

Application No: A.13-12-013
Exhibit No.: _____
Witness: David M. Bisi

)
Application of Southern California Gas Company)
(U 904 G) and San Diego Gas & Electric Company)
(U 902 G) For Authority To Recover North-South)
Project Revenue Requirement In Customer Rates)
And For Approval Of Related Cost Allocation And)
Rate Design Proposals)
_____)

A.13-12-013
(Filed December 20, 2013)

UPDATED DIRECT TESTIMONY OF

DAVID M. BISI

SAN DIEGO GAS & ELECTRIC COMPANY

AND

SOUTHERN CALIFORNIA GAS COMPANY

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

November 12, 2014

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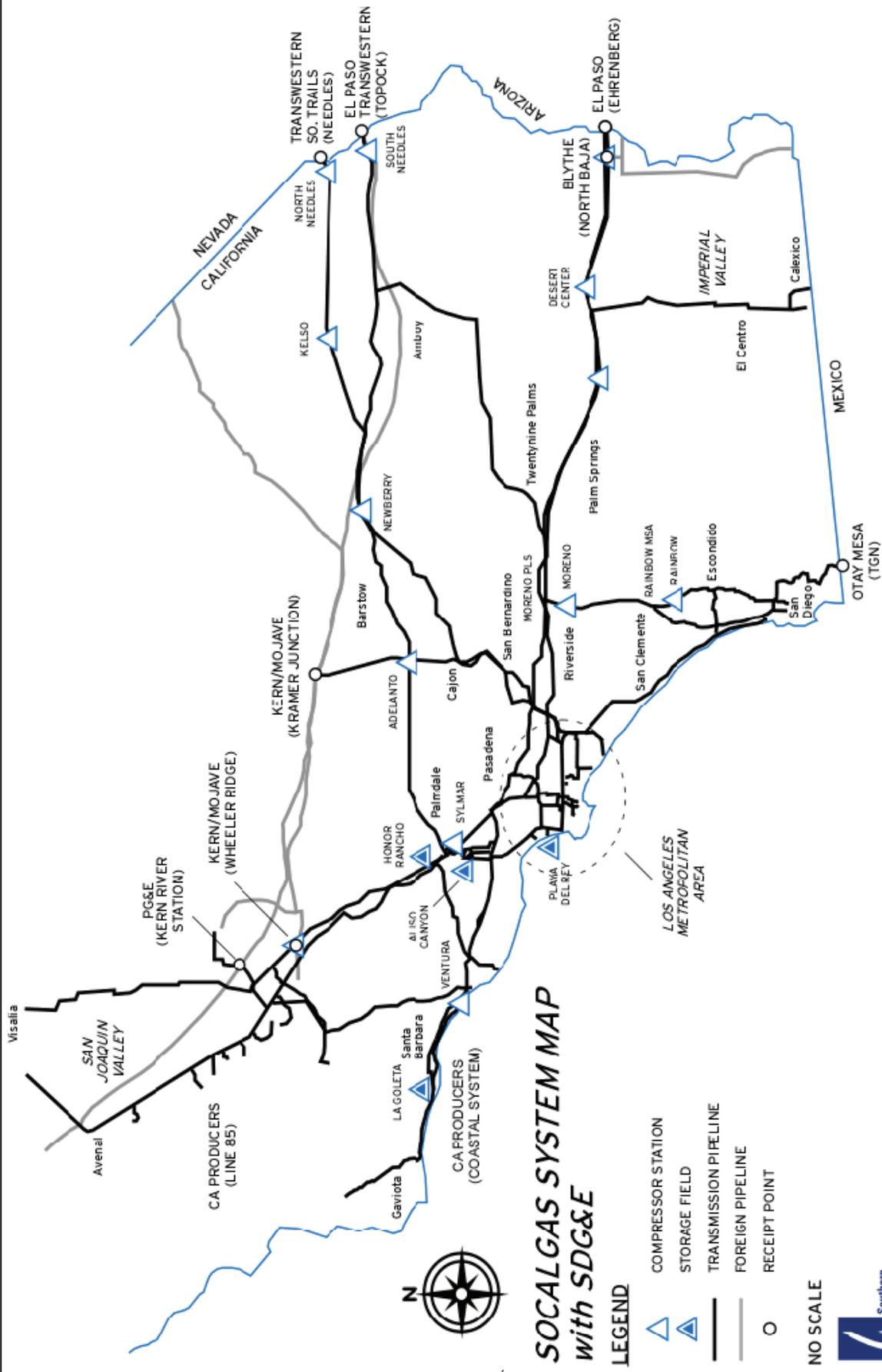
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1 southwestern United States, the Rocky Mountain region, Canada, and California on- and off-shore
2 production. The interstate pipelines that supply the SoCalGas transmission system are El Paso
3 Natural Gas Company (El Paso), North Baja Pipeline (North Baja), Transwestern Pipeline
4 Company (Transwestern), Kern River Gas Transmission Company (Kern River), Mojave Pipeline
5 Company (Mojave), Questar Southern Trails Pipeline Company (Southern Trails), and Gas
6 Transmission Northwest (GTN) via the intrastate system of Pacific Gas and Electric Company
7 (PG&E). The SoCalGas transmission system interconnects with El Paso at the Colorado River near
8 Needles and Blythe, California, with North Baja near Blythe, California, and with Transwestern and
9 Southern Trails near Needles, California. SoCalGas also interconnects with the common
10 Kern/Mojave pipeline at Wheeler Ridge in the San Joaquin Valley and at Kramer Junction in the
11 high desert. At Kern River Station in the San Joaquin Valley, SoCalGas maintains a major
12 interconnect with the PG&E intrastate pipeline system, and receives PG&E/GTN deliveries at that
13 location. SoCalGas operates four storage fields that interconnect with its transmission system.
14 These storage fields – Aliso Canyon, Honor Rancho, La Goleta, and Playa del Rey – are located
15 near the primary load centers of the SoCalGas system. Together they have a combined inventory
16 capacity of 134.1 billion cubic feet (Bcf), a combined firm injection capacity of 850 MMcfd, and a
17 combined firm withdrawal capacity of 3,195 MMcfd.

