

Application of SOUTHERN CALIFORNIA GAS )  
COMPANY for authority to update its gas revenue )  
requirement and base rates )  
effective January 1, 2019 (U 904-G) )

Application No. 17-10-\_\_\_\_  
Exhibit No.: (SCG-04-CWP)

CAPITAL WORKPAPERS TO  
PREPARED DIRECT TESTIMONY  
OF GINA OROZCO-MEJIA  
ON BEHALF OF SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA

OCTOBER 2017



**2019 General Rate Case - APP**  
**INDEX OF WORKPAPERS**

**Exhibit SCG-04-CWP - GAS DISTRIBUTION**

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**Overall Summary For Exhibit No. SCG-04-CWP**

<b>Area:</b>	<b>GAS DISTRIBUTION</b>
<b>Witness:</b>	<b>Gina Orozco-Mejia</b>

	In 2016 \$ (000)		
	Adjusted-Forecast		
	2017	2018	2019
<b>A. New Business</b>	36,632	45,313	50,393
<b>B. Pressure Betterments</b>	23,088	23,088	23,088
<b>C. Supply Line Replacements</b>	4,209	4,209	4,209
<b>D. Main Replacements</b>	33,711	33,711	33,711
<b>E. Service Replacements</b>	28,538	31,470	34,403
<b>F. Main &amp; Service Abandonments</b>	9,256	10,522	11,787
<b>G. Regulator Stations</b>	8,636	14,636	19,436
<b>H. Cathodic Protection Capital</b>	6,320	8,434	9,511
<b>I. Pipeline Relocations - Freeway</b>	7,837	7,837	7,837
<b>J. Pipeline Relocations - Franchise</b>	17,894	17,894	17,894
<b>K. Other Distribution Capital Projects &amp; Meter Guards</b>	3,656	11,596	11,596
<b>L. Measurement &amp; Regulation Devices</b>	22,266	29,547	37,037
<b>M. Capital Tools</b>	14,386	14,220	12,322
<b>N. Field Capital Support</b>	61,317	70,292	74,618
<b>O. Remote Meter Reading</b>	727	2,032	0
<b>Total</b>	<b>278,473</b>	<b>324,801</b>	<b>347,842</b>

*Note: Totals may include rounding differences.*

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Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: A. New Business  
Workpaper: VARIOUS

**Summary for Category: A. New Business**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	9,974	10,498	12,655	13,839
Non-Labor	34,247	32,443	38,967	42,863
NSE	0	-6,309	-6,309	-6,309
<b>Total</b>	<b>44,221</b>	<b>36,632</b>	<b>45,313</b>	<b>50,393</b>
FTE	115.4	127.2	153.3	167.2

**001510 New Business Construction**

Labor	9,974	10,498	12,655	13,839
Non-Labor	33,259	31,746	38,270	42,166
NSE	0	-6,309	-6,309	-6,309
<b>Total</b>	<b>43,233</b>	<b>35,935</b>	<b>44,616</b>	<b>49,696</b>
FTE	115.4	127.2	153.3	167.2

**A01510 New Business Trench Reimbursement**

Labor	0	0	0	0
Non-Labor	988	697	697	697
NSE	0	0	0	0
<b>Total</b>	<b>988</b>	<b>697</b>	<b>697</b>	<b>697</b>
FTE	0.0	0.0	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**001510 - New Business Construction**

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Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: 001510 - New Business Construction

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	Zero-Based	6,328	7,711	8,333	9,267	9,974	10,498	12,655	13,839
Non-Labor	Zero-Based	9,627	16,758	22,092	28,028	33,259	31,746	38,270	42,166
NSE	Zero-Based	0	0	0	0	0	-6,309	-6,309	-6,309
<b>Total</b>		<b>15,956</b>	<b>24,469</b>	<b>30,425</b>	<b>37,294</b>	<b>43,233</b>	<b>35,935</b>	<b>44,616</b>	<b>49,696</b>
FTE	Zero-Based	86.6	99.8	106.7	111.9	115.4	127.2	153.3	167.2

**Business Purpose:**

Budget Codes: 151-161, 165, 166.

This work category provides for changes and additions to the existing gas distribution system to connect new residential, commercial, and industrial customers.

**Physical Description:**

The activities of this category include installation of gas mains and services, meter set assemblies, regulator stations and the associated facilities necessary to provide service to new customers.

**Project Justification:**

The activities contained in New Business are necessary to provide a safe and reliable gas distribution system. These costs are being incurred in response to SoCalGas' obligation to serve the growing customer base.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
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Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00151.0  
Category: A. New Business  
Category-Sub: 1. New Business Construction  
Workpaper Group: 001510 - New Business Construction

**Forecast Methodology:**

**Labor - Zero-Based**

The New Business expenditures for each forecast year was based on the projected number of new meter sets multiplied by the cost per meter set, which yielded the total projected cost. This total cost was then multiplied by the historical labor ratio to yield the corresponding forecasted labor cost. This zero-based approach was deemed the most appropriate forecasting methodology for the labor component as it is based on the projected meter set growth. The projected number of new meter sets was obtained from Witness Rose-Marie Payan. The cost per meter set is based on the historical three-year weighted average (2014 through 2016). The labor ratio used in the calculation also represented an historical three-year weighted average (2014 through 2016).

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-001 and SCG-04-GOM-CAP-SUP-012 for calculation details.

**Non-Labor - Zero-Based**

Similarly, the forecast for the non-labor component was determined by multiplying the projected number of new meter sets with the cost per meter set. This total cost was then multiplied by the historical non-labor ratio to yield the corresponding forecasted non-labor cost. This zero-based approach was deemed the most appropriate forecasting methodology for the non-labor component because it accounts for all the activities required to construct new main extensions and associated service laterals. These activities include the use of contractor services, third-party services, municipal permit fees, and the proportionate use of plastic and steel materials. The projected number of new meter sets was obtained from Witness Rose-Marie Payan. The cost per meter set is based on the historical three-year weighted average (2014 through 2016). The non-labor ratio used in the calculation is also based on a historical three-year weighted average (2014 through 2016).

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-001 and SCG-04-GOM-CAP-SUP-012 for calculation details.

**NSE - Zero-Based**

Forfeiture amounts are dependent on customer gas throughput levels incurred over a three to ten-year period after commencement of service. Due to the high volume of activity and the inherent complexity to track each customer's construction job and the associated throughput over a period of time, SoCalGas forecasted Forfeitures based on the historical five-year (2012 through 2016) average in nominal dollars and entered the forecast as non-standard escalation. This methodology allows SoCalGas to capture years of high as well as years with low forfeiture activity.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-002 for calculation details.

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Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00151.0  
Category: A. New Business  
Category-Sub: 1. New Business Construction  
Workpaper Group: 001510 - New Business Construction

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Zero-Based	10,498	12,655	13,552	0	0	287	10,498	12,655	13,839
Non-Labor	Zero-Based	31,746	38,270	40,982	0	0	1,184	31,746	38,270	42,166
NSE	Zero-Based	0	0	0	-6,309	-6,309	-6,309	-6,309	-6,309	-6,309
<b>Total</b>		<b>42,244</b>	<b>50,925</b>	<b>54,534</b>	<b>-6,309</b>	<b>-6,309</b>	<b>-4,838</b>	<b>35,935</b>	<b>44,616</b>	<b>49,696</b>
FTE	Zero-Based	127.2	153.3	164.2	0.0	0.0	3.0	127.2	153.3	167.2

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID		
2017	Other	0	0	-6,309	-6,309	0.0	MEBARRIN20161204171536617		
<b>Explanation:</b>		i. New Business Forfeitures - Reimbursement for cost of unused or underutilized facilities constructed at the request of new business customers. See Supplemental Workpaper SCG-04-GOM-CAP-SUP-002							
<b>2017 Total</b>		0	0	-6,309	-6,309	0.0			
2018	Other	0	0	-6,309	-6,309	0.0	MEBARRIN20161204171610240		
<b>Explanation:</b>		i. New Business Forfeitures - Reimbursement for cost of unused or underutilized facilities constructed at the request of new business customers. See Supplemental Workpaper SCG-04-GOM-CAP-SUP-002							
<b>2018 Total</b>		0	0	-6,309	-6,309	0.0			
2019	Other	0	0	-6,309	-6,309	0.0	MEBARRIN20161204171626880		
<b>Explanation:</b>		i. New Business Forfeitures - Reimbursement for cost of unused or underutilized facilities constructed at the request of new business customers. See Supplemental Workpaper SCG-04-GOM-CAP-SUP-002							
2019	Other	287	1,184	0	1,471	3.0	FGALVAN20170310183636287		
<b>Explanation:</b>		ii. Advanced Metering Infrastructure (AMI) - Incremental funding to capture ongoing AMI New Business work. Equipment utilized to set up the AMI network as new business continues to expand into different areas. See Supplemental Workpaper SCG-04-GOM-CAP-SUP-012							
<b>2019 Total</b>		287	1,184	-6,309	-4,838	3.0			

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00151.0  
Category: A. New Business  
Category-Sub: 1. New Business Construction  
Workpaper Group: 001510 - New Business Construction

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	5,547	6,683	7,321	8,037	8,564
Non-Labor	9,789	16,939	22,576	28,241	33,259
NSE	0	0	0	0	0
<b>Total</b>	<b>15,336</b>	<b>23,623</b>	<b>29,888</b>	<b>36,275</b>	<b>41,822</b>
FTE	74.3	85.4	91.4	95.8	98.7
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	5,547	6,683	7,321	8,037	8,564
Non-Labor	9,789	16,939	22,576	28,241	33,259
NSE	0	0	-8	-2	0
<b>Total</b>	<b>15,336</b>	<b>23,623</b>	<b>29,888</b>	<b>36,275</b>	<b>41,822</b>
FTE	74.3	85.4	91.4	95.8	98.7
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	888	1,111	1,195	1,300	1,410
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>888</b>	<b>1,111</b>	<b>1,195</b>	<b>1,300</b>	<b>1,410</b>
FTE	12.3	14.4	15.3	16.1	16.7
<b>Escalation to 2016\$</b>					
Labor	-106	-83	-182	-70	0
Non-Labor	-162	-181	-484	-213	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-268</b>	<b>-264</b>	<b>-666</b>	<b>-283</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	6,328	7,711	8,333	9,267	9,974
Non-Labor	9,627	16,758	22,092	28,028	33,259
NSE	0	0	-8	-2	0
<b>Total</b>	<b>15,956</b>	<b>24,469</b>	<b>30,417</b>	<b>37,292</b>	<b>43,233</b>
FTE	86.6	99.8	106.7	111.9	115.4

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: 001510 - New Business Construction

**Summary of Adjustments to Recorded:**

In Nominal \$(000)					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 001510**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: 001510 - New Business Construction  
 Workpaper Detail: 001510.001 - Installation of gas main services and meter set assemblies for new customers  
 In-Service Date: Not Applicable  
 Description:

The activities contained in New Business are necessary to provide a safe and reliable gas distribution system. These costs are being incurred in response to SoCalGas' obligation to serve the growing customer base.

See supplemental workpaper SCG-04-GOM-CAP-SUP-001 for calculation details.

<b>Forecast in 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	10,498	12,655	13,552
Non-Labor	31,746	38,270	40,982
NSE	0	0	0
<b>Total</b>	<b>42,244</b>	<b>50,925</b>	<b>54,534</b>
FTE	127.2	153.3	164.2

*Note: Totals may include rounding differences.*

Southern California Gas Company  
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Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: 001510 - New Business Construction  
 Workpaper Detail: 001510.002 - New business forfeitures are recorded as reductions to new business expenditures  
 In-Service Date: Not Applicable

Description:

New business forfeitures are Customer Advances for Construction (CAC) that are no longer deemed refundable and are considered utility property in accordance with CPUC Rule 20 – Gas Main Extensions and Rule 21 – Gas Service Extensions.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-002 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		0	0	0
Non-Labor		0	0	0
NSE		-6,309	-6,309	-6,309
	<b>Total</b>	<b>-6,309</b>	<b>-6,309</b>	<b>-6,309</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: 001510 - New Business Construction  
 Workpaper Detail: 001510.003 - New Business cost for Advanced Meter activities pertaining to Data Collector Units (DCU)  
 In-Service Date: Not Applicable  
 Description:

Labor and non-labor cost for Advanced Metering Infrastructure (AMI) activities related to the installation and replacement of Data Collector Units (DCU) and poles to support and expanding system.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-012 for calculation details.

<b>Forecast in 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	0	0	287
Non-Labor	0	0	1,184
NSE	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1,471</b>
FTE	0.0	0.0	3.0

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 001510**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-001**

**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia  
Supplemental Workpaper Calculations for the Zero Based New Business Construction Forecast  
New Business Workpaper**

Assumptions:

[A] & [I] Refer to the prepared direct workpaper of Witness Rose-Marie Payan, Exhibit SCG-39-WP, for the new meter set forecast methodology.

Amounts are shown in 2016 dollars and include vacation and sick.

3-Year 2014-2016 Historical Data

	[A]	[B]	[C]	[D]	[E]	[F] ([C]/[E])	[G] ([B]/[A])
	Historical New Meter Set Installations	Adjusted Recorded Historical Total	Adjusted Recorded Historical Labor	Adjusted Recorded Historical Non-Labor	Historical FTEs	Historical 3-Yr Average Labor / FTE	Historical 3-Yr Average Cost Per Meter Set
<b>2014</b>	33,249	\$ 30,425,171	\$ 8,332,911	\$ 22,092,260	106.7		
<b>2015</b>	33,594	\$ 37,294,170	\$ 9,266,522	\$ 28,027,648	111.9		
<b>2016</b>	37,708	\$ 43,232,860	\$ 9,974,175	\$ 33,258,685	115.4		
<b>3-Yr Total</b>	<b>104,551</b>	<b>\$ 110,952,201</b>	<b>\$ 27,573,608</b>	<b>\$ 83,378,593</b>	<b>334</b>	<b>\$ 82,555.71</b>	<b>\$ 1,061.23</b>

	[H] ([C]/[B])
3-Year Historical Average Labor Ratio:	25%

Forecast Calculations

	[I]	[J] ([I]x[G])	[K] ([J]x[H])	[L] ([J]-[K])	[M] ([K]/[F])
	Projected Meter Set Installations	Total Forecast	Labor Forecast	Non-Labor Forecast	Forecasted FTEs
<b>2017</b>	39,807	\$ 42,243,805	\$ 10,497,586	\$ 31,746,219	127.2
<b>2018</b>	47,987	\$ 50,925,107	\$ 12,654,889	\$ 38,270,218	153.3
<b>2019</b>	51,388	\$ 54,534,135	\$ 13,551,733	\$ 40,982,402	164.2

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-002**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia**  
**Supplemental Workpaper Calculations for Forfeitures Related to New Business**  
**New Business Workpaper**

Assumptions: Amounts are shown in thousands of dollars of the year.

		Historical Fully Loaded Forfeitures (Nominal \$)				
	New Business Forfeitures	2012	2013	2014	2015	2016
[A]	Main & Stub Forfeitures	-2,565	-1,867	-2,938	-3,624	-7,499
[B]	Service & Meter Set Assembly Forfeitures	-7,051	-6,550	-5,178	-4,077	-6,802
[(A)+[B)]	<b>Total Loaded</b>	-9,616	-8,417	-8,116	-7,701	-14,302

[C]	Direct Cost Factor (Estimated Ratio of Loaded Forfeitures to Direct Forfeitures)	1.53	1.53	1.53	1.53	1.53
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		Historical Direct Cost (Nominal Dollars of the Year)					5-Year Ave.	5-yr Average Forecast (NSE)		
	New Business Forfeitures	2012	2013	2014	2015	2016		2017	2018	2019
[(A)/[C)]	Main & Stub Forfeitures	-1,680	-1,223	-1,925	-2,374	-4,912	-2,423	-2,423	-2,423	-2,423
[(B)/[C)]	Service & Meter Set Assembly Forfeitures	-4,619	-4,291	-3,392	-2,671	-4,456	-3,886	-3,886	-3,886	-3,886
[(D)+[E)]	<b>Total Direct</b>	-6,299	-5,514	-5,317	-5,045	-9,368	-6,309	-6,309	-6,309	-6,309

Southern California Gas Company  
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**SCG-04-GOM-CAP-SUP-012**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia**  
**Supplemental Workpaper Calculations for Advanced Metering Infrastructure Activities**  
**New Business Workpaper**

Assumptions:

- [A]: Total Units
- [B]: Unit Cost
- [C] Total Unit Cost
- [D] Number of FTEs required
- [E]: Labor Cost
- [F]: Total Labor Cost

Non-Labor

Description	Units [A]	Unit Cost [B]	Total [C] ([A]x[B])
New Easements	7	\$ 4,000	\$ 28,000
Poles (New Business/H2H/Optimization)	27	\$ 2,000	\$ 54,000
Poles (Emergency)	25	\$ 2,000	\$ 50,000
DCU (New Business)	31	\$ 4,000	\$ 124,000
DCU (H2H/Optimization)	10	\$ 4,000	\$ 40,000
DCU (Emergency)	25	\$ 4,000	\$ 100,000
Pole Construction	52	\$ 13,000	\$ 676,000
Attachment Construction	14	\$ 8,000	\$ 112,000
		Total	\$ 1,184,000.00

Labor

Description	FTEs [D]	Labor Cost [E]	Total [F] ([D]x[E])
Engineer	1	\$ 90,000	\$ 90,000
Project Manager	2	\$ 98,714	\$ 197,428
		Total	\$ 287,428

Labor Total	Non Labor Total	Overall Total
\$ 287,428	\$ 1,184,000	\$ 1,471,428

**Beginning of Workpaper Group**  
**A01510 - New Business Trench Reimbursement**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: A01510 - New Business Trench Reimbursement

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Average	0	0	0	0	0	0	0	
Non-Labor	5-YR Average	629	718	552	598	988	697	697	
NSE	5-YR Average	0	0	0	0	0	0	0	
<b>Total</b>		<b>629</b>	<b>718</b>	<b>552</b>	<b>598</b>	<b>988</b>	<b>697</b>	<b>697</b>	
FTE	5-YR Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Business Purpose:**

In accordance with CPUC Rules 20 and 21, customers who provide their own trench receive reimbursement for this contribution from SoCalGas.

**Physical Description:**

In conjunction with the installation of gas facilities (mains and services, meter set assemblies, and the associated regulator stations) necessary to provide service to the customers, a trench in which the pipeline is placed must be developed. If SoCalGas develops the trench the costs are included in the new business construction costs. If the customer provides the trench SoCalGas reimburses the customer for this cost. This workpaper covers only the latter.

**Project Justification:**

The activities contained in New Business Trench Reimbursements are necessary to provide a safe and reliable gas distribution system. These expenses are necessary to comply with customers' rights as defined in CPUC Rules 20 and 21.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00151.0  
Category: A. New Business  
Category-Sub: 1. New Business Construction  
Workpaper Group: A01510 - New Business Trench Reimbursement

**Forecast Methodology:**

**Labor - 5-YR Average**

Labor is not applicable in this workbook.

**Non-Labor - 5-YR Average**

The estimate of expenditures in this category consists of reimbursement costs based on the five-year historical average (2012 through 2016). This average covers variations in spending levels from year to year.

**NSE - 5-YR Average**

NSE is not applicable in this workbook.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: A01510 - New Business Trench Reimbursement

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	0	0	0	0	0	0	0	0	0
Non-Labor	5-YR Average	696	696	696	1	1	1	697	697	697
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>696</b>	<b>696</b>	<b>696</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>697</b>	<b>697</b>	<b>697</b>
FTE	5-YR Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Forecast Adjustment Details**

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00151.0  
Category: A. New Business  
Category-Sub: 1. New Business Construction  
Workpaper Group: A01510 - New Business Trench Reimbursement

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	0	0	0	0
Non-Labor	639	726	564	602	988
NSE	0	0	0	0	0
<b>Total</b>	<b>639</b>	<b>726</b>	<b>564</b>	<b>602</b>	<b>988</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	0	0	0	0	0
Non-Labor	639	726	564	602	988
NSE	0	0	0	0	0
<b>Total</b>	<b>639</b>	<b>726</b>	<b>564</b>	<b>602</b>	<b>988</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Escalation to 2016\$</b>					
Labor	0	0	0	0	0
Non-Labor	-11	-8	-12	-5	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-11</b>	<b>-8</b>	<b>-12</b>	<b>-5</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	0	0	0	0	0
Non-Labor	629	718	552	598	988
NSE	0	0	0	0	0
<b>Total</b>	<b>629</b>	<b>718</b>	<b>552</b>	<b>598</b>	<b>988</b>
FTE	0.0	0.0	0.0	0.0	0.0

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: A01510 - New Business Trench Reimbursement

**Summary of Adjustments to Recorded:**

In Nominal \$(000)					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group A01510**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00151.0  
 Category: A. New Business  
 Category-Sub: 1. New Business Construction  
 Workpaper Group: A01510 - New Business Trench Reimbursement  
 Workpaper Detail: A01510.001 - Customers who provide their own trench receive reimbursement for this from SoCalGas  
 In-Service Date: Not Applicable  
 Description:

In accordance with CPUC Rules 20 and 21 customers who provide their own trench receive reimbursement for this contribution from SoCalGas.

Forecast In 2016 \$(000)				
	Years	2017	2018	2019
Labor		0	0	0
Non-Labor		697	697	697
NSE		0	0	0
	<b>Total</b>	<b>697</b>	<b>697</b>	<b>697</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: B. Pressure Betterments  
Workpaper: 002510

**Summary for Category: B. Pressure Betterments**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,158	526	526	526
Non-Labor	28,212	22,562	22,562	22,562
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total</b>	<b>29,370</b>	<b>23,088</b>	<b>23,088</b>	<b>23,088</b>
FTE	11.7	5.6	5.6	5.6

**002510 Pressure Betterments - Routine**

Labor	1,158	526	526	526
Non-Labor	28,212	22,562	22,562	22,562
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total</b>	<b>29,370</b>	<b>23,088</b>	<b>23,088</b>	<b>23,088</b>
FTE	11.7	5.6	5.6	5.6

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**002510 - Pressure Betterments - Routine**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00251.0  
 Category: B. Pressure Betterments  
 Category-Sub: 1. Pressure Betterments  
 Workpaper Group: 002510 - Pressure Betterments - Routine

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Average	262	177	382	649	1,158	526	526	526
Non-Labor	5-YR Average	12,466	12,076	37,530	22,526	28,212	22,562	22,562	22,562
NSE	5-YR Average	0	0	0	0	0	0	0	0
<b>Total</b>		<b>12,728</b>	<b>12,253</b>	<b>37,912</b>	<b>23,175</b>	<b>29,371</b>	<b>23,088</b>	<b>23,088</b>	<b>23,088</b>
FTE	5-YR Average	3.3	2.0	4.1	6.8	11.7	5.6	5.6	5.6

**Business Purpose:**

Budget Code: 251

This work category records expenditure for gas distribution pressure betterment projects performed on an on-going basis to maintain system reliability and service to all customers. Pressure betterment projects are performed in areas where there is insufficient capacity or pressure to meet load growth. Once a pipeline system is designed and installed, the available capacity remains relatively fixed. However, as load increases over time due to population expansion or increased density, as well as new or larger commercial/industrial businesses, the available system pressure decreases. This, in turn, reduces the available capacity for customers. If the diminishing pressure is not addressed, gas service to customers could be interrupted.

**Physical Description:**

Pressure betterment projects typically involve one or more of the following:

- Installing new mains.
- Upsizing existing mains.
- Upgrading existing mains to higher pressure.
- Installing new regulator stations.
- Upsizing existing regulator stations.

**Project Justification:**

To determine which areas need pressure betterments, growth information is gathered from customer records, builders, city, county, and state agencies. In addition, SoCalGas collects data from pressure gauges and electronic pressure recorders. This information is used to model system flow and identify capacity constraints. Based on analysis of these constraints, local region engineering identifies specific pressure betterment projects and the estimated year in which the projects will need to be constructed.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00251.0  
Category: B. Pressure Betterments  
Category-Sub: 1. Pressure Betterments  
Workpaper Group: 002510 - Pressure Betterments - Routine

**Forecast Methodology:**

**Labor - 5-YR Average**

Pipeline Pressure Betterment requirements are identified during the year, as part of the regular course of maintenance activities and system testing and evaluation. SoCalGas' gas infrastructure is a large dynamic system of pipelines exposed to continual changes in customer load demand, which makes it difficult to identify and estimate specific routine pressure betterment projects more than a year into the future. Hence, the latest load and growth information is used. Furthermore, the timing to complete each project can be unpredictable due to the need for detailed planning requirements, acquiring required permits, and coordination and scheduling of resources. Given the complexities in identifying specific pressure betterment projects, SoCalGas used the historical five-year (2012 through 2016) average of recorded Pressure Betterment expenditures to forecast the labor cost requirement for the years 2017 through 2019. Although, other forecast methods were considered including the five-year historical trend and base year, which resulted in higher forecast amounts, the five-year average was chosen as it more accurately captures yearly variations in system Pressure Betterment requirements.

**Non-Labor - 5-YR Average**

Pipeline Pressure Betterment requirements are identified during the year, as part of the regular course of maintenance activities and system testing and evaluation. SoCalGas' gas infrastructure is a large dynamic system of pipelines exposed to continual changes in customer load demand, which makes it difficult to identify and estimate specific routine pressure betterment projects more than a year into the future. Hence, the latest load and growth information is used. Furthermore, the timing to complete each project can be unpredictable due to the need for detailed planning requirements, acquiring required permits, and coordination and scheduling of resources. Given the complexities in identifying specific pressure betterment projects, SoCalGas used the historical five-year (2012 through 2016) average of recorded Pressure Betterment expenditures to forecast the non-labor cost requirement for the years 2017 through 2019. Although, other forecast methods were considered including the five-year historical trend and base year, which resulted in higher forecast amounts, the five-year average was chosen as it more accurately captures yearly variations in system Pressure Betterment requirements.

