulations. As such, we request that the Commission adopt a forecast of Gas Transmission capital expenditures for years 2017, 2018 and 2019 of $135,413,000, $181,837,000, and $178,776,000, respectively.

B. Purpose of Joint Testimony

The purpose of this joint direct testimony is to support the request for Gas Transmission capital projects that are required for the safe, reliable and effective operation of the Gas Transmission system. The projects included in this Application are related to gas transmission pipelines and appurtenances along with projects associated with gas compressor stations which help move gas through natural gas transmission pipelines.

The SoCalGas natural gas system encompasses transmission lines, underground storage fields, and distribution lines. Our joint testimony focuses on infrastructure associated with the transmission function, which includes the operation of nine (9) compressor stations located throughout the service territory.[4] The transmission system is designed to receive natural gas from interstate pipelines and various California production sources both onshore and offshore.

Two SoCalGas organizations -- Gas Transmission and Major Projects -- are responsible for planning and executing key base-business projects and activities that support the ongoing reliability of SoCalGas' transmission operations. They share a common goal of providing safe and reliable natural gas service at a reasonable cost.

[4] Gas Transmission operates ten compressor stations. Nine of these compressor stations are SoCalGas assets and one is an SDG&E asset.

The SoCalGas Major Projects organization provides centralized fiscal and operational management of large capital investments. Major Projects provides analysis and consultation regarding cost estimates, permit requirements, and scheduling and execution of major gas infrastructure facilities projects necessary for the continued safe and reliable transmission of natural gas throughout the service territory.

C. Summary of Safety and Risk-Related Costs

SoCalGas places priority on maintaining compliance and managing risks, as evidenced by the effort and activity expended to identify and mitigate risks. Compliance with laws and regulations is also inherently tied to safety. Therefore, certain costs supported in our testimony are driven by activities described in SoCalGas and SDG&E's November 30, 2016 Risk Assessment Mitigation Phase (RAMP) Report.[5] The RAMP Report presented an assessment of the key safety risks of SoCalGas and SDG&E and proposed plans for mitigating those risks. As discussed in the testimony of Diana Day (Ex. SCG-02), the costs of risk-mitigation projects and programs were translated from that RAMP Report into the individual witness areas.[6]

In the course of preparing our GRC forecasts, we continued to evaluate the scope, schedule, resource requirements and synergies of RAMP-related projects and programs. Therefore, the final representation of RAMP costs may differ from the ranges shown in the original RAMP Report.

Table JGT-3 provides a summary of the RAMP-related costs supported in our testimony by RAMP risk. Additional detail on RAMP-related activities and costs is provided in Sections II and III of our testimony.

[5] I.16-10-015/I.16-10-016 Risk Assessment and Mitigation Phase Report of San Diego Gas & Electric Company and Southern California Gas Company, November 30, 2016. Please also refer to Ex. SCG/SDG&E-02 (Diana Day) for more details regarding the utilities' RAMP Report.
[6] Ex. 02 SCG/Day.

TABLE JGT-3

Summary of RAMP

GAS TRANSMISSION (In 2016 $)			
RAMP Risk Chapter	**2017 Estimated RAMP Total (000s)**	**2018 Estimated RAMP Total (000s)**	**2019 Estimated RAMP Total (000s)**
SCG-4 Catastrophic Damage Involving High-Pressure Pipeline Failure	5,862	10,755	3,109
SCG-6 Physical Security of Critical Gas Infrastructure	2,477	4,800	8,000
SCG-9 Climate Change Adaptation	396	396	400
Total Capital	**8,735**	**15,951**	**11,509**

D. Organization of Testimony

Our joint testimony sponsors the TY 2019 General Rate Case capital forecasts for years 2017, 2018, and 2019 for Gas Transmission. For projects of considerable scale, cost and/or duration, we provide a forecast and general description with this testimony and the supporting workpapers. Some of the projects included will not be completed until post-test years 2020 and 2021. All costs in this testimony are represented as 2016 dollars, unless otherwise noted. In addition to this testimony, please refer to the Capital Workpapers to Prepared Direct Testimony of Michael Bermel and Beth Musich, Exhibit SCG 07-CWP, for additional information on the projects and activities described herein.

Our testimony is organized as follows:

- Introduction;
- Risk Assessment Mitigation Phase and Safety Culture;
- Capital Requests for the Following Activities:
  - New Construction Pipeline;
  - Pipeline Replacements;
  - Pipeline Relocations (Freeway and Franchise);
  - Compressor Station Capital Improvements;
  - Cathodic Protection; and
  - Auxiliary Equipment;
- Recovery of North-South Project Costs; and
- Conclusion.

II. RISK ASSESSMENT MITIGATION PHASE AND SAFETY CULTURE

A. Risk Assessment Mitigation Phase

Part of the capital forecast sponsored in this joint testimony is linked to mitigating safety risks that have been identified in SoCalGas' RAMP Report. The general treatment of RAMP forecasting is described in the testimony of Diana Day (Ex. SCG-02). This testimony specifically addresses three RAMP elements, as summarized in this table:

TABLE JGT-4

RAMP Risk and Description

RAMP Risk	Description
SCG-4 Catastrophic Damage Involving High-Pressure Pipeline Failure	This risk relates to the potential public safety and property impacts that may result from the failure of high-pressure pipelines (greater than 60 psi).
SCG-6 Physical Security of Critical Gas Infrastructure	This risk relates to the damage to critical gas infrastructure that can result from intentional acts.
SCG-9 Climate Change Adaptation	This risk involves safety-related threats to gas infrastructure resulting from extreme weather events, subsidence and land movement or erosive forces.

For Chapter SCG-4, titled "Catastrophic Damage Involving a High-Pressure Gas Pipeline Failure," our testimony will address two distinct safety elements as mitigation. First, SoCalGas will de-rate, pressure test, or replace sections of pipeline, where necessary, due to class location changes based on a growth in population near our facilities. This joint testimony discusses those pipelines that will undergo replacement as a result of a change in class location, i.e., the re-classification of a pipeline segment from non-High Consequence Area to High Consequence Area (HCA) due to changes in population density in the vicinity of that pipeline segment.[7] Second, with respect to cathodic protection, we will execute activities including remediation of

[7] Testing and de-rating of pipeline necessitated by class location changes is discussed by Ms. Musich, Ex. SCG/Musich.

cathodic protection areas that are out-of-tolerance and preventative maintenance. This type of compliance-based work will enhance the public and employee safety.

Chapter SCG-6 of the RAMP Report, titled "Physical Security of Critical Gas Infrastructure," relates to damage to critical gas infrastructure that can result from intentional acts. To address this risk, SoCalGas will install or upgrade access control and detection capabilities. Security upgrades at select compressor stations will provide additional physical security by using local controls and communication devices such as programmable logic controllers (PLCs), pressure transmitters, gas quality remote sensors, communication interface technologies, intrusion monitoring and alerting systems and real-time video monitoring. These technology upgrades contribute to protecting our gas infrastructure from physical security threats and enabling more effective responses to potential intrusions. This mitigation will enhance both public and employee safety.

