STATE OF CALIFORNIA EDMUND Governor

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

FILED
12-12-13
04:16 PM

December 12, 2013

Agenda ID # 12647
Quasi-Legislative

TO PARTIES OF RECORD IN RULEMAKING 13-02-008

This is the proposed decision of Commissioner Carla J. Peterman. Until and unless the Commission hears the item and votes to approve it, the proposed decision has no legal effect. This item may be heard, at the earliest, at the Commission's January 16, 2014 Business Meeting. To confirm when the item will be heard, please see the Business Meeting agenda, which is posted on the Commission's website 10 days before each Business Meeting.

Parties of record may file comments on the proposed decision as provided in Rule 14.3 of the Commission's Rules of Practice and Procedure.

/s/ DOROTHY J. DUDA for
Karen V. Clopton, Chief
Administrative Law Judge

KVC:sbf

Attachment

Decision **PROPOSED DECISION OF CMMR PETERMAN** (Mailed 12/12/13)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Adopt Biomethane Standards and Requirements, Pipeline Open Access Rules, and Related Enforcement Provisions.	Rulemaking 13-02-008 (Filed February 13, 2013)

DECISION REGARDING THE BIOMETHANE IMPLEMENTATION TASKS IN ASSEMBLY BILL 1900

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DECISION REGARDING THE BIOMETHANE IMPLEMENTATION TASKS IN ASSEMBLY BILL 1900

1. Summary

Today's decision addresses the time-sensitive issues/actions required of the Commission as set forth in Assembly Bill (AB) 1900, which was enacted into law in Chapter 602 of the Statutes of 2012. That bill, among other things, requires the California Public Utilities Commission to adopt standards that specify the concentrations of constituents of concern that are found in biomethane, and to adopt monitoring, testing, reporting, and recordkeeping protocols, to ensure the protection of human health and to ensure the integrity and safety of the pipelines and pipeline facilities.

After careful consideration of the recommendations of the California Air Resources Board and the Office of Environmental Health Hazard Assessment, and the positions of the proponents of biomethane, the California gas utilities, and other interested parties, we adopt 17 constituents of concern that may be found in biomethane and establish the concentration standards for those constituents that the processed biomethane must meet before the biomethane is allowed to be injected into the utilities' gas pipeline systems. Today's decision also adopts the monitoring, testing, reporting and recordkeeping requirements that the Joint Report recommends be adopted, with certain clarifications.

The adoption of the concentration standards for the 17 constituents of concern, and the monitoring, testing, reporting, and recordkeeping protocols will allow processed biomethane, which originates from biogas sources, to be injected into the gas utilities' pipelines and mixed with fossil natural gas for use in heating, cooking, and industrial applications. Consistent with AB 1900, the California gas utilities are ordered to file tariffs reflecting the adopted

concentration standards and protocols.[1] These filed tariffs will allow potential biomethane suppliers to view all of the criteria that the biomethane must meet, so that the biomethane can be injected into the utilities' pipeline systems in a responsible, reasonable and fair manner, while ensuring that human health, and the integrity and safety of the gas pipelines and pipeline facilities, are protected.

Another phase in this proceeding will be opened to consider the cost issues associated with the actions adopted in today's decision.

2. Background

2.1. Procedural Background

This Order Instituting Rulemaking (Rulemaking or R.) was initiated on February 13, 2013 to implement two provisions of Assembly Bill (AB) 1900. AB 1900 was enacted into law in Chapter 602 of the Statutes of 2012, and amended and added several code sections pertaining to biogas and biomethane. AB 1900 added Health and Safety Code § 25421, which addresses the first implementation task that the California Public Utilities Commission (Commission) is required to undertake. Subdivision (c) of that code section requires the Commission to adopt, on or before December 31, 2013, "standards that specify, for constituents that may be found in that biomethane, concentrations that are reasonably necessary to ensure" the protection of human health, and pipeline and pipeline facility integrity and safety. In addition, to "ensure pipeline and pipeline facility integrity and safety," subdivision (d) of

[1] This is in contrast to the current practice of Southern California Gas Company and San Diego Gas & Electric Company of using their "Rule 30 Biomethane Gas Delivery Specifications Limits and Action Levels" document if a potential biomethane supplier wants to interconnect with those pipelines.

Health and Safety Code § 25421 requires the Commission to "adopt the monitoring, testing, reporting, and recordkeeping requirements identified pursuant to paragraph (5) of subdivision (a)" of that code section. [2]

The second implementation task that AB 1900 requires of the Commission is to "adopt pipeline access rules that ensure that each gas corporation provides nondiscriminatory open access to its gas pipeline system to any party for the purposes of physically interconnecting with the gas pipeline system and effectuating the delivery of gas." (Public Utilities Code Section 784.)

AB 1900 further requires the Commission to "adopt policies and programs that promote the in-state production and distribution of biomethane." (Public Utilities Code § 399.24.)

As described later in this decision, AB 1900 directed the Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board (CARB), in consultation with other state agencies, to perform certain tasks related to the human health effects of biogas and biomethane.