**NSE - 5-YR Average**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00251.0  
 Category: B. Pressure Betterments  
 Category-Sub: 1. Pressure Betterments  
 Workpaper Group: 002510 - Pressure Betterments - Routine

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	525	525	525	1	1	1	526	526	526
Non-Labor	5-YR Average	22,561	22,561	22,561	1	1	1	22,562	22,562	22,562
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>23,086</b>	<b>23,086</b>	<b>23,086</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>23,088</b>	<b>23,088</b>	<b>23,088</b>
FTE	5-YR Average	5.6	5.6	5.6	0.0	0.0	0.0	5.6	5.6	5.6

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
2017	Total	0	0	0	0	0.0	
2018	Total	0	0	0	0	0.0	
2019	Total	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00251.0  
Category: B. Pressure Betterments  
Category-Sub: 1. Pressure Betterments  
Workpaper Group: 002510 - Pressure Betterments - Routine

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	230	153	336	563	994
Non-Labor	12,675	12,206	38,352	22,697	28,212
NSE	0	0	0	0	0
<b>Total</b>	<b>12,905</b>	<b>12,359</b>	<b>38,688</b>	<b>23,260</b>	<b>29,207</b>
FTE	2.8	1.7	3.5	5.8	10.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	230	153	336	563	994
Non-Labor	12,675	12,206	38,352	22,697	28,212
NSE	0	0	0	0	0
<b>Total</b>	<b>12,905</b>	<b>12,359</b>	<b>38,688</b>	<b>23,260</b>	<b>29,207</b>
FTE	2.8	1.7	3.5	5.8	10.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	37	25	55	91	164
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>37</b>	<b>25</b>	<b>55</b>	<b>91</b>	<b>164</b>
FTE	0.5	0.3	0.6	1.0	1.7
<b>Escalation to 2016\$</b>					
Labor	-4	-2	-8	-5	0
Non-Labor	-209	-130	-822	-171	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-214</b>	<b>-132</b>	<b>-830</b>	<b>-176</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	262	177	382	649	1,158
Non-Labor	12,466	12,076	37,530	22,526	28,212
NSE	0	0	0	0	0
<b>Total</b>	<b>12,728</b>	<b>12,253</b>	<b>37,912</b>	<b>23,175</b>	<b>29,371</b>
FTE	3.3	2.0	4.1	6.8	11.7

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00251.0  
 Category: B. Pressure Betterments  
 Category-Sub: 1. Pressure Betterments  
 Workpaper Group: 002510 - Pressure Betterments - Routine

**Summary of Adjustments to Recorded:**

In Nominal \$(000)					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002510**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00251.0  
 Category: B. Pressure Betterments  
 Category-Sub: 1. Pressure Betterments  
 Workpaper Group: 002510 - Pressure Betterments - Routine  
 Workpaper Detail: 002510.001 - Pressure betterment projects performed in areas of insufficient capacity or pressure to  
 In-Service Date: Not Applicable

Description:

Routine pressure betterment activities that support the risk mitigation associated with system reliability.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<u>2017</u>	<u>2018</u>	<u>2019</u>
Labor		526	526	526
Non-Labor		22,562	22,562	22,562
NSE		0	0	0
	<b>Total</b>	<b>23,088</b>	<b>23,088</b>	<b>23,088</b>
FTE		5.6	5.6	5.6

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: C. Supply Line Replacements  
Workpaper: 002670

**Summary for Category: C. Supply Line Replacements**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	148	121	121	121
Non-Labor	2,920	4,088	4,088	4,088
NSE	0	0	0	0
<b>Total</b>	<b>3,068</b>	<b>4,209</b>	<b>4,209</b>	<b>4,209</b>
FTE	1.2	1.2	1.2	1.2

**002670 Supply Line Replacements**

Labor	148	121	121	121
Non-Labor	2,920	4,088	4,088	4,088
NSE	0	0	0	0
<b>Total</b>	<b>3,068</b>	<b>4,209</b>	<b>4,209</b>	<b>4,209</b>
FTE	1.2	1.2	1.2	1.2

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group  
002670 - Supply Line Replacements**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00267.0  
 Category: C. Supply Line Replacements  
 Category-Sub: 1. Supply Line Replacements  
 Workpaper Group: 002670 - Supply Line Replacements

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
	<b>Years</b>								
Labor	5-YR Average	294	114	38	9	148	121	121	121
Non-Labor	5-YR Average	10,479	3,045	3,690	305	2,920	4,088	4,088	4,088
NSE	5-YR Average	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>10,773</b>	<b>3,160</b>	<b>3,728</b>	<b>313</b>	<b>3,067</b>	<b>4,209</b>	<b>4,209</b>	<b>4,209</b>
FTE	5-YR Average	3.1	1.2	0.5	0.1	1.2	1.2	1.2	1.2

**Business Purpose:**

Budget Code: 267.

This work category includes expenditures to replace high-pressure distribution pipelines, known at SoCalGas as supply lines. Some of the major drivers for these supply line replacement projects include deteriorating pipe conditions, risk to the public, and increased maintenance costs.

**Physical Description:**

The distribution supply line system is comprised of approximately 3,700 miles of high-pressure pipeline constructed between the early 1920s and the present, and ranges in diameter from 2 inch to 30 inch. These supply lines normally operate at pressures higher than 60 psig. Projects in this workgroup include replacements of pipelines and associated facilities within the supply line system.

**Project Justification:**

The condition of SoCalGas' supply line system is typically assessed through O&M activities (i.e. excavations, leakage survey, and damage repairs). When deteriorating conditions are found to exist on any supply line, an engineering evaluation of the pipeline is conducted to determine the requirement for replacement or abandonment. Supply line replacement decisions are based on several factors, including pipe condition, leakage history, operating history, construction methods, system demands, proximity to known potential geologic hazards, and consequence of potential failure.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00267.0  
Category: C. Supply Line Replacements  
Category-Sub: 1. Supply Line Replacements  
Workpaper Group: 002670 - Supply Line Replacements

**Forecast Methodology:**

**Labor - 5-YR Average**

In developing the supply line replacements forecast, historical expenditures for 2012 through 2016 were evaluated. SoCalGas recognizes that the timing to complete each supply line replacement project is difficult to predict due to the need for: review of operating conditions, detailed planning requirements, acquisition of required permits, risk assessment, and coordination and scheduling of resources. Therefore, SoCalGas estimated the expenditures for the years 2017 through 2019 based on the historical average of recorded expenditures of the years 2012 through 2016. Based on the number of variables involved in these larger-scale projects, this average is most representative of future work requirements and expected labor expenditures, as it captures typical fluctuations in supply line project costs from year to year.

**Non-Labor - 5-YR Average**

In developing the supply line replacements forecast, historical expenditures for 2012 through 2016 were evaluated. SoCalGas recognizes that the timing to complete each supply line replacement project is difficult to predict due to the need for: review of operating conditions, detailed planning requirements, acquisition of required permits, risk assessment, and coordination and scheduling of resources. Therefore, SoCalGas estimated the expenditures for the years 2017 through 2019 based on the historical average of recorded expenditures of the years 2012 through 2016. Based on the number of variables involved in these larger-scale projects, this average is most representative of future work requirements and expected non-labor expenditures, as it captures typical fluctuations in supply line project costs from year to year.

**NSE - 5-YR Average**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00267.0  
 Category: C. Supply Line Replacements  
 Category-Sub: 1. Supply Line Replacements  
 Workpaper Group: 002670 - Supply Line Replacements

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	120	120	120	1	1	1	121	121	121
Non-Labor	5-YR Average	4,087	4,087	4,087	1	1	1	4,088	4,088	4,088
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>4,207</b>	<b>4,207</b>	<b>4,207</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>4,209</b>	<b>4,209</b>	<b>4,209</b>
FTE	5-YR Average	1.2	1.2	1.2	0.0	0.0	0.0	1.2	1.2	1.2

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00267.0  
Category: C. Supply Line Replacements  
Category-Sub: 1. Supply Line Replacements  
Workpaper Group: 002670 - Supply Line Replacements

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	258	99	33	7	127
Non-Labor	10,655	3,078	3,771	307	2,920
NSE	0	0	0	0	0
<b>Total</b>	<b>10,912</b>	<b>3,177</b>	<b>3,804</b>	<b>314</b>	<b>3,047</b>
FTE	2.7	1.0	0.4	0.1	1.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	258	99	33	7	127
Non-Labor	10,655	3,078	3,771	307	2,920
NSE	0	0	0	0	0
<b>Total</b>	<b>10,912</b>	<b>3,177</b>	<b>3,804</b>	<b>314</b>	<b>3,047</b>
FTE	2.7	1.0	0.4	0.1	1.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	41	16	5	1	21
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>41</b>	<b>16</b>	<b>5</b>	<b>1</b>	<b>21</b>
FTE	0.4	0.2	0.1	0.0	0.2
<b>Escalation to 2016\$</b>					
Labor	-5	-1	-1	0	0
Non-Labor	-176	-33	-81	-2	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-181</b>	<b>-34</b>	<b>-82</b>	<b>-2</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	294	114	38	9	148
Non-Labor	10,479	3,045	3,690	305	2,920
NSE	0	0	0	0	0
<b>Total</b>	<b>10,773</b>	<b>3,160</b>	<b>3,728</b>	<b>313</b>	<b>3,067</b>
FTE	3.1	1.2	0.5	0.1	1.2

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00267.0  
 Category: C. Supply Line Replacements  
 Category-Sub: 1. Supply Line Replacements  
 Workpaper Group: 002670 - Supply Line Replacements

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002670**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00267.0  
 Category: C. Supply Line Replacements  
 Category-Sub: 1. Supply Line Replacements  
 Workpaper Group: 002670 - Supply Line Replacements  
 Workpaper Detail: 002670.001 - Expenditures to replace high-pressure distribution pipelines  
 In-Service Date: Not Applicable

Description:

This work category includes expenditures to replace high-pressure distribution pipelines, known at SoCalGas as supply lines. Some of the major drivers for these supply line replacement projects include deteriorating pipe conditions, risk to the public, and increased maintenance costs.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		121	121	121
Non-Labor		4,088	4,088	4,088
NSE		0	0	0
	<b>Total</b>	<b>4,209</b>	<b>4,209</b>	<b>4,209</b>
FTE		1.2	1.2	1.2

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: D. Main Replacements  
Workpaper: 002520

**Summary for Category: D. Main Replacements**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	2,863	2,900	2,900	2,900
Non-Labor	29,419	30,811	30,811	30,811
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total</b>	<b>32,282</b>	<b>33,711</b>	<b>33,711</b>	<b>33,711</b>
FTE	38.5	38.0	38.0	38.0

**002520 Main Replacements**

Labor	2,863	2,900	2,900	2,900
Non-Labor	29,419	30,811	30,811	30,811
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total</b>	<b>32,282</b>	<b>33,711</b>	<b>33,711</b>	<b>33,711</b>
FTE	38.5	38.0	38.0	38.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**002520 - Main Replacements**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00252.0  
 Category: D. Main Replacements  
 Category-Sub: 1. Main Replacements  
 Workpaper Group: 002520 - Main Replacements

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Average	3,979	3,941	1,572	2,143	2,863	2,900	2,900	2,900
Non-Labor	5-YR Average	33,635	40,080	26,700	24,224	29,419	30,811	30,811	30,811
NSE	5-YR Average	0	0	0	0	0	0	0	0
<b>Total</b>		<b>37,614</b>	<b>44,021</b>	<b>28,272</b>	<b>26,367</b>	<b>32,282</b>	<b>33,711</b>	<b>33,711</b>	<b>33,711</b>
FTE	5-YR Average	54.4	51.5	19.4	26.3	38.5	38.0	38.0	38.0

**Business Purpose:**

Budget Codes: 252, 253, 255,

This work category includes expenditures to replace main operating at 60 psig and below, also referred to as medium-pressure main replacements. Some of the major drivers for these replacement projects include deteriorating pipe conditions, risk to the public, and increased maintenance costs.

**Physical Description:**

The distribution medium pressure system is comprised of approximately 47,093 miles of steel and plastic pipeline constructed between the early 1920s and the present, and ranges in diameter from 1-inch to 16-inch. These mains support the delivery of gas to more than 5.9 million customers. Pipeline replacement projects include:

- The installation of new mains to replace existing mains.
- Service line replacements associated with main replacements.
- Existing service line "tie-overs" to newly installed replacement main.
- Meter set re-builds associated with newly installed replacement main.
- Main replacements completed in advance of public infrastructure improvement projects.

**Project Justification:**

Leakage is often the driving factor for pipeline replacements; however, there are other considerations. Other factors are identified from information collected from various O&M activities and field observations. Other criteria taken into consideration are whether the steel pipe meets cathodic protection mandates, or the main is found to have active corrosion. In addition, the pipeline may be deemed unsafe or unfit for service under pressure due to manufacturing or other defects. Leak history and pending leaks on individual segments is the primary factor in qualifying the majority of SoCalGas' main replacements. These replacements are critical to sustain operational reliability and public safety.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00252.0  
Category: D. Main Replacements  
Category-Sub: 1. Main Replacements  
Workpaper Group: 002520 - Main Replacements

**Forecast Methodology:**

**Labor - 5-YR Average**

SoCalGas forecasts continuing main replacements at the five-year (2012 through 2016) historical average to mitigate potential risks associated with pipeline integrity, system reliability, and public safety. This approach also allows SoCalGas to capture historical spending under a variety of conditions that reflect fluctuations in labor expenditures associated with this work category.

**Non-Labor - 5-YR Average**

SoCalGas forecasts continuing main replacements at the five-year (2012 through 2016) historical average to mitigate potential risks associated with pipeline integrity, system reliability, and public safety. This approach also allows SoCalGas to capture historical spending under a variety of conditions that reflect fluctuations in non-labor expenditures associated with this work category.

**NSE - 5-YR Average**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00252.0  
 Category: D. Main Replacements  
 Category-Sub: 1. Main Replacements  
 Workpaper Group: 002520 - Main Replacements

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	2,899	2,899	2,899	1	1	1	2,900	2,900	2,900
Non-Labor	5-YR Average	30,811	30,811	30,811	0	0	0	30,811	30,811	30,811
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>33,710</b>	<b>33,710</b>	<b>33,710</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>33,711</b>	<b>33,711</b>	<b>33,711</b>
FTE	5-YR Average	38.0	38.0	38.0	0.0	0.0	0.0	38.0	38.0	38.0

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00252.0  
Category: D. Main Replacements  
Category-Sub: 1. Main Replacements  
Workpaper Group: 002520 - Main Replacements

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	3,487	3,416	1,381	1,859	2,458
Non-Labor	34,200	40,512	27,284	24,408	29,419
NSE	0	0	0	0	0
<b>Total</b>	<b>37,687</b>	<b>43,929</b>	<b>28,666</b>	<b>26,267</b>	<b>31,877</b>
FTE	46.7	44.1	16.6	22.5	32.9
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	3,487	3,416	1,381	1,859	2,458
Non-Labor	34,200	40,512	27,284	24,408	29,419
NSE	0	0	0	0	0
<b>Total</b>	<b>37,687</b>	<b>43,929</b>	<b>28,666</b>	<b>26,267</b>	<b>31,877</b>
FTE	46.7	44.1	16.6	22.5	32.9
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	558	568	225	301	405
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>558</b>	<b>568</b>	<b>225</b>	<b>301</b>	<b>405</b>
FTE	7.7	7.4	2.8	3.8	5.6
<b>Escalation to 2016\$</b>					
Labor	-67	-43	-34	-16	0
Non-Labor	-565	-433	-585	-184	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-632</b>	<b>-475</b>	<b>-619</b>	<b>-200</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	3,979	3,941	1,572	2,143	2,863
Non-Labor	33,635	40,080	26,700	24,224	29,419
NSE	0	0	0	0	0
<b>Total</b>	<b>37,614</b>	<b>44,021</b>	<b>28,272</b>	<b>26,367</b>	<b>32,282</b>
FTE	54.4	51.5	19.4	26.3	38.5

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00252.0  
 Category: D. Main Replacements  
 Category-Sub: 1. Main Replacements  
 Workpaper Group: 002520 - Main Replacements

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002520**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00252.0  
 Category: D. Main Replacements  
 Category-Sub: 1. Main Replacements  
 Workpaper Group: 002520 - Main Replacements  
 Workpaper Detail: 002520.001 - Expenditures to replace main operating at 60 psig and below  
 In-Service Date: Not Applicable

Description:

This work category includes expenditures to replace main operating at 60 psig and below, also referred to as medium-pressure main replacements. Some of the major drivers for these replacement projects include deteriorating pipe conditions, risk to the public, and increased maintenance costs.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		2,900	2,900	2,900
Non-Labor		28,665	28,665	28,665
NSE		0	0	0
	<b>Total</b>	<b>31,565</b>	<b>31,565</b>	<b>31,565</b>
FTE		38.0	38.0	38.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00252.0  
 Category: D. Main Replacements  
 Category-Sub: 1. Main Replacements  
 Workpaper Group: 002520 - Main Replacements  
 Workpaper Detail: 002520.002 - RAMP - Base - Risk ID SCG-02/SCG Employee Contractor Customer & Public Safety - Traffic  
 In-Service Date: Not Applicable  
 Description:

RAMP - Base - Risk ID SCG-02/SCG Employee Contractor Customer & Public Safety - Contracting for Traffic Control delineation materials - Distribution Only.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		0	0	0
Non-Labor		2,146	2,146	2,146
NSE		0	0	0
	<b>Total</b>	<b>2,146</b>	<b>2,146</b>	<b>2,146</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00252.0  
 Category: D. Main Replacements  
 Category-Sub: 1. Main Replacements  
 Workpaper Group: 002520 - Main Replacements  
 Workpaper Detail: 002520.002 - RAMP - Base - Risk ID SCG-02/SCG Employee Contractor Customer & Public Safety - Traffic Cont

**RAMP Item # 1**

RAMP Chapter: SCG-2

Program Name: Contracting for Traffic Control Delineation materials -- Distribution Only

Program Description: Contracting for Traffic Control Delineation materials

**Risk/Mitigation:**

Risk: Employee, Contractor, Customer and Public Safety

Mitigation: Contracting for Traffic Control Delineation materials

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,931	1,931	1,931
High	2,360	2,360	2,360

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation: N/A

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 2199

Explanation: Assumed 2016 actuals on adjusted 2015 dollars. This mitigation is incorporated within the workpaper.

Southern California Gas Company  
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Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: E. Service Replacements  
Workpaper: 002560

**Summary for Category: E. Service Replacements**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	5,999	6,303	6,833	7,363
Non-Labor	20,315	22,235	24,637	27,040
NSE	0	0	0	0
<b>Total</b>	<b>26,314</b>	<b>28,538</b>	<b>31,470</b>	<b>34,403</b>
FTE	65.4	67.4	71.0	74.6

**002560 Service Replacements**

Labor	5,999	6,303	6,833	7,363
Non-Labor	20,315	22,235	24,637	27,040
NSE	0	0	0	0
<b>Total</b>	<b>26,314</b>	<b>28,538</b>	<b>31,470</b>	<b>34,403</b>
FTE	65.4	67.4	71.0	74.6

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group  
002560 - Service Replacements**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00256.0  
 Category: E. Service Replacements  
 Category-Sub: 1. Service Replacements  
 Workpaper Group: 002560 - Service Replacements

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Linear	4,081	4,045	3,928	5,510	5,999	6,303	6,833	7,363
Non-Labor	5-YR Linear	9,965	12,439	16,654	15,763	20,315	22,235	24,637	27,040
NSE	5-YR Linear	0	0	0	0	0	0	0	0
<b>Total</b>		<b>14,046</b>	<b>16,485</b>	<b>20,581</b>	<b>21,273</b>	<b>26,315</b>	<b>28,538</b>	<b>31,470</b>	<b>34,403</b>
FTE	5-YR Linear	54.3	50.8	48.0	64.5	65.4	67.4	71.0	74.6

**Business Purpose:**

Budget Codes: 256, 257, 258, 260.

Service replacements represented in this category include expenditures specific to the replacement of isolated distribution service pipelines to maintain system reliability and to safely deliver gas to the customer, thus mitigating the risks associated with loss of service and public safety. Services are replaced by two construction methods, "insertion" and "direct bury". With the insertion method, a new plastic replacement service pipe is inserted into the to-be abandoned steel service pipe such that the steel service becomes casing for the plastic pipe. The direct bury technique specifies to the construction crews that the installation of new pipe does not need casing, and any installation method can be utilized such as boring or open trench.

**Physical Description:**

SoCalGas has approximately 49,516 miles of service pipe. These distribution service lines are used to transport gas from a common source of supply to an individual residence, or to two adjacent or adjoining residences, or a small commercial customer. It is also common to serve multi-residential buildings and multi-commercial customers through a meter header or a manifold. A service line ends at the end of the customer meter or at the connection to a customer's piping, whichever is further downstream.

**Project Justification:**

There are many reasons why services are replaced. It could be replaced because a large leak occurred or has a significant number of past leaks. Steel services in particular get replaced when active corrosion is found or when a leak is found on a non-cathodically protected steel service. During maintenance activities, it is possible to encounter services containing obsolete material such as cellulose, acetate butyrate or polyvinyl chloride which will prompt the service to be replaced. Services may also be replaced when the makeup of the service is found to contain Aldyl-A material. These replacements are critical to sustain operational reliability and public safety, especially since these laterals enter into private property.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00256.0  
Category: E. Service Replacements  
Category-Sub: 1. Service Replacements  
Workpaper Group: 002560 - Service Replacements

**Forecast Methodology:**

**Labor - 5-YR Linear**

The level of spending for routine service replacements is highly dependent on the condition of the pipe, as observed during maintenance activities. With the increase in leak survey and leak inventory reduction activities previously discussed as well as an increasingly aging infrastructure, SoCalGas forecasts for labor the service line replacements at the five-year (2012 through 2016) trend to mitigate potential risks associated with pipeline integrity, system reliability, and public safety.

**Non-Labor - 5-YR Linear**

The non-labor expenditures were also calculated using the historical five-year (2012 through 2016) linear trend. This methodology was selected because it complements the labor component in that it best represents the volume of work performed by pipeline contracts and third-party services. It also captures the increasing cost in paving services, municipal permit and inspector fees, and materials cost.

**NSE - 5-YR Linear**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00256.0  
 Category: E. Service Replacements  
 Category-Sub: 1. Service Replacements  
 Workpaper Group: 002560 - Service Replacements

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Linear	6,302	6,832	7,362	1	1	1	6,303	6,833	7,363
Non-Labor	5-YR Linear	22,234	24,637	27,039	1	0	1	22,235	24,637	27,040
NSE	5-YR Linear	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>28,536</b>	<b>31,469</b>	<b>34,401</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>28,538</b>	<b>31,470</b>	<b>34,403</b>
FTE	5-YR Linear	67.4	71.0	74.6	0.0	0.0	0.0	67.4	71.0	74.6

**Forecast Adjustment Details**

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00256.0  
Category: E. Service Replacements  
Category-Sub: 1. Service Replacements  
Workpaper Group: 002560 - Service Replacements

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	3,577	3,506	3,450	4,778	5,151
Non-Labor	10,132	12,574	17,018	15,883	20,315
NSE	0	0	0	0	0
<b>Total</b>	<b>13,709</b>	<b>16,080</b>	<b>20,469</b>	<b>20,661</b>	<b>25,466</b>
FTE	46.6	43.5	41.1	55.2	56.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	3,577	3,506	3,450	4,778	5,151
Non-Labor	10,132	12,574	17,018	15,883	20,315
NSE	0	0	0	0	0
<b>Total</b>	<b>13,709</b>	<b>16,080</b>	<b>20,469</b>	<b>20,661</b>	<b>25,466</b>
FTE	46.6	43.5	41.1	55.2	56.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	573	583	563	773	848
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>573</b>	<b>583</b>	<b>563</b>	<b>773</b>	<b>848</b>
FTE	7.7	7.3	6.9	9.3	9.4
<b>Escalation to 2016\$</b>					
Labor	-69	-44	-86	-42	0
Non-Labor	-167	-134	-365	-120	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-236</b>	<b>-178</b>	<b>-451</b>	<b>-162</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	4,081	4,045	3,928	5,510	5,999
Non-Labor	9,965	12,439	16,654	15,763	20,315
NSE	0	0	0	0	0
<b>Total</b>	<b>14,046</b>	<b>16,485</b>	<b>20,581</b>	<b>21,273</b>	<b>26,315</b>
FTE	54.3	50.8	48.0	64.5	65.4

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00256.0  
 Category: E. Service Replacements  
 Category-Sub: 1. Service Replacements  
 Workpaper Group: 002560 - Service Replacements

**Summary of Adjustments to Recorded:**

In Nominal \$(000)					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002560**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00256.0  
 Category: E. Service Replacements  
 Category-Sub: 1. Service Replacements  
 Workpaper Group: 002560 - Service Replacements  
 Workpaper Detail: 002560.001 - Expenditures specific to the replacement of isolated distribution service pipelines  
 In-Service Date: Not Applicable

Description:

Service replacements represented in this category include expenditures specific to the replacement of isolated distribution service pipelines to maintain system reliability, and secure customer safety by addressing aging infrastructure.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		6,303	6,833	7,363
Non-Labor		20,085	22,379	24,514
NSE		0	0	0
	<b>Total</b>	<b>26,388</b>	<b>29,212</b>	<b>31,877</b>
FTE		67.4	71.0	74.6

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00256.0  
 Category: E. Service Replacements  
 Category-Sub: 1. Service Replacements  
 Workpaper Group: 002560 - Service Replacements  
 Workpaper Detail: 002560.002 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Meter Set Assembly  
 In-Service Date: Not Applicable  
 Description:

RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Meter Set Assembly (MSA). Capital Service Installations related to New Business Activities.

Forecast In 2016 \$(000)				
	Years	2017	2018	2019
Labor		0	0	0
Non-Labor		2,150	2,258	2,526
NSE		0	0	0
	<b>Total</b>	<b>2,150</b>	<b>2,258</b>	<b>2,526</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00256.0  
 Category: E. Service Replacements  
 Category-Sub: 1. Service Replacements  
 Workpaper Group: 002560 - Service Replacements  
 Workpaper Detail: 002560.002 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Meter Set Assembly (MS.