Chapter SCG-9 of the RAMP Report, titled "Climate Change Adaptation," involves safety-related threats to gas infrastructure resulting from extreme weather events, subsidence, land movement or erosive forces. To address this risk, SoCalGas will install strain gauges near vulnerable natural gas transmission pipelines to monitor excessive stresses from land movement. This will support preventative measures to enhance public and employee safety by proactively identifying and mitigating such natural threats that could impact the integrity of our pipelines.

As illustrated in Table JGT-5, part of our requested funds is linked to mitigating safety risks that have been identified in these three chapters of SoCalGas' RAMP Report.

TABLE JGT-5

Summary of RAMP-Related Capital Costs

GAS TRANSMISSION (In 2016 $)			
SCG-4 Catastrophic Damage Involving High-Pressure Pipeline Failure	**2017 Estimated RAMP Total (000s)**	**2018 Estimated RAMP Total (000s)**	**2019 Estimated RAMP Total (000s)**
003160.001, RAMP - Base Gas Transmission Cathodic Protection / Externally Driven	1,927	1,729	1,219
M03120.019, RAMP - Base Blanket WOA	**3,935**	**9,026**	**1,890**
Total	**5,862**	**10,755**	**3,109**

SCG-6 Physical Security of Critical Gas Infrastructure	2017 Estimated RAMP Total (000s)	2018 Estimated RAMP Total (000s)	2019 Estimated RAMP Total (000s)
003090.004, RAMP - Incremental Blanket projects	2,477	4,800	8,000
Total	**2,477**	**4,800**	**8,000**
SCG-9 Climate Change Adaptation	**2017 Estimated RAMP Total (000s)**	**2018 Estimated RAMP Total (000s)**	**2019 Estimated RAMP Total (000s)**
00309A.001, RAMP - Incremental Real time monitoring of land movement via stress acting on infrastructure	396	396	400
Total	**396**	**396**	**400**

The RAMP risk mitigation efforts are associated with specific programs or projects. For each of these mitigation efforts, an evaluation was made to determine what portion, if any, was already included in our historical activities. A determination was also made of the portion that may be accommodated within a particular forecasting methodology such as averaging or trending, as well as the portion, if any, that represents a true incremental cost increase or decrease from that forecasting methodology.

While the starting point for consideration of the risk mitigation effort and cost was the RAMP Report, our evaluation of those efforts continued through the preparation of this request. Therefore, the incremental costs of risk mitigation sponsored in our testimony may differ from those identified in the RAMP Report.

Additional details on project-specific RAMP attributes are provided in Section III as well as in the Capital Workpapers found in Exhibit SCG-07-CWP.

B. Safety Culture

In addition to the focus on safety through our RAMP efforts, SoCalGas maintains a foundational safety-first culture that focuses on public, customer, and employee safety and is implicit in every decision we make. Our commitment to safety is embedded in every aspect of our work. This is exhibited through recurring training, safety awareness postings at SoCalGas facilities, Job Site Safety Plans at active construction sites, our Injury Illness and Prevention Plans, and other activities that enable us to provide safe and reliable natural gas service while

maintaining compliance with applicable regulatory and environmental regulations and utilizing capital in a manner that supports our foundational safety culture and is consistent with local, state, and federal codes and regulations.

III. CAPITAL

The primary objective of SoCalGas' capital investments is to provide safe and reliable delivery of natural gas to customers at a reasonable cost. This commitment requires SoCalGas to invest in its infrastructure and support services. The main factors that drive the purpose and need for Gas Transmission capital projects relate to load growth in particular geographic regions, the increasing average age of natural gas transportation infrastructure, and the need to relocate existing facilities. In many cases capital projects are driven by the desire to leverage the benefits of automation and remote operating capabilities, the obsolescence of equipment that may no longer be supported by the manufacturer, and the increasing scarcity of replacement parts.

In preparing the TY 2019 General Rate Case forecast for this testimony, we conducted a review of historical project activity and associated spending levels to develop an assessment of future requirements that are incremental to levels of historical spending and necessary to maintain the safe and reliable operation of the natural gas transmission system while mitigating risks. Thus, the forecasting methodologies vary depending on the type of activity analyzed and the expectations of future system needs. These methods include forecasts of future spending based on historical averages, historical growth and estimated future growth, identified projects or materials, and a combination of project-specific justification and analysis of historical spending. SoCalGas' Gas Transmission capital expenditure forecasts are rooted in a historical review of spending and are adjusted, where appropriate, to account for new work or changes in operating conditions and risk mitigation which would not have been reflected in the past spending patterns.

We request the Commission to adopt our forecast for capital expenditures in 2017, 2018, and 2019, as summarized in Table JGT-6.

TABLE JGT-6

Gas Transmission Capital Expenditures Summary of Costs

GAS TRANSMISSION (In 2016 $)				
Categories of Management	**2016 Adjusted-Recorded**	**Estimated 2017 (000s)**	**Estimated 2018 (000s)**	**Estimated 2019 (000s)**
A. NEW PIPELINE	4,984	8,543	7,383	7,383
B. PIPELINE REPLACEMENT	16,563	30,194	26,358	10,499
C. PIPELINE RELOCATIONS	4,218	11,596	10,476	5,922
D. COMPRESSOR STATIONS	20,099	50,432	103,351	116,626
E. CATHODIC PROTECTION	3,637	5,000	6,235	6,658
F. MEASUREMENT & REGULATION	18,946	18,938	18,938	18,938
G. AUXILIARY EQUIPMENT	3,321	10,710	9,096	12,750
TOTAL	**71,768**	**135,413**	**181,837**	**178,776**

A. New Construction Pipeline

The construction of new pipeline is required to provide the backbone and local natural gas transmission system with additional resiliency, capacity, and reliability in order to serve load and to provide natural gas supply reinforcement to an existing area. The related forecast captures costs associated with the El Segundo Loop project in addition to multiple smaller new pipeline construction capital projects.

The El Segundo Loop project was requested in SoCalGas' TY 2016 General Rate Case, but project construction was delayed due to extensive permitting delays. The El Segundo Loop project was completed in July 2017. The specific project details of the El Segundo Loop project and the multiple smaller new pipeline construction projects are found in the Capital Workpapers in Exhibit SCG-07-CWP, Workpaper Group 003010.