The initiating Rulemaking directed the respondent gas utilities, and other parties, to serve their preliminary information and recommendations in the form of prepared testimony. This prepared testimony was to address the following: (1) the proposals that they had provided to the CARB and OEHHA; (2) the standards and requirements that should be adopted for biomethane that is to be injected into the a common carrier pipeline; (3) information about the

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[2] Former Health and Safety Code Section 25421, which was repealed by AB 1900, prohibited the sale or transport of landfill gas to a gas corporation if that gas contains a vinyl chloride concentration exceeding 1170 parts per billion by volume. (*See* section 7 of General Order No. 58A.)

current status about open access to pipelines, and what rules the Commission should adopt; (4) the existing laws, rules, and regulations concerning the standards and requirements, and open access rules, and what amendments should be adopted; and (5) other information to adopt, implement, and enforce the standards and requirements for the use of biomethane in California.[3]

In accordance with the Rulemaking's directive, on March 25, 2013, the "Preliminary Information and Recommendations of the Independent Storage Providers," and the "Proposed Prepared Direct Testimony of Southern California Gas Company, San Diego Gas & Electric Company, Pacific Gas & Electric Company, and Southwest Gas Corporation," were served on the service list.[4]

A prehearing conference was noticed for and held on March 27, 2013. Following the prehearing conference, a scoping memo and ruling (Scoping Ruling) was issued on May 2, 2013. The Scoping Ruling set forth the scope of issues to be addressed in this proceeding. The Scoping Ruling also stated that "the cost associated with meeting the Commission-adopted standards and requirements will be addressed in this proceeding, after the Commission has undertaken the work associated with adopting such standards and requirements," and that "the cost-related issue may have to be addressed in a separate phase of this proceeding." (Scoping Ruling at 7.)

The Scoping Ruling also stated that "As for the policy issue of whether some or all of the costs of complying with the adopted biomethane standards

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[3] A more detailed list of the type of information to be supplied in the preliminary information is set forth in the Rulemaking at 15 to 17.

[4] These utilities are referred to in this decision as the "four utilities."

and requirements should be subsidized by customers of the gas utilities, that is an issue that belongs in R.11-05-005, as discussed below in the biomethane promotion section." (Scoping Ruling at 7.) Similarly, the Scoping Ruling also stated that the biomethane promotion requirement contained in Public Utilities Code Section 399.24 should be addressed in R.11-05-005. (Scoping Ruling at 8.) The Scoping Ruling left open the possibility of "revisiting whether additional work on biomethane promotion policies and related costs subsidies is needed, after more progress has been made in R.11-05-005." (Scoping Ruling at 8-9.)

To meet the various details and deadlines imposed by AB 1900, and to collaboratively work with all of the state agencies and participants, the Scoping Ruling addressed the need for workshops. A total of three workshops were held in this proceeding to discuss the following topics: human health and safety implications of AB 1900; update on the state agencies' activities regarding human health and safety; and pipeline safety standards.

The Scoping Ruling also established the procedural schedule following the service of the CARB and OEHHA report on May 15, 2013. The Scoping Ruling set the dates for parties to serve supplemental testimony on the CARB and OEHHA report, and to serve concurrent rebuttal testimony.[5] The Scoping Ruling also set the dates for evidentiary hearings.

On May 15, 2013, the CARB and OEHHA transmitted and released their "Recommendations to the California Public Utilities Commission Regarding

[5] The dates set forth in the Scoping Ruling for serving the supplemental testimony, and the concurrent rebuttal testimony, were pushed back in the May 17, 2013 e-mail ruling, as confirmed in the August 27, 2013 written ruling of the Administrative Law Judge (ALJ).

Health Protective Standards for the Injection of Biomethane into the Common Carrier Pipeline" (Joint Report).[6] In a May 15, 2013 e-mail ruling to the service list, the assigned ALJ informed the parties about the availability of the Joint Report. The parties then served their supplemental testimony, and concurrent rebuttal testimony, in accordance with the May 17, 2013 e-mail ruling.

Following the service of the concurrent rebuttal testimony, the active parties to this proceeding requested in an August 12, 2013 e-mail request that the evidentiary hearings be taken off calendar, and that a proposed decision be prepared based on a list of documents that had been served in this proceeding. In the August 13, 2013 e-mail ruling, the assigned ALJ granted the request to take the evidentiary hearings off calendar, and ruled that a prepared decision would be prepared on the non-cost issues based on the evidentiary record consisting of the list of documents attached to the August 12, 2013 e-mail request. In the ALJ's written ruling of August 27, 2013, those list of documents were assigned exhibit numbers, and received into evidence.

In accordance with the schedule in the August 27, 2013 ruling, opening briefs were filed on September 5, 2013, and reply briefs were filed on September 19, 2013. The issues in this phase of the proceeding were submitted on September 19, 2013.