18

FIGURE 1



Apr 2013

1 A schematic of the SDG&E gas transmission system is shown in Figure 2. The SDG&E gas
2 transmission system consists primarily of two high-pressure large diameter pipelines that extend
3 south from Rainbow Station, located at the Riverside/San Diego County border. Both pipelines
4 terminate at the San Diego metropolitan area.

5 The pipelines are interconnected approximately at their midpoint and again near their
6 southern terminus. The northern cross-tie runs between Carlsbad and Escondido, with the southern
7 cross-tie running through Miramar.

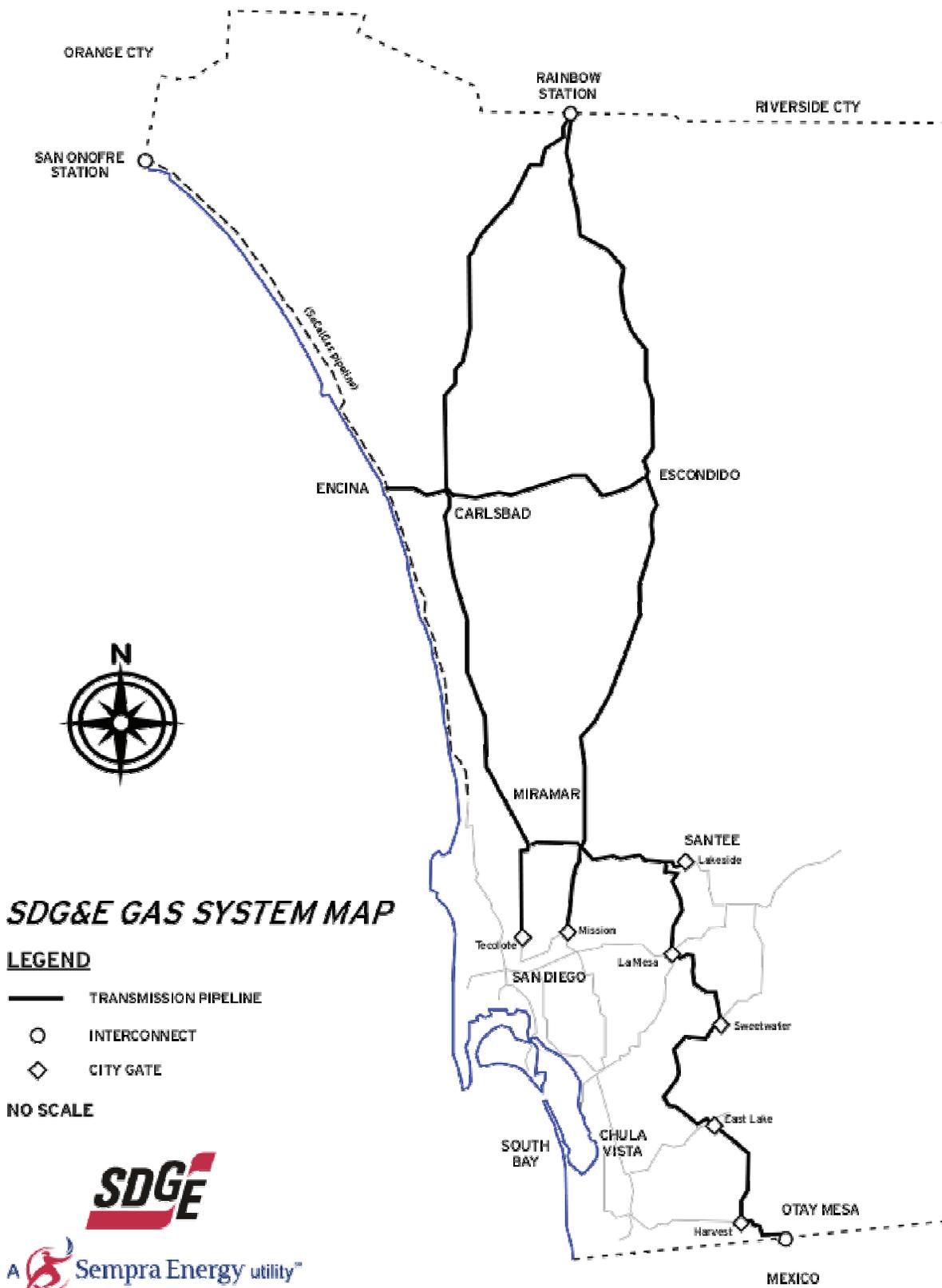
8 A large diameter pipeline extends from the cross-tie at Miramar to Santee. At Santee,
9 another large diameter pipeline extends to the Otay Mesa metering station at the U.S./Mexico
10 border. At Otay Mesa, the SDG&E system interconnects with the Transportadora de Gas Natural
11 de Baja, California, S.de R.L. de C.V. (TGN) pipeline, providing another receipt point for supplies
12 into the SoCalGas/SDG&E system.