TABLE JGT-7

New Construction Pipeline Capital Expenditures Summary

GAS TRANSMISSION (In 2016 $)			
NEW CONSTRUCTION PIPELINE	**Estimated 2017 (000s)**	**Estimated 2018 (000s)**	**Estimated 2019 (000s)**
EL SEGUNDO LOOP	8,543	0	0
BLANKET	0	7,383	7,383
Total	**8,543**	**7,383**	**7,383**

1. Forecast Methodology for New Construction Pipeline Projects

The new pipeline construction projects were forecast using the five-year average capital cost forecast methodology and adjusted for actual costs associated with the El Segundo Loop project in forecast year 2017. The five-year average better accounts for this type of work that ebbs and flows over time. The addition of the Blanket Work Order brings the forecast for 2018 and 2019 to the five-year average.

2. Cost Drivers for New Construction Pipeline Projects

Underlying cost drivers considered when forecasting new pipeline construction projects, as in the case of the El Segundo Loop, include the pipe size and pressure, the location of the project (specifically, whether the project is located in an urban setting versus a rural setting), the availability of qualified contractors, and permitting conditions which often include review and approval by local governments.

B. Pipeline Replacements

Natural gas transmission pipelines need to be replaced, among other reasons, due to the condition of the pipeline, class location changes, or hazardous conditions affecting the existing pipeline location. Included within these pipeline replacement activities are the RAMP activities associated with the High Consequence Area class location changes described in SoCalGas' RAMP Report Chapter 4. As mentioned in Section II, residential, commercial or industrial development near gas pipelines can impact the class location for existing natural gas transmission pipeline. Changes in class location require the pipeline to be analyzed and verified to be commensurate with regulations set forth in 49 C.F.R. 192.611. If the pre-existing maximum allowable operating pressure (MAOP) exceeds the updated class location, the pipe

must be remediated by derating, replacement or hydro-testing to re-establish the MAOP. Under applicable regulation, SoCalGas has two years from the time of change in class location to remediate the pipeline.

The forecast provided herein includes the cost to plan, design and engineer, permit, procure material, construct, commission, and mitigate any environmental impacts that may arise. The following provides a brief summary of projects currently planned or in the process of being executed; specific detail on each of these projects may be found in the Capital Workpapers Exhibit SCG-07-CWP, Workpaper Group M03120.

- SoCalGas intends to replace a short pipeline segment in the vicinity of Bakersfield due to a change in class location.
- A short pipeline segment in the city of Cerritos will be replaced due to a class location change resulting from encroachment.
- Multiple segments of transmission pipeline in SoCalGas' Southern System will be replaced to accommodate class location changes due to ongoing residential and commercial development in the vicinity of the natural gas transmission pipeline.
- Pipeline in the vicinity of El Capitan State Beach in Santa Barbara will undergo replacement for a class location change.
- A section of pipeline will undergo class location remediation between Adelanto and the Cajon Pass.
- In the city of Palm Springs, a segment of pipeline will be replaced to accommodate a change in class location.
- Two pipeline segments in Yucca Valley and Twenty-Nine Palms will undergo exposure repair resulting from storm water runoff. Natural gas transmission pipelines that traverse farmland, hillsides, and waterways are susceptible to losing cover through erosion and agricultural activities and can become exposed over time. SoCalGas either will use revetment mats to protect the pipeline or will remove segments of the pipeline and replace them at a greater depth.
- A tap valve in the vicinity of Laguna Niguel will be replaced.
- Corrosion repair will be completed on a pipeline in the city of La Conchita by replacing a small segment of pipeline.

- A section of pipeline in the vicinity of Tupman will undergo exposure mitigation by having revetment matting installed.
- A pipeline segment in Kern County will be replaced due to corrosion near an existing drip segment.
- In the city of Palmdale, pipeline will be repaired and revetment matting will be installed due to surface erosion.
- Several vaults in the San Joaquin Valley will be replaced.
- Several smaller projects are included in the forecasts. It is anticipated these projects will be completed throughout 2018 and 2019.

TABLE JGT-8

Pipeline Replacements Capital Expenditures Summary

GAS TRANSMISSION (In 2016 $)			
PIPELINE REPLACEMENTS	**Estimated 2017(000s)**	**Estimated 2018(000s)**	**Estimated 2019(000s)**
CLASS LOCATION (PLANNED)	15,780	7392	0
RELOCATION (PLANNED)	5,500	0	0
CLASS LOCATION OR RELOCATION (BUNDLE)	0	8,000	8,609
CLASS LOCATION OR RELOCATION (UNPLANNED)	3,935	9,026	1,890
EXPOSURE REPAIR/REPLACEMENT	900	1,940	0
CORROSION REPAIR/REPLACEMENT	1,808	0	0
TAP VALVES	971	0	0
WOOD VAULT REPLACEMENT	1,300	0	0
TOTAL	**30,194**	**26,358**	**10,499**

1. Forecast Methodology for Pipeline Replacement Projects

The Pipeline Replacement projects were forecast using the zero-based methodology because historical spending is not fully reflective of future cost and, moreover, the projects tend to be defined and budgeted. Cost estimates are prepared by experienced pipeline construction management personnel with reference to recent pipeline construction projects of similar scope, pipe size and pressure, and accounting for construction environment.

2. Cost Drivers for Pipeline Replacement Projects

Cost estimates are influenced by efforts to enhance engineering and design work to bolster the integrity of replaced pipeline. New and replacement pipelines are built to be piggable in conformance with Department of Transportation guidelines. Underlying cost drivers considered when forecasting replacement pipeline projects include the pipe size and pressure, the location of the project (specifically, whether the project is located in an urban setting versus a rural setting), the availability of qualified contractors, soil conditions, and permitting conditions which often include review and approval by local governments.

C. Pipeline Relocation

The forecast for Pipeline Relocation includes expenditures associated with relocating or altering SoCalGas facilities in response to external requests, as specified by the provisions of utility agreements with state and local agencies. Pipelines and related facilities must occasionally be relocated because they are in conflict with planned Caltrans construction projects on freeways or, in the case of franchise relocations, pipelines and related facilities must be relocated to accommodate planned private property development, municipal public works and street improvement projects, right-of-way agreements, or other contract or franchise agreements. The projects that fall into this category are summarized below; specific details associated with each of the Pipeline Relocation projects may be found in the Capital Workpapers Exhibit SCG-07-CWP, Workpaper Group 003130 and Workpaper Group 003040.

- Preliminary planning activities for a pipeline relocation project to accommodate Caltrans activities in Riverside County.
- The Fullerton Road Grade Separation involves the relocation of a short segment of natural gas transmission pipeline to accommodate a grade separation from the Union Pacific Railroad tracks.
- The Metro Conflict-LAX project involves the relocation of a short segment of two separate pipelines to accommodate the construction of a new Metro Station platform.
- The Cabrillo Pavilion relocation project involves the relocation of a short segment of natural gas transmission pipeline to accommodate improvements planned by the city of Santa Barbara.