2.2. Background of AB 1900

AB 1900 was enacted to address the development of standards for constituents of concern that are found in biogas and which can pose risks to human health. AB 1900 required OEHHA and the CARB to undertake and to

[6] The Joint Report was received into evidence as Exhibit 1, and is described in more detail later in this decision.

complete certain tasks by May 15, 2013. AB 1900 also requires the Commission to adopt standards for biomethane that specify the concentrations of constituents of concern that are reasonably necessary to ensure the protection of human health, and for pipeline and pipleline facility integrity and safety. To ensure pipeline and pipeline facility integrity and safety, AB 1900 also requires the Commission to adopt monitoring, testing, reporting, and recordkeeping requirements for biogas.

Under AB 1900, OEHHA, in consultation with other state agencies, was tasked with compiling "a list of constituents of concern that could pose risks to human health and that are found in biogas at concentrations that significantly exceed the concentrations of those constituents in natural gas." (Health and Safety Code § 25421(a)(1).) AB 1900 also directed OEHHA to determine the health protective levels for that list of constituents of concern.

AB 1900 directed the CARB to identify realistic health exposure scenarios, and in consultation with OEHHA, to identify the health risks associated with the exposure scenarios for the constituents of concern identified by OEHHA.

After the above tasks were completed, AB 1900 directed the CARB, in consultation with OEHHA and other state agencies to "determine the appropriate concentrations of constituents of concern," using the health protective levels identified by OEHHA, and the exposure scenarios identified by CARB. (Health and Safety Code § 25421(a)(4).) AB 1900 also directed the CARB to "identify reasonable and prudent monitoring, testing, reporting, and recordkeeping requirements, separately for each source of biogas, that are sufficient to ensure compliance with the health protective standards adopted" by the Commission. (Health and Safety Code §25421(a)(5).)

In satisfaction of all of the above tasks to be completed pursuant to AB 1900, and as a result of the collaborative efforts of the various state agencies, the CARB and OEHHA prepared and transmitted the Joint Report to the Commission on May 15, 2013. We extend our thanks to the CARB, OEHHA, the Department of Toxic Substances Control, the Department of Resources Recycling and Recovery, and the California Environmental Protection Agency for all of their efforts and cooperation.

As described above, AB 1900 mandated that the Commission take certain actions. Sections 3 through 9 of this decision addresses the tasks that AB 1900 directs the Commission to undertake.

2.3. What is Biogas and Biomethane

Before addressing the tasks that the Commission is required to adopt pursuant to AB 1900, it is useful to describe what the terms "biogas" and "biomethane" mean.

The term "biogas" is defined in Health and Safety Code § 25420 to mean "gas that is produced from the anaerobic decomposition of organic material," while the term "biomethane" is defined to mean "biogas that meets the standards adopted pursuant to subdivisions (c) and (d) of [Health and Safety Code] Section 25421 for injection into a common carrier pipeline."

According to the Joint Report at page 1:

> Biogas is created when organic waste decomposes anaerobically (without oxygen). This can occur in landfills, covered lagoons, or enclosed vessels, where access to oxygen is limited. The decomposition (or 'digestion') process involves a series of steps in which microorganisms break down the organic waste, ultimately producing primarily methane and carbon dioxide. The raw (unprocessed) mixture of methane and carbon dioxide is referred to as biogas. Biogas can be processed or upgraded to increase the

> percentage of methane in the gas by removing carbon dioxide and other trace components. When biogas is upgraded to pipeline quality, it is referred to as biomethane. Biomethane is interchangeable with natural gas.
>
> At page 7 of the Joint Report, it states:
>
> Raw biogas consists primarily of methane (the main component in natural gas), carbon dioxide (CO_2), and smaller amounts of nitrogen, oxygen, and hydrogen. Depending on the waste stream, several trace gases can also be produced, including hydrogen sulfide, ammonia, and various volatile organic compounds. Particulates and biological components, such as bacteria, can also be present.
>
> Biogas can be processed or upgraded to increase the percentage of methane in the gas by removing CO_2 and other trace components. When biogas is upgraded to pipeline quality, it is referred to as biomethane. Conversion of biogas into biomethane typically requires water removal, CO_2 separation (using adsorption, absorption, membrane separation, or cryogenic distillation technology), and compression. During biogas upgrading, trace constituents are removed to levels comparable to or below those in traditional pipeline natural gas. This is done with the same equipment (adsorption, absorption, membrane separation, or cryogenic distillation technology) that is needed to upgrade the biogas to meet pipeline quality (tariff) specifications. (Citations omitted.)

According to the Joint Report, the use of biomethane offers several benefits, including (1) supporting energy diversity as a renewable energy source; (2) reducing greenhouse gas emissions; (3) promoting sustainable waste management practices, and (4) the creation of new jobs through the production and use of biomethane.

The largest sources of biogas come from landfills, dairies, and sewage treatment plants. These three sources of biogas have the "greatest potential to

economically inject biogas into the natural gas pipeline in California." (Joint Report 1-2.)

3. Issues Addressed In This Phase

3.1. Introduction

AB 1900 requires the Commission to take certain action with respect to biogas and biomethane. There are principally two actions that the Commission is required to take. Other actions that are required by AB 1900 are discussed as subissues under these two principal actions.