13 A small diameter, lower pressure pipeline owned by SoCalGas also extends south from
14 Orange County down to San Diego.

15 Two compressor stations are also a part of the SDG&E gas transmission system. SDG&E's
16 Moreno compressor station, located in Moreno Valley, boosts pressure into the SoCalGas
17 transmission lines serving Rainbow Station. A much smaller compressor station is located at
18 Rainbow Station.

19 SDG&E has no storage fields in its service territory.

FIGURE 2



1 **III. SOUTHERN SYSTEM MINIMUM FLOW REQUIREMENT**

2 The SoCalGas Southern System consists primarily of three high-pressure pipelines
3 extending westward from the Colorado River near Blythe to Moreno Station in the City of Moreno
4 Valley and two high-pressure pipelines extending westward from Moreno Station to the Los
5 Angeles Basin. Three high-pressure pipelines also extend southward from Moreno Station to the
6 SDG&E gas transmission system; the area between Moreno Station and the SDG&E gas
7 transmission system is referred to as the Rainbow Corridor. Additionally, compressor stations are
8 located near Blythe, Desert Center and Cactus City to boost pressures westward along the system
9 and near Moreno Valley and Temecula to boost pressures south into San Diego. The Southern
10 System was primarily designed to receive gas from El Paso at the Colorado River near Blythe and
11 redeliver it to load centers in the Inland Empire, Imperial Valley, San Diego and the Los Angeles
12 basin. Furthermore, the system consists of pipelines with “telescoping” operating pressures as gas
13 moves from the receipt point towards the load centers. Specifically, the pipelines’ Minimum
14 Operating Pressures (MinOPs) and Maximum Allowable Operating Pressures (MAOPs) are higher
15 at the Blythe receipt point and lower near the load centers.

16 The Southern System can receive additional supplies from other pipelines within the
17 SoCalGas transmission system by the use of two valve stations located along each of the two high-
18 pressure pipelines extending westward from Moreno Station. These two valve stations are Chino
19 and Prado Stations near the cities of Chino and Corona, respectively. Supplies from Chino and
20 Prado Stations can flow both westward to the Los Angeles basin and eastward to Moreno Station.

21 Supplies can also be received into the Southern System at the Otay Mesa receipt point in
22 San Diego.¹ The Otay Mesa receipt point was designed to receive supplies through TGN from two
23 sources: LNG supplies from the Energia Costa Azul LNG terminal in Baja California, and

¹ D.04-09-022, Ordering Paragraph 7.

1 Southwestern Basin supplies from the El Paso system via the North Baja pipeline. However, since
2 2008 the volume of supplies received into the Southern System at Otay Mesa has been minimal, due
3 to market price differentials between domestic United States and foreign LNG supplies and due to
4 growing demand for domestic supplies exported to Mexico.

5 SoCalGas also has the ability to transport a limited volume of supply from its Northern
6 System to the Southern System via Transmission Line 6916, formerly the Questar Southern Trails
7 Pipeline. SoCalGas can transport up to 80 MMcfd on this pipeline to the Southern System.

8 Unlike other parts of SoCalGas' system, the Southern System requires minimum flow
9 volumes at the Blythe and/or Otay Mesa receipt points to maintain service to its customers in the
10 Imperial Valley and San Diego load centers and other communities in San Bernardino and
11 Riverside Counties. While supplies from the Chino and Prado Stations and from Line 6916 can
12 flow eastward, these facilities provide only a limited amount of supplies to meet the demand of the
13 Southern System during peak periods. Additionally, due to the telescoping operating pressures of
14 the Southern System pipelines, the higher MinOPs of the pipelines east of Moreno Station restrict
15 further eastward flow. Similarly, supplies delivered via Line 6916 cannot flow east of the Cabazon
16 area. In other words, supplies delivered at the pipeline MAOP from Chino and Prado Stations and
17 from Line 6916 are at lower pressures than the MinOPs on the eastern portion of the Southern
18 Transmission System. As a result, the remaining supply needed to meet Southern System demand
19 must be delivered from El Paso or North Baja at the Blythe receipt point, and/or from TGN at the
20 Otay Mesa receipt point, in order to maintain service to both core and noncore customers on the
21 Southern System.

22 **IV. POTENTIAL INFRASTRUCTURE IMPROVEMENTS**

23 SoCalGas examined three different pipeline projects to address the Southern System
24 reliability needs. Each of the pipeline projects has the capacity to transport 800 MMcfd of supply

1 from the Northern Transmission System to the Southern System in the event of low deliveries at
2 Blythe and/or Otay Mesa. As a design condition, SoCalGas used a 1-in-10 year cold day demand
3 forecast for core customers along with the connected capacity for existing large noncore customers,
4 and no gas supply delivered at Blythe or Otay Mesa. All three projects examined kept system
5 pressures above MinOPs and below MAOPs, did not exceed the capacity of current transmission
6 facilities (unless otherwise noted and identified as needing improvement), and allowed the system
7 linepack to be fully recovered at the end of the 24 hour simulated period.