**RAMP Item # 1**

RAMP Chapter: SCG-10

Program Name: Meter Set Assembly (MSA)

Program Description: Maintenance and inspections of meter set assemblies in the system. Per region basis

**Risk/Mitigation:**

Risk: Catastrophic Damage Involving Medium-Pressure Pipeline Failure

Mitigation: MSA Inspections

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,900	1,995	2,233
High	2,400	2,520	2,820

Funding Source: FERC

Forecast Method: Trend

Work Type: Mandated

Work Type Citation: CFR 49 Subpart H

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 1765

Explanation: Assumed 2016 actuals on adjusted 2015 dollars. Created to document that the mitigation is incorporated within the workpaper.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: F. Main & Service Abandonments  
Workpaper: 002540

**Summary for Category: F. Main & Service Abandonments**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	2,500	2,767	3,049	3,331
Non-Labor	6,163	6,489	7,473	8,456
NSE	0	0	0	0
<b>Total</b>	<b>8,663</b>	<b>9,256</b>	<b>10,522</b>	<b>11,787</b>
FTE	28.2	31.2	33.6	36.0

**002540 Main & Service Abandonments**

Labor	2,500	2,767	3,049	3,331
Non-Labor	6,163	6,489	7,473	8,456
NSE	0	0	0	0
<b>Total</b>	<b>8,663</b>	<b>9,256</b>	<b>10,522</b>	<b>11,787</b>
FTE	28.2	31.2	33.6	36.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**002540 - Main & Service Abandonments**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00254.0  
 Category: F. Main & Service Abandonments  
 Category-Sub: 1. Main & Service Abandonments  
 Workpaper Group: 002540 - Main & Service Abandonments

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Linear	1,447	1,509	1,924	2,224	2,500	2,767	3,049	3,331
Non-Labor	5-YR Linear	1,978	2,520	3,048	3,985	6,163	6,489	7,473	8,456
NSE	5-YR Linear	0	0	0	0	0	0	0	0
<b>Total</b>		<b>3,425</b>	<b>4,029</b>	<b>4,973</b>	<b>6,209</b>	<b>8,663</b>	<b>9,256</b>	<b>10,522</b>	<b>11,787</b>
FTE	5-YR Linear	19.9	19.9	24.6	27.3	28.2	31.2	33.6	36.0

**Business Purpose:**

Budget Codes: 254, 259.

This work category includes expenditures associated with the abandonment of distribution pipeline mains and services without the installation of new pipeline to replace the old.

**Physical Description:**

Abandonment of mains and services can only occur when abandonment of the pipeline is deemed to not cause a negative effect on the distribution system, otherwise a replacement plan will be pursued. Mains are retired from service by stopping the flow of gas into the section of pipe to be abandoned. This is typically accomplished with pressure control fittings installed on both extremes of the section of pipe in order to isolate from gas flow. Abandonment of service lines is accomplished by cutting and capping at the service-to-main connection.

**Project Justification:**

The activities contained in main and service abandonments are necessary to eliminate the risk that may result from a hazardous condition due to the potential for third party damage, and to eliminate unnecessary continued maintenance activities. The main abandonments are typically driven by city and state requests involving the vacating and demolition of public property at which point there is no opportunity for replacement. Service abandonments are driven by customers requesting cancellation of gas service due to building demolitions, or to terminate a temporary service.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00254.0  
Category: F. Main & Service Abandonments  
Category-Sub: 1. Main & Service Abandonments  
Workpaper Group: 002540 - Main & Service Abandonments

**Forecast Methodology:**

**Labor - 5-YR Linear**

The level of spending in this routine abandonment category is highly dependent on the demand for demolition and grading on private and public property. This work is often driven by economic conditions and, as the economy continues to trend in a positive direction over the forecast period, so will the need for main and service abandonments. Furthermore, the timing of individual projects is based on a number of factors including the need for review of operating conditions, detailed planning requirements, acquisition of required permits, and coordination and scheduling of resources. Due to the level of work and continued housing starts increase, SoCalGas used the five-year (2012 through 2016) trend to forecast the labor expenditures for this work category.

**Non-Labor - 5-YR Linear**

The level of spending in this routine abandonment category is highly dependent on the demand for demolition and grading on private and public property. This work is often driven by economic conditions and, as the economy continues to trend in a positive direction over the forecast period, so will the need for main and service abandonments. Furthermore, the timing of individual projects is based on a number of factors including the need for review of operating conditions, detailed planning requirements, acquisition of required permits, and coordination and scheduling of resources. Due to the level of work and continued housing starts increase, SoCalGas used the five-year (2012 through 2016) trend to forecast the non-labor expenditures for this work category.

**NSE - 5-YR Linear**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00254.0  
 Category: F. Main & Service Abandonments  
 Category-Sub: 1. Main & Service Abandonments  
 Workpaper Group: 002540 - Main & Service Abandonments

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Linear	2,767	3,049	3,331	0	0	0	2,767	3,049	3,331
Non-Labor	5-YR Linear	6,489	7,472	8,456	0	1	0	6,489	7,473	8,456
NSE	5-YR Linear	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>9,256</b>	<b>10,521</b>	<b>11,787</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>9,256</b>	<b>10,522</b>	<b>11,787</b>
FTE	5-YR Linear	31.2	33.6	36.0	0.0	0.0	0.0	31.2	33.6	36.0

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
2017 Total		0	0	0	0	0.0	
2018 Total		0	0	0	0	0.0	
2019 Total		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00254.0  
Category: F. Main & Service Abandonments  
Category-Sub: 1. Main & Service Abandonments  
Workpaper Group: 002540 - Main & Service Abandonments

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	1,268	1,308	1,691	1,929	2,146
Non-Labor	2,011	2,547	3,115	4,015	6,163
NSE	0	0	0	0	0
<b>Total</b>	<b>3,279</b>	<b>3,855</b>	<b>4,806</b>	<b>5,944</b>	<b>8,309</b>
FTE	17.1	17.0	21.1	23.4	24.1
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	1,268	1,308	1,691	1,929	2,146
Non-Labor	2,011	2,547	3,115	4,015	6,163
NSE	0	0	0	0	0
<b>Total</b>	<b>3,279</b>	<b>3,855</b>	<b>4,806</b>	<b>5,944</b>	<b>8,309</b>
FTE	17.1	17.0	21.1	23.4	24.1
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	203	217	276	312	353
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>203</b>	<b>217</b>	<b>276</b>	<b>312</b>	<b>353</b>
FTE	2.8	2.9	3.5	3.9	4.1
<b>Escalation to 2016\$</b>					
Labor	-24	-16	-42	-17	0
Non-Labor	-33	-27	-67	-30	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-58</b>	<b>-44</b>	<b>-109</b>	<b>-47</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	1,447	1,509	1,924	2,224	2,500
Non-Labor	1,978	2,520	3,048	3,985	6,163
NSE	0	0	0	0	0
<b>Total</b>	<b>3,425</b>	<b>4,029</b>	<b>4,973</b>	<b>6,209</b>	<b>8,663</b>
FTE	19.9	19.9	24.6	27.3	28.2

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00254.0  
 Category: F. Main & Service Abandonments  
 Category-Sub: 1. Main & Service Abandonments  
 Workpaper Group: 002540 - Main & Service Abandonments

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002540**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00254.0  
 Category: F. Main & Service Abandonments  
 Category-Sub: 1. Main & Service Abandonments  
 Workpaper Group: 002540 - Main & Service Abandonments  
 Workpaper Detail: 002540.001 - Expenditures associated with the abandonment of distribution pipeline mains and service  
 In-Service Date: Not Applicable  
 Description:

This work category includes expenditures associated with the abandonment of distribution pipeline mains and services without the installation of new pipeline to replace the old.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	2,767	3,049	3,331
Non-Labor	6,489	7,473	8,456
NSE	0	0	0
<b>Total</b>	<b>9,256</b>	<b>10,522</b>	<b>11,787</b>
FTE	31.2	33.6	36.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: G. Regulator Stations  
Workpaper: 002650

**Summary for Category: G. Regulator Stations**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	447	447	775	1,037
Non-Labor	8,189	8,189	13,861	18,399
NSE	0	0	0	0
<b>Total</b>	<b>8,636</b>	<b>8,636</b>	<b>14,636</b>	<b>19,436</b>
FTE	4.6	4.6	8.3	11.2

**002650 Regulator Stations**

Labor	447	447	775	1,037
Non-Labor	8,189	8,189	13,861	18,399
NSE	0	0	0	0
<b>Total</b>	<b>8,636</b>	<b>8,636</b>	<b>14,636</b>	<b>19,436</b>
FTE	4.6	4.6	8.3	11.2

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**002650 - Regulator Stations**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00265.0  
 Category: G. Regulator Stations  
 Category-Sub: 1. Regulator Stations  
 Workpaper Group: 002650 - Regulator Stations

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	Base YR Rec	370	236	329	428	447	447	775	1,037
Non-Labor	Base YR Rec	4,294	6,936	6,069	6,993	8,189	8,189	13,861	18,399
NSE	Base YR Rec	0	0	0	0	0	0	0	0
<b>Total</b>		<b>4,665</b>	<b>7,172</b>	<b>6,398</b>	<b>7,422</b>	<b>8,635</b>	<b>8,636</b>	<b>14,636</b>	<b>19,436</b>
FTE	Base YR Rec	4.7	2.7	3.5	4.7	4.6	4.6	8.3	11.2

**Business Purpose:**

Budget Code: 265.

Represented in this work category are expenditures for the construction of new installations, relocations, and replacements of distribution regulator stations.

**Physical Description:**

Regulator Stations are key assemblies of control equipment on the SoCalGas pipeline system. They are installed to reduce the pressure of gas from high-pressure pipelines to provide the lower pressures used on the distribution pipeline system, which provides steady continued operating conditions to the customer. These stations consist of pipes, electronics, valves and regulators, which are installed in either below-ground vaults or above-ground fenced facilities, and in some instance inside specially built housing. These stations not only serve to control gas pressure but also as a line of defense against over-pressurization. Many of the modern stations are design with dual run feeds to maintain continued operation of the station in the event of a failure within either of the two runs.

**Project Justification:**

Annual maintenance and inspections are used to record the condition of each station. These evaluation elements are used to identify station replacement projects. Stations identified for replacement contain one or more of the following risk factors and are prioritized accordingly: design obsolescence, active corrosion, deteriorating vaults or equipment, exposure to flooding, hazardous traffic conditions, or considered ergonomically unsafe. SoCalGas proactively targets these stations for replacement before operation and safety issues arise.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00265.0  
Category: G. Regulator Stations  
Category-Sub: 1. Regulator Stations  
Workpaper Group: 002650 - Regulator Stations

**Forecast Methodology:**

**Labor - Base YR Rec**

Given the need to continue the replacement of regulator stations at an increasing rate, SoCalGas used the 2016 Base plus incremental forecast to capture the labor expenditures for this work category. SoCalGas plans to accelerate the rate at which it replaces its regulator stations and reduce its system risk by replacing an incremental 10 regulator stations in 2018 and 18 in 2019 in addition to its baseline work. SoCalGas will rank the replacement of district regulator stations across its operating regions based on criteria that prioritize stations that have outdated designs, are prone to corrosion, have limited capacity, and have single run designs that create labor intensive routine maintenance.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-011 for calculation details.

**Non-Labor - Base YR Rec**

Given the need to continue the replacement of regulator stations at an increasing rate, SoCalGas used the 2016 Base plus incremental forecast to capture the non-labor expenditures for this work category. SoCalGas plans to accelerate the rate at which it replaces its regulator stations and reduce its system risk by replacing an incremental 10 regulator stations in 2018 and 18 in 2019 in addition to its baseline work. SoCalGas will rank the replacement of district regulator stations across its operating regions based on criteria that prioritize stations that have outdated designs, are prone to corrosion, have limited capacity, and have single run designs that create labor intensive routine maintenance.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-011 for calculation details.

**NSE - Base YR Rec**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00265.0  
 Category: G. Regulator Stations  
 Category-Sub: 1. Regulator Stations  
 Workpaper Group: 002650 - Regulator Stations

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	446	446	446	1	329	591	447	775	1,037
Non-Labor	Base YR Rec	8,188	8,188	8,188	1	5,673	10,211	8,189	13,861	18,399
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>8,634</b>	<b>8,634</b>	<b>8,634</b>	<b>2</b>	<b>6,002</b>	<b>10,802</b>	<b>8,636</b>	<b>14,636</b>	<b>19,436</b>
FTE	Base YR Rec	4.6	4.6	4.6	0.0	3.7	6.6	4.6	8.3	11.2

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
<b>2017 Total</b>		0	0	0	0	0.0	
2018	Other	328	5,672	0	6,000	3.7	FGALVAN20170626104106770
<b>Explanation:</b> i. Regulator Station Replacement Program - SoCalGas will replace 10 regulator stations in 2018 and 18 in 2019 to address and accelerate the replacement of regulator stations due to age, corrosion, limited capacity, and single run designs that create labor intensive routine maintenance. Incremental funding of \$6,000,000 and \$10,800,000 in 2018 and 2019 respectively.							
See Supplemental Workpaper SCG-04-GOM-CAP-SUP-011							
<b>2018 Total</b>		328	5,672	0	6,000	3.7	
2019	Other	590	10,210	0	10,800	6.6	FGALVAN20170626104131470
<b>Explanation:</b> i. Regulator Station Replacement Program - SoCalGas will replace 10 regulator stations in 2018 and 18 in 2019 to address and accelerate the replacement of regulator stations due to age, corrosion, limited capacity, and single run designs that create labor intensive routine maintenance. Incremental funding of \$6,000,000 and \$10,800,000 in 2018 and 2019 respectively.							
See Supplemental Workpaper SCG-04-GOM-CAP-SUP-011							
<b>2019 Total</b>		590	10,210	0	10,800	6.6	

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00265.0  
Category: G. Regulator Stations  
Category-Sub: 1. Regulator Stations  
Workpaper Group: 002650 - Regulator Stations

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	325	205	289	372	384
Non-Labor	4,366	7,011	6,202	7,047	8,189
NSE	0	0	0	0	0
<b>Total</b>	<b>4,691</b>	<b>7,216</b>	<b>6,491</b>	<b>7,418</b>	<b>8,572</b>
FTE	4.0	2.3	3.0	4.0	3.8
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	325	205	289	372	384
Non-Labor	4,366	7,011	6,202	7,047	8,189
NSE	0	0	0	0	0
<b>Total</b>	<b>4,691</b>	<b>7,216</b>	<b>6,491</b>	<b>7,418</b>	<b>8,572</b>
FTE	4.0	2.3	3.0	4.0	3.8
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	52	34	47	60	63
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>52</b>	<b>34</b>	<b>47</b>	<b>60</b>	<b>63</b>
FTE	0.7	0.4	0.5	0.7	0.7
<b>Escalation to 2016\$</b>					
Labor	-6	-3	-7	-3	0
Non-Labor	-72	-75	-133	-53	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-78</b>	<b>-77</b>	<b>-140</b>	<b>-56</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	370	236	329	428	447
Non-Labor	4,294	6,936	6,069	6,993	8,189
NSE	0	0	0	0	0
<b>Total</b>	<b>4,665</b>	<b>7,172</b>	<b>6,398</b>	<b>7,422</b>	<b>8,635</b>
FTE	4.7	2.7	3.5	4.7	4.5

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00265.0  
 Category: G. Regulator Stations  
 Category-Sub: 1. Regulator Stations  
 Workpaper Group: 002650 - Regulator Stations

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002650**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00265.0  
 Category: G. Regulator Stations  
 Category-Sub: 1. Regulator Stations  
 Workpaper Group: 002650 - Regulator Stations  
 Workpaper Detail: 002650.001 - Distribution Regulator Station expenditures for new installations, relocations, and rep  
 In-Service Date: Not Applicable  
 Description:

Represented in this work category are expenditures for the construction of new installations, relocations, and replacements of distribution regulator stations.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-011 for calculation details.

<b>Forecast in 2016 \$(000)</b>					
<b>Years</b>		<b>2017</b>	<b>2018</b>	<b>2019</b>	
Labor		405	733	995	
Non-Labor		8,004	13,676	18,214	
NSE		0	0	0	
	<b>Total</b>	<b>8,409</b>	<b>14,409</b>	<b>19,209</b>	
FTE		4.2	7.9	10.8	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00265.0  
 Category: G. Regulator Stations  
 Category-Sub: 1. Regulator Stations  
 Workpaper Group: 002650 - Regulator Stations  
 Workpaper Detail: 002650.002 - RAMP - Base - Risk ID SCG-04/SCG High-Pressure Pipeline Failure - Overpressure protecti  
 In-Service Date: Not Applicable

Description:

RAMP - Base - Risk ID SCG-04/SCG High-Pressure Pipeline Failure - Measurement and Regulation (M&R)  
 - Inspection of regulators and gauges to ensure overpressure protection is in place and maintained. Field activities related to capital construction projects.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	0	0	0
Non-Labor	185	185	185
NSE	0	0	0
<b>Total</b>	<b>185</b>	<b>185</b>	<b>185</b>
FTE	0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00265.0  
 Category: G. Regulator Stations  
 Category-Sub: 1. Regulator Stations  
 Workpaper Group: 002650 - Regulator Stations  
 Workpaper Detail: 002650.002 - RAMP - Base - Risk ID SCG-04/SCG High-Pressure Pipeline Failure - Overpressure protection

**RAMP Item # 1**

RAMP Chapter: SCG-4

Program Name: Regulator Station Inspection and Maintenance

Program Description: Inspect regulators to ensure Overpressure Protection is in place and maintained

**Risk/Mitigation:**

Risk: Catastrophic Damage involving High Pressure Pipeline Failure

Mitigation: Systems are in place to monitor and manage compliance activity schedules.

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	176	175	175
High	194	194	194

Funding Source: FERC

Forecast Method: Base Year

Work Type: Mandated

Work Type Citation: DOT

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 179

Explanation: Assumed 2016 actuals on adjusted 2015 dollars. Created to document that the mitigation is incorporated within the workpaper.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00265.0  
 Category: G. Regulator Stations  
 Category-Sub: 1. Regulator Stations  
 Workpaper Group: 002650 - Regulator Stations  
 Workpaper Detail: 002650.003 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure  
 In-Service Date: Not Applicable  
 Description:

RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure  
 - Measurement and Regulation (M&R)  
 - Inspection of regulators and gauges to ensure overpressure protection is in place and maintained. Field activities related to capital construction projects.

Forecast In 2016 \$(000)				
	Years	2017	2018	2019
Labor		42	42	42
Non-Labor		0	0	0
NSE		0	0	0
	<b>Total</b>	<b>42</b>	<b>42</b>	<b>42</b>
FTE		0.4	0.4	0.4

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00265.0  
 Category: G. Regulator Stations  
 Category-Sub: 1. Regulator Stations  
 Workpaper Group: 002650 - Regulator Stations  
 Workpaper Detail: 002650.003 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure

**RAMP Item # 1**

RAMP Chapter: SCG-10

Program Name: Measurement & Regulation and maintenance

Program Description: Inspect regulators and gauges to ensure overpressure protection is in place and maintained.

**Risk/Mitigation:**

Risk: Catastrophic Damage Involving Medium-Pressure Pipeline Failure

Mitigation: Systems are in place to monitor and manage compliance activity schedules

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	37	37	37
High	47	47	47

Funding Source: CPUC-GRC

Forecast Method: Trend

Work Type: Mandated

Work Type Citation: CFR 49 Subpart H

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 318

Explanation: Assumed 2016 actuals on adjusted 2015 dollars. Created to document that the mitigation is incorporated within the workpaper.

**Supplemental Workpapers for Workpaper Group 002650**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

SCG-04-GOM-CAP-SUP-011

Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia  
Supplemental Workpaper for Zero Based Calculations Related to Incremental Regulator Stations  
Regulator Stations Workpaper

Assumptions: [A]: Historical Total Labor Cost  
[B]: Historical Total Non-Labor Cost  
[C]: Historical FTE Count  
[D]: Total Labor and Non-Labor Cost  
[E]: Average Reg Station Cost (Labor and Non-Labor Total)  
[F]: Historical Five Year (2012 through 2016) Labor Average  
[G]: Historical Five Year (2012 through 2016) Non-Labor Average  
[H]: Historical Five Year (2012 through 2016) FTE/Labor Rate  
[I]: Forecasted Regulator Stations  
[J]: Forecasted Labor Rate  
[K]: Forecasted Non-Labor Rate  
[L]: Forecasted FTE Count

Table 1: Historical Labor and Non Labor Cost for Regulation Stations:

	Labor [A]	Non-Labor [B]	FTE [C]	Total Labor and Non-Labor [D] ([A]+[B])
2012	\$ 370,241	\$ 4,294,303	4.7	\$ 4,664,544
2013	\$ 236,430	\$ 6,935,792	2.7	\$ 7,172,222
2014	\$ 329,155	\$ 6,068,698	3.5	\$ 6,397,853
2015	\$ 428,469	\$ 6,993,477	4.7	\$ 7,421,946
2016	\$ 446,802	\$ 8,188,681	4.6	\$ 8,635,483

Average Cost per Reg Station [E]
\$ 600,000

Labor % ([A]/[D])	Non-Labor % ([B]/[D])	FTE/Labor ([A]/[C])
8%	92%	\$ 78,775
3%	97%	\$ 87,567
5%	95%	\$ 94,044
6%	94%	\$ 91,164
5%	95%	\$ 97,131

Average Labor % [F]	Average Non- Labor % [G]	Average FTE/Labor [H]
5%	95%	\$ 89,736

Table 2: Incremental Forecasted Regulator Station Cost:

	Incremental Reg Stations [I]	Labor [J] ([I]x([E]X[F])	Non-Labor [K] ([I]x([E]X[G])	FTE [L] ([I]x([E]X[H])	Total Labor and Non- Labor
2017	-	\$ -	\$ -	-	\$ -
2018	10	\$ 327,907	\$ 5,672,093	3.7	\$ 6,000,000
2019	18	\$ 590,233	\$ 10,209,767	6.6	\$ 10,800,000

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: H. Cathodic Protection Capital  
Workpaper: 001730

**Summary for Category: H. Cathodic Protection Capital**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	291	331	381	430
Non-Labor	5,171	5,989	8,053	9,081
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total</b>	<b>5,462</b>	<b>6,320</b>	<b>8,434</b>	<b>9,511</b>
FTE	2.6	3.0	3.4	3.8

**001730 Cathodic Protection (CP) Capital**

Labor	291	331	381	430
Non-Labor	5,171	5,989	8,053	9,081
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<b>Total</b>	<b>5,462</b>	<b>6,320</b>	<b>8,434</b>	<b>9,511</b>
FTE	2.6	3.0	3.4	3.8

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**001730 - Cathodic Protection (CP) Capital**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Linear	53	177	199	196	291	331	381	430
Non-Labor	5-YR Linear	2,346	3,666	4,143	3,659	5,171	5,989	8,053	9,081
NSE	5-YR Linear	0	0	0	0	0	0	0	0
<b>Total</b>		<b>2,400</b>	<b>3,842</b>	<b>4,342</b>	<b>3,855</b>	<b>5,462</b>	<b>6,320</b>	<b>8,434</b>	<b>9,511</b>
FTE	5-YR Linear	0.6	1.9	1.9	1.9	2.6	3.0	3.4	3.8

**Business Purpose:**

Budget Codes: 173, 263, 273.

This work category includes the capital expenditures associated with the installation of cathodic protection equipment used to preserve the integrity of steel pipelines by protecting them from external corrosion. These projects are in compliance with federal and state pipeline safety regulations and provides for proper cathodic protection on company facilities.

**Physical Description:**

Typical projects for this workgroup include the capital expenditures associated with the installation of new and replacement cathodic protection stations and applying cathodic protection to existing steel mains and service lines. This includes the additions of new rectifier (impressed current) sites along with associated anode installations including the necessary cathodic protection instrumentation and remote monitoring equipment; shallow well and deep well anode bed replacements for existing rectified systems; as well as installation and replacement of larger surface bed magnesium anode systems.

**Project Justification:**

The activities contained in this work category are necessary to protect and mitigate corrosion on the steel piping system, comply with federal and state safety compliance requirements, and thus maintain a safe and reliable distribution system and extend the life of the asset.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00173.0  
Category: H. Cathodic Protection Capital  
Category-Sub: 1. Cathodic Protection (CP) Capital  
Workpaper Group: 001730 - Cathodic Protection (CP) Capital

**Forecast Methodology:**

**Labor - 5-YR Linear**

SoCalGas selected a five-year (2012 through 2016) linear trend plus incremental for its labor forecast as this allows the Company to capture the increased activity necessary to respond to an aging CP system requiring increased rates of infrastructure renewal. Other forecast methods considered included the 2016 Base and the 2016 five year (2012 through 2016) historical average. Using either of these methods would not provide sufficient funding to address the routine and incremental work anticipated for this work category, thus placing the integrity of the CP and pipeline systems at risk.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-013 for calculation details regarding the installation of Remote Monitoring Units (RMU)

**Non-Labor - 5-YR Linear**

SoCalGas selected a five-year (2012 through 2016) linear trend plus incremental for its non-labor forecast as this allows the Company to capture the increased activity necessary to respond to an aging CP system requiring increased rates of infrastructure renewal. Other forecast methods considered included the 2016 Base and the 2016 five year (2012 through 2016) historical average. Using either of these methods would not provide sufficient funding to address the routine and incremental work anticipated for this work category, thus placing the integrity of the CP and pipeline systems at risk.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-013 for calculation details regarding the installation of Remote Monitoring Units (RMU)

**NSE - 5-YR Linear**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Linear	331	380	430	0	1	0	331	381	430
Non-Labor	5-YR Linear	5,490	6,054	6,618	499	1,999	2,463	5,989	8,053	9,081
NSE	5-YR Linear	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>5,821</b>	<b>6,434</b>	<b>7,048</b>	<b>499</b>	<b>2,000</b>	<b>2,463</b>	<b>6,320</b>	<b>8,434</b>	<b>9,511</b>
FTE	5-YR Linear	3.0	3.4	3.8	0.0	0.0	0.0	3.0	3.4	3.8

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
2017	Other	0	499	0	499	0.0	FGALVAN20170719162615360

**Explanation:** i. Remote Monitoring Units (RMU) - Replacement and installation of RMUs to monitor the level of protection provided by rectifier units to steel pipelines. Current RMUs rely on cellular connections to communicate with software and was built with a 2G technology that will be shut down by the end of 2019. SoCalGas will replace these units with new access technology to maintain communication with these devices and continue monitoring rectifiers. SoCalGas is requesting incremental funding of \$499,000, \$1,999,000, and \$2,462,000 in 2017, 2018, and 2019 respectively.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-013 for additional details.