First, Health and Safety Code § 25421(c) requires the Commission to adopt standards that specify the concentration of allowable constituents in biomethane that is to be injected into a common carrier pipeline. The adoption of such standards is to ensure the protection of human health, and to ensure pipeline and pipeline facility integrity and safety.

The second action is required by Health and Safety Code §25421(d). That subdivision requires the Commission to "adopt the monitoring, testing, reporting, and recordkeeping requirements identified pursuant to paragraph (5) of subdivision (a) [of Health and Safety Code §25421]. The adoption of such requirements is to ensure pipeline and pipeline facility integrity and safety.

These two subsections of the Health and Safety Code require the Commission to take action by December 31, 2013. In adopting such requirements, the Commission is to give due deference to the CARB's determinations.

AB 1900 also requires the Commission to take other action. Health and Safety Code § 25421(e) requires the Commission to "review and update the standards for the protection of human health and pipeline integrity and safety" that have been adopted pursuant to Health and Safety Code § 25421(c). In

addition, subdivision (e) requires the Commission to review and update the monitoring, testing, reporting, and recordkeeping requirements that the Commission has adopted pursuant to Health and Safety Code § 25421(d). This review and update procedure is to take place every five years, or earlier if new information becomes available.

Public Utilities Code § 784 requires the Commission to adopt pipeline access rules for each gas corporation to "ensure that each gas corporation provides nondiscriminatory open access to its gas pipeline system to any party for the purposes of physically interconnecting with the gas pipeline system and effectuating the delivery of gas."

And, Health and Safety Code § 25421(g) prohibits biogas from a hazardous waste landfill from being injected into a common carrier pipeline, and prohibits a gas corporation from knowingly purchasing gas that has been collected from a hazardous waste landfill through a common carrier pipeline.

Each of these issues is addressed in turn in the following sections.

4. Standards for Constituent Concentrations

4.1. Introduction

This section of the decision addresses the adoption of standards for biomethane that is to be injected into a common carrier pipeline. Pursuant to Health and Safety Code § 25421(c), the Commission is required to adopt standards "that specify, for constituents that may be found in that biomethane, concentrations that are reasonably necessary to ensure" the protection of human health, and pipeline and pipeline facility integrity and safety. In adopting standards that are reasonably necessary to protect human health, subdivision (c)(1) of that code section states that in adopting such specifications, "the commission shall give due deference to the determinations of the [CARB]

pursuant to paragraph (4) of subdivision (a) [of Health and Safety Code § 25421].

Also within the purview of this Commission are subdivisions (f)(1) and (f)(2) of Health and Safety Code § 25421 which provide as follows:

> a) A person shall not inject biogas into a common carrier pipeline unless the biogas satisfies both the standards set by the commission pursuant to subdivision (c), as well as the monitoring, testing, reporting, and recordkeeping requirements of subdivision (d).
>
> b) The commission shall require gas corporation tariffs to condition access to common carrier pipelines on the applicable customer meeting the standards and requirements adopted by the commission pursuant to subdivisions (c) and (d).

Subdivision (f) of this code section is addressed in this section of the decision as it implements the standards that the Commission is required to adopt.

In the sub-sections below, we describe the recommendations for the constituents of concern that are contained in the Joint Report, and the positions of the various parties. This is followed by a discussion of what constituents of concern are adopted in this proceeding.

4.2. The Joint Report

4.2.1. Background

In order for the Commission to adopt standards that specify the allowable concentrations for constituents of concern that are found in biomethane,

AB 1900 directed OEHHA and the CARB to undertake and complete several tasks by May 15, 2013. These tasks consist of the following four actions.[7]

First, Health and Safety Code § 25421(a)(1), as added by AB 1900, requires OEHHA, in consultation with the CARB, and the other state agencies, to "compile a list of constituents of concern that could pose risks to human health and that are found in biogas at concentrations that significantly exceed the concentrations of those constituents in natural gas." The list of constituents of concern is to be updated at least every five years.

Second, Health and Safety Code § 25421(a)(2) requires OEHHA to determine the health protective levels for the list of constituents of concern. In "determining those health protective levels, the office shall consider potential health impacts and risks, including, but not limited to, health impacts and risks to utility workers and gas end users." These health protective levels are to be updated by OEHHA at least every five years.

Third, Health and Safety Code § 25421(a)(3) requires the CARB to "identify realistic exposure scenarios," and in consultation with OEHHA, to "identify the health risks associated with the exposure scenarios for the constituents of concern identified by the office…." CARB is to update the exposure scenarios, and in consultation with OEHHA, to update "the health risks associated with the exposure scenarios, at least every five years."

Fourth, after the above tasks are completed, Health and Safety Code § 25421(a)(4) requires the CARB, in consultation with the other state

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[7] The task of identifying reasonable and prudent monitoring, testing, report, and recordkeeping requirements for each source of biogas is discussed in section 5.4 of this decision.

agencies, to "determine the appropriate concentrations of constituents of concern," and in determining those concentrations, the CARB is to use the health protective levels and the exposure scenarios described in subdivisions (a)(2) and (a)(3) of this code section. The concentrations are to be updated at least every five years by CARB, in consultation with the other state agencies.