8 The design criteria used for this assessment was similar to the CPUC-mandated design
9 standard for firm noncore service, but was modified for this analysis because of the issue unique to
10 the Southern System, in order to ensure long-term service to the region. The CPUC-mandated
11 design standard for firm noncore service is the 1-in-10 year cold day demand forecast for core
12 customers and a forecast of firm demand for noncore customers.² The forecasted noncore demand
13 is less than the connected capacities for noncore customers since noncore customers either have
14 redundant equipment or are not typically all at their connected capacity at the same time.
15 Therefore, the demand used for this assessment represented an extreme condition, and as such,
16 gives us more confidence that the evaluated pipeline improvements can meet the design criteria to
17 maintain service to all noncore customers without supply delivered on the Southern System.

18 The demand condition assumed in this evaluation is also similar to, but not the same as, the
19 demand used when evaluating the results of the SoCalGas and SDG&E constrained area open
20 seasons. Pursuant to Decision (D.) 06-09-039, SoCalGas and SDG&E conduct open seasons for
21 firm noncore transportation capacity in areas of the system where requests for firm noncore service
22 can or have exceeded the available capacity. When reviewing the results of the open season bid
23 process, SoCalGas and SDG&E use the bid requests for firm noncore service coupled with the 1-in-

² See D.06-09-039, mimeo., at 184.

1 10 year cold day demand forecast for core customers. Bid requests are typically less than either the
2 forecasted noncore demand or their connected capacities discussed previously, and to date,
3 SoCalGas and SDG&E have been able to award all requests for firm noncore service in its currently
4 capacity constrained areas.³

5 Per D.06-09-039, SoCalGas and SDG&E filed an advice letter documenting the results of
6 the capacity open seasons and discussing any further action. The issue of reinforcing the Southern
7 System with a new pipeline from the Northern Transmission System was not discussed in any of
8 these advice letter filings because this interconnect does not expand capacity to a capacity
9 constrained area, and is not needed for that purpose. In other words, any of the pipelines discussed
10 in more detail below will transport supply from the Northern Transmission System to the Southern
11 System in the event of low deliveries at Blythe or Otay Mesa; however, they do not provide for
12 additional capacity to move those gas supplies south into the capacity constrained areas of the
13 Rainbow Corridor or San Diego. The SDG&E Gas Capacity Planning and Demand Forecast Semi-
14 Annual Report, most recently submitted on October 30, 2013, documents potential capacity
15 improvements to this area.

16 **A. NORTH-SOUTH PROJECT**

17 The North-South Project, shown in Figure 3, involves installing new pipeline between the
18 town of Adelanto and our Moreno Pressure Limiting Station, and rebuilding the Adelanto
19 Compressor Station. Approximately 63 miles of 36-inch diameter pipeline must be installed from
20 the Adelanto Compressor Station to the Moreno Pressure Limiting Station. The preliminary route
21 will take it through the Cajon Pass, inhabited regions of San Bernardino County, and wetland areas.

³ Requests for firm noncore service exceeded the available capacity in the 2007 Imperial Valley open season. Subsequently, SoCalGas expanded the capacity of the system by installing Transmission Line 6914, and the Imperial Valley is no longer a potential capacity constrained area.

1 The Adelanto Compressor Station must be rebuilt with approximately 30,000 HP of compression in
2 order to accommodate the design throughput.⁴

3 The North-South Project originally included 31 miles of new pipeline between Whitewater
4 Station and Moreno Pressure Limiting Station would need to be installed in order to facilitate the
5 higher pressures that would result from the new Adelanto-Moreno pipeline and compression, and
6 move those gas supplies transported from Adelanto to load centers on the Southern System east of
7 Moreno Pressure Limiting Station. However, this new pipeline between Whitewater Station and
8 Moreno Pressure Limiting Station is only required in order to satisfy the condition of no flowing
9 supplies needed at Blythe under the demand scenario used for these analyses (i.e., a 1-in-10 year
10 cold day demand forecast for core customers along with the connected capacity for existing large
11 noncore and electric generation customers).⁵ As explained by Ms. Marelli, SoCalGas and SDG&E
12 have determined that the North-South Project can still meet their project objectives while satisfying
13 a somewhat less rigorous set of criteria than we originally used to develop the project – i.e., zero
14 deliveries at Blythe under the specified demand scenario. Without the requirement of zero
15 deliveries at Blythe under this demand scenario, the pipeline between Whitewater Station and
16 Moreno Pressure Limiting Station can be eliminated from the project, and the remaining two
17 components of the North-South Project – the new pipeline between Adelanto and the Moreno

⁴ SoCalGas believes that this new compressor should be gas-driven. Electric drive compression may be suitable for some applications that are not critical to reliably serve customer demand or manage system deliveries, such as our project to replace the compressors at our Aliso Canyon storage field. However, SoCalGas cannot tolerate an impact to its critical gas operations when the electric grid is down, or even just resulting from a simple electric service interruption to its facility. An interruption at a major mainline compressor station could certainly lead to noncore customer curtailment and may also jeopardize core reliability. In addition, an electric service interruption to an electric mainline natural gas compressor could in turn cause additional problems with the electric grid if needed flowing natural gas supplies are not able to reach electric generators. Conversely, natural gas mainline compressors act as a backstop to electric grid reliability by enabling local generators to come back on line in the event of a large-scale grid outage.

⁵ This demand scenario results in a forecasted sendout of 5.370 billion cubic feet per day (Bcf/d) on the SoCalGas/SDG&E transmission system. A simple 1-in-10 year cold day demand forecast for both core and noncore customers (i.e., a forecast that does not also include all connected capacity for existing large noncore customers) results in a forecasted sendout of 5.026 Bcf/d.