<b>2017 Total</b>		0	499	0	499	0.0	
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2018	Other	0	1,999	0	1,999	0.0	FGALVAN20170719162644157
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**Explanation:** i. Remote Monitoring Units (RMU) - Replacement and installation of RMUs to monitor the level of protection provided by rectifier units to steel pipelines. Current RMUs rely on cellular connections to communicate with software and was built with a 2G technology that will be shut down by the end of 2019. SoCalGas will replace these units with new access technology to maintain communication with these devices and continue monitoring rectifiers. SoCalGas is requesting incremental funding of \$499,000, \$1,999,000, and \$2,462,000 in 2017, 2018, and 2019 respectively.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-013 for additional details.

<b>2018 Total</b>		0	1,999	0	1,999	0.0	
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2019	Other	0	2,462	0	2,462	0.0	FGALVAN20170719162702413
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*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
<b>Explanation:</b>							
i. Remote Monitoring Units (RMU) - Replacement and installation of RMUs to monitor the level of protection provided by rectifier units to steel pipelines. Current RMUs rely on cellular connections to communicate with software and was built with a 2G technology that will be shut down by the end of 2019. SoCalGas will replace these units with new access technology to maintain communication with these devices and continue monitoring rectifiers. SoCalGas is requesting incremental funding of \$499,000, \$1,999,000, and \$2,462,000 in 2017, 2018, and 2019 respectively.							
See Supplemental Workpaper SCG-04-GOM-CAP-SUP-013 for additional details.							
<b>2019 Total</b>		0	2,462	0	2,462	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	47	153	175	170	250
Non-Labor	2,386	3,706	4,234	3,687	5,171
NSE	0	0	0	0	0
<b>Total</b>	<b>2,432</b>	<b>3,859</b>	<b>4,409</b>	<b>3,857</b>	<b>5,421</b>
FTE	0.5	1.6	1.6	1.6	2.2
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	47	153	175	170	250
Non-Labor	2,386	3,706	4,234	3,687	5,171
NSE	0	0	0	0	0
<b>Total</b>	<b>2,432</b>	<b>3,859</b>	<b>4,409</b>	<b>3,857</b>	<b>5,421</b>
FTE	0.5	1.6	1.6	1.6	2.2
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	7	25	29	28	41
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>7</b>	<b>25</b>	<b>29</b>	<b>28</b>	<b>41</b>
FTE	0.1	0.3	0.3	0.3	0.4
<b>Escalation to 2016\$</b>					
Labor	-1	-2	-4	-1	0
Non-Labor	-39	-40	-91	-28	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-40</b>	<b>-42</b>	<b>-95</b>	<b>-29</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	53	177	199	196	291
Non-Labor	2,346	3,666	4,143	3,659	5,171
NSE	0	0	0	0	0
<b>Total</b>	<b>2,400</b>	<b>3,842</b>	<b>4,342</b>	<b>3,855</b>	<b>5,462</b>
FTE	0.6	1.9	1.9	1.9	2.6

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 001730**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital  
 Workpaper Detail: 001730.001 - Capital expenditures associated with the installation of cathodic protection equipment  
 In-Service Date: Not Applicable  
 Description:

Typical projects for this workgroup include the capital expenditures associated with the installation of new and replacement cathodic protection stations and applying cathodic protection to existing steel mains and service lines. This includes the additions of new rectifier (impressed current) sites including the necessary cathodic protection instrumentation and remote monitoring unit equipment (RMUs); shallow well and deep well anode bed replacements; as well as installation and replacement of larger surface bed magnesium anode systems.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		331	381	430
Non-Labor		1,582	958	1,029
NSE		0	0	0
	<b>Total</b>	<b>1,913</b>	<b>1,339</b>	<b>1,459</b>
FTE		3.0	3.4	3.8

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital  
 Workpaper Detail: 001730.002 - Installation and replacement of Remote Monitoring Units (RMU) for Cathodic Protection R  
 In-Service Date: Not Applicable  
 Description:

SoCalGas utilizes RMUs to monitor the level of cathodic protection provided by rectifier units to steel pipelines. These units allow employees to complete mandated bi-monthly inspections to verify that the level of current from the rectifiers is protecting steel pipelines adequately. Similar to electronic pressure monitoring units, RMUs send out alarm notifications to the department monitoring these devices when the current levels are below or above a pre-set tolerance. This allows SoCalGas to send personnel to determine what triggered the alarm and address the issue. Currently RMUs rely on cellular connections to communicate with software and was built with a 2G technology that will be shut down by the end of 2019. SoCalGas will replace these units with new access technology to maintain communication with these devices and continue monitoring rectifiers.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-013 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		0	0	0
Non-Labor		499	1,999	2,462
NSE		0	0	0
	<b>Total</b>	<b>499</b>	<b>1,999</b>	<b>2,462</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital  
 Workpaper Detail: 001730.003 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Cathodic Protection  
 In-Service Date: Not Applicable

Description:

RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Cathodic Protection Capital Activities (Per Region)

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		0	0	0
Non-Labor		3,908	5,096	5,590
NSE		0	0	0
	<b>Total</b>	<b>3,908</b>	<b>5,096</b>	<b>5,590</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00173.0  
 Category: H. Cathodic Protection Capital  
 Category-Sub: 1. Cathodic Protection (CP) Capital  
 Workpaper Group: 001730 - Cathodic Protection (CP) Capital  
 Workpaper Detail: 001730.003 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Cathodic Protection (Per

**RAMP Item # 1**

RAMP Chapter: SCG-10

Program Name: Cathodic Protection (Per Region)

Program Description: System Protection of all distribution system

**Risk/Mitigation:**

Risk: Catastrophic Damage Involving Medium-Pressure Pipeline Failure

Mitigation: Systems are in place to monitor and manage compliance activity schedules

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	3,454	4,504	4,940
High	3,908	5,096	5,590

Funding Source: FERC

Forecast Method: Trend

Work Type: Mandated

Work Type Citation: CFR 49 Subpart I

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 3727

Explanation: Assumed 2016 actuals on adjusted 2015 dollars. Created to document that the mitigation is incorporated within the workpaper.

**Supplemental Workpapers for Workpaper Group 001730**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-013**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia**  
**Supplemental Workpaper Calculations for Remote Monitoring Units**  
**Cathodic Protection Workpaper**

Assumptions:

Amounts are shown in thousands of 2016 dollars and include vacation and sick.

			# Units	Cost per Unit	Installation Cost	Total Cost	Total
2017	Replacement	Cellular	130	\$ 2,018	\$ 735	\$ 357,890	\$ 499,061
		Satelite	2	\$ 2,402	\$ 735	\$ 6,274	
	New Installation	Cellular	49	\$ 2,018	\$ 735	\$ 134,897	
		Satelite	0	\$ 2,402	\$ 735	\$ -	
2018	Replacement	Cellular	248	\$ 2,018	\$ 735	\$ 682,744	\$ 1,999,446
		Satelite	0	\$ 2,402	\$ 735	\$ -	
	New Installation	Cellular	476	\$ 2,018	\$ 735	\$ 1,310,428	
		Satelite	2	\$ 2,402	\$ 735	\$ 6,274	
2019	Replacement	Cellular	283	\$ 2,018	\$ 735	\$ 779,099	\$ 2,461,950
		Satelite	0	\$ 2,402	\$ 735	\$ -	
	New Installation	Cellular	609	\$ 2,018	\$ 735	\$ 1,676,577	
		Satelite	2	\$ 2,402	\$ 735	\$ 6,274	

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: I. Pipeline Relocations - Freeway  
Workpaper: 002610

**Summary for Category: I. Pipeline Relocations - Freeway**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	94	171	171	171
Non-Labor	6,457	7,666	7,666	7,666
NSE	0	0	0	0
<b>Total</b>	<b>6,551</b>	<b>7,837</b>	<b>7,837</b>	<b>7,837</b>
FTE	0.8	1.9	1.9	1.9

**002610 Pipeline Relocations - Freeway**

Labor	94	171	171	171
Non-Labor	6,457	7,666	7,666	7,666
NSE	0	0	0	0
<b>Total</b>	<b>6,551</b>	<b>7,837</b>	<b>7,837</b>	<b>7,837</b>
FTE	0.8	1.9	1.9	1.9

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**002610 - Pipeline Relocations - Freeway**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00261.0  
 Category: I. Pipeline Relocations - Freeway  
 Category-Sub: 1. Pipeline Relocations - Freeway (Collectible)  
 Workpaper Group: 002610 - Pipeline Relocations - Freeway

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Average	246	199	174	143	94	171	171	171
Non-Labor	5-YR Average	8,680	9,992	10,060	3,138	6,457	7,666	7,666	7,666
NSE	5-YR Average	0	0	0	0	0	0	0	0
<b>Total</b>		<b>8,926</b>	<b>10,191</b>	<b>10,234</b>	<b>3,282</b>	<b>6,551</b>	<b>7,837</b>	<b>7,837</b>	<b>7,837</b>
FTE	5-YR Average	2.8	2.2	1.9	1.6	0.8	1.9	1.9	1.9

**Business Purpose:**

Budget Codes: 261, 268.

Freeway work in SoCalGas is driven by external agencies, such as the California Department of Transportation. These agencies submit requests for SoCalGas to relocate pipe that would, in its current location, interfere with planned construction or reconstruction of freeways. The work in this category includes expenditures associated with relocating or altering SoCalGas facilities in response to these external requests, as specified under the provisions of SoCalGas' Caltrans Master Agreement.

**Physical Description:**

Gas pipeline relocation projects are performed to establish adequate clearance to accommodate freeway construction improvements and/or expansions. These pipeline relocation projects include all sizes of distribution main and associated service lines, meter set assemblies and related gas facilities. Freeway relocation projects include altering:

- Pipeline crossing over and under a freeway bridge span.
- Any gas facility interfering with construction and located within CalTrans' right-of-way.
- Any gas facility outside of CalTrans' right-of-way deemed to interfere with freeway construction.

**Project Justification:**

The exact timing and number of freeway pipeline projects are driven by outside agencies, thus expenditures in this category are dependent on the number, extent and timing of these requests and are outside of SoCalGas' control. However, when projects do occur, SoCalGas must complete its portion of the work in a timely manner in an effort to not cause construction schedule delays for the agency.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00261.0  
Category: I. Pipeline Relocations - Freeway  
Category-Sub: 1. Pipeline Relocations - Freeway (Collectible)  
Workpaper Group: 002610 - Pipeline Relocations - Freeway

**Forecast Methodology:**

**Labor - 5-YR Average**

SoCalGas forecasted expenditures for this work category using the five-year (2012 through 2016) historical average. This average is most representative of future work requirements and expected expenditures, as it captures typical fluctuations in project costs from year to year and provides for special projects taking place during the forecast period. The labor is a small portion of this workgroup. A separate workpaper sub was created to capture the forecasted collectible portion of this work category.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-003 for calculation details.

**Non-Labor - 5-YR Average**

SoCalGas forecasted expenditures for this work category using the five-year (2012 through 2016) historical average. This average is most representative of future work requirements and expected expenditures, as it captures typical fluctuations in project costs from year to year and provides for special projects taking place during the forecast period. A separate workpaper sub was created to capture the forecasted collectible portion of this work category.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-003 for calculation details.

**NSE - 5-YR Average**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00261.0  
 Category: I. Pipeline Relocations - Freeway  
 Category-Sub: 1. Pipeline Relocations - Freeway (Collectible)  
 Workpaper Group: 002610 - Pipeline Relocations - Freeway

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	171	171	171	0	0	0	171	171	171
Non-Labor	5-YR Average	7,665	7,665	7,665	1	1	1	7,666	7,666	7,666
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>7,836</b>	<b>7,836</b>	<b>7,836</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>7,837</b>	<b>7,837</b>	<b>7,837</b>
FTE	5-YR Average	1.9	1.9	1.9	0.0	0.0	0.0	1.9	1.9	1.9

**Forecast Adjustment Details**

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
2017 Total		0	0	0	0	0.0	
2018 Total		0	0	0	0	0.0	
2019 Total		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00261.0  
 Category: I. Pipeline Relocations - Freeway  
 Category-Sub: 1. Pipeline Relocations - Freeway (Collectible)  
 Workpaper Group: 002610 - Pipeline Relocations - Freeway

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	215	173	152	124	81
Non-Labor	8,826	10,100	10,281	3,162	6,457
NSE	0	0	0	0	0
<b>Total</b>	<b>9,041</b>	<b>10,272</b>	<b>10,433</b>	<b>3,286</b>	<b>6,538</b>
FTE	2.4	1.9	1.6	1.4	0.7
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	215	173	152	124	81
Non-Labor	8,826	10,100	10,281	3,162	6,457
NSE	0	0	0	0	0
<b>Total</b>	<b>9,041</b>	<b>10,272</b>	<b>10,433</b>	<b>3,286</b>	<b>6,538</b>
FTE	2.4	1.9	1.6	1.4	0.7
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	34	29	25	20	13
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>34</b>	<b>29</b>	<b>25</b>	<b>20</b>	<b>13</b>
FTE	0.4	0.3	0.3	0.2	0.1
<b>Escalation to 2016\$</b>					
Labor	-4	-2	-4	-1	0
Non-Labor	-146	-108	-220	-24	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-150</b>	<b>-110</b>	<b>-224</b>	<b>-25</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	246	199	174	143	94
Non-Labor	8,680	9,992	10,060	3,138	6,457
NSE	0	0	0	0	0
<b>Total</b>	<b>8,926</b>	<b>10,191</b>	<b>10,234</b>	<b>3,282</b>	<b>6,551</b>
FTE	2.8	2.2	1.9	1.6	0.8

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00261.0  
 Category: I. Pipeline Relocations - Freeway  
 Category-Sub: 1. Pipeline Relocations - Freeway (Collectible)  
 Workpaper Group: 002610 - Pipeline Relocations - Freeway

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002610**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00261.0  
 Category: I. Pipeline Relocations - Freeway  
 Category-Sub: 1. Pipeline Relocations - Freeway (Collectible)  
 Workpaper Group: 002610 - Pipeline Relocations - Freeway  
 Workpaper Detail: 002610.001 - Freeway work in SoCalGas driven by external agencies such as California Department of T  
 In-Service Date: Not Applicable  
 Description:

Freeway work in SoCalGas is driven by external agencies such as the California Department of Transportation. These agencies submit requests for SoCalGas to relocate pipe that would, in its current location, interfere with planned construction or reconstruction of freeways. The work in this category includes expenditures associated with relocating or altering SoCalGas facilities in response - Collectible

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-003 for calculation details.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	16	16	16
Non-Labor	728	728	728
NSE	0	0	0
<b>Total</b>	<b>744</b>	<b>744</b>	<b>744</b>
FTE	0.2	0.2	0.2

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00261.0  
 Category: I. Pipeline Relocations - Freeway  
 Category-Sub: 1. Pipeline Relocations - Freeway (Collectible)  
 Workpaper Group: 002610 - Pipeline Relocations - Freeway  
 Workpaper Detail: 002610.002 - Freeway work in SoCalGas driven by external agencies such as California DOT - Non Colle  
 In-Service Date: Not Applicable

Description:

Freeway work in SoCalGas is driven by external agencies such as the California Department of Transportation. These agencies submit requests for SoCalGas to relocate pipe that would, in its current location, interfere with planned construction or reconstruction of freeways. The work in this category includes expenditures associated with relocating or altering SoCalGas facilities in response- Non Collectible

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-003 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		155	155	155
Non-Labor		6,938	6,938	6,938
NSE		0	0	0
	<b>Total</b>	<b>7,093</b>	<b>7,093</b>	<b>7,093</b>
FTE		1.7	1.7	1.7

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 002610**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-003**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia**  
**Supplemental Workpaper Calculations for Collectible Cost Related to Freeway**  
**Pipeline Replacements - Freeway Workpaper**

Assumptions:

\* Direct Cash Credits were excluded from historical data, but are shown here to calculate the collectible portion of capital.

\*\* The forecasted ratio of cash to total direct cost is the historical five-year (2012-2016) average ratio. This ratio is applied to the forecasted amount to calculate the collectible and non-collectible portions.

Amounts are shown in thousands of 2016 dollars and include vacation and sick.

		Adjusted Recorded History					2012-2016 Total	Forecast (5 Year Average)		
		2012	2013	2014	2015	2016		2017	2018	2019
<b>Total Capital</b>										
[A]	Labor	\$ 247	\$ 199	\$ 174	\$ 143	\$ 94		\$ 171	\$ 171	\$ 171
[B]	Non-Labor	\$ 8,680	\$ 9,992	\$ 10,060	\$ 3,138	\$ 6,457		\$ 7,666	\$ 7,666	\$ 7,666
[C]	<b>Total</b>	<b>\$ 8,927</b>	<b>\$ 10,191</b>	<b>\$ 10,234</b>	<b>\$ 3,282</b>	<b>\$ 6,551</b>	<b>\$ 39,184</b>	<b>\$ 7,837</b>	<b>\$ 7,837</b>	<b>\$ 7,837</b>
[D]	FTEs	2.8	2.2	1.9	1.6	0.8		1.9	1.9	1.9
<b>Collectible Ratio Calculations</b>										
[E]	Historical Direct Cash Credits*	\$ (650)		\$ (1,139)	\$ (517)	\$ (1,446)	\$ (3,752)			
[F] (-[E]/[C])	Ratio Cash to Total Direct Cost**	7%	0%	11%	16%	22%	10%	10%	10%	10%
<b>Collectible Portion of Forecast</b>										
[G] ([A]x[F])	Labor							\$ 16	\$ 16	\$ 16
[H] ([B]x[F])	Non-Labor							\$ 728	\$ 728	\$ 728
([G]+[H])	<b>Total</b>							<b>\$ 744</b>	<b>\$ 744</b>	<b>\$ 744</b>
[I] ([D]x[F])	FTEs							0.2	0.2	0.2
<b>Non-Collectible Portion of Forecast</b>										
[J] ([A]-[G])	Labor							\$ 155	\$ 155	\$ 155
[K] ([B]-[H])	Non-Labor							\$ 6,937	\$ 6,937	\$ 6,937
([J]+[K])	<b>Total</b>							<b>\$ 7,092</b>	<b>\$ 7,092</b>	<b>\$ 7,092</b>
[D]-[I]	FTEs							1.7	1.7	1.7

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: J. Pipeline Relocations - Franchise  
Workpaper: 002620

**Summary for Category: J. Pipeline Relocations - Franchise**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	419	530	530	530
Non-Labor	12,900	17,364	17,364	17,364
NSE	0	0	0	0
<b>Total</b>	<b>13,319</b>	<b>17,894</b>	<b>17,894</b>	<b>17,894</b>
FTE	4.6	6.3	6.3	6.3

**002620 Pipeline Relocations - Franchise**

Labor	419	530	530	530
Non-Labor	12,900	17,364	17,364	17,364
NSE	0	0	0	0
<b>Total</b>	<b>13,319</b>	<b>17,894</b>	<b>17,894</b>	<b>17,894</b>
FTE	4.6	6.3	6.3	6.3

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**002620 - Pipeline Relocations - Franchise**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00262.0  
 Category: J. Pipeline Relocations - Franchise  
 Category-Sub: 1. Pipeline Relocations - Franchise (Collectible)  
 Workpaper Group: 002620 - Pipeline Relocations - Franchise

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Average	633	644	487	467	419	530	530	530
Non-Labor	5-YR Average	16,254	15,746	18,236	23,686	12,900	17,364	17,364	17,364
NSE	5-YR Average	0	0	0	0	0	0	0	0
<b>Total</b>		<b>16,886</b>	<b>16,389</b>	<b>18,723</b>	<b>24,153</b>	<b>13,319</b>	<b>17,894</b>	<b>17,894</b>	<b>17,894</b>
FTE	5-YR Average	8.0	7.8	5.7	5.4	4.6	6.3	6.3	6.3

**Business Purpose:**

Budget Codes: 262, 269, 271, 272.

Franchise work in SoCalGas is driven by external agencies such as the cities, counties, or state. These agencies submit requests for SoCalGas to relocate pipe that would, in its current location, interfere with the construction or reconstruction of streets and other public works projects. The work in this category includes expenditures associated with relocating or altering SoCalGas facilities in response to these external requests, as specified under the provisions of SoCalGas' franchise agreements with city, county, or state agencies.

**Physical Description:**

Franchise related pipeline relocation projects are performed to establish adequate clearance to accommodate public works construction improvements and/or expansions. These pipeline relocation projects include all sizes of distribution main and associated service lines and related pipeline facilities including meter set assemblies. Some examples of the type of municipality work that drives franchise pipe relocations include:

- Street widening, resurfacing, or repairs.
- Storm drain work.
- Municipal water work.
- Sewer work

**Project Justification:**

The exact timing and number of franchise pipeline projects are driven by outside agencies. Therefore, expenditures in this category are dependent on the number, extent, and timing of these requests and are outside of SoCalGas' control. However, when projects do occur, SoCalGas must complete its portion of the work in a timely manner in an effort to not cause construction schedule delays for the municipality or agency. SoCalGas expects to see requests from municipalities for pipe relocations and alterations at the same rate it has been seeing over the historical five-year period (2012 through 2016). Some of the factors that are expected to continue in the amount of municipality work include the following:

- Continued positive economic conditions.
- Availability of funding to municipalities.
- Population growth and density.
- Aging public infrastructure.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00262.0  
Category: J. Pipeline Relocations - Franchise  
Category-Sub: 1. Pipeline Relocations - Franchise (Collectible)  
Workpaper Group: 002620 - Pipeline Relocations - Franchise

**Forecast Methodology:**

**Labor - 5-YR Average**

SoCalGas reviewed the 2012 through 2016 historical spending for this work category. As economic conditions continue in a positive direction, municipalities will continue to improve their infrastructure. The labor is a small portion of this workgroup. Thus, to reflect the anticipated rate of pipeline replacements related to franchise work and to account for the historical fluctuations in project costs from year to year, SoCalGas projects expenses for this workgroup will follow the five-year (2012 through 2016) historical average. A separate workpaper sub was created to capture the forecasted collectible portion of this work category.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-004 for calculation details.

**Non-Labor - 5-YR Average**

SoCalGas reviewed the 2012 through 2016 historical spending for this work category. As economic conditions continue in a positive direction, municipalities will continue to improve their infrastructure. Thus, to reflect the anticipated rate of pipeline replacements related to franchise work and to account for the historical fluctuations in project costs from year to year, SoCalGas projects expenses for this workgroup will follow the five-year (2012 through 2016) historical average. A separate workpaper sub was created to capture the forecasted collectible portion of this work category.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-004 for calculation details.

**NSE - 5-YR Average**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00262.0  
 Category: J. Pipeline Relocations - Franchise  
 Category-Sub: 1. Pipeline Relocations - Franchise (Collectible)  
 Workpaper Group: 002620 - Pipeline Relocations - Franchise

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	529	529	529	1	1	1	530	530	530
Non-Labor	5-YR Average	17,364	17,364	17,364	0	0	0	17,364	17,364	17,364
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>17,893</b>	<b>17,893</b>	<b>17,893</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>17,894</b>	<b>17,894</b>	<b>17,894</b>
FTE	5-YR Average	6.3	6.3	6.3	0.0	0.0	0.0	6.3	6.3	6.3

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
2017	Total	0	0	0	0	0.0	
2018	Total	0	0	0	0	0.0	
2019	Total	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00262.0  
 Category: J. Pipeline Relocations - Franchise  
 Category-Sub: 1. Pipeline Relocations - Franchise (Collectible)  
 Workpaper Group: 002620 - Pipeline Relocations - Franchise

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	554	558	428	405	360
Non-Labor	16,527	15,916	18,635	23,866	12,900
NSE	0	0	0	0	0
<b>Total</b>	<b>17,081</b>	<b>16,474</b>	<b>19,063</b>	<b>24,271</b>	<b>13,260</b>
FTE	6.9	6.7	4.9	4.5	3.9
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	554	558	428	405	360
Non-Labor	16,527	15,916	18,635	23,866	12,900
NSE	0	0	0	0	0
<b>Total</b>	<b>17,081</b>	<b>16,474</b>	<b>19,063</b>	<b>24,271</b>	<b>13,260</b>
FTE	6.9	6.7	4.9	4.5	3.9
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	89	93	70	66	59
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>89</b>	<b>93</b>	<b>70</b>	<b>66</b>	<b>59</b>
FTE	1.1	1.1	0.8	0.8	0.7
<b>Escalation to 2016\$</b>					
Labor	-11	-7	-11	-4	0
Non-Labor	-273	-170	-399	-180	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-284</b>	<b>-177</b>	<b>-410</b>	<b>-184</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	633	644	487	467	419
Non-Labor	16,254	15,746	18,236	23,686	12,900
NSE	0	0	0	0	0
<b>Total</b>	<b>16,886</b>	<b>16,389</b>	<b>18,723</b>	<b>24,153</b>	<b>13,319</b>
FTE	8.0	7.8	5.7	5.3	4.6

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00262.0  
 Category: J. Pipeline Relocations - Franchise  
 Category-Sub: 1. Pipeline Relocations - Franchise (Collectible)  
 Workpaper Group: 002620 - Pipeline Relocations - Franchise

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002620**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00262.0  
 Category: J. Pipeline Relocations - Franchise  
 Category-Sub: 1. Pipeline Relocations - Franchise (Collectible)  
 Workpaper Group: 002620 - Pipeline Relocations - Franchise  
 Workpaper Detail: 002620.001 - Work in SoCalGas driven by external agencies such as the cities, counties, or state - C  
 In-Service Date: Not Applicable  
 Description:

Franchise work in SoCalGas is driven by external agencies such as the cities, counties, or state. These agencies submit requests for SoCalGas to relocate pipe that would, in its current location, interfere with the construction or reconstruction of streets and other public works projects. The work in this category includes expenditures associated with relocating or altering SoCalGas facilities in response to these external requests, as specified under the provisions of SoCalGas' franchise agreements with city, county, or state agencies - Collectible Work

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-004 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<u>2017</u>	<u>2018</u>	<u>2019</u>
Labor		47	47	47
Non-Labor		1,528	1,528	1,528
NSE		0	0	0
	<b>Total</b>	<b><u>1,575</u></b>	<b><u>1,575</u></b>	<b><u>1,575</u></b>
FTE		0.6	0.6	0.6

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00262.0  
 Category: J. Pipeline Relocations - Franchise  
 Category-Sub: 1. Pipeline Relocations - Franchise (Collectible)  
 Workpaper Group: 002620 - Pipeline Relocations - Franchise  
 Workpaper Detail: 002620.002 - SoCalGas work driven by external agencies such as the cities, counties, or state - Non  
 In-Service Date: Not Applicable

Description:

Franchise work in SoCalGas is driven by external agencies such as the cities, counties, or state. These agencies submit requests for SoCalGas to relocate pipe that would, in its current location, interfere with the construction or reconstruction of streets and other public works projects. The work in this category includes expenditures associated with relocating or altering SoCalGas facilities in response to these external requests, as specified under the provisions of SoCalGas' franchise agreements with city, county, or state agencies. - Non Collectible

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-004 for calculation details.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	483	483	483
Non-Labor	15,836	15,836	15,836
NSE	0	0	0
<b>Total</b>	<b>16,319</b>	<b>16,319</b>	<b>16,319</b>
FTE	5.7	5.7	5.7

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 002620**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-004**

**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco Mejia  
Supplemental Workpaper Calculations for Collectible Cost Related to Franchise  
Pipeline Replacements - Franchise Workpaper**

Assumptions:

\* Direct Cash Credits were excluded from historical data, but are shown here to calculate the collectible portion of capital.