CARB and OEHHA completed all of the tasks that AB 1900 required it to complete. The results of these completed tasks were then summarized and incorporated into the recommendations of the May 15, 2013 Joint Report.

4.2.2. Recommendations

The Joint Report contains the findings and recommendations for the tasks that the CARB and OEHHA were responsible for, and also describes the processes that they went through, and the information that they relied on, to develop their recommendations. CARB and OEHHA "analyzed the constituents in both raw (untreated) biogas and upgraded biogas (or biomethane) to determine what compounds may be present, the concentration of these compounds, and the potential for control technologies to reduce or remove these compounds." (*Ex*. 1 at 9-10.) CARB and OEHHA also relied on "existing sources of information … to develop the underlying technical foundation for the recommendations." (*Ex*. 1 at 11.)

To evaluate and identify the constituents of concern in biogas, CARB and OEHHA focused on the larger sources of biogas. These sources are landfills, dairies, and sewage treatment plants.[8] These three sources were the focus of attention because of the data that is available concerning the constituents that

[8] Sewage treatment plants are referred to in the Joint Report, and in this decision, as publicly owned treatment works or POTWs.

are present in biogas, and because those "three sources have the greatest potential to economically inject biogas into the natural gas pipeline in California." (*Ex*. 1 at 2.) As described in the Joint Report, the data sources that CARB and OEHHA used to compile the list of constituents identified in biogas came from various studies and reports, as well as consultation "with representatives from the Gas Technology Institute (GTI), biogas-related businesses, and California POTWs and landfills to obtain additional biogas and natural gas constituent data." (*Ex.* 1 at 13.) CARB and OEHHA plan to address other sources of biogas (such as crop residuals, food waste, woody biomass, energy crops) in future updates as additional data becomes available about the constituents present in those sources of biogas.

The Joint Report states: "Based on the available data, and depending on the biogas source, there are up to 12 constituents of concern that can potentially be present in raw biogas that if not sufficiently removed during the cleaning and upgrading processes may present health concerns." (*Ex*. 1 at 2.) The Joint Report notes that not all of the constituents were found in each of the three sources of biogas. However, the Joint Report states that "All 12 constituents of concern were present in landfill biogas, 6 were present in dairy biogas and 5 in POTW biogas." (*Ex*. 1 at 2.) These 12 constituents of concern are listed in the table below.

Constituents of Concern	Landfills	Dairies	POTWs
Antimony	x		
Arsenic	x		
Copper[9]	x		
p-Dichlorobenzene	x	x	
Ethylbenzene	x	x	x
Hydrogen Sulfide	x	x	x
Lead	x		
Methacrolein	x		
n-Nitroso-di-n-propylamine	x	x	
Mercaptans (Alkyl Thiols)	x	x	x
Toluene	x	x	x
Vinyl Chloride	x		x

Consistent with Health and Safety Code § 25421(a)(2), OEHHA determined the health protective levels for the list of constituents of concern. This health risk assessment was developed from the modeling of realistic exposure scenarios as identified by the CARB in compliance with Health and

[9] Footnote 1 of the Joint Report states that "Copper was not detected in any of the raw biogas but was detected in some samples of landfill biomethane, raising the possibility that it was introduced in either the upgrading equipment or the sampling apparatus used for testing." That footnote recommends "that the status of copper be further evaluated by [CARB] staff during the CPUC rulemaking process to determine whether it is appropriate to require monitoring of this compound, or if the risk management approach needs to be adjusted."

Safety Code § 25421(a)(3).[10] To develop the CARB's determination of the appropriate concentrations of constituents of concern (which the Joint Report refers to as the "risk management levels" or "health based standards"), the CARB and OEHHA used "established OEHHA guidelines and recommended health values … to estimate the potential cancer risks and non-cancer health impacts (acute and chronic) for each constituent in the biogas/biomethane."[11] (*Ex*. 1 at 19.)

The Joint Report contains CARB's recommended risk management levels. The CARB's risk management levels utilize trigger levels, and lower and upper action levels. The trigger level is set at the OEHHA health protective level for each constituent of concern.[12] The Joint Report recommends that the operators be required to routinely monitor, on a quarterly or annual basis, "the levels of compounds above the trigger levels to verify that the total potential cancer and non-cancer risks for the constituents of concern continue to stay within the trigger level and the lower and upper action levels." (*Ex*. 1at 3.)

The Joint Report's recommended risk management levels for the constituents of concern are set forth in the following table.[13]

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[10] Section III of the Joint Report describes the exposure scenarios, and the exposure adjustment factors for each exposure scenario.

[11] Section IV of the Joint Report discusses how the exposure adjustment factors were applied to the constituent of concerns to estimate the trigger levels, and lower and upper action levels.