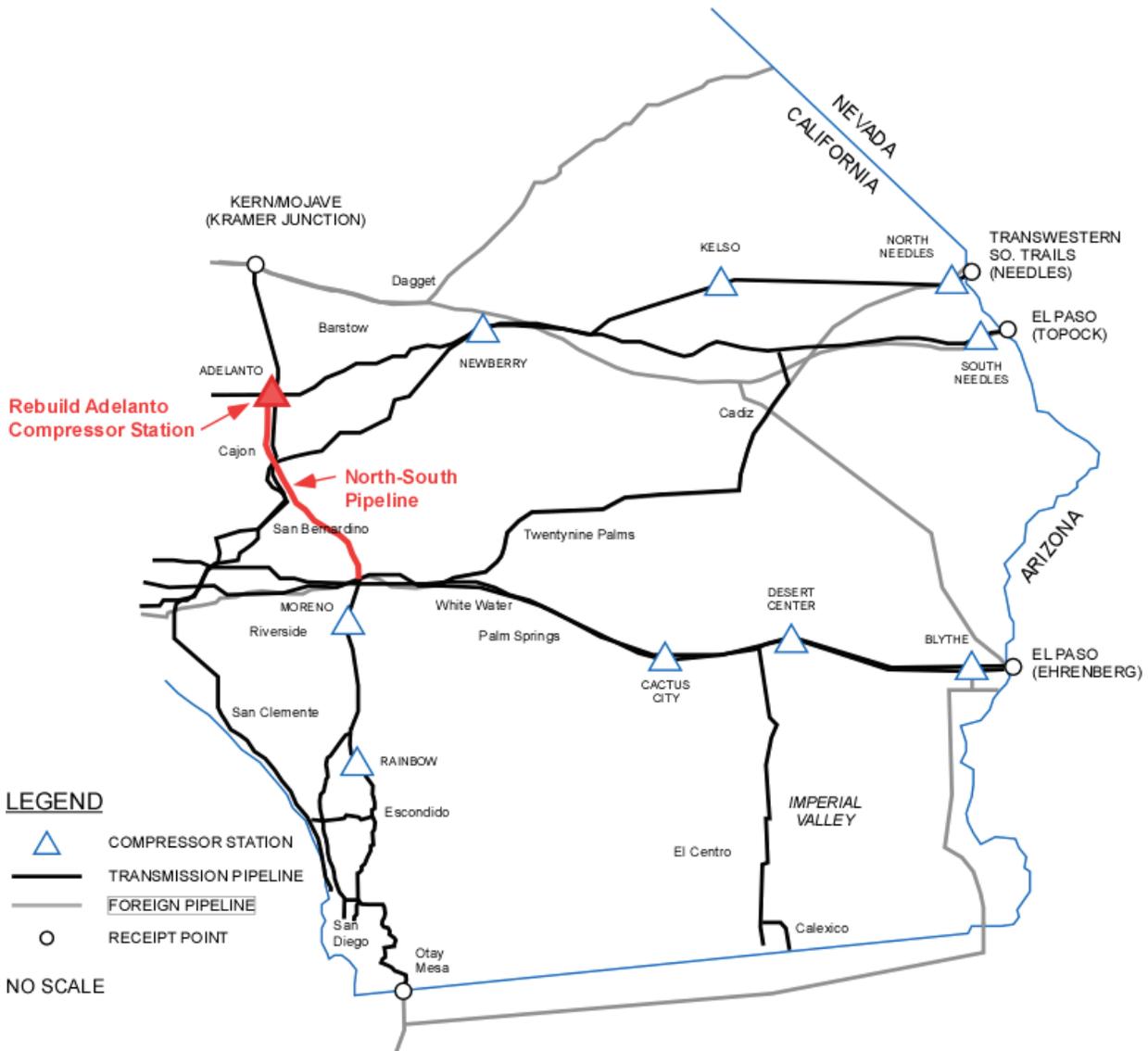
1 Pressure Limiting Station and the rebuilt Adelanto Compressor Station – can maintain system
2 integrity and provide reliable service under this demand scenario with only 100 MMcfd of supply
3 needed at Blythe.⁶ Furthermore, eliminating this pipeline now does not preclude its construction
4 later; if this minimal supply requirement at Blythe becomes burdensome at some point in the future,
5 the Moreno-Whitewater pipeline could be installed at that time.

6

⁶ Under a simple 1-in-10 year cold day demand forecast for both core and noncore customers, no flowing supplies would be needed at Blythe once the Adelanto-to-Moreno pipeline and the rebuild of the Adelanto Compressor Station are placed into service.