\*\* The forecasted ratio of cash to total direct cost is the historical five-year (2012-2016) average ratio. This ratio is applied to the forecasted amount to calculate the collectible and non-collectible portions.

Amounts are shown in thousands of 2016 dollars and include vacation and sick.

		Adjusted Recorded History					2012-2016 Total	Forecast (5 Year Average)		
		2012	2013	2014	2015	2016		2017	2018	2019
<b>Total Capital</b>										
[A]	Labor	\$ 633	\$ 644	\$ 487	\$ 467	\$ 419		\$ 530	\$ 530	\$ 530
[B]	Non-Labor	\$ 16,254	\$ 15,746	\$ 18,236	\$ 23,686	\$ 12,900		\$ 17,364	\$ 17,364	\$ 17,364
[C]	<b>Total</b>	<b>\$ 16,887</b>	<b>\$ 16,390</b>	<b>\$ 18,723</b>	<b>\$ 24,153</b>	<b>\$ 13,319</b>	<b>\$ 89,472</b>	<b>\$ 17,894</b>	<b>\$ 17,894</b>	<b>\$ 17,894</b>
[D]	FTEs	8.0	7.8	5.7	5.4	4.6		6.3	6.3	6.3
<b>Collectible Ratio Calculations</b>										
[E]	First Direct Cash Credits*	\$ (2,383)	\$ (866)	\$ (2,829)	\$ (541)	\$ (1,259)	\$ (7,878)			
[F] (-[E]/[C])	Ratio Cash to Total Direct Cost**	14%	5%	15%	2%	9%	9%	9%	9%	9%
<b>Collectible Portion of Forecast</b>										
[G] ([A]x[F])	Labor							\$ 47	\$ 47	\$ 47
[H] ([B]x[F])	Non-Labor							\$ 1,528	\$ 1,528	\$ 1,528
[(G)+[H])	<b>Total</b>							<b>\$ 1,575</b>	<b>\$ 1,575</b>	<b>\$ 1,575</b>
[I] ([D]x[F])	FTEs							0.6	0.6	0.6
<b>Non-Collectible Portion of Forecast</b>										
[J] ([A]-[G])	Labor							\$ 483	\$ 483	\$ 483
[K] ([B]-[H])	Non-Labor							\$ 15,836	\$ 15,836	\$ 15,836
[(J)+[K])	<b>Total</b>							<b>\$ 16,320</b>	<b>\$ 16,320</b>	<b>\$ 16,320</b>
[(D)-[I])	FTEs							5.7	5.7	5.7

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: K. Other Distribution Capital Projects & Meter Guards  
Workpaper: VARIOUS

**Summary for Category: K. Other Distribution Capital Projects & Meter Guards**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	469	470	1,021	1,021
Non-Labor	4,314	3,186	10,575	10,575
NSE	0	0	0	0
<b>Total</b>	<b>4,783</b>	<b>3,656</b>	<b>11,596</b>	<b>11,596</b>
FTE	5.4	5.5	12.4	12.4

**002640 Meter Guards**

Labor	279	279	830	830
Non-Labor	80	80	7,469	7,469
NSE	0	0	0	0
<b>Total</b>	<b>359</b>	<b>359</b>	<b>8,299</b>	<b>8,299</b>
FTE	3.4	3.4	10.3	10.3

**002700 Other Distribution Capital Projects**

Labor	190	191	191	191
Non-Labor	4,234	3,106	3,106	3,106
NSE	0	0	0	0
<b>Total</b>	<b>4,424</b>	<b>3,297</b>	<b>3,297</b>	<b>3,297</b>
FTE	2.0	2.1	2.1	2.1

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group  
002640 - Meter Guards**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00264.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002640 - Meter Guards

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
Years									
Labor	Zero-Based	473	277	209	192	279	279	830	830
Non-Labor	Zero-Based	206	105	175	64	80	80	7,469	7,469
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>678</b>	<b>381</b>	<b>384</b>	<b>256</b>	<b>358</b>	<b>359</b>	<b>8,299</b>	<b>8,299</b>
FTE	Zero-Based	6.6	3.6	2.8	2.4	3.4	3.4	10.3	10.3

**Business Purpose:**

Budget Code: 264  
 Meter guards are installed to protect the meter set assemblies at existing customer locations from vehicular traffic in accordance with CPUC General Order 112-F and 49 CFR 192.353(a). The meter guards are installed at targeted sites, where meter set assembly location and/or design warrants consideration of traffic patterns and exposure to other potential sources of impact damage.

**Physical Description:**

Meter guards consist of pipeline compatible materials with sufficient structural integrity to guard against damage to meter set assemblies. Posts installed into the ground with welded cross braces, usually made of steel pipe, are fabricated and installed by SoCalGas field crews and contractors.

**Project Justification:**

Meter guard installations support public safety and system integrity in a growing service territory. They serve as a first line of defense against vehicular impact in a service territory, where in many areas parking is a premium and space for meter set assembly installations is limited.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00264.0  
Category: K. Other Distribution Capital Projects & Meter Guards  
Category-Sub: 1. Other Distribution Capital Projects  
Workpaper Group: 002640 - Meter Guards

**Forecast Methodology:**

**Labor - Zero-Based**

Given the significant increase in meter guard orders and the anticipated increase in the next few years due to the continued increase in MSA inspections, SoCalGas forecasted the labor work in this category using a zero-based approach. For the year 2017, SoCalGas used the Base Year 2016 to forecast the level of expenditure in this capital category. During 2017, SoCalGas will develop a plan to address the installation of the incremental meter guards, for implementation starting in 2018. SoCalGas forecasts installing meter guards at approximately 13,000 MSA locations each year in 2018 and 2019.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-014 for calculation details.

**Non-Labor - Zero-Based**

Given the significant increase in meter guard orders and the anticipated increase in the next few years due to the continued increase in MSA inspections, SoCalGas forecasted the non-labor work in this category using a zero-based approach. For the year 2017, SoCalGas used the Base Year 2016 to forecast the level of expenditure in this capital category. During 2017, SoCalGas will develop a plan to address the installation of the incremental meter guards, for implementation starting in 2018. SoCalGas forecasts installing meter guards at approximately 13,000 MSA locations each year in 2018 and 2019.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-014 for calculation details.

**NSE - Zero-Based**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00264.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002640 - Meter Guards

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Zero-Based	279	830	830	0	0	0	279	830	830
Non-Labor	Zero-Based	80	7,469	7,469	0	0	0	80	7,469	7,469
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>359</b>	<b>8,299</b>	<b>8,299</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>359</b>	<b>8,299</b>	<b>8,299</b>
FTE	Zero-Based	3.4	10.3	10.3	0.0	0.0	0.0	3.4	10.3	10.3

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00264.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002640 - Meter Guards

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	414	240	184	166	239
Non-Labor	209	106	179	65	80
NSE	0	0	0	0	0
<b>Total</b>	<b>623</b>	<b>346</b>	<b>363</b>	<b>231</b>	<b>319</b>
FTE	5.7	3.1	2.4	2.1	2.9
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	414	240	184	166	239
Non-Labor	209	106	179	65	80
NSE	0	0	0	0	0
<b>Total</b>	<b>623</b>	<b>346</b>	<b>363</b>	<b>231</b>	<b>319</b>
FTE	5.7	3.1	2.4	2.1	2.9
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	66	40	30	27	39
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>66</b>	<b>40</b>	<b>30</b>	<b>27</b>	<b>39</b>
FTE	0.9	0.5	0.4	0.3	0.5
<b>Escalation to 2016\$</b>					
Labor	-8	-3	-5	-1	0
Non-Labor	-3	-1	-4	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-11</b>	<b>-4</b>	<b>-8</b>	<b>-2</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	473	277	209	192	279
Non-Labor	206	105	175	64	80
NSE	0	0	0	0	0
<b>Total</b>	<b>678</b>	<b>381</b>	<b>384</b>	<b>256</b>	<b>358</b>
FTE	6.6	3.6	2.8	2.4	3.4

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00264.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002640 - Meter Guards

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2012	2013	2014	2015	2016
Labor		0	0	0	0	0
Non-Labor		0	0	0	0	0
NSE		0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE		0.0	0.0	0.0	0.0	0.0

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002640**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00264.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002640 - Meter Guards  
 Workpaper Detail: 002640.001 - Meter guards installed to protect the meter set assemblies at existing customer locatio  
 In-Service Date: Not Applicable

Description:

Meter guards are installed to protect the meter set assemblies at existing customer locations from vehicular traffic in accordance with CPUC General Order 112-F and 49 CFR 192.353(a). The meter guards are installed at targeted sites, where meter set assembly location and/or design warrants consideration of traffic patterns and exposure to other potential sources of impact damage.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-014 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		279	830	830
Non-Labor		80	7,469	7,469
NSE		0	0	0
	<b>Total</b>	<b>359</b>	<b>8,299</b>	<b>8,299</b>
FTE		3.4	10.3	10.3

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 002640**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-014**

**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia  
Supplemental Workpaper Calculations for Meter Guard Installations  
Meter Guards Workpaper**

Assumptions:

- [A]: Total Orders to be Completed
- [B]: Total Labor and Non Labor
- [C]: Average Cost Per Order
- [D]: Total Labor Expense
- [E]: Blended 2016 rate for Lead Construction Tech and Construction Tech
- [F]: Yearly Factor
- [G]: Number of FTEs

**Meter Guard Forecast**

	[A]	[B]	[C] (B/A)
	Total Orders	Total Cost	Cost Per Order
2018	12,848	\$ 8,299,009	\$ 646
2019	12,848	\$ 8,299,009	\$ 646

	<u>FTEs</u>			
	[D]	[E]	[F]	[G] (D/E/F)
	Total Labor Per Year	Wage Rate	Yearly Factor	FTE's
2018	\$ 829,901	\$ 38.54	2,088	10.3
2019	\$ 829,901	\$ 38.54	2,088	10.3

Amounts are shown in 2016 dollars and include vacation and sick.

**Beginning of Workpaper Group**  
**002700 - Other Distribution Capital Projects**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Average	130	383	91	158	190	191	191	191
Non-Labor	5-YR Average	2,957	3,696	2,125	2,515	4,234	3,106	3,106	3,106
NSE	5-YR Average	0	0	0	0	0	0	0	0
<b>Total</b>		<b>3,088</b>	<b>4,079</b>	<b>2,216</b>	<b>2,674</b>	<b>4,424</b>	<b>3,297</b>	<b>3,297</b>	<b>3,297</b>
FTE	5-YR Average	1.6	4.3	1.0	1.8	2.0	2.1	2.1	2.1

**Business Purpose:**

Budget Codes: 270, 274, 275, 901

This work category covers the expenditures for capital relocations of SoCalGas facilities not specifically included in any of the other capital categories of work. It covers collectible and non-collectible construction projects not covered under the franchise agreements, and not related to freeway work, and not covered in other capital budget categories.

**Physical Description:**

These facility relocation projects include all sizes of distribution main and associated service lines, meter set assemblies and related gas facilities. Examples of these "other" projects include, but are not limited to:

- Replacement or alteration and abandonment of appurtenance to mains such as valves and vaults, drips, traps, roads, and fences due to condition in order to maintain the reliable operation of the distribution system.
- Raising, lowering or relocating main due to interference with external party construction.
- Changes to Company facilities at customer request. This could include items such as alteration or relocation of main or meter set assemblies; installation of customer exclusively used mains, or moving or relocating regulator stations.
- Changes to SoCalGas facilities in accordance with right-of-way agreements, encroachment permits, and railroad crossing lease agreements.

**Project Justification:**

The activities contained in Other Distribution Projects are necessary to provide a safe and reliable gas distribution system. The majority of the workload is driven by external parties requesting SoCalGas to move its facilities to accommodate others' construction. Advance payment is collected for projects that qualify as collectible. A ruling of collectability is issued for each project to qualify as collectible or non-collectible.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00270.0  
Category: K. Other Distribution Capital Projects & Meter Guards  
Category-Sub: 1. Other Distribution Capital Projects  
Workpaper Group: 002700 - Other Distribution Capital Projects

**Forecast Methodology:**

**Labor - 5-YR Average**

The level of spending in this work category is highly driven by the volume of external construction activity. Given the generally unpredictable nature of this activity, SoCalGas used the historical five-year (2012 through 2016) average to forecast labor expenditures. This forecast methodology best represents the cyclical volume of work completed on an annual basis and captures the various challenges encountered during construction, which tend to require a higher level of coordination with external parties. Projects in this work category are heavily dependent on the schedules and permitting constraints of third parties. The parties that generate this type of work for SoCalGas range in size from small clients to large corporations, which trigger a varying degree of scope of work for each construction job.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-005 for calculation details.

**Non-Labor - 5-YR Average**

The level of spending in this work category is highly driven by the volume of external construction activity. Given the generally unpredictable nature of this activity, SoCalGas used the historical five-year (2012 through 2016) average to forecast non-labor expenditures. This forecast methodology best represents the cyclical volume of work completed on an annual basis and captures the various challenges encountered during construction, which tend to require a higher level of coordination with external parties. Projects in this work category are heavily dependent on the schedules and permitting constraints of third parties. The parties that generate this type of work for SoCalGas range in size from small clients to large corporations, which trigger a varying degree of scope of work for each construction job.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-005 for calculation details.

**NSE - 5-YR Average**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Average	190	190	190	1	1	1	191	191	191
Non-Labor	5-YR Average	3,105	3,105	3,105	1	1	1	3,106	3,106	3,106
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>3,295</b>	<b>3,295</b>	<b>3,295</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3,297</b>	<b>3,297</b>	<b>3,297</b>
FTE	5-YR Average	2.1	2.1	2.1	0.0	0.0	0.0	2.1	2.1	2.1

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	114	332	80	137	163
Non-Labor	3,007	3,736	2,172	2,534	4,234
NSE	0	0	0	0	0
<b>Total</b>	<b>3,121</b>	<b>4,068</b>	<b>2,252</b>	<b>2,672</b>	<b>4,397</b>
FTE	1.4	3.7	0.9	1.5	1.7
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	114	332	80	137	163
Non-Labor	3,007	3,736	2,172	2,534	4,234
NSE	0	0	0	0	0
<b>Total</b>	<b>3,121</b>	<b>4,068</b>	<b>2,252</b>	<b>2,672</b>	<b>4,397</b>
FTE	1.4	3.7	0.9	1.5	1.7
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	18	55	13	22	27
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>18</b>	<b>55</b>	<b>13</b>	<b>22</b>	<b>27</b>
FTE	0.2	0.6	0.1	0.3	0.3
<b>Escalation to 2016\$</b>					
Labor	-2	-4	-2	-1	0
Non-Labor	-50	-40	-47	-19	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-52</b>	<b>-44</b>	<b>-49</b>	<b>-20</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	130	383	91	158	190
Non-Labor	2,957	3,696	2,125	2,515	4,234
NSE	0	0	0	0	0
<b>Total</b>	<b>3,088</b>	<b>4,079</b>	<b>2,216</b>	<b>2,674</b>	<b>4,424</b>
FTE	1.6	4.3	1.0	1.8	2.0

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002700**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects  
 Workpaper Detail: 002700.001 - Expenditures for capital relocations of SoCalGas facilities not included in any other c  
 In-Service Date: Not Applicable  
 Description:

This work category covers the expenditures for capital relocations of SoCalGas facilities not specifically included in any of the other capital categories of work. This workpaper contains the collectible portion of this forecast.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-005 for calculation details.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	122	122	122
Non-Labor	1,972	1,972	1,972
NSE	0	0	0
<b>Total</b>	<b>2,094</b>	<b>2,094</b>	<b>2,094</b>
FTE	1.4	1.4	1.4

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects  
 Workpaper Detail: 002700.002 - Expenditures for capital relocations of SoCalGas facilities not included in any other c  
 In-Service Date: Not Applicable  
 Description:

This work category covers the expenditures for capital relocations of SoCalGas facilities not specifically included in any of the other capital categories of work. This workpaper contains the non-collectible portion of this forecast.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-005 for calculation details.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	34	42	42
Non-Labor	1,134	1,134	1,134
NSE	0	0	0
<b>Total</b>	<b>1,168</b>	<b>1,176</b>	<b>1,176</b>
FTE	0.4	0.4	0.4

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects  
 Workpaper Detail: 002700.003 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure  
 In-Service Date: Not Applicable  
 Description:

RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure  
 - Valve inspections related to capital installation construction projects.

Forecast In 2016 \$(000)				
	Years	2017	2018	2019
Labor		13	5	5
Non-Labor		0	0	0
NSE		0	0	0
	<b>Total</b>	<b>13</b>	<b>5</b>	<b>5</b>
FTE		0.1	0.1	0.1

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Gua  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects  
 Workpaper Detail: 002700.003 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure

**RAMP Item # 1**

RAMP Chapter: SCG-10

Program Name: Valve Inspection and Maintenance (Per Region)

Program Description: Maintenance and Inspection of Valves

**Risk/Mitigation:**

Risk: Catastrophic Damage Involving Medium-Pressure Pipeline Failure

Mitigation: Systems are in place to monitor and manage compliance activity schedules

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	11	5	5
High	14	6	6

Funding Source: FERC

Forecast Method: Trend

Work Type: Mandated

Work Type Citation: CFR 49 Subpart P

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 5

Explanation: Assumed 2016 actuals on adjusted 2015 dollars. Created to document that the mitigation is incorporated within the workpaper.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Guards  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects  
 Workpaper Detail: 002700.004 - RAMP - Base - Risk ID SCG-04/SCG High-Pressure Pipeline Failure -Valve Inspections Capi  
 In-Service Date: Not Applicable  
 Description:

RAMP - Base - Risk ID SCG-04/SCG High-Pressure Pipeline Failure - Valve inspections related to capital installation construction projects.

Forecast In 2016 \$(000)				
	Years	2017	2018	2019
Labor		22	22	22
Non-Labor		0	0	0
NSE		0	0	0
	<b>Total</b>	<b>22</b>	<b>22</b>	<b>22</b>
FTE		0.2	0.2	0.2

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00270.0  
 Category: K. Other Distribution Capital Projects & Meter Gua  
 Category-Sub: 1. Other Distribution Capital Projects  
 Workpaper Group: 002700 - Other Distribution Capital Projects  
 Workpaper Detail: 002700.004 - RAMP - Base - Risk ID SCG-04/SCG High-Pressure Pipeline Failure -Valve Inspections Capital

**RAMP Item # 1**

RAMP Chapter: SCG-4

Program Name: Valve Maintenance and Installation  
 (Distribution High Pressure)

Program Description: Maintain valves with lubrication and servicing, and replace or install valves required for compliance

**Risk/Mitigation:**

Risk: Catastrophic Damage involving High-Pressure Pipeline Failure

Mitigation: Maintenance

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	21	21	21
High	23	23	23

Funding Source: FERC

Forecast Method: Base Year

Work Type: Mandated

Work Type Citation: DOT

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 21

Explanation: Assumed 2016 actuals on adjusted 2015 dollars. Created to document that the mitigation is incorporated within the workpaper.

**Supplemental Workpapers for Workpaper Group 002700**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-005**

**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia  
Supplemental Workpaper Calculations for Collectible Cost Related to Other Distribution Capital Projects  
Other Distribution Capital Projects Workpaper**

Assumptions:

\* Direct Cash Credits were excluded from historical data, but are shown here to calculate the collectible portion of capital.

\*\* The forecasted ratio of cash to total direct cost is the historical five-year (2012-2016) average ratio. This ratio is applied to the forecasted amount to calculate the collectible and non-collectible portions.

Amounts are shown in thousands of 2016 dollars and include vacation and sick.

		Adjusted Recorded History					2012-2016 Total	Forecast (5 Year Average)		
		2012	2013	2014	2015	2016		2017	2018	2019
<b>Total Capital</b>										
[A]	Labor	\$ 130	\$ 383	\$ 91	\$ 158	\$ 190		\$ 191	\$ 191	\$ 191
[B]	Non-Labor	\$ 2,957	\$ 3,696	\$ 2,125	\$ 2,515	\$ 4,235		\$ 3,106	\$ 3,106	\$ 3,106
[C]	<b>Total</b>	<b>\$ 3,088</b>	<b>\$ 4,079</b>	<b>\$ 2,216</b>	<b>\$ 2,674</b>	<b>\$ 4,425</b>	<b>\$ 16,481</b>	<b>\$ 3,296</b>	<b>\$ 3,296</b>	<b>\$ 3,296</b>
[D]	FTEs	1.6	4.3	1.0	1.8	2.0		2.1	2.1	2.1
<b>Collectible Ratio Calculations</b>										
[E]	Historical Direct Cash Credits*	\$ (1,799)	\$ (883)	\$ (530)	\$ (191)	\$ (1,803)	\$ (5,206)			
[F] (-[E]/[C])	Ratio Cash to Total Direct Cost**	58%	22%	24%	7%	41%	32%	64%	64%	64%
<b>Collectible Portion of Forecast</b>										
[G] ([A]x[F])	Labor							\$ 121	\$ 121	\$ 121
[H] ([B]x[F])	Non-Labor							\$ 1,972	\$ 1,972	\$ 1,972
([G]+[H])	<b>Total</b>							<b>\$ 2,093</b>	<b>\$ 2,093</b>	<b>\$ 2,093</b>
[I] ([D]x[F])	FTEs							1.4	1.4	1.4
<b>Non-Collectible Portion of Forecast</b>										
[J] ([A]-[G])	Labor							\$ 70	\$ 70	\$ 70
[K] ([B]-[H])	Non-Labor							\$ 1,135	\$ 1,135	\$ 1,135
([J]+[K])	<b>Total</b>							<b>\$ 1,203</b>	<b>\$ 1,203</b>	<b>\$ 1,203</b>
([D]-[I])	FTEs							0.8	0.8	0.8

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: L. Measurement & Regulation Devices  
Workpaper: VARIOUS

**Summary for Category: L. Measurement & Regulation Devices**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	1,228	805	976	932
Non-Labor	36,509	21,461	28,571	36,105
NSE	0	0	0	0
<b>Total</b>	<b>37,737</b>	<b>22,266</b>	<b>29,547</b>	<b>37,037</b>
FTE	14.2	8.8	10.9	10.4

**001630 Meters**

Labor	715	269	411	385
Non-Labor	26,970	16,020	21,795	29,453
NSE	0	0	0	0
<b>Total</b>	<b>27,685</b>	<b>16,289</b>	<b>22,206</b>	<b>29,838</b>
FTE	9.2	3.5	5.3	5.0

**001640 Regulators**

Labor	3	2	3	4
Non-Labor	8,412	3,731	4,959	5,124
NSE	0	0	0	0
<b>Total</b>	<b>8,415</b>	<b>3,733</b>	<b>4,962</b>	<b>5,128</b>
FTE	0.0	0.1	0.1	0.1

**001810 Electronic Pressure Monitors (EPM)**

Labor	147	168	175	147
Non-Labor	430	661	734	430
NSE	0	0	0	0
<b>Total</b>	<b>577</b>	<b>829</b>	<b>909</b>	<b>577</b>
FTE	1.4	1.6	1.7	1.4

**002800 Gas Energy Measurement Systems (GEMS)**

Labor	363	366	387	396
Non-Labor	697	1,049	1,083	1,098
NSE	0	0	0	0
<b>Total</b>	<b>1,060</b>	<b>1,415</b>	<b>1,470</b>	<b>1,494</b>
FTE	3.6	3.6	3.8	3.9

Note: Totals may include rounding differences.

**Beginning of Workpaper Group**  
**001630 - Meters**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00163.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001630 - Meters

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	Zero-Based	551	801	819	952	715	269	411	385
Non-Labor	Zero-Based	15,703	17,983	20,137	32,454	26,970	16,020	21,795	29,453
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>16,254</b>	<b>18,784</b>	<b>20,956</b>	<b>33,405</b>	<b>27,685</b>	<b>16,289</b>	<b>22,206</b>	<b>29,838</b>
FTE	Zero-Based	7.8	11.1	11.6	12.7	9.2	3.5	5.3	5.0

**Business Purpose:**

Budget Code: 163

Meters are purchased for two primary purposes: new business installations and meter replacements. These purchases and the subsequent installations enable accurate billing, reliability, and continued safe and reliable service to customers. The expenditures included here are for materials, warehouse handling, technical evaluations, and quality assurance. The associated installation expenses are covered in other applicable work categories (e.g., New Business Capital, Field O&M - Measurement and Regulation).