[12] According to the Joint Report at 59, the OEHHA based the health protective levels "on the values that have been typically used by the Air Pollution Control Districts for risk management under the California Air Toxics 'Hotspot' program…."

[13] The Joint Report notes in footnote 2 at 3 that hydrogen sulfide and mercaptans (alkyl thiols are usually addressed in the natural gas tariffs. In the event the natural gas tariff

Footnote continued on next page

Constituent of Concern[14]	Trigger Level mg/m³ (ppmv)[15]	Lower Action Level mg/m³ (ppmv)	Upper Action Level[16] mg/m³ (ppmv)
Arsenic	0.019 (0.006)	0.19 (0.06)	0.48 (0.15)
p-Dicholorobenzene	5.7 (0.95)	57 (9.5)	140 (24)
Ethylbenzene	26 (6.0)	260 (60)	650 (150)
n-Nitroso-din-propylamine	0.033 (0.006)	0.33 (0.06)	0.81 (0.15)
Vinyl Chloride	0.84 (0.33)	8.4 (3.3)	21 (8.3)
Antimony	0.60 (0.12)	6.0 (1.2)	30 (6.1)
Copper	0.060 (0.02)	0.60 (0.23)	3.0 (1.2)
Hydrogen Sulfide	30 (22)	300 (216)	1,500 (1,080)
Lead	0.075 (0.009)	0.75 (0.09)	3.8 (0.44)

for either of these compounds is lower that the trigger level in the following table, the Joint Report states that compliance with the natural gas "tariff is sufficient for demonstrating compliance with the health protective standards recommended."

[14] The constituents listed from "arsenic" to "vinyl chloride" are carcinogenic constituents of concern. The constituents listed from "antimony" to "toluene" are non-carcinogenic constituents of concern.

[15] The first number in this table are in milligrams per cubic meter of air (mg/m³), while the second number in ( ) is in parts per million by volume (ppmv).

[16] The action levels act as a warning or alarm. The lower action level is used to screen gas suppliers during the initial gas quality review, and as an ongoing screening level during the periodic testing. The upper action level results in an immediate shut-off, and the gas supplier is denied access to the utilities' pipeline systems until the supplier can demonstrate compliance with the gas quality and constituent requirements.

Methacrolein	1.1 (0.37)	11 (3.7)	53 (18)
Alkyl Thiols (Mercaptans)	n/a (12)	n/a (120)	n/a (610)
Toulene	904 (240)	9,000 (2,400)	45,000 (12,000)

The Joint Report recommends that the measurement of the constituents of concern depend on the biogas source.[17] The Joint Report also recommends that the frequency of monitoring be dependent on the concentration level of a constituent of concern measured during the initial pre-injection screening evaluation. The Joint Report also recommends that a facility be shut-off (injection into the pipeline be stopped) and repaired if the lower action level is exceeded three times in a 12-month period, or at any time the levels exceed the upper action level.[18]

The Joint Report at 2-3 states that: "In our review of the available data, the majority of the constituents of concern in the biogas were either not detected or reduced to concentrations below the OEHHA recommended health protective levels during the upgrading process to biomethane indicating that from a public health perspective, the injection of biomethane does not present additional health risk as compared to natural gas." This statement is based on the conclusions drawn from Table V-5 of the Joint Report at 70. This table compares the recommended trigger levels and lower action levels, to the observed

[17] Table V-3 of the Joint Report shows that different constituents of concern are found in landfills, dairies, and POTWs.

[18] The Joint Report's measurement and testing recommendations are described in section 2.3 of this decision.

maximum concentration noted for each biomethane source in the data that was analyzed. The Joint Report states this table shows that "for most compounds, the maximum values found are well below the trigger levels." The Joint Report states that the high level noted for hydrogen sulfide (187 parts per million (ppm)) in that table "is an anomaly because the raw biogas at this site was subjected to only partial clean up and was not intended to produce a pipeline quality product gas." (Joint Report at 70.)

The Joint Report notes that CARB and OEHHA did not consider the pipeline integrity and safety aspects that may be associated with the use of biogas, and that those aspects will be addressed by the Commission in this proceeding.

4.3. Positions of the Parties

4.3.1. Bioenergy Association of California

The Bioenergy Association of California (BAC) "is an association of bioenergy companies and public agencies working to promote economically and environmentally sustainable bioenergy development." (*Ex*. 11 at 2.)

BAC contends that AB 1900 was enacted to promote the many economic and environmental benefits of biomethane use, and the in state production and use of biomethane.

According to BAC, another benefit of injecting biomethane into the pipeline is that it can replace diesel, natural gas, and gasoline. This in turn can reduce diesel emissions, protect air quality, and reduce public health impacts in different communities. The increased use of biomethane will also benefit water quality by reducing the use of fossil fuels that pollute the water, and by encouraging the development of anaerobic digestion facilities.

BAC contends that it will be difficult to meet the state's clean energy, low carbon fuels and air quality standards without biomethane being allowed to be injected in the utilities' gas pipelines. In order to facilitate pipeline access for biomethane, BAC contends that the Commission needs to minimize costs and constraints.