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**Figure 3
North-South Project**



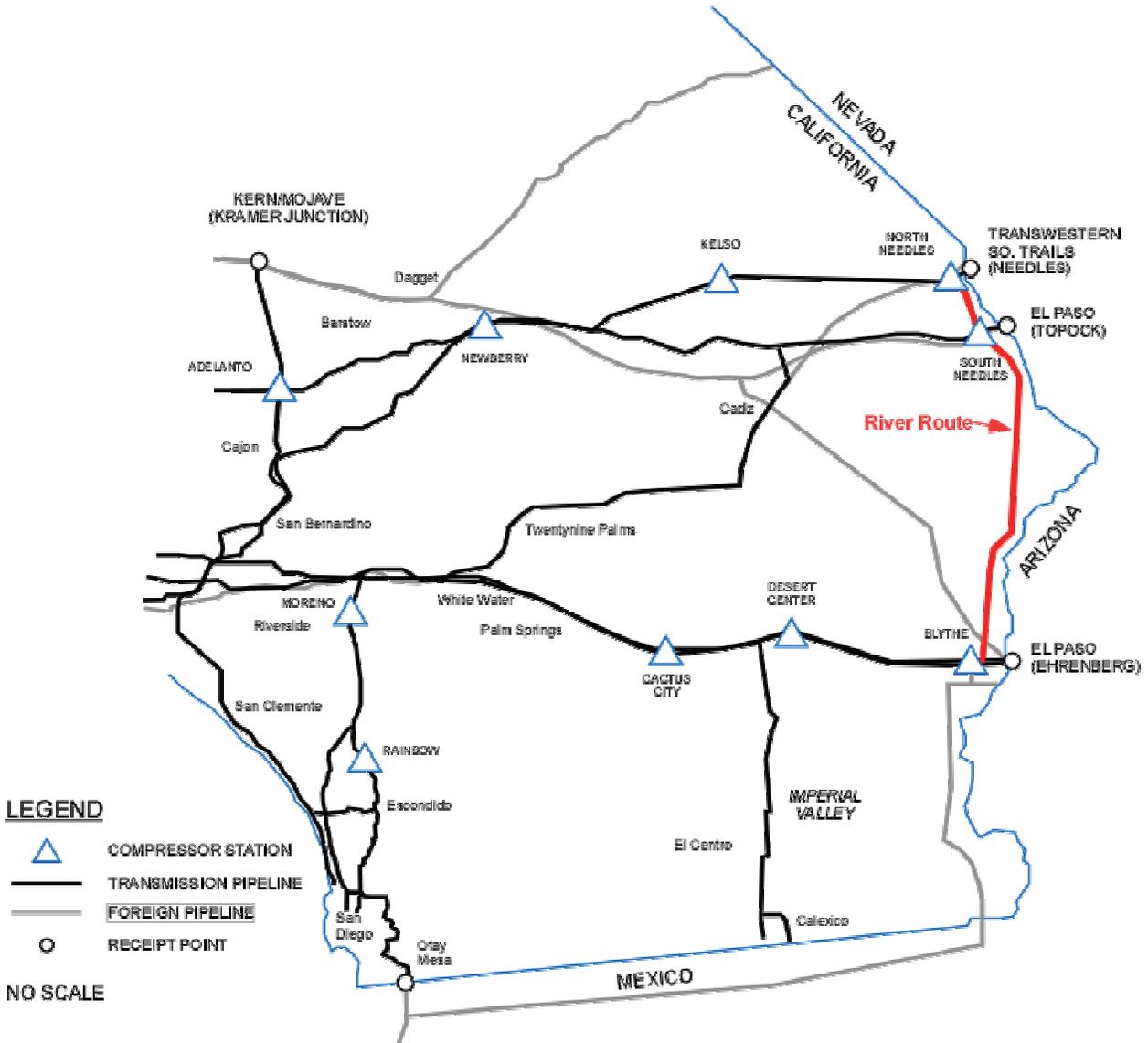
3 The North-South Project can transport supply delivered at the North Needles, South
4 Needles, Kramer Junction, Wheeler Ridge, and Kern River Station receipt points, as well as
5 transport storage supplies from our Honor Rancho storage field to serve customers off the Southern
6 System.

B. RIVER ROUTE PIPELINE

7
8 The River Route Pipeline, shown in Figure 4, involves the installation of approximately 100
9 miles of 36-inch diameter pipeline connecting North Needles to South Needles and continuing to

1 Blythe. No additional compression is required for this project. Since the River Route Pipeline
 2 transports its supplies to the inlet of the Blythe Compressor Station, the flow of gas on the Southern
 3 System is unchanged from its current operation, and no additional improvements are necessary on
 4 existing Southern System facilities.

5 **Figure 4**
 6 **River Route Pipeline**



7 Supplies transported on the River Route Pipeline are limited to those delivered at the North
 8 Needles and South Needles receipt points. Because of pressure limitations in the design of
 9 SoCalGas' pipeline network, gas supplies cannot be transported east from Newberry to North and