**Physical Description:**

A meter is the device that measures the customer's gas consumption. Meter types purchased within this budget code include diaphragm, rotary, turbine, and ultrasonic. Meters are grouped into two sizing groups, where the small and medium size meters are referred to as "size 1 through 3" meters, and the other being the large size meters referred to as "size 4 and above" meters. Size 1 through 3 meters are typical of residential and small commercial customers. The size 4 and above are typical of large commercial and industrial customers.

**Project Justification:**

Meters are purchased for:

- Installation at new customers' premises.
- Replacements due to meter accuracy, age, or operation.
- Replacements due to a pre-determined replacement cycle based on meter capacity, size, and performance.

It is necessary to install new and replacement meters to obtain accurate measurement of customers' gas consumption for billing purposes.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00163.0  
Category: L. Measurement & Regulation Devices  
Category-Sub: 1. Meters  
Workpaper Group: 001630 - Meters

**Forecast Methodology:**

**Labor - Zero-Based**

A zero-based forecasting methodology was used to forecast the labor expenditures. This methodology was chosen for the same reasons that influence the non-labor forecast.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-006 for calculation details.

**Non-Labor - Zero-Based**

A zero-based forecasting methodology was used to forecast the non-labor expenditures. This methodology was chosen because it allowed the forecasting calculations to consider the projected number of new meter sets as discussed by SoCalGas' Customer Growth Witness Rose-Marie Payan in Exhibit SCG-39-WP. This methodology also allowed for the calculation to consider weighted averages based on historical meter purchases factoring in the quantities purchased of each type of meter and its corresponding cost per meter. Since the zero-based calculation incorporates these factors, it yields the most accurate forecast which is consistent with the projected customer growth while at the same time taking into account the historical proportional cost per meter type.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-006 for calculation details.

**NSE - Zero-Based**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00163.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001630 - Meters

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Zero-Based	269	411	385	0	0	0	269	411	385
Non-Labor	Zero-Based	16,020	21,795	29,453	0	0	0	16,020	21,795	29,453
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>16,289</b>	<b>22,206</b>	<b>29,838</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16,289</b>	<b>22,206</b>	<b>29,838</b>
FTE	Zero-Based	3.5	5.3	5.0	0.0	0.0	0.0	3.5	5.3	5.0

**Forecast Adjustment Details**

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
2017 Total		0	0	0	0	0.0	
2018 Total		0	0	0	0	0.0	
2019 Total		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00163.0  
Category: L. Measurement & Regulation Devices  
Category-Sub: 1. Meters  
Workpaper Group: 001630 - Meters

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	483	694	720	825	614
Non-Labor	15,967	18,178	20,578	32,700	26,970
NSE	0	0	0	0	0
<b>Total</b>	<b>16,449</b>	<b>18,871</b>	<b>21,298</b>	<b>33,526</b>	<b>27,584</b>
FTE	6.7	9.5	9.9	10.9	7.9
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	483	694	720	825	614
Non-Labor	15,967	18,178	20,578	32,700	26,970
NSE	0	0	0	0	0
<b>Total</b>	<b>16,449</b>	<b>18,871</b>	<b>21,298</b>	<b>33,526</b>	<b>27,584</b>
FTE	6.7	9.5	9.9	10.9	7.9
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	77	115	117	134	101
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>77</b>	<b>115</b>	<b>117</b>	<b>134</b>	<b>101</b>
FTE	1.1	1.6	1.7	1.8	1.3
<b>Escalation to 2016\$</b>					
Labor	-9	-9	-18	-7	0
Non-Labor	-264	-194	-441	-247	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-273</b>	<b>-203</b>	<b>-459</b>	<b>-254</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	551	801	819	952	715
Non-Labor	15,703	17,983	20,137	32,454	26,970
NSE	0	0	0	0	0
<b>Total</b>	<b>16,254</b>	<b>18,784</b>	<b>20,956</b>	<b>33,405</b>	<b>27,685</b>
FTE	7.8	11.1	11.6	12.7	9.2

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00163.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001630 - Meters

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 001630**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00163.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001630 - Meters  
 Workpaper Detail: 001630.001 - Meter purchases for two primary purposes: new business installations and meter replacement  
 In-Service Date: Not Applicable  
 Description:

Meters are purchased for two primary purposes: new business installations and meter replacements. These purchases and the subsequent installations enable accurate billing, reliability, and continued safe and reliable service to customers. The expenditures included here are for materials, warehouse handling, technical evaluations, and quality assurance. The associated installation expenses are covered in other applicable work categories (e.g., New Business, Field O&M - Measurement and Regulation).

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-006 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		269	411	385
Non-Labor		16,020	21,795	29,453
NSE		0	0	0
	<b>Total</b>	<b>16,289</b>	<b>22,206</b>	<b>29,838</b>
FTE		3.5	5.3	5.0

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 001630**

SCG-04-GOM-CAP-SUP-006

Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia  
 Supplemental Workpaper for Zero-Based Calculations Related to Meters  
 Meters Workpaper

Assumptions: [A], [H]: Refer to the prepared direct workpaper of Witness Rose-Marie Payan, Exhibit SCG-39-WP for the new meter set forecast calculation.  
 [D], [E], [L], [M], [N]: Routine Meter Change-Outs (RMCs) and Planned Meter Change-Outs (PMCs).

Table 1: Historical Units and Dollars, 2016 Dollars with Vacation & Sick

	Historical New Business (NB) Meters			Historical Replacement Meters			Total
	[A]	[B]	[C] ((A)-[B])	[D]	[E]	[F] ((D)+[E])	[G] ((A)+[F])
	Total Historical NB Meter Sets	Historical Size 4+ NB Meters	Historical Size 1-3 NB Meters	Historical PMCs & Size 1-3 RMCs	Historical Size 4+ RMCs & Meter Resets	Total Historical Replacement Meters	Total Historical Meters
2012	21,898	1,510	20,388	117,704	6,933	124,637	146,535
2013	26,787	2,036	24,751	81,425	7,785	89,210	115,997
2014	33,249	2,524	30,725	191,443	7,824	199,267	232,516
2015	33,594	2,894	30,700	336,725	8,739	345,464	379,058
2016	37,708	3,412	34,296	296,720	7,990	304,710	342,418

Table 2: Forecasted Meters

	New Business (NB) Meter Forecast				Replacement Meter Forecast			Total	
	[H]	[I] (% Growth in Each Year for [H])	[J] ((1+[I])x(Previous Year [J]))	[K] ([H]-[J])	[L]	[M]	[N] (Ave. of [E])	[O] ((L)+[M]+[N])	[P] ([H]+[O])
	Total NB Meter Set Forecast	NB Forecast Growth Factor	Size 4+ NB Forecast	Size 1-3 NB Forecast	Size 1-3 RMCs & PMCs Forecast	Size 4+ PMCs Forecast	Size 4+ RMCs Forecast	Total Replacement Meter Forecast	Total Meter Forecast
2016 (Table 1)	37,708	N/A	3,412	34,296	296,720	7,990	304,710	342,418	
2017	39,807	6%	3,602	36,205	76,647	4,705	7,854	89,206	129,013
2018	47,987	21%	4,342	43,645	133,180	7,793	7,854	148,827	196,814
2019	51,388	7%	4,650	46,738	120,000	5,271	7,854	133,125	184,513

SCG-04-GOM-CAP-SUP-006

Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia  
 Supplemental Workpaper for Zero-Based Calculations Related to Meters  
 Meters Workpaper

Table 3: 2016 Historical Meter Costs (2016\$ with Vacation & Sick)

	[Q] Historical FTEs	[R] Historical Labor \$	[S] Historical Non-Labor \$	[T] ([R]+[S]) Historical Total \$
<b>2016</b>	9.2	714,904	26,970,403	27,685,307

Table 4: 2016 Unit Costs and FTEs/Meter Installation (2016\$ with Vacation & Sick)

	[U] ((Q)/([G] for 2016))	[V] ([R]/([G] for 2016))	[W] 2016 Average Weighted Non- Labor Cost per Size 1-3 Meter with MTU	[X] 2016 Average Weighted Non- Labor Cost per Size 4 Meter with MTU	[WW] 2016 Average Weighted Non- Labor Cost per Size 1-3 Meter	[XX] 2016 Average Weighted Non- Labor Cost per Size 4 Meter
<b>2016</b>	0.000027	\$2.09	\$99.45	\$724.11	\$53.16	\$620.11

Table 5: Forecasted FTEs and Dollars (Thousands of 2016\$ with Vacation & Sick)

	[Y] ([P]x[U])	[Z] ([P]x[V])/1000	[AA] ((K)+[L])x[W] /1000	[BB] ((J)+[M]+[N])x[XX] /1000	[CC] ([AA]+[BB])	[CC] ([Z]+[C])
	FTEs	Labor Forecast	Non-Labor for Size 1-3 Meters	Non-Labor for Size 4+ Meters	Total Non-Labor Forecast	Total Forecast
<b>2017</b>	3.5	\$ 269	\$ 5,999	\$ 10,022	\$ 16,020	\$ 16,290
<b>2018</b>	5.3	\$ 411	\$ 9,400	\$ 12,395	\$ 21,795	\$ 22,206
<b>2019</b>	5.0	\$ 385	\$ 16,582	\$ 12,871	\$ 29,453	\$ 29,838

**Beginning of Workpaper Group  
001640 - Regulators**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00164.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001640 - Regulators

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
Labor	Zero-Based	0	5	2	0	3	2	3	4
Non-Labor	Zero-Based	4,264	6,748	6,318	4,425	8,412	3,731	4,959	5,124
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>4,264</b>	<b>6,753</b>	<b>6,320</b>	<b>4,425</b>	<b>8,415</b>	<b>3,733</b>	<b>4,962</b>	<b>5,128</b>
FTE	Zero-Based	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1

**Business Purpose:**

Budget Code: 164

Gas regulators are used by SoCalGas to reduce the pressure of gas entering the distribution system from high-pressure pipelines to provide the lower pressures used on the distribution pipeline network and further reduce pressure at the customer's meter set. As such, they are the principal protective devices to secure employee and public safety and to protect physical assets in alignment with CPUC/DOT regulations. They also support accurate billing for most customers, where delivery pressure is employed to compute corrected gas volumes delivered to customers. The expenditures included here are for the purchase of the regulators, warehouse handling, technical evaluations, and quality assurance. The associated installation expenses are covered in other applicable work categories (e.g., New Business, Field O&M - Measurement and Regulation).

**Physical Description:**

Gas regulators are purchased for two primary purposes, new business installations and replacements. When choosing a pressure regulator many factors are considered before selecting a model. Important considerations include: material choice, inlet operating pressure, outlet delivery pressure, flow capacity, temperature, and size constraints.

**Project Justification:**

While new installations are driven by new meter set activities, replacement needs are driven by customer or company identified problems, age, and obsolescence of equipment. Regulators are purchased for:

- Installation at new customers' premises.
- Replacements due to regulator age or operation.
- Replacements due to a pre-determined replacement cycle based on meter set assembly capacity, size, and performance.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00164.0  
Category: L. Measurement & Regulation Devices  
Category-Sub: 1. Meters  
Workpaper Group: 001640 - Regulators

**Forecast Methodology:**

**Labor - Zero-Based**

The forecasted labor expenditures for regulators used as a basis the historical five-year ratio between purchased meters to purchased regulators (2009 through 2013). The determined five-year ratio represented the regulator factor used to forecast the number of regulators to be purchased. SoCalGas used the ratio from the historical period (2009 through 2013) as it best represents the ratio between meters to purchased regulators (51%). Due to the Advanced Metering Infrastructure (AMI) project, SoCalGas purchased meters at a higher rate during the five year (2012 through 2016) period. Using the period 2012 through 2016 would reflect a ratio lower (37%) than what is required for the forecasted period 2017 through 2019. By multiplying the regulator to meter ratio from the (2009 through 2013) historical period with the projected number of forecasted meter purchases, it yielded the projected number of regulators for each of the forecast years. The labor expenditure was then calculated by taking the projected number of regulators multiplied by the historical 2016 average labor cost per regulator.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-007 for calculation details.

**Non-Labor - Zero-Based**

Taking the same projected number of regulator count used in the labor calculations, the non-labor expenditures were determined by multiplying the projected number of regulators by the historical 2016 weighted average of the non-labor cost per regulator.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-007 for calculation details.

**NSE - Zero-Based**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00164.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001640 - Regulators

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Zero-Based	2	3	4	0	0	0	2	3	4
Non-Labor	Zero-Based	3,731	4,959	5,124	0	0	0	3,731	4,959	5,124
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>3,733</b>	<b>4,962</b>	<b>5,128</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,733</b>	<b>4,962</b>	<b>5,128</b>
FTE	Zero-Based	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1

**Forecast Adjustment Details**

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00164.0  
Category: L. Measurement & Regulation Devices  
Category-Sub: 1. Meters  
Workpaper Group: 001640 - Regulators

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	4	2	0	3
Non-Labor	4,335	6,821	6,456	4,458	8,412
NSE	0	0	0	0	0
<b>Total</b>	<b>4,335</b>	<b>6,825</b>	<b>6,458</b>	<b>4,458</b>	<b>8,415</b>
FTE	0.0	0.1	0.0	0.0	0.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	0	4	2	0	3
Non-Labor	4,335	6,821	6,456	4,458	8,412
NSE	0	0	0	0	0
<b>Total</b>	<b>4,335</b>	<b>6,825</b>	<b>6,458</b>	<b>4,458</b>	<b>8,415</b>
FTE	0.0	0.1	0.0	0.0	0.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	1	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Escalation to 2016\$</b>					
Labor	0	0	0	0	0
Non-Labor	-72	-73	-138	-34	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-72</b>	<b>-73</b>	<b>-138</b>	<b>-34</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	0	5	2	0	3
Non-Labor	4,264	6,748	6,318	4,425	8,412
NSE	0	0	0	0	0
<b>Total</b>	<b>4,264</b>	<b>6,753</b>	<b>6,320</b>	<b>4,425</b>	<b>8,415</b>
FTE	0.0	0.1	0.0	0.0	0.0

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00164.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001640 - Regulators

**Summary of Adjustments to Recorded:**

In Nominal \$(000)					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 001640**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00164.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001640 - Regulators  
 Workpaper Detail: 001640.001 - Gas regulators purchased for new business installations and replacements  
 In-Service Date: Not Applicable

Description:

Gas regulators are used by SoCalGas to reduce the pressure of gas entering the distribution system from high pressure pipelines to provide the lower pressures used on the distribution pipeline system and further reduce pressure at the customer's meter set assemblies. They are the principal protective device at the meter set assembly that secures employee and public safety, and protects physical assets in alignment with CPUC/DOT regulations. They also support accurate billing for most customers, where delivery pressure is employed to compute corrected gas volumes delivered to customers. The expenditures included here are for the purchase of the regulators, warehouse handling, technical evaluations, and quality assurance. The associated installation expenses are covered in other applicable work categories (e.g., New Business, Field O&M - Measurement and Regulation).

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-007 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		2	3	4
Non-Labor		3,731	4,959	5,124
NSE		0	0	0
	<b>Total</b>	<b>3,733</b>	<b>4,962</b>	<b>5,128</b>
FTE		0.1	0.1	0.1

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 001640**

**SCG-04-GOM-CAP-SUP-007**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia**  
**Supplemental Workpaper for Zero Based Calculations Related to Regulators**  
**Regulators Workpaper**

**Table 1: Historical Units:**

	[A] Total Meters Purchased	[B] Total Regulators Purchased	[C] ([B]/[A]) Regulator Factor	[D] (Sum of [B] / Sum of [A]) 5-Year Average Regulator Factor
2009	175,609	85,988	49%	51.0%
2010	195,055	91,110	47%	
2011	191,736	74,872	39%	
2012	147,171	83,959	57%	
2013	122,796	89,205	73%	

**Table 2: Forecasted Meters (Taken from Table 2, in supplemental workpaper SCG-04-GOM-CAP-SUP-006):**

	New Business (NB) Meter Forecast			Replacement Meter Forecast			Total	
	[H] Total NB Meter Set Forecast	[J] Size 4+ NB Forecast	[K] Size 1-3 NB Forecast	[L] Size 1-3 RMCs & PMCs Forecast	[M] Size 4+ PMCs Forecast	[N] Size 4+ RMCs Forecast	[O] Total Replacement Meter Forecast	[P] Total Meter Forecast
2017	39,807	3,602	36,205	76,647	4,705	7,854	89,206	129,013
2018	47,987	4,342	43,645	133,180	7,793	7,854	148,827	196,814
2019	51,388	4,650	46,738	120,000	5,271	7,854	133,125	184,513

**Table 3: Forecasted Regulators**

	New Business (NB) Regulators Forecast			Replacement Regulator Forecast				Total	
	[E] ([F]+[G])	[F] ([J]x[D])	[G] ([K]x[D])	[Q] ([L]x[D])	[R] ([M]x[D])	[S] ([N]x[D])	[T]	[U] ([Q]+[R]+[S]+[T])	[V] ([E]+[U])
	Total NB Regulators	Commercial & Industrial NB Regulators	Residential NB Regulators	Residential Replacement Regulators	Commercial & Industrial PMC Regulators	Commercial & Industrial RMC Regulators	Proactive Slam Shut Regulator Replacements	Total Replacement Regulators	Total Regulator Forecast
2017	20,301	1,837	18,464	39,090	2,400	4,006	-	45,496	65,797
2018	24,473	2,214	22,259	67,922	3,974	4,006	-	75,902	100,375
2019	26,208	2,372	23,836	61,200	2,688	4,006	8,342	76,236	102,444

**SCG-04-GOM-CAP-SUP-007**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia**  
**Supplemental Workpaper for Zero Based Calculations Related to Regulators**  
**Regulators Workpaper**

Table 4: 2016 Historical Regulator Costs (2016\$ with Vacation & Sick)

	[W] Historical FTEs	[X] Historical Labor \$	[Y] Historical Non-Labor \$	[Z] ([X]+[Y]) Historical Total \$
2016	0.00	3,066	8,412,286	8,415,352

Table 5: 2016 Unit Costs and FTEs/Regulator Installation (2016\$ with Vacation & Sick)

	[AA] ([W]/([B] for 2016))	[BB] ([X]/([B] for 2016))	[CC] 2016 Average Weighted Non- Labor Cost per Residential Regulator	[DD] 2016 Average Weighted Non- Labor Cost per Commercial & Industrial Regulator	[EE] 2016 Average Weighted Non- Labor Cost per Slam Shut Regulator
2016	0.000000000	0.0344	\$18.17	\$325.76	\$75.00

Table 6: Forecasted FTEs and Dollars (Thousands of 2016\$ with Vacation & Sick)

	[FF] ([V]x[AA])	[GG] ([V]x[BB])/1000	[HH] (([G]+[Q])x[CC]) /1000	[II] (([F]+[R]+[S])x[DD]) /1000	[JJ] [T]x[[EE]/1000	[KK] ([HH]+[II]+[JJ])	[LL] ([GG]+[KK])
	FTEs	Labor Forecast	Non-Labor for Residential Regulators	Non-Labor for Commercial & Industrial Regulators	Non-Labor for Curb Regulators	Total Non-Labor Forecast	Total Forecast
2017	0.0	\$ 2	\$ 1,046	\$ 2,685	\$ -	\$ 3,731	\$ 3,733
2018	0.0	\$ 3	\$ 1,639	\$ 3,321	\$ -	\$ 4,959	\$ 4,963
2019	0.0	\$ 4	\$ 1,545	\$ 2,953	\$ 626	\$ 5,124	\$ 5,128

**Beginning of Workpaper Group**  
**001810 - Electronic Pressure Monitors (EPM)**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00181.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001810 - Electronic Pressure Monitors (EPM)

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
Years									
Labor	Base YR Rec	252	325	262	292	147	168	175	147
Non-Labor	Base YR Rec	455	725	958	846	430	661	734	430
NSE	Base YR Rec	0	0	0	0	0	0	0	0
<b>Total</b>		<b>708</b>	<b>1,050</b>	<b>1,220</b>	<b>1,138</b>	<b>577</b>	<b>829</b>	<b>909</b>	<b>577</b>
FTE	Base YR Rec	3.1	3.6	2.8	2.8	1.4	1.6	1.7	1.4

**Business Purpose:**

Budget Codes: 181, 281.

Electronic Pressure Monitors (EPM) are devices used by SoCalGas to remotely monitor distribution pipeline pressures in support of gas system capacity analysis; and for alarming of over or under-pressure events. Costs discussed here are for the materials purchased, labor cost for warehouse handling, equipment configuration, and associated cost for the field installation and replacement work.

**Physical Description:**

An Electronic Pressure Monitors (EPM) is a unit made for the purpose of measuring and recording gas pressure within a gas pipe via a connected gas transducer sensor. The unit has a box shaped shell cover that protects the internal circuitry from environmental hazards. After initial installation, this device is placed on an annual maintenance plan which includes inspection of the battery pack serving as the source of power for most EPMs. Currently, this device is commonly connected to a telephone hardline. These devices will be converted to operate using the Advance Metering Infrastructure (AMI) network. The line of communication is what allows the EPM device to send pressure data logs to a calling computer, at which point, the pressure data can be electronically reviewed, analyzed, stored, and archived. These EPM units are commonly affixed to wall-mount and pole-mount configurations.

**Project Justification:**

The primary purpose of the electronic pressure monitor network is system safety as well as compliance with 49 CFR 192.741 (Pressure limiting and regulating stations: Telemetry or recording gauges).

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00181.0  
Category: L. Measurement & Regulation Devices  
Category-Sub: 1. Meters  
Workpaper Group: 001810 - Electronic Pressure Monitors (EPM)

**Forecast Methodology:**

**Labor - Base YR Rec**

A 2016 base forecast methodology plus incremental cost was used to forecast the expenditures of this capital work category. The number of new electronic pressure monitor (EPM) installations includes the replacement of 350 units that are incompatible with the new advance meter system. SoCalGas will also continue installing new electronic pressure monitors in zones where system pressure is under-monitored. SoCalGas considered using a historical (2012 through 2016) five-year average or five-year linear trend, which would result in a higher forecast; however, this would overstate the funding requirement as SoCalGas completed its replacement of terminal gauges during the previous five-years (2012 through 2016) increasing spending during that period. Using a 2016 base forecast method plus incremental is a better representation of future needs as it captures the rate of replacement and new installations needed to continue to monitor the system safely and efficiently.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-009 for calculation details.

**Non-Labor - Base YR Rec**

A 2016 base forecast methodology plus incremental cost was used to forecast the expenditures of this capital work category. The number of new electronic pressure monitor (EPM) installations includes the replacement of 350 units that are incompatible with the new advance meter system. SoCalGas will also continue installing new electronic pressure monitors in zones where system pressure is under-monitored. SoCalGas considered using a historical (2012 through 2016) five-year average or five-year linear trend, which would result in a higher forecast; however, this would overstate the funding requirement as SoCalGas completed its replacement of terminal gauges during the previous five-years (2012 through 2016) increasing spending during that period. Using a 2016 base forecast method plus incremental is a better representation of future needs as it captures the rate of replacement and new installations needed to continue to monitor the system safely and efficiently.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-009 for calculation details.

**NSE - Base YR Rec**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00181.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001810 - Electronic Pressure Monitors (EPM)

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Base YR Rec	146	146	146	22	29	1	168	175	147
Non-Labor	Base YR Rec	429	429	429	232	305	1	661	734	430
NSE	Base YR Rec	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>575</b>	<b>575</b>	<b>575</b>	<b>254</b>	<b>334</b>	<b>2</b>	<b>829</b>	<b>909</b>	<b>577</b>
FTE	Base YR Rec	1.4	1.4	1.4	0.2	0.3	0.0	1.6	1.7	1.4

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
2017	Other	21	231	0	252	0.2	FGALVAN20170628153724140
<b>2017 Total</b>		21	231	0	252	0.2	
2018	Other	28	304	0	332	0.3	FGALVAN20170628153819947
<b>2018 Total</b>		28	304	0	332	0.3	
<b>2019 Total</b>		0	0	0	0	0.0	

**Explanation:** i. Incremental (EPM) Installations - SoCalGas will replace 151 EPM units in 2017 and 199 in 2018 due to incompatibility with the Advanced Metering Infrastructure (AMI) communication system. Incremental funding of \$254,000 and \$334,000 in 2017 and 2018.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-009 for additional details.