- The Pipe Support project involves the replacement of the pipe bridge over the waterway in Tupman, Kern County.
- The Meridian West Development project involves the relocation of a short segment of pipeline to accommodate a new mixed-use development near March Air Reserve Base in Riverside County.
- The Port of Long Beach Pier B project involves the relocation of a pipeline in two separate locations to accommodate a new railroad adjacent to the Port of Long Beach.
- The Westridge Parkway relocation project in the city of Valencia involves the relocation of natural gas transmission pipeline to accommodate the extension of Westridge Parkway.
- The Fairway Drive Grade Separation in the City of Industry involves the relocation of the pipeline to accommodate the Alameda Corridor.
- The Ballona Wetlands Restoration project in the city of Marina Del Rey involves the relocation of the pipeline to accommodate restoration of the wetlands that includes, but is not limited to, construction of new perimeter flood protection levees, realignment of Ballona Creek Channel and full tidal restoration.
- The Northlake Development project in the city of Castaic involves the relocation of a pipeline to accommodate a new residential development.
- The LAWA-LAX project involves the relocation of a pipeline within the Los Angeles World Airport to accommodate street improvement work.
- Farmland Protections are required to reduce the inherent risk of third-party strike damage to existing SoCalGas natural gas transmission pipelines.[8]
- SoCalGas has included capital in this forecast for costs associated with unplanned natural gas transmission pipeline relocations that may be required within the forecasted period.

[8] Many of the farmland natural gas transmission pipeline strikes are due to a reduction in the original buried depth below grade. Although these pipelines were originally installed at sufficient depths, subsequent grading to create level fields combined with the natural geological process of erosion from wind and water, storm water and irrigation water runoff have resulted in these pipelines becoming shallow and increasingly vulnerable to third-party strike damage.

TABLE JGT-9

Pipeline Relocations – Freeway and Franchise, Capital Expenditures Summary[9]

GAS TRANSMISSION (In 2016 $)			
RELOCATIONS	**Estimated 2017 (000s)**	**Estimated 2018 (000s)**	**Estimated 2019 (000s)**
FREEWAY RELOCATIONS	12	12	88
FULLERTON RD SEPARATION	3,250	0	0
METRO CONFLICT LAX	2,000	2,500	0
CABRILLO PAVILION	1,500	0	0
PIPE SUPPORTS TUPMAN ROAD FACILITY	750	750	0
MERIDIAN WEST DEVELOPMENT	750	0	0
PORT OF LONG BEACH PIER B PROJECT	500	1,000	500
RELOCATE 34 LINE WESTRIDGE PARKWAY VA	350	678	0
FAIRWAY DRIVE GRADE SEPARATION	24	1,015	0
BALLONA WETLANDS	0	3,000	0
NORTHLAKE DEVELOPMENT	250	250	250
LAWA - LAX	1,000	500	0
FARMLAND PROTECTIONS	500	500	500
BLANKET	710	271	4,584
TOTAL	**11,596**	**10,476**	**5,922**

[9] The forecast includes both collectible and non-collectible costs.

1. Forecast Methodology for Pipeline Relocations

The Pipeline Replacement projects for freeway relocations were forecast using the zero-based methodology because historical spending is not fully reflective of future cost. Project scope and frequency is not consistent over time. Pipeline Replacement projects for franchise relocations use the five-year-average forecast methodology with incremental capital added for projects already known and planned.

2. Cost Drivers for Pipeline Relocations

Upcoming projects associated with Caltrans or franchise relocations are not always known during the budgeting process and, moreover, SoCalGas frequently must relocate pipelines with very little notice. Underlying cost drivers considered when forecasting Pipeline Relocation projects for freeway and franchise relocations include the accelerated time frame in which planning, permitting, procurement of material, and construction must take place. Other cost drivers include the pipe size and pressure, the location of the project (specifically, whether the project is located in an urban setting versus a rural setting), the availability of qualified contractors, and permitting conditions which often include the review and approval by local governments.

D. Compressor Station Capital Improvements

The availability and reliability of SoCalGas' nine compressor stations are at the core of the Company's operational success.[10] SoCalGas is confronted with the reality that many of these compressor stations and sub-systems were placed in service over 50 years ago, with some placed in service almost 70 years ago. SoCalGas historically has managed its compressor stations reliably through targeted capital upgrades and vigilant maintenance programs. Nevertheless, no matter the diligence placed into maintenance programs and tactical component replacements, the assets eventually must be replaced in significant scale to support continued reliable operations. The age of these assets directly contributes to a combination of component failures and associated unplanned start and run-time failures, and further challenges are presented by original equipment manufacturer parts sourcing and support limitations as well as the retirement of personnel versed in major maintenance and capital replacement operations on obsolete

[10] Gas Transmission operates ten compressor stations. Nine compressor stations are SoCalGas assets and one compressor station is an SDG&E asset.

assets. Moreover, SoCalGas must manage its operations to increasing environmental regulations which also drive the need for technological asset additions and foundational mechanical systems which can support advanced controls. SoCalGas expects asset aging and environmental compliance to continue to challenge operational reliability and system resiliency. The capital forecast for compressor station work addresses all aspects of the drivers noted above. In order to provide more granularity to the capital cost summary provided in Table JGT-6, we categorized our request into the following four categories of compressor station capital improvements:

- Small compressor projects (under $1MM);
- Medium compressor projects ($1MM to $29MM);
- Large compressor projects including compressor replacements ($30MM+); and
- Compressor station decommissioning.

TABLE JGT-10

Compressor Station Capital Improvements

GAS TRANSMISSION (In 2016 $)			
COMPRESSOR STATION CAPITAL IMPROVEMENTS	**Estimated 2017(000s)**	**Estimated 2018(000s)**	**Estimated 2019(000s)**
SMALL PROJECTS	2,794	11,831	10,826
MEDIUM PROJECTS	10,500	7,520	1,800
LARGE PROJECTS	34,000	84,000	104,000
COMPRESSOR DECOMMISSIONING	3,138	0	0
TOTAL	**50,432**	**103,351**	**116,626**

1. Small Capital Compressor Projects

This is a bulk account for miscellaneous projects and capital parts replacement to sustain operational availability, efficiency and compliance.