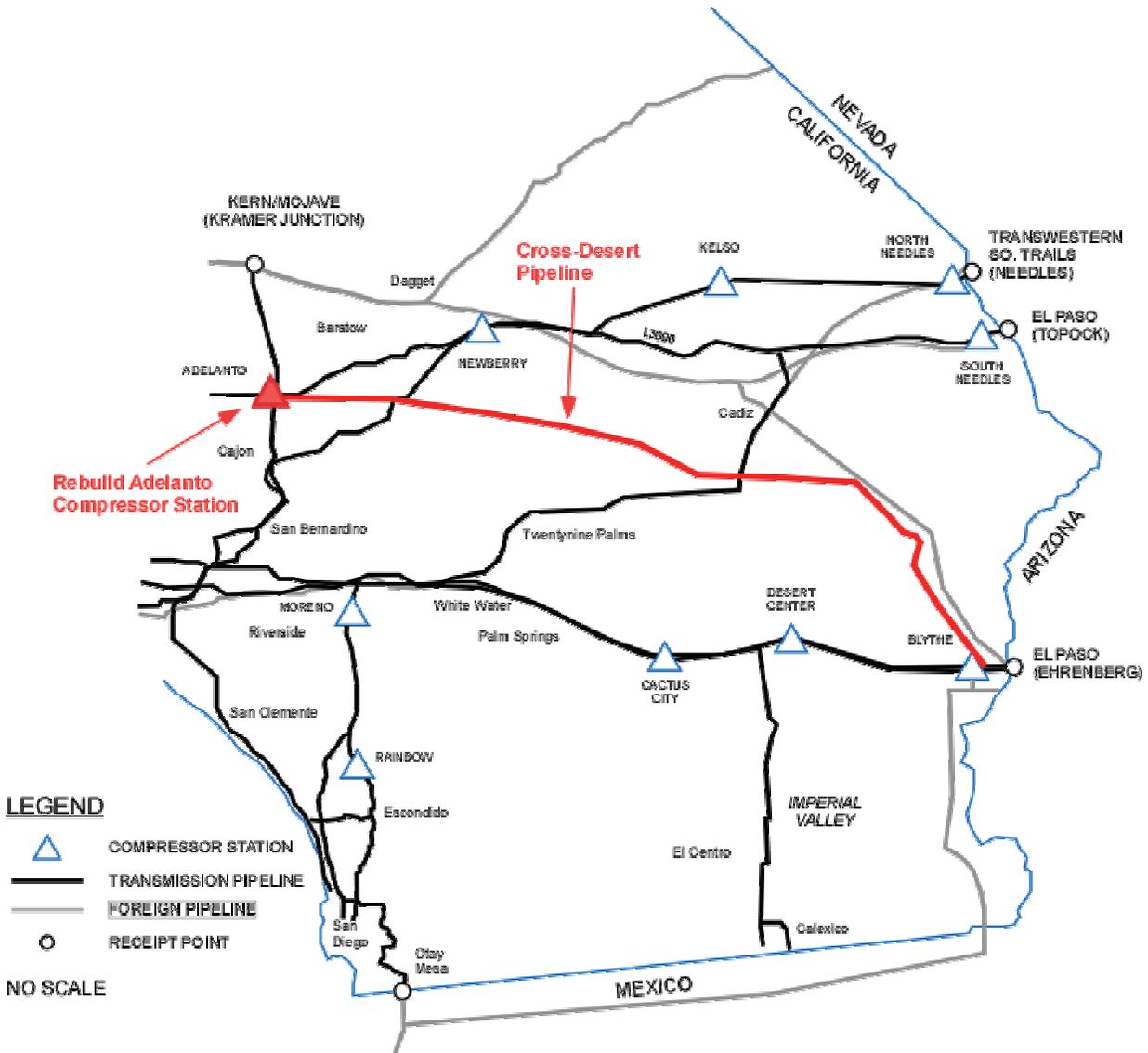
1 South Needles. This means that supplies delivered at Kramer Junction, Wheeler Ridge, and Kern
2 River Station cannot be redelivered to the Southern System via the River Route Pipeline, nor gas
3 supply from the Honor Rancho Storage field.

4 **C. CROSS DESERT PROJECT**

5 The Cross Desert Project, shown in Figure 5, includes the installation of new pipeline and
6 rebuilding of the Adelanto Compressor Station. Approximately 200 miles of 36-inch diameter
7 pipeline must be installed from the Adelanto Compressor Station to Blythe. The Adelanto
8 Compressor Station must be rebuilt with approximately 35,000 HP of compression. As with the
9 River Route Pipeline, the flow of gas on the Southern System is unchanged from its current
10 operation, so no additional improvements are necessary on existing Southern System facilities.

1
2

**Figure 5
Cross Desert Project**



3 The Cross Desert Project can transport the same supplies to the Southern System as the
4 North-South Project, including storage supplies from the Honor Rancho storage field.

1 **V. THE NORTH-SOUTH PROJECT WOULD INCREASE THE SYSTEM RECEIPT**
2 **CAPACITY**

3 The receipt capacity of the Northern Zone is 1,590 MMcfd.⁷ Although it was not a driving
4 factor for this analysis, all three pipeline projects discussed in Section V can increase this receipt
5 capacity by 300 MMcfd. However, because both the River Route and Cross Desert Pipelines
6 interconnect with the Southern System upstream of the Blythe compressor station, any increase in
7 receipt capacity in the Northern Zone is offset by a loss in receipt capacity on the Southern Zone –
8 specifically at Blythe due to the capacity of the Blythe compressor station and the take-away
9 capacity of the pipelines downstream of that location. Only the North-South Project can increase
10 the Northern Zone receipt capacity without degrading the Southern Zone receipt capacity because it
11 interconnects with the Southern System far downstream of Blythe and is not limited by the take-
12 away capacity from that location.

13 Therefore, with any of the pipelines discussed herein, the Northern Transmission Zone
14 receipt capacity can be increased by 300 MMcfd to 1,890 MMcfd. However, both the River Route
15 and Cross Desert Pipelines would degrade the Southern Transmission Zone receipt capacity, and
16 only the North-South Project can also increase the entire system receipt capacity from 3,875 MMcfd
17 to 4,175 MMcfd.⁸

18 Again, increased receipt capacity was not a problem that SoCalGas was seeking to solve
19 with any of these three pipelines, but is rather an added benefit that the market and our customers
20 may appreciate. SoCalGas believes that its current receipt capacity of 3,875 MMcfd is sufficient to

⁷ More information on SoCalGas' receipt capacity can be found at <https://scgenvoy.sempa.com> and in SoCalGas Schedule No. G-BTS.