Another benefit of using biomethane is that it can provide a source of revenue for dairy farms, as well as for governments and agencies that operate wastewater treatment facilities, landfills, and other solid waste facilities. In addition, BAC contends that the use of biomethane will create jobs in California.

BAC notes that the Joint Report referenced numerous biomethane projects in the United States, and one ongoing biomethane project in California. BAC contends that there are 59 ongoing biomethane projects in 15 states, which demonstrates that such projects are successful. BAC further contends that the Joint Report and GTI have concluded that the "pipeline injection of biomethane is common across the country and is not a greater risk to pipeline integrity than natural gas." (*Ex*. 11 at 9.) BAC contends that California lags the other states in allowing the development of biomethane projects.

Regarding the health based standards that are set forth in the Joint Report, BAC finds most of the recommendations in the Joint Report to be feasible, and supports the recommended measures to protect public health. However, BAC takes issue with three of the health based recommendations.

First, BAC takes issue with the current gas specification tariffs of the utilities, which contain a number of constituents of concern that have not been listed in the Joint Report's recommendations for constituents of concern. BAC contends that the utilities' gas tariffs should be modified to eliminate the following as constituents of concern: aldehydes and ketones, fomaldehyde,

ammonia, biologicals, halocarbons, hydrogen, mercury, volatile metals, polychlorinated biphenyls (PCBs), pesticides, pharmaceuticals, animal products, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and volatile fatty acids. BAC recommends that if testing is required for these constituents, that the testing should be similar to the spot testing that the Joint Report recommends.

Second, BAC recommends that the trigger level for arsenic be revised since it was based on quarterly, rather than annual testing, and the detected levels were at or below the detection limit of the testing equipment.

And third, BAC contends that copper should not be included in the constituents of concern because it was not found in raw biogas. In addition, BAC contends that the GTI study noted potential quality assurance and quality control issues about the reliability of the positive copper test results. The trigger level for copper is 0.06 milligrams per cubic meter of air (mg/m^3). BAC contends that ten of the 13 tests were below the detection limit of 0.03 mg/m^3. However, three of the biomethane tests reported detections of copper up to 0.25mg/m^3. Copper was also detected in one of the field blanks.

BAC points out that the Joint Report states that "from a public health perspective, the injection of biomethane does not present additional health risk as compared to natural gas," and that because the maximum levels that were detected in samples are below the lower action level, that this "indicates that from a public health perspective, the injection of biomethane does not present additional health risk as compared to natural gas." (*Ex*. 11 at 5.)

Regarding the pipeline safety and integrity standards, BAC takes issue with three of the utilities' recommendations.

First, BAC recommends that the Commission adopt a heating value standard of 950 British thermal unit (btu) per standard cubic feet (scf) of gas, instead of the 990 btu/scf that the Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) adhere to. BAC contends that its recommendation "is the same or closer to the standard adopted by other states for pipeline gas (fossil fuel and renewable)." (*Ex*. 11 at 10.) BAC points out that in the past, both Pacific Gas and Electric Company (PG&E) and SoCalGas have accepted gas with a heating value of 970 btu/scf, and that the utilities' requirement of 990 btu/scf is "higher than most or all other states' standards." BAC asserts that requiring biomethane to meet the heating value requirement of 990 btu/scf will act as a de facto prohibition against the injection of biomethane, which does not have as high a heating value. BAC contends that "Adopting a lower heating value standard would be much more feasible than blending before the point of injection, although that should be allowed as well to achieve sufficient heat value for biomethane injection." (*Ex*. 11 at 10.) BAC also asserts that adopting a heating value of 950-970 btu/scf would be consistent with pipeline biomethane projects across the country, and would satisfy the intent of AB 1900 to promote and facilitate pipeline biomethane in California.

Second, BAC is opposed to volume restrictions on biomethane, and to pilot programs that would result in a significant dilution of biomethane. BAC contends that "No other state requires volume restrictions or significant dilution to maintain pipeline integrity." (*Ex*. 11 at 10.) BAC asserts that if either of these two recommendations are adopted, that this will make biomethane injection infeasible, and contrary to the goals of AB 1900 and AB 2196.

Third, BAC contends that any testing requirements that are adopted should be based on biomethane, and not untreated biogas. BAC contends that

only conditioned gas will be injected into the pipeline, and therefore any testing requirements should be for biomethane only.

BAC asserts that the utilities are attempting to shift the explicit purpose of AB 1900 of promoting biomethane, to the regulation of biomethane constituents. BAC contends that such a shift, if adopted, will result in costly and unnecessary testing and monitoring of biogas and biomethane, which will continue to act as discriminatory barrier to the pipeline injection of biomethane, which is contrary to the stated purpose of AB 1900.

BAC contends that this proceeding has demonstrated a number of gaps and discrepancies between the way that biomethane and natural gas are treated. As a result, BAC asserts that natural gas has an unfair and unwarranted market advantage over biomethane. BAC recommends that a rulemaking be opened to "address constituents of concern in natural gas so that California has in fact a level playing field between natural gas and biomethane." (*Ex*. 11 at 11.)