TABLE JGT-11

Compressor Station Capital Improvements – Small Projects

GAS TRANSMISSION (In 2016 $)			
SMALL COMPRESSOR PROJECTS	**Estimated 2017 (000s)**	**Estimated 2018 (000s)**	**Estimated 2019 (000s)**
COMPRESSOR STATION CAPITAL ADDITIONS	0	5,000	8,000
COMPRESSOR STATION RANKING (BULK UNDER 250K)	0	650	650
M0305 BLANKET	193	193	193
M0315 BLANKET	1,318	4,705	700
M0325 BLANKET	1,283	1,283	1,283
TOTAL	**2,794**	**11,831**	**10,826**

2. Medium Capital Compressor Projects

a. New Water Lines and Tank at Newberry Springs

Onsite water lines for domestic, firewater, and equipment cooling at the Newberry Springs Compressor Station are exhibiting signs of corrosion. The water cooling system, including the water headers for the cooling towers, need to be replaced.

b. North Needles Check Valve Installation

This project will entail engineering design and installation of check valves in discharge lines at the North Needles Compressor Station.

c. Rule 1160 Upgrades for Mojave Air Quality Management District

Compliance with Mojave Air Quality Management District's Rule 1160, which limits certain emissions of stationary internal combustion engines rated at 500 or more brake horsepower, requires certain replacement and upgrade projects to be executed. Rule 1160 limits emissions associated with emergency, portable, standby, or stationary internal combustion engines located in the Mojave Air District which includes the North Needles, South Needles, Blythe, Adelanto, Kelso, and Newberry Springs Compressor Stations.

d. Catalyst Housing and SCR at Wheeler Ridge

The Selective Catalytic Reduction (SCR) catalyst bed and housing at Wheeler Ridge Compressor Station is aging and requires replacement. This project proposes to redesign a Selective Catalytic Reduction system for the entire station and install new ammonia injection, catalyst bed, and housing. Other units will be replaced as necessary in the future.

e. Water Line to Plant in South Needles

The water line serving the South Needles Compressor Station is a Transite-lined steel pipeline of approximately 11 miles that runs adjacent to the Colorado River. The line was installed in 1957 and is under cathodic protection, but due to the age and condition of the pipe, replacement is necessary.

f. Newberry Springs Replacement of Auxiliary Tower Air Washers

The Newberry Springs Compressor Station requires replacement of 14 auxiliary cooling tower air washers: two per cooling tower on seven towers.

g. Newberry Springs Capstone Generator Overhaul and Catalyst Replacement

The Capstone generators at the Newberry Springs Compressor Station require an annual overhaul and catalyst replacement in order to maintain emission control standards.

h. Blythe Station Cooling Tower Upgrades

The cooling towers at the Blythe Compressor Station have multiple heat exchanger bundles and bays adjacent to each other within the cooling tower. This design allows ambient (non-cooled) air to be drawn into the suction path of the fan that is operating, resulting in a reduction in cooling efficiencies. Upgrading will promote more efficient cooling.

i. Replace Buried Station Bypass Valves at Newberry Springs

This project proposes to replace four aging bypass valves with a modulating design to enhance functionality at the Newberry Springs Compressor Station.

j. Wheeler Ridge Filter Separator

Replacement of a filter separator at Wheeler Ridge is required for proper filtration of liquids. The current filter medium is intended for larger amounts of dry particle substance and is inadequate for the large quantities of liquids the Wheeler Ridge station encounters.

TABLE JGT-12

Compressor Station Capital Improvements – Medium Capital Projects

GAS TRANSMISSION (In 2016 $)			
MEDIUM COMPRESSOR PROJECTS	**Estimated 2017(000s)**	**Estimated 2018(000s)**	**Estimated 2019(000s)**
RULE 1160 UPGRADES	3,500	3,500	0
CATALYST HOUSING AND SCR CO CATALYST – WHEELER RIDGE	3,000	0	0
WATER LINE TO PLANT – SOUTH NEEDLES	1,500	0	0
REPLACEMENT OF AUXILIARY TOWER AIR WASHERS – NEWBERRY SPRINGS	1,100	0	0
WATER TANK – NEWBERRY SPRINGS	1,100	0	0
INSTALL CHECK VALVE – NORTH NEEDLES	0	790	0
CAPSTONE GENERATOR OVERHAUL AND CATALYST REPLACEMENT - NEWBERRY SPRINGS	300	300	300
COOLING TOWER UPGRADES - BLYTHE STATION	0	1,500	0
REPLACE BYPASS VALVE - NEWBERRY SPRINGS	0	0	1,500
FILTER SEPARATOR - WHEELER RIDGE	0	1,430	0
TOTAL	**10,500**	**7,520**	**1,800**

3. Large Capital Compressor Projects including Compressor Replacements (Blythe and Ventura)

TABLE JGT-13

Compressor Station Capital Improvements – Large Capital Projects

GAS TRANSMISSION (In 2016 $)			
COMPRESSOR STATIONS - Replacements	**Estimated 2017(000s)**	**Estimated 2018(000s)**	**Estimated 2019(000s)**
BLYTHE COMPRESSOR PROJECT PHASE 1	24,000	20,000	4,000
BLYTHE COMPRESSOR PROJECT PHASE 2	10,000	64,000	100,000
TOTAL	**34,000**	**84,000**	**104,000**

In the SoCalGas TY 2016 General Rate Case, the Commission authorized capital investments for "Compressor Change Outs for Reliability & Capacity" at Ventura Station and Blythe Station. In response, SoCalGas engaged a third-party engineering firm to conduct the Front End Engineering Design (FEED) for compressor replacement for both these facilities. Whereas SoCalGas' proposals and associated forecasted dollars in the TY 2016 General Rate Case were, in part, to purchase and install new compressors in existing buildings and foundations and/or to retain and employ existing ancillary infrastructure (including piping, headers generators, gas cooling, compressed air, generators and related electrical infrastructure), a subsequent engineering review concluded that continued reliance upon sixty-year old mechanical and supporting infrastructure would not yield the forward-looking reliability metrics to support SoCalGas' operational needs, nor the life-cycle cost efficiencies originally sought.

The results of the FEED reviews commissioned by SoCalGas suggested that SoCalGas' objectives could better be achieved by replacing much of the supporting infrastructure at the plants in addition to the base compressor units. SoCalGas will, as part of its strategic plan for the station, rebuild five Clark reciprocating compressors and outfit them with state-of-the-art clean-burn emission reduction technology.

The updated scope and cost for the Blythe and Ventura Station projects are as follows.

a. Blythe Compressor Replacement Project

The Blythe Compressor Station utilizes much of the original vintage equipment, including eight Clark compressors that were installed in the 1940s. Blythe Station's function is to receive natural gas from the Kinder Morgan interstate pipeline and compress it westward into the Southern System. The transmission pipelines that comprise the Southern System provide the natural gas supply to Imperial County, Riverside County, San Diego County, parts of Orange County and parts of San Bernardino County. The majority of this gas flows through the Blythe Compressor Station, and thus the ongoing reliability of the Blythe facility is critical to SoCalGas meeting its current and future obligation to serve customers reliably.

As compared to the scope of work and cost provided in the TY 2016 General Rate Case, the revised scope of work as provided through the FEED has increased the project costs and extended the project completion schedule.[11]

SoCalGas updated the project scope following completion of the FEED to include two new turbine-driven compressors and supporting ancillary systems at the Blythe Compressor Facility with an expected completion date of November 30, 2019. To accommodate the new compressors while maintaining operations at the facility, a new compressor building will be constructed within the existing property boundary. Appurtenances including compressor pipe manifolds, electric generators and cabling related switch gear, control systems, panel and wiring will be installed to support the new turbine-driven compressors. New gas and engine cooling systems are also part of the planned projects.