**Explanation:** i. Incremental (EPM) Installations - SoCalGas will replace 151 EPM units in 2017 and 199 in 2018 due to incompatibility to Advanced Metering Infrastructure (AMI) communication system. Incremental funding of \$254,000 and \$334,000 in 2017 and 2018.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-009 for additional details.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00181.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001810 - Electronic Pressure Monitors (EPM)

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	221	282	230	253	126
Non-Labor	463	733	979	852	430
NSE	0	0	0	0	0
<b>Total</b>	<b>684</b>	<b>1,014</b>	<b>1,209</b>	<b>1,106</b>	<b>556</b>
FTE	2.7	3.1	2.4	2.4	1.2
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	221	282	230	253	126
Non-Labor	463	733	979	852	430
NSE	0	0	0	0	0
<b>Total</b>	<b>684</b>	<b>1,014</b>	<b>1,209</b>	<b>1,106</b>	<b>556</b>
FTE	2.7	3.1	2.4	2.4	1.2
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	35	47	38	41	21
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>35</b>	<b>47</b>	<b>38</b>	<b>41</b>	<b>21</b>
FTE	0.4	0.5	0.4	0.4	0.2
<b>Escalation to 2016\$</b>					
Labor	-4	-4	-6	-2	0
Non-Labor	-8	-8	-21	-6	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-12</b>	<b>-11</b>	<b>-27</b>	<b>-9</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	252	325	262	292	147
Non-Labor	455	725	958	846	430
NSE	0	0	0	0	0
<b>Total</b>	<b>708</b>	<b>1,050</b>	<b>1,220</b>	<b>1,138</b>	<b>577</b>
FTE	3.1	3.6	2.8	2.8	1.4

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00181.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001810 - Electronic Pressure Monitors (EPM)

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 001810**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00181.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001810 - Electronic Pressure Monitors (EPM)  
 Workpaper Detail: 001810.001 - Electronic Pressure Monitors (EPM) are used by SoCalGas to remotely monitor distributio  
 In-Service Date: Not Applicable  
 Description:

Electronic Pressure Monitors (EPM) are devices used by SoCalGas to remotely monitor distribution pipeline pressures in support of gas system capacity analysis; and for alarming of over or under-pressure events. Costs discussed here are for the materials purchased, labor cost for warehouse handling, equipment configuration, and associated cost for the field installation and replacement work.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	147	147	147
Non-Labor	430	430	430
NSE	0	0	0
<b>Total</b>	<b>577</b>	<b>577</b>	<b>577</b>
FTE	1.4	1.4	1.4

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00181.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 001810 - Electronic Pressure Monitors (EPM)  
 Workpaper Detail: 001810.002 - Incremental Electronic Pressure Monitor (EPM) replacements for new Advance Meter system  
 In-Service Date: Not Applicable  
 Description:

The implementation of the Advanced Metering Infrastructure (AMI) communication system, used to transmit meter consumption data, has allowed SoCalGas to move towards consolidating the communication of its electronic devices, including the EPMS, into this wireless communication network. In order to synchronize the new AMI communication system with the current electronic pressure monitoring system, SoCalGas evaluated their compatibility. During this evaluation, 350 unique units were identified as incompatible and therefore requiring replacement. SoCalGas plans to replace 199 units in 2017 and 151 units in 2018 to attain proper communication with the new AMI system and sustain ongoing monitoring of the gas distribution system.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-009 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		21	28	0
Non-Labor		231	304	0
NSE		0	0	0
	<b>Total</b>	<b>252</b>	<b>332</b>	<b>0</b>
FTE		0.2	0.3	0.0

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 001810**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-009**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia**  
**Supplemental Workpaper for Incremental Calculations Related to Electronic Pressure Monitors**  
**Electronic Pressure Monitor (EPM) Workpaper**

Assumptions: [A]: Incremental EPM Installations  
[B]: Estimated Measurement & Regulation (M&R) hours spent installing EPM. Estimates from Measurement & Regulation subject matter experts.  
[D]: 2016 M&R Tech Labor rate  
[E]: Total Labor Cost Per Year  
[G]: Non-Labor Cost Per Order  
[H]: Non-Labor Total Cost  
[I]: Labor and Non-Labor Total Cost with V&S included  
[L]: Yearly Factor  
[M]: Calculated FTEs

**Calculations for Forecasted Dollars and FTEs (2016\$ with Vacation & Sick)**

Incremental EPM Installations Cost Forecast								
New EPM Installations [A]	Hours Per Order [B]	Total Labor Hours [C] ((A)x[B])	Represented Rate [D]	Labor Total Cost [E] ((A)x[B)x[C])	Calculated Vacation and Sick [F] (KxD)	Non-Labor Cost Per Order [G]	Non-Labor Total Cost [H] ((A)x[G])	Labor and Non-Labor Total with V&S included [I] ((D)x[F])
2017	151	3	\$ 39.88	\$ 18,066	\$ 2,975	\$ 1,527	\$ 230,577	\$ 251,618
2018	199	3	\$ 39.88	\$ 23,808	\$ 3,921	\$ 1,527	\$ 303,873	\$ 331,603
2019	-	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

V&S Rate [J]	V&S Hours [K] ((J)x[C])
2017	0.1647 75
2018	0.1647 98

Incremental EPM Installations FTE Forecast			
Total Incremental Labor Cost [E]	Yearly Factor [L]	Represented Rate [D]	FTEs [M] ((E)/(L)/(D))
2017	\$ 18,066	2,080	\$ 39.88 0.2
2018	\$ 23,808	2,088	\$ 39.88 0.3
2019	\$ -	-	\$ - -

**Beginning of Workpaper Group**  
**002800 - Gas Energy Measurement Systems (GEMS)**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00280.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 002800 - Gas Energy Measurement Systems (GEMS)

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	Zero-Based	229	218	216	255	363	366	387	396
Non-Labor	Zero-Based	1,206	915	838	901	697	1,049	1,083	1,098
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>1,435</b>	<b>1,133</b>	<b>1,054</b>	<b>1,157</b>	<b>1,059</b>	<b>1,415</b>	<b>1,470</b>	<b>1,494</b>
FTE	Zero-Based	2.6	2.3	2.2	2.7	3.6	3.6	3.8	3.9

**Business Purpose:**

Budget Codes: 180, 280.

Gas Energy Measurement Systems (GEMS) are used by SoCalGas to facilitate accurate billing and gas volume measurement of each customer meter set operating at non-standard metering pressures and temperatures. The expenditures included here are for the purchase of the GEMS device, other associated material, warehouse handling technical evaluations, and quality assurance. Cost for the initial installation of a GEMS device is also included.

**Physical Description:**

Gas Energy Measurement Systems (GEMS) provide the electronic means to compute and accumulate corrected volumetric measurements. They also have the ability to provide gas volume corrections based on "live" temperature measurement, provide audit trail capabilities, and some models provide remote communication capabilities. These devices are configured to fit the requirements of each GEMS field site. Proper pressure and temperature transducers need to be considered, as well as casing size and mounting configuration. The types of GEMS included in this category are: Electronic Correctors, little GEMS, big GEMS, and new generation GEMS.

**Project Justification:**

In accordance with CPUC General Order 58-A and to obtain accurate accounting and billing, GEMS instruments are used by SoCalGas as electronic pressure and temperature correctors to compute and accumulate corrected volume from the mechanical output of positive displacement and turbine gas meters. These units are necessary for larger, industrial customers that require non-standard delivery pressures and require compensation for varying gas temperature effect on measurement.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00280.0  
Category: L. Measurement & Regulation Devices  
Category-Sub: 1. Meters  
Workpaper Group: 002800 - Gas Energy Measurement Systems (GEMS)

**Forecast Methodology:**

**Labor - Zero-Based**

SoCalGas used a zero-based forecast to determine the level of labor funding needed for this workbook. The forecasted labor expenditures for the GEMS category used as a basis the projected number of new GEMS installations plus the projected replacement units for each of the forecast years (2017 through 2019). The projected total count of new GEMS installations was obtained using the recorded number of GEMS purchased towards new installations from year 2016, plus the new business growth factor. The projected total count of GEMS replacements was determined using the recorded number of GEMS purchased towards replacements from the year 2016.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-008 for calculation details.

**Non-Labor - Zero-Based**

SoCalGas used a zero-based forecast to determine the level of non-labor funding needed for this work category. Taking the same projected number of GEMS count used in the labor calculations, the non-labor expenditures were determined by multiplying the projected number of units by the historical 2016 average non-labor cost per unit,

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-008 for calculation details.

**NSE - Zero-Based**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00280.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 002800 - Gas Energy Measurement Systems (GEMS)

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Zero-Based	366	387	396	0	0	0	366	387	396
Non-Labor	Zero-Based	1,049	1,083	1,098	0	0	0	1,049	1,083	1,098
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>1,415</b>	<b>1,470</b>	<b>1,494</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,415</b>	<b>1,470</b>	<b>1,494</b>
FTE	Zero-Based	3.6	3.8	3.9	0.0	0.0	0.0	3.6	3.8	3.9

**Forecast Adjustment Details**

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
2017 Total		0	0	0	0	0.0	
2018 Total		0	0	0	0	0.0	
2019 Total		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00280.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 002800 - Gas Energy Measurement Systems (GEMS)

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	201	189	189	222	311
Non-Labor	1,226	925	857	908	697
NSE	0	0	0	0	0
<b>Total</b>	<b>1,427</b>	<b>1,114</b>	<b>1,046</b>	<b>1,130</b>	<b>1,008</b>
FTE	2.2	2.0	1.9	2.3	3.1
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	201	189	189	222	311
Non-Labor	1,226	925	857	908	697
NSE	0	0	0	0	0
<b>Total</b>	<b>1,427</b>	<b>1,114</b>	<b>1,046</b>	<b>1,130</b>	<b>1,008</b>
FTE	2.2	2.0	1.9	2.3	3.1
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	32	31	31	36	51
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>32</b>	<b>31</b>	<b>31</b>	<b>36</b>	<b>51</b>
FTE	0.4	0.3	0.3	0.4	0.5
<b>Escalation to 2016\$</b>					
Labor	-4	-2	-5	-2	0
Non-Labor	-20	-10	-18	-7	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-24</b>	<b>-12</b>	<b>-23</b>	<b>-9</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	229	218	216	255	363
Non-Labor	1,206	915	838	901	697
NSE	0	0	0	0	0
<b>Total</b>	<b>1,435</b>	<b>1,133</b>	<b>1,054</b>	<b>1,157</b>	<b>1,059</b>
FTE	2.6	2.3	2.2	2.7	3.6

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00280.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 002800 - Gas Energy Measurement Systems (GEMS)

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years	2012	2013	2014	2015	2016	
Labor	0	0	0	0	0	
Non-Labor	0	0	0	0	0	
NSE	0	0	0	0	0	
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	
FTE	0.0	0.0	0.0	0.0	0.0	

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 002800**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00280.0  
 Category: L. Measurement & Regulation Devices  
 Category-Sub: 1. Meters  
 Workpaper Group: 002800 - Gas Energy Measurement Systems (GEMS)  
 Workpaper Detail: 002800.001 - The purchase of Gas Energy Measurement System (GEMS) devices  
 In-Service Date: Not Applicable

Description:

Gas Energy Measurement Systems (GEMS) are used by SoCalGas to facilitate accurate billing and gas volume measurement of each customer meter set operating at non-standard metering pressures and temperatures. The expenditures included here are for the purchase of the GEMS device, other associated material, warehouse handling, technical evaluations, and quality assurance. Cost for the initial installation of a GEMS device is also included.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-008 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		366	387	396
Non-Labor		1,049	1,083	1,098
NSE		0	0	0
	<b>Total</b>	<b>1,415</b>	<b>1,470</b>	<b>1,494</b>
FTE		3.6	3.8	3.9

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 002800**

**SCG-04-GOM-CAP-SUP-008**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Mejia-Orozco**  
**Supplemental Workpaper for Zero Based Calculations Related to Gas Energy Measurement Systems**  
**Gas Energy Measurement Systems (GEMS) Workpaper**

**Unit Forecast**

	<b>Growth</b>	<b>New Installations</b>		<b>Replacement Installations</b>			<b>Total</b>
	[I] (SCG-04-GOM-CAP-SUP-006, Table 2, [I])	[A] ([I]x[A] for Previous Year)	[B] ([I]x[B] for Previous Year)	[C] (2016 Base)	[D] (2016 Base)	[E] (2016 Base)	[G] (Sum [A] Thru [E])
	NB Forecast Growth Factor	Electronic Correctors	Little GEMS	Electronic Corrector	Little GEMS	Big GEMS	Total
2016 Historical [1]	N/A	40	40	280	130	20	510
2017 [2]	6%	42	42	280	130	20	514
2018 [3]	21%	51	51	280	130	20	532
2019 [4]	7%	55	55	280	130	20	540

**2016 Historical Costs and FTEs (2016\$ with vacation & sick)**

	<b>New Installations</b>		<b>Replacement Installations</b>			<b>Total</b>
	Electronic Correctors	Little GEMS	Electronic Corrector	Little GEMS	Big GEMS	
2016 Non-Labor [5]	34,584	85,979	270,038	115,208	190,614	696,423
2016 Labor [6]		89,940			272,010	361,950
2016 FTEs [7]		0.9			2.7	3.6

	<b>New Installations</b>		<b>Replacement Installations</b>			<b>Total [H]</b>
	Electronic Correctors	Little GEMS	Electronic Corrector	Little GEMS	Big GEMS	
Non-Labor Unit Cost [8]	1,948	1,799	1,948	1,799	5,630	13,124
2017 ([8]x[2])	81,816	75,558	545,440	233,870	112,600	1,049,284
2018 ([8]x[3])	99,348	91,749	545,440	233,870	112,600	1,083,007
2019 ([8]x[4])	107,140	98,945	545,440	233,870	112,600	1,097,995

\* 2016 historical weighted average cost not available, so forecasted unit cost was estimated.

**SCG-04-GOM-CAP-SUP-008**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Mejia-Orozco**  
**Supplemental Workpaper for Zero Based Calculations Related to Gas Energy Measurement Systems**  
**Gas Energy Measurement Systems (GEMS) Workpaper**

**Labor Forecast (2016\$ with vacation & sick)**

		New Installations	Replacement Installations	Total (I)
Labor Unit Cost	<b>[9]</b> ((f6)/(f1))	1,124.25	633	1,757
2017	((9)x(2))	94,437	272,010	366,447
2018	((9)x(3))	114,674	272,010	386,684
2019	((9)x(4))	123,668	272,010	395,678

**FTE Forecast (with vacation & sick)**

		New Installations	Replacement Installations	Total (J)
FTEs per Unit	<b>[10]</b> ((7)/(f1))	0.0113	0.0063	0.0
2017	((10)x(2))	0.9	2.70	3.6
2018	((10)x(3))	1.1	2.70	3.8
2019	((10)x(4))	1.2	2.70	3.9

**Total Forecast (Thousands of 2016\$ with vacation & sick)**

	FTEs (J)	Labor (I)/1000	Non-Labor (H)/1000	Total (I)+(H)
2017	3.6	366.45	1,049.28	1,416
2018	3.8	386.68	1,083.01	1,470
2019	3.9	395.68	1,098.00	1,494

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: M. Capital Tools  
Workpaper: 007250

**Summary for Category: M. Capital Tools**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	13	14	17	20
Non-Labor	9,652	14,372	14,203	12,302
NSE	0	0	0	0
<b>Total</b>	<b>9,665</b>	<b>14,386</b>	<b>14,220</b>	<b>12,322</b>
FTE	0.1	0.1	0.2	0.2

**007250 Capital Tools & Equipment - Routine**

Labor	13	14	17	20
Non-Labor	9,652	14,372	14,203	12,302
NSE	0	0	0	0
<b>Total</b>	<b>9,665</b>	<b>14,386</b>	<b>14,220</b>	<b>12,322</b>
FTE	0.1	0.1	0.2	0.2

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**007250 - Capital Tools & Equipment - Routine**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
<b>Years</b>									
Labor	5-YR Linear	3	0	1	9	13	14	17	20
Non-Labor	5-YR Linear	2,097	2,341	734	4,219	9,652	14,372	14,203	12,302
NSE	5-YR Linear	0	0	0	0	0	0	0	0
<b>Total</b>		<b>2,100</b>	<b>2,341</b>	<b>735</b>	<b>4,227</b>	<b>9,665</b>	<b>14,386</b>	<b>14,220</b>	<b>12,322</b>
FTE	5-YR Linear	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2

**Business Purpose:**

Budget Codes: 713, 725, 727, 729.

This work category includes expenditures associated with the purchase of capital tools and equipment used by distribution field personnel for the maintenance and repair of gas pipeline systems. The main driver of this plant category is the need to replace existing tools that are broken, outdated, or have outlived their useful lives. In addition, SoCalGas invests in new tools that provide innovative ways of completing the construction, maintenance and repair of its facilities in order to lessen customer disruptions and improve construction safety. This workpaper covers routine capital tool and equipment purchases.

**Physical Description:**

Routine tool and equipment purchases are used by the gas distribution field, meter shop, fabrication & repair shop, measurement & controls, and other departments to efficiently and safely install and maintain the gas distribution system.

**Project Justification:**

In order to maintain the effectiveness and efficiency of the field personnel it is necessary to provide adequate and appropriate tools that will enable them to complete thorough system inspection, maintenance and construction functions.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00725.0  
Category: M. Capital Tools  
Category-Sub: 1. Capital Tools  
Workpaper Group: 007250 - Capital Tools & Equipment - Routine

**Forecast Methodology:**

**Labor - 5-YR Linear**

SoCalGas used the five-year historical (2012 through 2016) linear trend to forecast the ongoing needs for the labor portion of this workbook.

**Non-Labor - 5-YR Linear**

Routine tool purchase requirements are identified during the year, as part of the regular course of maintenance and construction activities. SoCalGas expects routine tool purchases to continue on an increasing trend as existing tools and equipment reach their useful life expectancies and the level of construction and maintenance activities increases, adding to the number of new employees that must be equipped with tools and equipment. Some tools are exposed to rigorous use. Due to safety risks, such tools must be replaced before breaking, otherwise, they could potentially cause injury to an employee. A five-year (2012 through 2016) historical linear trend forecast methodology was used to forecast the expenditures of routine tool purchases. Risk Assessment Mitigation Plans (RAMP) are included in this workbook as incremental such as standardizing Locate and Mark tools, upgrading Nomex coveralls, air monitoring equipment.

**NSE - 5-YR Linear**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	5-YR Linear	13	16	19	1	1	1	14	17	20
Non-Labor	5-YR Linear	8,904	10,603	12,302	5,468	3,600	0	14,372	14,203	12,302
NSE	5-YR Linear	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>8,917</b>	<b>10,619</b>	<b>12,321</b>	<b>5,469</b>	<b>3,601</b>	<b>1</b>	<b>14,386</b>	<b>14,220</b>	<b>12,322</b>
FTE	5-YR Linear	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.2	0.2

**Forecast Adjustment Details**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID		
2017	Other	0	3,800	0	3,800	0.0	MEBARRIN20161110112329223		
<b>Explanation:</b>		RAMP - Incremental - SCG-01 - Dig-Ins - Excavation Damages: Funds to standardize leak detection equipment.							
2017	Other	0	1,667	0	1,667	0.0	FGALVAN20170628134334490		
<b>Explanation:</b>		RAMP - Incremental - SCG-02 - Upgrade Nomex coveralls and fresh air equipment. Replace all current Nomex and fresh air equipment.							
<b>2017 Total</b>		0	5,467	0	5,467	0.0			
2018	Other	0	1,100	0	1,100	0.0	FGALVAN20170628133150090		
<b>Explanation:</b>		RAMP - Incremental - SCG-02 - Confined Space Air Monitoring System for Field Personnel. Replace the current confined space and H2S monitoring equipment system-wide to address age-related equipment failures that currently present a potential risk to the safety of employees working in gaseous atmospheres.							
2018	Other	0	2,500	0	2,500	0.0	FGALVAN20170831131824167		
<b>Explanation:</b>		RAMP - Incremental - SCG-01 - Dig-Ins - Excavation Damages: Funds to standardize leak detection equipment.							
<b>2018 Total</b>		0	3,600	0	3,600	0.0			
<b>2019 Total</b>		0	0	0	0	0.0			

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00725.0  
Category: M. Capital Tools  
Category-Sub: 1. Capital Tools  
Workpaper Group: 007250 - Capital Tools & Equipment - Routine

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	3	0	0	7	11
Non-Labor	2,132	2,367	751	4,251	9,652
NSE	0	0	0	0	0
<b>Total</b>	<b>2,135</b>	<b>2,367</b>	<b>751</b>	<b>4,258</b>	<b>9,663</b>
FTE	0.0	0.0	0.0	0.1	0.1
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	3	0	0	7	11
Non-Labor	2,132	2,367	751	4,251	9,652
NSE	0	0	0	0	0
<b>Total</b>	<b>2,135</b>	<b>2,367</b>	<b>751</b>	<b>4,258</b>	<b>9,663</b>
FTE	0.0	0.0	0.0	0.1	0.1
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	0	0	1	2
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Escalation to 2016\$</b>					
Labor	0	0	0	0	0
Non-Labor	-35	-25	-16	-32	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-35</b>	<b>-25</b>	<b>-16</b>	<b>-32</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	3	0	1	9	13
Non-Labor	2,097	2,341	734	4,219	9,652
NSE	0	0	0	0	0
<b>Total</b>	<b>2,100</b>	<b>2,341</b>	<b>735</b>	<b>4,227</b>	<b>9,665</b>
FTE	0.0	0.0	0.0	0.1	0.1

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine

**Summary of Adjustments to Recorded:**

In Nominal \$(000)					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 007250**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine  
 Workpaper Detail: 007250.001 - Expenditures associated with the purchase of capital tools and equipment used by distri  
 In-Service Date: Not Applicable  
 Description:

Routine tool and equipment purchases are used by the gas distribution field, meter shop, fabrication & repair shop, measurement & controls, and other departments. These specialized tools and equipment enable SoCalGas' personnel to efficiently and safely install and maintain the gas distribution system.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		14	17	20
Non-Labor		8,905	10,603	12,302
NSE		0	0	0
	<b>Total</b>	<b>8,919</b>	<b>10,620</b>	<b>12,322</b>
FTE		0.1	0.2	0.2

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine  
 Workpaper Detail: 007250.002 - RAMP - Incremental - Standardizing locate and mark tools used by locators by replacing  
 In-Service Date: 12/31/2017

Description:

RAMP - Incremental - Replacement of aging tools by standardizing new tools used by locators. Standardizing the locate and mark equipment will improve locator knowledge and experience with the equipment. It will improve equipment training, marking accuracy, and create a best practice of utilizing only one approved tool.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		0	0	0
Non-Labor		3,800	2,500	0
NSE		0	0	0
	<b>Total</b>	<b>3,800</b>	<b>2,500</b>	<b>0</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine  
 Workpaper Detail: 007250.002 - RAMP - Incremental - Standardizing locate and mark tools used by locators by replacing aging tools

**RAMP Item # 1**

RAMP Chapter: SCG-1

Program Name: Standardize Locate & Mark Equipment

Program Description: Standardize locating tools used by Locators by replacing aging tools

**Risk/Mitigation:**

Risk: Catastrophic Damage Involving Third Party Dig-Ins

Mitigation: Prevention and Improvements

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	5,985	0	0
High	6,615	0	0

Funding Source: CPUC-GRC

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 0

Explanation: 2016 embedded costs based on historicals. This is a proposed mitigation where the incremental costs will occur in 2017.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine  
 Workpaper Detail: 007250.004 - RAMP - Incremental - Upgrade Nomex coveralls and fresh air equipment  
 In-Service Date: Not Applicable

Description:

RAMP - Incremental - Field personnel working in Immediately Dangerous to Life or Health (IDLH) environments or in flammable atmospheres must wear gas extraction suits and a Supplied Air Respirator (SAR) with an escape bottle or a Self-Contained Breathing Apparatus (SCBA). The manufacturer of the currently used SAR kits no longer supports the equipment. System-wide replacement of the SAR kits with SCBA kits prior to failure will improve employee safety and create consistency among operating groups. In addition, the fire resistant gloves currently used with the gas extraction suits provide minimal dexterity making it difficult for field personnel to handle small tools and equipment. Replacement of these gloves will reduce the risks associated with working in potentially hazardous atmospheres for extended periods of time.

Forecast In 2016 \$(000)				
	Years	2017	2018	2019
Labor		0	0	0
Non-Labor		1,667	0	0
NSE		0	0	0
	<b>Total</b>	<b>1,667</b>	<b>0</b>	<b>0</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine  
 Workpaper Detail: 007250.004 - RAMP - Incremental - Upgrade Nomex coveralls and fresh air equipment

**RAMP Item # 1**

RAMP Chapter: SCG-2

Program Name: Upgrade Nomex coveralls and fresh air equipment

Program Description: Replace all current Nomex and fresh air equipment

**Risk/Mitigation:**

Risk: Employee, Contractor, Customer, and Public Safety

Mitigation: Upgrade Nomex Coveralls & Fresh Equipment

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	1,364	0	0
High	1,667	0	0

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Non-Mandated

Work Type Citation: N/A

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 0

Explanation: 2016 embedded costs based on historicals. This is a proposed mitigation where the incremental costs will occur in 2017.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine  
 Workpaper Detail: 007250.005 - RAMP - Incremental - Confined space air monitoring system for field personnel  
 In-Service Date: Not Applicable

Description:

RAMP - Incremental - Age-related equipment failures currently present a potential risk to the safety of employees working in gaseous atmospheres warranting acquisition and deployment of new equipment. This program would involve replacement of the current confined space and Hydrogen Sulfide (H2S) monitoring equipment system-wide. The new equipment and associated training would encompass both regular and occasional users who have been identified as performing duties in confined spaces or where the potential for H2S exposure exists. Replace 280 confined space monitors and 380 personal monitors in 2018.

Forecast In 2016 \$(000)				
	Years	2017	2018	2019
Labor		0	0	0
Non-Labor		0	1,100	0
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>1,100</b>	<b>0</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00725.0  
 Category: M. Capital Tools  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007250 - Capital Tools & Equipment - Routine  
 Workpaper Detail: 007250.005 - RAMP - Incremental - Confined space air monitoring system for field personnel

**RAMP Item # 1**

RAMP Chapter: SCG-2

Program Name: Confined space air monitoring system for field personnel

Program Description: Replace 280 confined space monitors in 2018. Replace 380 personal monitors in 2018. 100 calibration gas cylinders purchased per year

**Risk/Mitigation:**

Risk: Employee, Contractor, Customer and Public Safety

Mitigation: Confined space air monitoring system for field personnel

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	0	900	0
High	0	1,100	0

Funding Source: Other

Forecast Method: Zero-Based

Work Type: Non-Mandated

Work Type Citation: N/A

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 0

Explanation: 2016 embedded costs based on historicals. This is a proposed mitigation where the incremental costs will occur in 2018.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: N. Field Capital Support  
Workpaper: 009030

**Summary for Category: N. Field Capital Support**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	64,910	60,491	69,466	73,792
Non-Labor	1,700	826	826	826
NSE	0	0	0	0
<b>Total</b>	<b>66,610</b>	<b>61,317</b>	<b>70,292</b>	<b>74,618</b>
FTE	692.9	681.2	782.3	831.0

**009030 Field Capital Support**

Labor	64,910	60,491	69,466	73,792
Non-Labor	1,700	826	826	826
NSE	0	0	0	0
<b>Total</b>	<b>66,610</b>	<b>61,317</b>	<b>70,292</b>	<b>74,618</b>
FTE	692.9	681.2	782.3	831.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group  
009030 - Field Capital Support**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00903.0  
 Category: N. Field Capital Support  
 Category-Sub: 1. Field Capital Support  
 Workpaper Group: 009030 - Field Capital Support

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
Labor	Zero-Based	38,607	43,418	47,982	57,391	64,910	60,491	69,466	73,792
Non-Labor	5-YR Average	-248	339	755	1,582	1,700	826	826	826
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>38,359</b>	<b>43,757</b>	<b>48,736</b>	<b>58,974</b>	<b>66,610</b>	<b>61,317</b>	<b>70,292</b>	<b>74,618</b>
FTE	Zero-Based	480.5	517.4	558.6	638.5	692.9	681.2	782.3	831.0

**Business Purpose:**

Budget Code: 903

This work category provides the funding for a broad range of services to support Gas Distribution field capital asset construction.