⁸ System capacity, which is defined as system demand plus injection capacity less off-system deliveries, must be equal to the level of supply delivered to the system. SoCalGas and SDG&E cannot receive its total system receipt capacity of 3,875 MMcfd (or 4,175 MMcfd with the North-South Project) of supply unless the system capacity is also at least this much.

1 meet the long term demand requirements of our customers and also provides a sufficient level of
2 excess, or “slack,” capacity per Commission guidelines.⁹

3 **VI. NORTH-SOUTH PROJECT IS THE BEST INFRASTRUCTURE ALTERNATIVE**

4 SoCalGas’ preference between these three pipeline options is the North-South Project. The
5 North-South Project provides a direct interconnect between the Northern System and the largest
6 load center on the Southern System: the Rainbow Corridor and San Diego. That direct interconnect
7 will allow the system to respond more quickly to changes made by our Gas Control Department to
8 meet changing demand conditions on the Southern System.

9 The North-South Project also provides a level of redundancy for supply delivered to the
10 Southern System that the other two pipelines do not. Because the River Route Pipeline and Cross
11 Desert Project interconnect upstream of the Blythe Compressor Station, an outage on the Southern
12 System downstream of Blythe has the ability to impact supply to all points downstream. By
13 providing an independent interconnect on the Southern System, the North-South Project can
14 mitigate the customer impact from any supply disruption at Blythe.

15 Demand on the Southern System has steadily increased over the years, and SoCalGas is
16 aware of further potential growth in this part of our service territory. The North-South Project is
17 uniquely suited to meet growth in customer demand. As already discussed earlier, because it
18 interconnects far downstream of Blythe, it does not impede or impact our ability to receive
19 1,210 MMcfd at Blythe if we have enough demand on our system to support that level of supply. In
20 contrast, supply transported from the Northern System to the Southern System via either the River
21 Route Pipeline or the Cross Desert Project simply displaces supply that would normally be
22 delivered at Blythe from El Paso. Without further expansion on the Southern System, neither
23 pipeline can be effective in meeting incremental growth in customer demand.

⁹ See SoCalGas Advice Letter No. 4383, Biennial Report on Backbone Transmission and Slack Capacity, June 29, 2012.

1 **VII. FROM A DESIGN AND OPERATION STANDPOINT, AN INFRASTRUCTURE**
2 **IMPROVEMENT IS MUCH BETTER THAN THE OTHER ALTERNATIVES**
3 **CONSIDERED BY SOCALGAS**

4 As discussed by Ms. Marelli, SoCalGas has considered various contractual alternatives to
5 deal with future Southern System minimum flow requirements. Such alternatives may have certain
6 price advantages or disadvantages which I will leave to the other witnesses to discuss. From a
7 system design and system operation standpoint, however, any of the infrastructure improvement
8 projects that SoCalGas has proposed in this application are clearly superior to any contractual
9 alternative.

10 A new pipeline, such as the North-South Project that SoCalGas prefers, provides operational
11 flexibility that is maintained, controlled, and operated by SoCalGas within the jurisdiction and
12 oversight of the Commission, and is not reliant on outside companies to maintain their pipeline
13 systems and contractual obligations upstream of SoCalGas. Additionally, all contractual
14 alternatives assume that customers and shippers (or, potentially, the System Operator) are able to
15 actually acquire gas supply on that upstream pipeline and make use of the pipeline capacity on the
16 day that supply is needed on the Southern System. This is not a significant improvement over the
17 current situation. Any supply shortages upstream of our system could still leave SoCalGas unable
18 to maintain service to our customers on the Southern System.

19 In contrast, the North-South Project allows supplies to be delivered virtually anywhere on
20 the SoCalGas system to support the Southern System, and does not depend upon a single or specific
21 path or contract, except for a minimal level of flowing supplies that would still be required at Blythe
22 during a high-sendout event such as that assumed for the design condition. While dependency on
23 upstream pipelines can never be fully eliminated, as a system planner, there is value in eliminating
24 extreme levels of dependency, such as the situation that currently exists on the Southern System.

1 **VIII. QUALIFICATIONS**

2 My name is David M. Bisi. I am employed by SoCalGas as the Gas Transmission Planning
3 Department Manager. My business address is 555 West Fifth Street, Los Angeles, California,
4 90013-1011.

5 I received a Bachelor of Science degree in Mechanical Engineering from the University of
6 California at Irvine in 1989. I have been employed by SoCalGas since 1989, and have held
7 positions within the Engineering, Customer Services, and Gas Transmission departments.

8 I have held my current position since April, 2002. My current responsibilities include the
9 management of the Gas Transmission Planning Department responsible for the design and planning
10 of SoCalGas and SDG&E's gas transmission and storage systems. As such, I am responsible for:
11 ensuring that the transmission system meets the CPUC-mandated design standards for core and
12 noncore firm service over a 25 year forecast period; recommending improvements and additions as
13 necessary; monitoring the changing dynamics of the gas transmission system as new load centers
14 develop and new supply receipt points are created; alerting management when operating
15 precautions or changes become necessary; performing short-term capacity analyses for customer
16 service requests from the transmission system; evaluating system impacts from storage expansion
17 projects and new product offerings to customers; and developing staff to maintain continuity and
18 consistency in system planning.

19 I have previously testified before the Commission.

20 This concludes my updated prepared direct testimony.