In addition to addressing existing infrastructure concerns, SoCalGas has updated its criteria for compressor station design and concluded that each station should conform to a plant design standard that allows for compressing when any single engine/compressor, generator or cooling bank is out of service. This design standard approach is to allow for scheduled and unscheduled maintenance and appropriately manage risk.

The installation of these new compressors will allow SoCalGas to continue to meet the current design specification and capacity of 1.2 BCF per day while retiring three 1940s vintage compressors and relegating two Caterpillar engine-driven compressors to standby service until

[11] SoCalGas engaged a third party to evaluate and prepare a Front End Engineering Design (FEED) package for three of SoCalGas and SDG&E's compressor stations – Blythe, Ventura and Moreno. This deliverable included a detailed scope of work and cost estimate for each compressor facility.

they can be replaced. Although these two Caterpillar units were targeted for replacement in SoCalGas' TY 2016 General Rate Case, SoCalGas conducted additional analysis and concluded the operational life of these assets can be extended to 2022 through limited standby operation and some moderate monitoring and remediation work on the existing plant structures.

As provided in Table JGT-13, we have identified two phases for this project. Phase 1 and Phase 2 will proceed concurrently. Splitting activities between Phase 1 and Phase 2 is for the purpose of capturing scope of work and capital assets that can be placed into service a few months prior to the commissioning of the total project. The capital assets that comprise Phase 1, the smaller capital budget, are anticipated to be placed into service at the end of August 2019. Generally, these elements include the new electric generators, cooling tower apparatus, underground and aboveground pipelines, and other infrastructure that will be used and useful in the existing operation of the Blythe Compressor Facility. Phase 2, the larger capital budget, generally includes the capital assets associated with the commissioning of the new turbine compressors associated with the new Plant 4.

Upon completion, the Blythe Compressor Replacement project will provide the necessary operational reliability and resiliency to support SoCalGas' transmission system's operational needs. Additionally, the replacement of aging compressors with new natural gas-fired turbines combined with the installation of state-of-the-art clean-burn emission reduction technology on the five remaining Clark reciprocating compressors will result in significant environmental benefits including a 90+% measurable reduction of criteria air pollutants such as oxides of nitrogen, greenhouse gases, particulate matter, and fugitive methane emissions.

Additional details for the Blythe Compressor replacement project may be found in the Capital Workpapers Exhibit SCG-07-CWP, Workpaper Group M03350.

b. Ventura Compressor Replacement Project

The scope of the Ventura Compressor Replacement Project proposed in the 2016 General Rate Case was subject to the same FEED process as Blythe and similarly was revised. The scope revision includes the addition of supporting system replacement and back-up unit design criteria. This revision has impacted both cost and schedule. Due to the expected completion date of later phases extending into 2021 or 2022, there are no explicit cost representations or revenue requirement for this project in this General Rate Case. The project and revised capital expenditures for this project will be presented in a future General Rate Case with a significantly

more detailed scope than presented in the TY 2016 General Rate Case forecast. While SoCalGas spent some of its allocation of authorized 2016 capital to complete a substantial FEED for Ventura Station, significant scope change and challenges in permitting and logistics have required us to extend the execution schedule and in-service date beyond this General Rate Case cycle.

Ventura Station is critical to the continued ability of SoCalGas to meet its obligation to serve customers. The continued reliable operation of this station will be needed, in part, to compensate for the continued decline in offshore gas supplies entering into the North Coastal pipeline system as the associated gas and oil fields are drawn down.

Additional details on the Ventura Compressor Replacement project, including the forecasted capital expenditures and post-test year investment, are provided in the Supplemental Workpaper in Exhibit SCG-07-CWP, Workpaper Group M03350.

4. Compressor Decommissioning

SoCalGas proposes to fully decommission two of its stations constructed in the 1950s because the stations no longer are necessary. Cactus City Compressor Station and Desert Center Compressor Station have been decommissioned. These stations, commissioned in the 1950s, have reached the effective end of their working lives. The projects identified below include piping reconfiguration at the stations to isolate the decommissioned station from existing transmission pipelines.

TABLE JGT-14

Compressor Station Capital Improvements – Compressor Decommissioning

GAS TRANSMISSION (In 2016 $)			
COMPRESSOR STATIONS - Decommissioning	**Estimated 2017(000s)**	**Estimated 2018(000s)**	**Estimated 2019(000s)**
PHASE 1 DECOM PIPE ISOLATION - CACTUS CITY	1,569	0	0
PHASE 1 DECOM PIPE ISOLATION - DESERT CENTER	1,569	0	0
TOTAL	**3,138**	**0**	**0**

E. Cathodic Protection

Cathodic protection equipment is used to preserve the integrity of natural gas transmission pipelines, steel mains, services lines, and buried appurtenances by protecting them from external corrosion. Cathodic protection of these facilities is mandated by federal and state pipeline safety regulations and, as mentioned in Section II above, is included in SoCalGas' RAMP Report Chapter 4 addressing Transmission Cathodic Protection.

These projects include the installation or replacement of surface anode beds, deep-well anodes and rectifier systems, and the installation or replacement of cathodic protection stations.

Cathodic Protection Engine Bundle work is related to the installation or modification of engine-driven generator equipment used to impress electric current onto gas transmission pipelines to support cathodic protection.

Specific details associated with the Cathodic Protection projects may be found in Capital Workpapers Exhibit SCG-7-CWP, Workpaper Group 003160.

TABLE JGT-15

Cathodic Protection Capital Expenditures Summary

GAS TRANSMISSION (In 2016 $)			
CATHODIC PROTECTION	**Estimated 2017(000s)**	**Estimated 2018(000s)**	**Estimated 2019(000s)**
CATHODIC PROTECTION	1,927	1,729	1,219
CATHODIC PROTECTION ENGINES (BUNDLE)	3,073	4,506	5,439
TOTAL	**5,000**	**6,235**	**6,658**

1. Forecast Methodology for Cathodic Protection

We elected to use the base-year forecast methodology with incremental adjustments for cathodic protection activities. SoCalGas has identified cathodic protection as a RAMP Report Chapter SCG-4 element and, given the recent work demands in this area, base-year with incremental adjustments was the most representative of planned cathodic protection activities.

2. Cost Drivers for Cathodic Protection

The underlying cost drivers for cathodic protection activities relate to the specialized nature of pipeline coating application and the need to install rectifiers that provide adequate

protection without affecting nearby foreign pipelines. These projects require excavation to expose the pipeline, strip the existing coating, rewrap, backfill and compact, and repave the impacted area as required. Another cost driver is the location of the project (urban versus rural), lead time, availability of qualified contractors and drilling rigs, and workload. Lead time is often a function of capacity and volume demands or the demands of local governmental agencies. There are only so many qualified drilling contractors in Southern California and they perform work for customers other than SoCalGas. Thus, the bid climate varies depending on contractor workload and associated lead times.