**Physical Description:**

Traditional work elements recorded to this budget category include project planning, local engineering, clerical support, field dispatch, field management and supervision, and off-production time for support personnel and field crews who install the Gas Distribution capital assets.

**Project Justification:**

The activities contained in Field Capital Support include key support functions for the safe, reliable and efficient construction of the gas distribution system.

Activities supported within this group include the following:

- Technical Planning
- Local Engineering
- Clerical
- Scheduling and Dispatch
- Field Management and Supervision
- Off production time.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00903.0  
Category: N. Field Capital Support  
Category-Sub: 1. Field Capital Support  
Workpaper Group: 009030 - Field Capital Support

**Forecast Methodology:**

**Labor - Zero-Based**

The labor forecast for the category of Field Capital Support is based on the level of historical costs as a percentage of construction costs incurred. Over the past five years (2012 through 2016), the percentage has ranged from 29% to 37%, with 2015 experiencing the highest ratio and 2014 the lowest. This variation is due in part to the mix of projects in each year as some capital work requires more labor support as a percentage of the project's cost. Given this variation in work and associated labor support costs, SoCalGas chose the five-year (2012 through 2016) historical average support ratio of 32.7% to determine the base forecast for the Field Capital Support work category. SoCalGas applied this labor ratio of 32.7% to the overall projected capital construction cost to determine the future needs of this workgroup.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-010 for calculation details.

**Non-Labor - 5-YR Average**

The non-labor forecast for Field Capital Support was based on the historical five-year (2012 through 2016) average. Using this method best represents the non-labor funding needed to support this work category and complements the labor requirement.

**NSE - Zero-Based**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00903.0  
 Category: N. Field Capital Support  
 Category-Sub: 1. Field Capital Support  
 Workpaper Group: 009030 - Field Capital Support

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Zero-Based	60,491	69,466	73,792	0	0	0	60,491	69,466	73,792
Non-Labor	5-YR Average	825	825	825	1	1	1	826	826	826
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>61,316</b>	<b>70,291</b>	<b>74,617</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>61,317</b>	<b>70,292</b>	<b>74,618</b>
FTE	Zero-Based	681.2	782.3	831.0	0.0	0.0	0.0	681.2	782.3	831.0

**Forecast Adjustment Details**

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00903.0  
Category: N. Field Capital Support  
Category-Sub: 1. Field Capital Support  
Workpaper Group: 009030 - Field Capital Support

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	33,838	37,632	42,153	49,774	55,731
Non-Labor	-253	343	771	1,594	1,700
NSE	0	0	0	0	0
<b>Total</b>	<b>33,586</b>	<b>37,975</b>	<b>42,924</b>	<b>51,368</b>	<b>57,431</b>
FTE	412.1	442.6	478.3	546.7	592.6
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	33,838	37,632	42,153	49,774	55,731
Non-Labor	-253	343	771	1,594	1,700
NSE	0	0	0	0	0
<b>Total</b>	<b>33,586</b>	<b>37,975</b>	<b>42,924</b>	<b>51,368</b>	<b>57,431</b>
FTE	412.1	442.6	478.3	546.7	592.6
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	5,418	6,254	6,879	8,053	9,179
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>5,418</b>	<b>6,254</b>	<b>6,879</b>	<b>8,053</b>	<b>9,179</b>
FTE	68.4	74.8	80.3	91.8	100.3
<b>Escalation to 2016\$</b>					
Labor	-649	-469	-1,051	-436	0
Non-Labor	4	-4	-17	-12	0
NSE	0	0	0	0	0
<b>Total</b>	<b>-644</b>	<b>-473</b>	<b>-1,067</b>	<b>-448</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	38,607	43,418	47,982	57,391	64,910
Non-Labor	-248	339	755	1,582	1,700
NSE	0	0	0	0	0
<b>Total</b>	<b>38,359</b>	<b>43,757</b>	<b>48,736</b>	<b>58,974</b>	<b>66,610</b>
FTE	480.5	517.4	558.6	638.5	692.9

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00903.0  
 Category: N. Field Capital Support  
 Category-Sub: 1. Field Capital Support  
 Workpaper Group: 009030 - Field Capital Support

**Summary of Adjustments to Recorded:**

In Nominal \$(000)					
Years	2012	2013	2014	2015	2016
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
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*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 009030**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00903.0  
 Category: N. Field Capital Support  
 Category-Sub: 1. Field Capital Support  
 Workpaper Group: 009030 - Field Capital Support  
 Workpaper Detail: 009030.001 - Funding for a broad range of services to support Gas Distribution field capital asset c

In-Service Date: Not Applicable

Description:

This work category provides the funding for a broad range of services to support Gas Distribution field capital asset construction. Traditional work elements recorded to this budget category include project planning, local engineering, clerical support, field dispatch, field management and supervision, and off-production time for support personnel and field crews who install the Gas Distribution capital assets.

See Supplemental Workpaper SCG-GOM-CAP-SUP-010 for calculation details.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	60,350	69,322	73,626
Non-Labor	826	826	826
NSE	0	0	0
<b>Total</b>	<b>61,176</b>	<b>70,148</b>	<b>74,452</b>
FTE	679.7	780.8	829.2

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00903.0  
 Category: N. Field Capital Support  
 Category-Sub: 1. Field Capital Support  
 Workpaper Group: 009030 - Field Capital Support  
 Workpaper Detail: 009030.002 - RAMP - Base - Risk ID SCG-02/SCG Employee Contractor Customer & Public Safety - Field I  
 In-Service Date: Not Applicable  
 Description:

RAMP - Base - Risk ID SCG-02/SCG Employee Contractor Customer & Public Safety - Medium Pressure Company Crew Inspections. Field Operation Supervisors (FOS) and Field Team Leads will complete inspections on company crew work. Supervisors will complete the Field Audit Collection Tool (FACT) form to record their findings. The time spent by the FOS and Field Team Lead is included as part of their daily management responsibilities and charged to their default labor reporting – O&M and Capital.

<b>Forecast In 2016 \$(000)</b>			
<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor	58	58	58
Non-Labor	0	0	0
NSE	0	0	0
<b>Total</b>	<b>58</b>	<b>58</b>	<b>58</b>
FTE	0.6	0.6	0.6

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00903.0  
 Category: N. Field Capital Support  
 Category-Sub: 1. Field Capital Support  
 Workpaper Group: 009030 - Field Capital Support  
 Workpaper Detail: 009030.002 - RAMP - Base - Risk ID SCG-02/SCG Employee Contractor Customer & Public Safety - Field Inspe

**RAMP Item # 1**

RAMP Chapter: SCG-2

Program Name: Medium Pressure Company Crew Inspections

Program Description: FOS and Team Leads will complete inspections on company crew work

**Risk/Mitigation:**

Risk: Employee, Contractor, Customer and Public Safety

Mitigation: Med Pressure Company Crew Inspections

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	52	52	52
High	64	64	64

Funding Source: CPUC-GRC

Forecast Method: Other

Work Type: Mandated

Work Type Citation: N/A

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 59

Explanation: 2015 dollars escalated to 2016. Created to account for RAMP activity within this work group.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00903.0  
 Category: N. Field Capital Support  
 Category-Sub: 1. Field Capital Support  
 Workpaper Group: 009030 - Field Capital Support  
 Workpaper Detail: 009030.003 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Utility Conflict Re  
 In-Service Date: Not Applicable  
 Description:

RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Utility Conflict Review (Right of Way) - Review right of way and other conflicts and resolve these matters for capital construction projects.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		83	86	108
Non-Labor		0	0	0
NSE		0	0	0
	<b>Total</b>	<b>83</b>	<b>86</b>	<b>108</b>
FTE		0.9	0.9	1.2

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00903.0  
 Category: N. Field Capital Support  
 Category-Sub: 1. Field Capital Support  
 Workpaper Group: 009030 - Field Capital Support  
 Workpaper Detail: 009030.003 - RAMP - Base - Risk ID SCG-10/SCG Medium-Pressure Pipeline Failure - Utility Conflict Review

**RAMP Item # 1**

RAMP Chapter: SCG-10

Program Name: Utility Conflict Review (Right of Way)

Program Description: Review right of way and other conflicts and resolve these matters

**Risk/Mitigation:**

Risk: Catastrophic Damage Involving Medium-Pressure Pipeline Failure

Mitigation: Systems are in place to monitor and manage compliance activity schedules

**Forecast CPUC Cost Estimates (\$000)**

	<u>2017</u>	<u>2018</u>	<u>2019</u>
Low	73	76	95
High	92	96	120

Funding Source: FERC

Forecast Method: Trend

Work Type: Mandated

Work Type Citation: CFR 49 Subpart M

**Historical Embedded Cost Estimates (\$000)**

Embedded Costs: 72

Explanation: Assumed 2016 actuals on adjusted 2015 dollars. Created to document that the mitigation is incorporated within the workpaper.

**Supplemental Workpapers for Workpaper Group 009030**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

**SCG-04-GOM-CAP-SUP-010**  
**Southern California Gas Company -- Gas Distribution -- Witness Gina Mejia-Orozco**  
**Supplemental Workpaper Calculations for Support Personnel Related To Field Capital Construction Work**  
**Field Capital Support Workpaper**

Assumptions:

*Construction costs include only the work categories requiring field support.*  
Amounts include vacation and sick.

Capital Construction Costs and Historical Field Capital Support Labor Costs (Thousands of 2016\$)

	Historical					Forecast		
	2012	2013	2014	2015	2016	2017	2018	2019
New Business	15,956	24,469	30,425	37,294	43,233	42,244	50,925	54,534
Pressure Betterment	12,728	12,253	37,912	23,175	29,371	23,088	23,088	23,088
Supply Line Replacement	10,773	3,160	3,728	313	3,067	4,209	4,209	4,209
Main Replacement	37,614	44,021	28,272	26,367	32,282	33,711	33,711	33,711
Service Replacement	14,046	16,485	20,581	21,273	26,315	28,538	31,470	34,403
Main/Service Abandon	3,425	4,029	4,973	6,209	8,663	9,256	10,522	11,787
Regulator Stations	4,665	7,172	6,398	7,422	8,635	8,636	14,636	19,436
Cathodic Protection	2,400	3,842	4,342	3,855	5,462	5,821	6,435	7,049
Freeway Relocation	8,926	10,191	10,234	3,282	6,551	7,837	7,837	7,837
Franchise Relocation	16,886	16,389	18,723	24,153	13,319	17,894	17,894	17,894
Other Distribution Capital Projects	3,088	4,079	2,216	2,674	4,424	3,297	3,297	3,297
Meter Guards	678	381	384	256	358	359	8,299	8,299
Total Construction Costs* [A]	131,183	146,471	168,189	156,273	181,680	184,890	212,323	225,544
Historical Field Support Labor [B]	38,359	43,757	48,736	58,974	66,610			
Historical Field Support Ratio ((B)/[A])	29.2%	29.9%	29.0%	37.7%	36.7%			

Historical Calculations (2016\$)

	[C] ((A)*1000)	[D] ((B)*1000)	[E]
	Historical 5-Year Total Applicable Capital	Historical Capital Field Support Labor	Historical Field Capital Support FTEs
2012	\$ 131,182,524	\$ 38,358,723	480.5
2013	\$ 146,471,043	\$ 43,757,163	517.4
2014	\$ 168,188,685	\$ 48,736,127	558.6
2015	\$ 156,273,000	\$ 58,973,562	638.5
2016	\$ 181,680,000	\$ 66,609,757	692.9
5-Year 2012-2016 Total	\$ 783,795,252	\$ 256,435,332	2,887.9

5-Year 2012-2016 Average Ratio of Labor to Capital Construction Total	32.7%	[F] [D/C]
5-Year 2012-2016 Average Labor Dollars per FTE	\$ 88,796	[G] [D/E]

Forecast Data (Thousands of 2016\$)

	[H] ([A])	[I] ([H]*[F])	[J] ([I]*1000/[G])
	Forecasted Total Applicable Capital	Forecasted Labor Expenditures	Forecasted FTEs
2017	\$ 184,890	\$ 60,491	681.2
2018	\$ 212,323	\$ 69,466	782.3
2019	\$ 225,544	\$ 73,792	831.0

Supplemental Workpaper Page 1 of 1

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Category: O. Remote Meter Reading  
Workpaper: 001820

**Summary for Category: O. Remote Meter Reading**

	In 2016\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2016	2017	2018	2019
Labor	2,938	655	1,744	0
Non-Labor	1,727	72	288	0
NSE	0	0	0	0
<b>Total</b>	<b>4,665</b>	<b>727</b>	<b>2,032</b>	<b>0</b>
FTE	52.5	7.7	21.7	0.0

**001820 Remote Mtr Reading**

Labor	2,938	655	1,744	0
Non-Labor	1,727	72	288	0
NSE	0	0	0	0
<b>Total</b>	<b>4,665</b>	<b>727</b>	<b>2,032</b>	<b>0</b>
FTE	52.5	7.7	21.7	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group  
001820 - Remote Mtr Reading**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00182.0  
 Category: O. Remote Meter Reading  
 Category-Sub: 1. Remote Meter Reading  
 Workpaper Group: 001820 - Remote Mtr Reading

**Summary of Results (Constant 2016 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2012	2013	2014	2015	2016	2017	2018	2019
Labor	Zero-Based	0	792	1,258	3,748	2,938	655	1,744	0
Non-Labor	Zero-Based	0	-47	210	2,088	1,727	72	288	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>745</b>	<b>1,468</b>	<b>5,835</b>	<b>4,665</b>	<b>727</b>	<b>2,032</b>	<b>0</b>
FTE	Zero-Based	0.0	11.3	19.3	70.1	52.5	7.7	21.7	0.0

**Business Purpose:**

Budget Code: 182

This cost category consists of Customer Services Field (CSF) labor and non-labor expenses for curb meter replacements as part of the planned meter changes associated with the Advanced Metering Infrastructure (AMI) implementation. Beginning in 2013, the Advanced Metering Infrastructure (AMI) project assumed responsibility for above-ground Planned Meter Changes (PMC), including both planned and accelerated meter changes, and CSF shifted its focus to curb meter changes. This trade-off (i.e., the AMI project team focusing on above-ground meters and CSF focusing on curb meters) enabled a better match between the work and employee skill sets. Over the course of the deployment period, all GRC and AMI-funded planned meter changes will be completed. (Reference: ORA-SCG-DR-012-DAO, SoCalGas 2016 GRC – A.14-11-004)

**Physical Description:**

This category includes CSF labor and associated non-labor costs for the replacement of curb meters. CSF labor includes field technicians who perform the meter replacement work, supervision and management support staff.

**Project Justification:**

All curb meters need to be replaced with one that includes the AMI technology. The costs are split 50/50 between O&M and Capital for curb meter replacements because the existing curb meters are incompatible with AMI technology. The O&M forecast for 2017 and 2018 are covered in the workpapers of SoCalGas witness, Gwen Marelli, Ex. SCG-18.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00182.0  
Category: O. Remote Meter Reading  
Category-Sub: 1. Remote Meter Reading  
Workpaper Group: 001820 - Remote Mtr Reading

**Forecast Methodology:**

**Labor - Zero-Based**

Field Labor costs are primarily driven by the order volumes and average number of orders completed per FTE based on 2016 base year. Vacation and sick loaders were applied to productive hours to determine total FTE requirements. Incremental labor costs from higher skilled field employees are required to provide support which includes restoring gas service to customers premise due to unforeseen interruption, replacing broken, frozen or leaking service valves, and testing for leakage on company or customer gas piping. Costs are driven by the number of employees needed to support these activities and applicable wage rates. Supervision manages the work and performance of the field technicians. Supervision costs are based on maintaining a reasonable span of control and taking into consideration the geographical dispersion of the workforce as supervision needs to be able to respond to the employee in case of emergencies. Other management labor includes the following:

- 1) Curb Replacement Program Manager
- 2) Field Team Lead responsible for overseeing the field supervisors, planning and general coordination of the project;
- 3) Project Manager responsible for the work order schedule and assisting in the planning and coordination of day to day operations.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-015 for calculation details.

**Non-Labor - Zero-Based**

The costs in this category consist of vehicles used by field service assistants who perform the curb meter replacements. The zero-based non-labor forecast is based on the number of field employees and rental cost per vehicle.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-015 for calculation details.

**NSE - Zero-Based**

NSE is not applicable to this workgroup.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00182.0  
 Category: O. Remote Meter Reading  
 Category-Sub: 1. Remote Meter Reading  
 Workpaper Group: 001820 - Remote Mtr Reading

**Summary of Adjustments to Forecast**

In 2016 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2017	2018	2019	2017	2018	2019	2017	2018	2019
Labor	Zero-Based	655	1,744	0	0	0	0	655	1,744	0
Non-Labor	Zero-Based	72	288	0	0	0	0	72	288	0
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>727</b>	<b>2,032</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>727</b>	<b>2,032</b>	<b>0</b>
FTE	Zero-Based	7.7	21.7	0.0	0.0	0.0	0.0	7.7	21.7	0.0

**Forecast Adjustment Details**

<u>Year</u>	<u>Adj Group</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2017 Total</b>		0	0	0	0	0.0	
<b>2018 Total</b>		0	0	0	0	0.0	
<b>2019 Total</b>		0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
Witness: Gina Orozco-Mejia  
Budget Code: 00182.0  
Category: O. Remote Meter Reading  
Category-Sub: 1. Remote Meter Reading  
Workpaper Group: 001820 - Remote Mtr Reading

**Determination of Adjusted-Recorded:**

	2012 (\$000)	2013 (\$000)	2014 (\$000)	2015 (\$000)	2016 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	1,372	2,079	6,376	4,992
Non-Labor	0	56	535	4,340	3,598
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1,428</b>	<b>2,614</b>	<b>10,716</b>	<b>8,590</b>
FTE	0.0	19.2	31.2	117.9	89.2
<b>Adjustments (Nominal \$)**</b>					
Labor	0	-685	-973	-3,125	-2,470
Non-Labor	0	-104	-320	-2,237	-1,871
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>-789</b>	<b>-1,294</b>	<b>-5,362</b>	<b>-4,341</b>
FTE	0.0	-9.5	-14.7	-57.9	-44.3
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	0	687	1,105	3,250	2,522
Non-Labor	0	-48	215	2,104	1,727
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>639</b>	<b>1,320</b>	<b>5,354</b>	<b>4,249</b>
FTE	0.0	9.7	16.5	60.0	44.9
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	114	180	526	415
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>114</b>	<b>180</b>	<b>526</b>	<b>415</b>
FTE	0.0	1.6	2.8	10.1	7.6
<b>Escalation to 2016\$</b>					
Labor	0	-9	-28	-28	0
Non-Labor	0	1	-5	-16	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>-8</b>	<b>-32</b>	<b>-44</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2016\$)</b>					
Labor	0	792	1,258	3,748	2,938
Non-Labor	0	-47	210	2,088	1,727
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>745</b>	<b>1,468</b>	<b>5,835</b>	<b>4,665</b>
FTE	0.0	11.3	19.3	70.1	52.5

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00182.0  
 Category: O. Remote Meter Reading  
 Category-Sub: 1. Remote Meter Reading  
 Workpaper Group: 001820 - Remote Mtr Reading

**Summary of Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2012	2013	2014	2015	2016
Labor		0	-685	-973	-3,125	-2,470
Non-Labor		0	-104	-320	-2,237	-1,871
NSE		0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>-789</b>	<b>-1,294</b>	<b>-5,362</b>	<b>-4,341</b>
FTE		0.0	-9.5	-14.7	-57.9	-44.3

**Detail of Adjustments to Recorded in Nominal \$:**

Year	Adj Group	Labor	NLbr	NSE	Total	FTE	RefID
<b>2012 Total</b>		0	0	0	0	0.0	
2013	Other	-685	-104	0	-789	-9.5	FGALVAN20170512112429167
<b>Explanation:</b>	Historical Adjustment To Capital Workgroup. Cost captured under CSFC O&M.						
<b>2013 Total</b>		-685	-104	0	-789	-9.5	
2014	Other	-973	-320	0	-1,294	-14.7	FGALVAN20170512112502783
<b>Explanation:</b>	Historical Adjustment To Capital Workgroup. Cost captured under CSFC O&M.						
<b>2014 Total</b>		-973	-320	0	-1,294	-14.7	
2015	Other	-3,125	-2,237	0	-5,362	-57.9	FGALVAN20170512112652810
<b>Explanation:</b>	Historical Adjustment To Capital Workgroup. Cost captured under CSFC O&M.						
<b>2015 Total</b>		-3,125	-2,237	0	-5,362	-57.9	
2016	Other	-2,470	-1,871	0	-4,341	-44.3	FGALVAN20170512112732023
<b>Explanation:</b>	Historical Adjustment To Capital Workgroup. Cost captured under CSFC O&M.						
<b>2016 Total</b>		-2,470	-1,871	0	-4,341	-44.3	

Note: Totals may include rounding differences.

**Beginning of Workpaper Sub Details for  
Workpaper Group 001820**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

Area: GAS DISTRIBUTION  
 Witness: Gina Orozco-Mejia  
 Budget Code: 00182.0  
 Category: O. Remote Meter Reading  
 Category-Sub: 1. Remote Meter Reading  
 Workpaper Group: 001820 - Remote Mtr Reading  
 Workpaper Detail: 001820.001 - Labor and non-labor for remote meter reading installation of curb box devices  
 In-Service Date: 12/31/2018  
 Description:

Labor and non-labor components for replacement of curbside meters to be equipped with advance meter technology. Project to end in 2018.

See Supplemental Workpaper SCG-04-GOM-CAP-SUP-015 for calculation details.

<b>Forecast In 2016 \$(000)</b>				
	<b>Years</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>
Labor		655	1,744	0
Non-Labor		72	288	0
NSE		0	0	0
	<b>Total</b>	<b>727</b>	<b>2,032</b>	<b>0</b>
FTE		7.7	21.7	0.0

*Note: Totals may include rounding differences.*

**Supplemental Workpapers for Workpaper Group 001820**

Southern California Gas Company  
2019 GRC - APP  
Capital Workpapers

SCG-04-GOM-CAP-SUP-015  
Southern California Gas Company -- Gas Distribution -- Witness Gina Orozco-Mejia  
Supplemental Workpaper for Curb Meter Replacements  
Remote Meter Reading Workpaper

Assumptions: [A]: Non-Represented Positions  
[C]: Yearly Factor  
[D]: Non-Represented Hourly Rate  
[E]: Non-Represented Positions Total Labor  
[F]: Non-Represented Positions FTE  
[G]: Orders worked by Energy Technician Residential (ETR)  
[O]: Orders worked by Field Service Assistant (FSA)  
[L]: ETR to FSA Support Ratio (7 to 1) - For every 7 FSA's forecasted, 1 ETR is needed for additional Field Support  
[U]: FTEs in Section R rounded to the nearest hundredth for 1:1 FTE/Vehicle Factor. Non Labor applied to FSAs only  
[W]: Total multiplied by 12 to account for months in Year  
[Z]: Total includes labor and non labor multiplied by 50% to account for portion of Capital dollars

**Calculations for Forecasted Labor Dollars and FTEs (2016\$ with Vacation & Sick)**

	Position [A]	FTE [B]	Yearly Factor [C]	Hourly Rate [D]	Total Labor ([B]x[C]x[D])	Total Labor [E]	Total FTE [F]
2017	Manager	1	2,080	\$ 60.68	\$ 126,214	2017 \$ 557,330	5.58
2017	Project Managers	2	2,080	\$ 51.03	\$ 212,285		
2017	Project Specialist	1	2,080	\$ 41.15	\$ 49,643	2018 \$ 935,236	10.00
2017	Field Supervision	2	2,080	\$ 40.67	\$ 169,187		
2018	Manager	1	2,088	\$ 60.68	\$ 126,700		
2018	Project Managers	2	2,088	\$ 51.03	\$ 213,101		
2018	Project Specialist	1	2,088	\$ 41.15	\$ 85,921		
2018	Field Supervision	6	2,088	\$ 40.67	\$ 509,514		

	Orders worked by ETR's [G]	Hours Per Order [H]	Represented Rate [I]	Labor Total [J] ([G]x[H]x[I])	Yearly Factor [C]	FTE [K] ([J]/[C]/[I])	ETR to FSA Ratio Support [L] (7 to 1) ([R]/(7))	ETR to FSA Hours Support [M] 2017 ([L]x[C]) 2018 ([L]x[C])	ETR to FSA Labor Cost [N] ([I]x[M])
2017	948	3.4	\$ 35.05	\$ 113,004	2,080	1.6	1.2	2,497	\$ 87,494
2018	962	3.4	\$ 35.05	\$ 114,673	2,088	1.6	4.5	9,500	\$ 332,949

	Orders worked by FSA's [O]	Hours Per Order [P]	Represented Rate [Q]	Labor Total [R] ([O]x[P]x[Q])	Yearly Factor [C]	FTE [R] ([R]/[C]/[Q])	2017 Total Labor [S] 2017 ([J]+[N]+[R])	2018 Total Labor [T] 2018 ([J]+[N]+[R])
2017	5,138	3.4	\$31.65	\$ 553,043	2,080	8.4	\$ 753,541	\$ 2,552,156
2018	19,552	3.4	\$31.65	\$ 2,104,535	2,088	31.8		

**Non-Labor Cost**

	Total Vehicles (FSA FTEs Only) [U]	Rental Cost Per Vehicle [V]	Total Vehicle Rental Cost [W] ([U]x[V]x12)
2017	8	\$ 1,500	\$ 144,000
2018	32	\$ 1,500	\$ 576,000

**Total Labor and Non Labor Forecast for 2017 and 2018**

	Total Labor Per Year [X] 2017 (([E]+[S])x.5) 2018 (([E]+[S])x.5)	Total Non Labor Per Year [Y] ([W]x.5)	Total Labor and Non Labor [Z] ([Y]+[X])	Total FTE [AA] ([F]+[K]+[R])
2017	\$ 655,436	\$ 72,000	\$ 727,436	7.8
2018	\$ 1,743,696	\$ 288,000	\$ 2,031,696	21.7