Applicant No: A-11-09-0
Exhibit No:
Witness: Hugo Mejia

Application of Southern California Gas Company (U904G) to Maintain Existing Tariff Rule 30 Gas Interchangeability Rules.	A.11-09-0 (Filed September 2, 2011)

PREPARED DIRECT TESTIMONY

OF HUGO MEJIA

SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA
September 2, 2011

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I. QUALIFICATION AND PURPOSE

My name is Hugo C. Mejia and I have been employed by Southern California Gas Company since 1990. My current position is Manager of the Engineering Analysis Center ("EAC") and I have the responsibility of managing the four sections within the EAC that provides testing and consulting support to SoCalGas operating and marketing groups. Prior to this assignment, I held other management positions within SoCalGas as Environmental Services Manager, Transmission Technical Services Manager, Transmission District Operations Manager, Senior Engineer for Gas Storage Operations and Operations Specialist for Natural Gas Vehicle Market Development Group. I received a Bachelor's Degree in Engineering from California State University, Northridge and I am a Registered Mechanical Engineer in the State of California.

The purpose of my testimony is to describe Southern California Gas Company's ("SoCalGas") current gas quality standards (Rule 30). In addition, I will discuss SoCalGas' request to have the Rule 30 Gas delivery specifications apply to all receipt points.

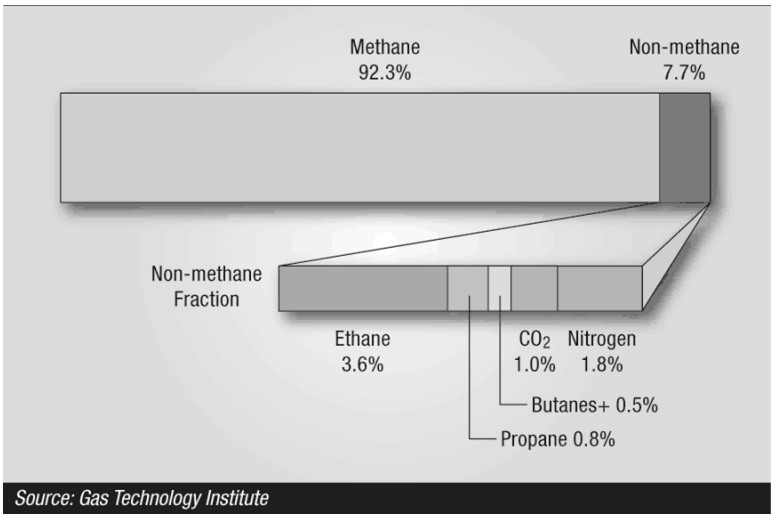
I have previously testified before the California Public Utilities Commission.

II. EVOLUTION OF RULE 30

SoCalGas' first and foremost priority in developing the Rule 30 gas quality specifications was, and will continue to be, the protection of its customers, employees, pipeline system, and the public in general. SoCalGas' current Rule 30 gas delivery specifications have evolved over time, primarily based on the historical and potential sources of gas supplies. Due to improvements in

the interstate pipeline systems, large quantities of high-pressure, natural gas is now delivered to California from other production areas of the country, such as Texas, the Rocky Mountains and the San Juan Basin.[1] Natural gas from these areas is usually stripped of the heavier hydrocarbons to both prevent condensation during transport over the long distance and to supply heavier hydrocarbons to their local markets. The heating value and Wobbe number of this gas is usually lower than most of the Southern California in-state production, which is not processed to the same extent.

Table 1 - Average US National Gas Composition



SoCalGas' Rule 30 gas delivery specifications were initially adopted in 1988 and were based on existing knowledge at the time, including identifying contaminants and constituent limits at levels that historically had provided safe operation. Rule 30 originally included a minimum British thermal unit (Btu) higher heating value, but did not specify an upper Btu higher heating value. The determination for the interchangeability of gases was calculated in conformance with the American Gas Association ("AGA") 36 interchangeability indices and laboratory testing with various end-use burners.

[1] Interstate gas comprises about 92% of the total supply.

In the mid 1990s, a California producer sought to introduce a higher Btu gas into a portion of SoCalGas' service territory that historically had received lower Btu gas. SoCalGas conducted appliance testing in the field as well as in its Engineering Analysis Center during that time, which indicated that some of the newer, more advanced burner design technologies in some end-use equipment did not perform as predicted by the AGA calculation methods. A study was performed by SoCalGas that resulted in a 1998 to Rule 30 change, which introduced a higher heating value upper limit of 1150 Btu/scf.[2]

In 2005, in light of the then recently issued NGC+ White Paper[3] and appliance testing results, SoCalGas petitioned the Commission to change the Wobbe index range to 1290 - 1400, or ± 4% of the national average Wobbe number (1345).[4] SoCalGas testing results demonstrated that above Wobbe number 1400, carbon monoxide had a tendency to increase at a very rapid rate in some pre-mixed equipment used by end-users.[5] Instead, in D.06-03-039, the Commission adopted a SoCalGas 1279 to 1385 Wobbe range, finding that this range was consistent with the NGC+ recommendation. The Commission also approved SoCalGas' proposal to increase the minimum heating value from 970 Btu/scf to 990 Btu/scf, while maintaining a maximum of 1150 Btu/scf.[6] However, the existing producers (or "grandfathered" suppliers) were exempt, such that, their Wobbe Index specification remains at ± 10% or 1199-1465, which was based on a majority of tests conducted on pre-1950 appliances and gas mixtures. These California producers' minimum heating also value remains at 970 Btu/scf.