F. Meter and Regulator

Both the safety and reliability of SoCalGas' transmission system is dependent on the meter and regulator equipment that is used to control the flow of natural gas in transmission pipelines through the use of valves and regulator stations. This equipment is controlled locally or through remote commands from a central Supervisory Control and Data Acquisition (SCADA) system. The communication equipment includes programmable logic controllers, pressure transmitters, uninterruptible power supply systems, temperature probes, gas quality sensors, and communication/interface technologies. In addition to the seven planned projects summarized below, SoCalGas has consolidated several smaller projects into this forecast. Specific details associated with each of the planned Meter and Regulator projects may be found in the Capital Workpapers Exhibit SCG-07-CWP, Workpaper Group 03080.

- The Divide Station Regulation Upgrade SCADA project involves the upgrade and installation of local controls and communication devices.
- The White Oak A project involves the replacement of the valve and actuator to increase serviceability.
- The biogas project involves the preparation of a detailed engineering study and the procurement of long lead items for a new biomethane interconnection.
- The Gaviota Station Control Valve Upgrade project involves an upgrade of antiquated control valves, installation of a new filter separator and meter, and the installation of a new SCADA system for increased control capabilities.
- A Pressure Limiting Station will be installed in response to a class location change in the Bakersfield area. In addition to the installation of the pressure

limiting station and appurtenances, a new SCADA unit will be installed along with electrical and communication equipment.

- The Cordes Crossover project involves relocating a regulator station to accommodate the removal of a supply line and relocate the station away from a high vehicular traffic area.
- The Quigley Station Upgrade project scope includes demolishing existing tanks, replacement of meters, telecommunications upgrade, control valve replacements and removal of associated piping due to aging piping, valves and systems.

The Bulk Projects in this activity category include a number of smaller projects that are required to safely and reliably operate SoCalGas' natural gas transmission system, but do not meet the individual capital cost threshold to require a discreet workpaper.

TABLE JGT-16

Meter and Regulator Capital Expenditures Summary

GAS TRANSMISSION (In 2016 $)			
MEASUREMENT & REGULATION STATIONS	**Estimated 2017(000s)**	**Estimated 2018(000s)**	**Estimated 2019(000s)**
REGULATION UPGRADE SCADA - DIVIDE STATION	2,700	0	0
REPLACE MLV & VAULT WHITE OAK	1,800	0	0
BIOGAS ENGINEERING STUDY	1,500	0	0
CONTROL VALVE UPGRADE & INSTALL SCADA - GAVIOTA STATION	1,500	0	0
PRESSURE LIMITING STATION	1,000	0	0
CORDES CROSSOVER	1,000	0	0
UPGRADE CONTROLS & METER EQUIPMENT - QUIGLEY STATION	2,000	4,000	2,000
BULK PROJECTS	7,438	14,938	16,938
TOTAL	**18,938**	**18,938**	**18,938**

1. Forecast Methodology for Meter and Regulator Projects

The forecast methodology for Meter and Regulator projects was base-year, as the activities in 2016 most accurately represent the activities that would be carried into the forecast years. Costs are estimated by pipeline construction management personnel experienced in

rebuilding and upgrading large industrial meter sets, pressure regulating and valve stations and operating and controls technology. Estimating personnel reference recent station projects of similar scope, equipment type, and construction environment in order to develop accurate cost estimates.

2. Cost Drivers for Meter and Regulator Projects

The costs for Meter and Regulator projects are typically driven by material and technology costs as this category includes local controls and communication devices to control the flow of natural gas in pipelines, valves and regulator stations both locally and through the initiation of remote commands from a central SCADA system.

G. Auxiliary Equipment

The auxiliary equipment capital request captures the cost of equipment used to support the natural gas transmission system operations that cannot appropriately be assigned to a specific project. This category includes, among other items, RAMP-related costs associated with physical security upgrades to energy infrastructure and for equipment to assist SoCalGas with real-time monitoring of land movement. Specific details associated with each of the planned Auxiliary projects and equipment may be found in the Capital Workpapers Exhibit SCG-07-CWP, Workpaper Group 03090.

- Newberry Springs Water Line Replacement Project will replace approximately 4,720 feet of concrete-line Transite water supply pipe. The water supply is from two offsite water wells.
- Wooden vaults housing meters, instrumentation, valves and related appurtenances will be replaced with concrete vaults throughout SoCalGas' natural gas transmission system.
- Blythe Station Security Upgrades will provide additional physical security for the Blythe Compressor Station. This project incorporates RAMP elements addressed in SoCalGas' RAMP Report, Chapter SCG-6 for "Physical Security of Critical Gas Infrastructure."
- The blanket projects in this category represent several smaller projects incorporating RAMP elements addressed in SoCalGas' RAMP Report, Chapter SCG-6 for Physical Security requests. Included are communication interface

technologies, intrusion monitoring and alerting systems, and real-time video monitoring.

- Moisture analyzers will be installed on select transmission pipeline fittings to provide moisture monitoring and feedback to the SCADA system.
- The installation of strain gauges will allow SoCalGas to measure land movement around vulnerable natural gas transmission pipelines. This project incorporates RAMP elements addressed in SoCalGas' RAMP Report, Chapter SCG-9 for "Climate Change Adaptation."

TABLE JGT-17

Auxiliary Equipment and Projects

GAS TRANSMISSION (In 2016 $)			
AUXILIARY EQUIPMENT & PROJECTS	**Estimated 2017(000s)**	**Estimated 2018(000s)**	**Estimated 2019(000s)**
WATER LINE REPLACEMENT – NEWBERRY SPRINGS	4,437	0	0
WOODEN VAULT REPLACEMENTS (BUNDLE)	2,500	3,000	3,000
STATION SECURITY - BLYTHE	900	0	0
BLANKET	2,477	4,800	8,000
MOISTURE ANALYZERS	0	900	1,350
STRAIN GUAGE INSTALLATION	396	396	400
TOTAL	**10,710**	**9,096**	**12,750**

1. Forecast Methodology for Auxiliary Equipment and Projects

The forecast methodology employed for the Auxiliary Equipment and Projects addressed in this section is zero-based as there is no regular historical average for reference. Detailed cost estimates from third-party firms were obtained for the Newberry Springs Water Line Replacement project. Estimates for the remaining projects were provided by personnel experienced in estimating projects with similar scope, equipment, and construction environment.

2. Cost Drivers for Auxiliary Equipment and Projects

The underlying cost drivers associated with these auxiliary equipment and projects relate to equipment type, operating location, and the availability of qualified contractors or service professionals.

IV. COST RECOVERY FOR THE NORTH-SOUTH PROJECT

On December 20, 2013 SoCalGas and SDG&E filed a joint application, A.13-12-013 (North-South Application), for authority to recover in rates the revenue requirement associated with the North-South Project as well as approval of related cost allocation and rate design proposals. The North-South Project, also referred to as the Southern Gas System Reliability Project, proposed to construct a new natural gas pipeline between the town of Adelanto and SDG&E's Moreno Compressor Station and to reconfigure SoCalGas' Adelanto Compressor Station. SoCalGas and SDG&E proposed the project in order to address a risk prudently identified by them: the reliability of the Southern System is dependent almost entirely on supplies flowing through the Blythe interconnection with Kinder Morgan interstate natural gas pipeline.

At the time the North-South Project was proposed, electric generation demand on the Southern System was increasing while customer deliveries were decreasing.[12] Disruption or diminution in supplies flowing through the Blythe receipt point can cause the curtailment of customers.

As reasonable managers, SoCalGas and SDG&E explored various options to alleviate the risk of a shortage of supplies available to the Southern System and ultimately selected the North-South Project as the most suitable option. The new pipeline proposed as part of the North-South Project would have made gas from SoCalGas' northern receipt points and storage facilities in Honor Rancho available to the Southern System. Multiple delivery sources into the Southern System would have provided operational flexibility and enhanced reliability.

Consistent with Commission precedent,[13] SoCalGas and SDG&E deemed it prudent to present its cost allocation and rate design proposals associated with rate recovery for the North-South Project to the Commission in the North-South Application. On May 5, 2014, the assigned Commissioner issued a scoping ruling which determined that the Commission would act as the

[12] As the Commission acknowledged in Decision (D.)16-07-015, "increased electric generation demand on the Southern System due to the unanticipated shutdown of the SONGS nuclear power plant" drove "increased costs in Sep. 2011 – Aug. 2013." D.16-07-015 at page 11.

[13] The Commission stated in D.89-02-071, "The Commission has the statutory responsibility to approve the addition of new pipeline capacity to serve the California utility market… as part of its responsibility to ensure that adequate utility service is provided at just and reasonable rates; that the service and facilities of the utilities are sufficient and reasonable, and to determine the level of service to be provided to all classes of customers." D.89-02-071 at page 12 (Conclusion of Law 1).

lead agency for an environmental review of the proposed project pursuant to the California Environmental Quality Act (CEQA) and ordered SoCalGas and SDG&E to file and serve a Proponent's Environmental Assessment (PEA).

SoCalGas and SDG&E complied with the Commission's directive to pursue a CEQA review. Before that review was completed, on July 14, 2016, the Commission issued a decision, D.16-07-015, rejecting the North-South Project. Although the Commission agreed "that there is a need to enhance the reliability of natural gas supplies to the Southern System,"[14] the Commission determined that "the alternative physical solutions proposed by TransCanada, Transwestern and EPNG all provide redundant pipeline capacity at a significantly lower cost than the North-South pipeline."[15] The "alternative physical solutions" to which the Commission refers are proposals by TransCanada Corporation, Transwestern Pipeline Company, LLC, and El Paso Natural Gas Company, L.L.C. to build interstate and intrastate pipelines owned by them and regulated by the Federal Energy Regulatory Commission (FERC). SoCalGas and SDG&E's access to these proposed pipelines would be by way of contracts to be negotiated between the parties.[16]

The costs incurred by SoCalGas and SDG&E in conceiving and pursuing the North-South Project and undertaking activities in furtherance of the Commission-ordered CEQA review are reasonable (please see detailed Gas Transmission Operation workpapers in Ex. SCG-06-WP). The Commission has recognized that "a shortage of natural gas and/or electricity, whether real or contrived, can be devastating to the people, businesses, and the economy of the State of California. Even a shortage in just a couple of months could cause billions of dollars of additional costs, which would not be incurred if there were a balance in the supply and demand."[17] Thus, it has ordered that "the utilities must continue to study and report on the adequacy of their entire system, including local transmission, and act to ensure that it remains reliable."[18] The Commission has gone even further to state that it "expect[s] the utilities to expand their local transmission systems based on system planning analyses (using the one-in-ten

[14] D.16-07-015 at page 15.
[15] *Id.* at page 15.
[16] To date, SoCalGas is not aware that any of the proposed pipelines cited by the Commission are in the process of being constructed.
[17] Rulemaking (R.) 04-01-025 at pages 4-5.
[18] D.06-09-039 at page 61.

year criterion), instead of relying solely on open seasons."[19] Repeatedly the Commission has emphasized that "the utilities' primary obligation [is] to ensure infrastructure adequacy."[20]

The Commission has permitted cost recovery of this type under similar circumstances under the abandoned project theory and when equity so requires. Therefore, we request that the Commission approve the North-South Project costs as just and reasonable. SoCalGas proposes that it be authorized cost recovery spread evenly across the three-year General Rate Case period, i.e., $7,162,000 annually.

V. CONCLUSION

SoCalGas' ability to meet its obligation to provide natural gas service in accordance with its tariff provisions and customer expectations is highly dependent on the reliable operation of its natural gas transmission pipeline, mainline compressor stations, valves and related appurtenances. In order to continue to provide safe and reliable service while continuously mitigating risk, SoCalGas must continue to invest in its infrastructure pursuant to applicable regulatory requirements.

SoCalGas requests the Commission to adopt its forecasted capital expenditures for years 2017, 2018, and 2019 of $135,413,000, $181,837,000, and $178,776,000, respectively, and grant recovery of the expense associated with the North-South Project. This forecast reflects SoCalGas' commitment to sustaining safe and reliable service to our customers while also striving to control project costs without compromising safety or regulatory compliance.

This concludes our prepared joint direct testimony.

[19] *Id.* at page 64.
[20] *Id.* at page 72.

VI. WITNESS QUALIFICATIONS

Beth Musich has been the Director of Gas Transmission for SoCalGas and SDG&E since January 2015. She holds a Bachelor of Science degree in Mechanical Engineering from Colorado School of Mines in Golden, Colorado. She was originally employed by Pacific Enterprises in 1993 and moved to SoCalGas in 1996 and since then has held positions of increasing responsibilities in the Marketing, Regulatory and Operations departments. Ms. Musich has previously testified before the Commission on behalf of Southern California Gas Company and San Diego Gas & Electric.

Michael A. Bermel currently is Director of Major Projects and Construction under the Gas Engineering and Major Projects organization at SoCalGas. The Major Projects and Construction organization provides non-shared O&M services to SoCalGas and supports capital projects for both SoCalGas and SDG&E. He joined SoCalGas in 1981 and has been in his current position since January 2017. Prior to that he was the Manager of the Measurement, Regulation and Control Organization in Gas Engineering for nearly 20 years. He has a Bachelor of Science Degree in Mechanical Engineering from California State University, Long Beach and is a Registered Professional Mechanical Engineer in the state of California. Mr. Bermel has testified before the Commission previously.