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[2] SoCalGas' Rule No. 30, at Section I.2.a.
[3] In March 2005 the Natural Gas Council ("NGC") issued interchangeability recommendations (the "NGC+ White Paper") to the Federal Energy Regulatory Commission ("FERC") that included a Wobbe Index maximum of 1400 Btu/SCF. FERC made an announcement on 15 June 2006 where they recommended following the NGC+ White Paper criteria on a voluntary basis. *See* proceeding PL04-3.
[4] In D.06-09-039, the Commission denied SoCalGas' request to reduce the oxygen constituent limits from 0.2% to 0.1% and carbon dioxide limit from 3% to 2% by volume.
[5] SoCalGas also reasoned that the proposed Wobbe index specifications would allow California to receive the full benefits of new gas supplies, without adversely affecting equipment performance or air quality.
[6] D.06-03-039, at Conclusion of Law 34.

III. RULE 30 FRAMEWORK

SoCalGas' Rule 30 gas delivery specifications entail two major aspects: gas constituent limits (composition-based specifications) and gas interchangeability specifications (performance-based quality specifications). Rule 30's gas constituent limits restrict the concentration of gas impurities, so as to protect pipeline integrity and ensure safe and proper combustion[7] in end-user equipment. The interchangeability specifications address end-user combustion issues, and thereby ensure that gas supplied to end-users will combust safely and properly. Collectively, the Rule 30 gas constituent limits and gas interchangeability specifications serve to protect SoCalGas' customers, employees, and pipeline system.

Historical California Production is exempt from Rule 30, pursuant to Rule 30, Section I.5. Section I. 5 states:

> A generic deviation from the minimum gas quality specifications set forth in Paragraph I.3 is granted for 'Historical California Production.' Quality specifications for Historical California Production will be governed by SoCalGas Rule No. 30 in effect as of September 21, 2006, or, to the extent that production had a deviation in place at that time, pursuant to the agreement governing that deviation. 'Historical California Production' is defined as follows: Onshore or offshore California-produced natural gas delivered at points of interconnection existing as of January 1, 2006, up to the maximum historical deliveries or Maximum Daily Volume effective on that date as specified in any agreement permitting supply delivery at those points. If a producer moves its deliveries of Historical California Production from a point of interconnection existing as of January 1, 2006, to another existing or a new point on the system, or if one or more producers consolidate two or more existing points of interconnection existing as of January 1, 2006, to another existing or a new point on the system, the deviation granted under this provision will follow the Historical California Production provided that (a) the Utility has required or approved the change in receipt point location and (b) the continuing deviation shall not exceed the Maximum Daily Volume stated in the access agreement(s) governing deliveries at

[7] Combustion takes place when fuel, most commonly a fossil fuel, reacts with the oxygen in air to produce heat. The heat created by the burning of a fossil fuel is used in the operation of equipment such as boilers, furnaces, kilns, and engines. Along with heat, carbon dioxide and water are created as byproducts of the exothermic reaction. The objective of combustion is to retrieve energy from the burning of fuels in the most efficient way possible. For a general discussion regarding combustion, *see* http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway/carbon_chem/7_using_carbon_fuels1.shtml.

the producer's original point of interconnection and (c) specifically, the quality of the gas should not lessen to the point that it falls outside the grandfathered Rule No. 30 specifications.

A. Gas Delivery Specifications[8]

Table 2 – Rule 30 Non-Hydrogen Sulfide Limits

Parameter	Current Rule 30	Purpose
Heating Value:	990 – 1150 Btu (gross) per standard cubic foot on a dry basis.	• Safe and proper end-use operation
Carbon Dioxide:	≤ 3% by volume.	• Pipeline integrity • Internal corrosion • Safe and proper end-use operation
Oxygen:	≤ 0.2% by volume.	• Pipeline integrity • Internal corrosion • Production operation
Inerts:	≤ 4% total inerts (the total combined carbon dioxide, nitrogen, oxygen and any other inert compound) by volume.	• Pipeline integrity • Internal corrosion • Transmission efficiency • Safe, clean and proper combustion of end-use equipment

Historical California Production is exempt from the minimum Btu content listed above.

B. Natural Gas Interchangeability

Natural Gas interchangeability is defined in combustion applications as the ability to substitute one gaseous fuel for another without materially reducing operational safety, efficiency and performance and without materially increasing air pollutants. SoCalGas maintains gas interchangeability at Producer receipt points by monitoring real-time, carbon dioxide, total inerts and heating values. SoCalGas conducts interchangeability evaluation for new supplies and uses the Wobbe number and the various AGA Bulletin 36 empirically based indices to determine if they are interchangeable. AGA Bulletin 36 Multiple Indices include the Lifting Index,

[8] Pursuant to D.10-09-001, only the inert constituents and heating value are at issue in this Application.

Flashback Index and Yellow Tipping Index, which is discussed in detail in the testimony of Charles Benson.

IV. THE CALIFORNIA PRODUCER GRANDFATHERING EXEMPTION SHOULD BE ELIMINATED, WHEN CONTRACTUALLY PERMISSIBLE.

Historical California Production is not required to comply with the Rule 30 gas delivery specifications. Rather, it is governed either by SoCalGas Rule 30 in effect as of September 21, 2006, or, by agreement. As described herein above, the ±10% Wobbe number exception (1199-1465) creates an unacceptable and unnecessary flame lifting, yellow tipping, food safety, and excessive carbon monoxide emissions risks.[9]

The Historical California Production exemption is incompatible with SoCalGas' pipeline safety goals and requirements. Accordingly, to maintain the protection of SoCalGas customers, employees, pipeline system, and the public-at-large, the Commission should approve SoCalGas' request that *all* Historical California Production, when contractually permissible, should meet *all* Rule 30 gas delivery specifications.

This concludes my testimony.

[9] Additionally, SoCalGas' 2003 testing of the industrial heat treating furnace shows carbon monoxide levels increased in excess of 20,000 ppm with 1435 Wobbe gas.