4.3.2. California Association of Sanitation Agencies

The California Association of Sanitation Agencies (CASA) "is a statewide association of cities, counties, special districts, and joint powers agencies that provide wastewater collection, treatment, water recycling, and biosolids management services to more than 90% of the sewered population of California." (*Ex*. 12 at 1.) Many of CASA's members are involved in anaerobic digestion "activities that produce biomethane, heat and power for on-site use, clean bioenergy, and low carbon fuels for use in California." (*Ex*. 12 at 1.) CASA also states that some of its members receive organic wastes, such as fats, oils, and grease, and food waste, which increases the biomethane production at those wastewater treatment plants, while avoiding methane emissions at landfills.

CASA is a member of BAC, and supports BAC's more extensive comments. CASA agrees with BAC's comments that the heating value should be lowered, and that the testing and monitoring of arsenic and copper should be modified. CASA also agrees with BAC that the Joint Report's list of constituents of concern should be adopted instead of the utilities' list of constituents.

CASA asserts that AB 1900 is intended to facilitate the pipeline injection of biomethane. CASA contends that the standards to be adopted in this proceeding are intended to help the state achieve mandates and goals by 2020, including (1) providing 33% of the state's energy needs from renewable sources; (2) reducing carbon dioxide equivalent emissions to 1990 levels; (3) reducing the carbon intensity of transportation fuel used in the state by 10%; and (4) recycling 75% of the solid waste generated in the state.

CASA states that it generally supports the approach, recommendations, and conclusions of the Joint Report. CASA contends that the health based standards for pipeline biomethane should be reasonable and non-discriminatory CASA agrees with the statement in the Joint Report that from a public health perspective, the injection of biomethane does not present additional health risks as compared to natural gas. CASA also points out that the Joint Report references 59 projects in 15 states where biomethane is being successfully injected into natural gas pipelines. Of those projects, there is only one project in California, the Point Loma wastewater treatment plant in San Diego.

CASA opposes the recommendations of the four utilities concerning the pipeline integrity standards that the Commission should adopt. CASA contends that the utilities' recommendations "are unnecessarily conservative, onerous, and would discourage future biomethane injection projects." (*Ex*. 12 at 2.) CASA contends that none of the other biomethane projects in operation have

experienced any public health or pipeline integrity issues. CASA contends that the projects in the other states have been required to comply with the standards established in those states for btu, oxygen, nitrogen, inerts, total sulfur, hydrogen sulfide, water, temperature, and the Wobbe index. Since the standards of those other states have been achievable, CASA contends that similar standards should be adopted by the Commission for California.

CASA recommends that the Commission do the following:

- The Commission should adopt a heating value standard of 950 btu/scf , which CASA contends is consistent with standards adopted in many states for fossil fuel and renewable gas pipeline injection;
- The Commission should not include dilution requirements as part of these standards;
- All testing requirements should apply to treated biomethane, and not to biogas, since it is biomethane which will be injected into the gas pipeline;
- In adopting the gas quality standards, the Commission should consider the costs of complying with the standards and the interconnection costs, which will impact the viability of the biomethane projects.

4.3.3. Coalition for Renewable Natural Gas

The Coalition for Renewable Natural Gas (CRNG) is a nonprofit group which seeks to advance renewable natural gas, i.e., biogas and biomethane, "as a clean, low-carbon, renewable energy resource for utilization in the generation of electric power, thermal heat and transportation fuel." (*Ex*. 5 at 2.) CRNG's members and "partner organizations include small business, renewable energy developers, engineers, financiers, gas marketers, gas transporters, environmental advocates, organized labor, law firms, ratepayers and utilities." (*Ex*. 5 at 2.)

During the course of this proceeding, CRNG had many interactions with the CARB and OEHHA, and provided them with multiple documents. Many of these documents were provided as attachments to CRNG's rebuttal testimony in Exhibit 6. CRNG's testimony in Exhibits 5 and 6 describe and provide a summary of some of the attachments that were appended to Exhibit 6, which CRNG contends the Commission should consider in implementing AB 1900.

CRNG requests that the Commission adopt, with CRNG's modifications, the Joint Report's recommendations concerning the acceptable constituent levels, the corresponding trigger levels, and the lower and upper action levels.

With respect to the list of constituents of concern in the Joint Report, CRNG contends that the Commission must keep in mind whether it should impose additional, and more stringent and costly requirements on biogas and biomethane, as compared to the requirements imposed on fossil natural gas suppliers.[19] CRNG states "that there are far more similarities than dissimilarities in the way natural gas and biogas are treated and processed after collection and before injection into natural gas pipelines." (*Ex*. 5 at 6.) CRNG states that renewable natural gas "is molecularly and substantively natural gas," and that the primary difference between the two is that biogas comes from decomposing organic waste, as opposed to "geologically-trapped natural gas that had been produced from organic materials in the past." (*Ex*. 5 at 9.) The

[19] CRNG acknowledges that the AB 1900 requirement to promote the in state production and distribution of biomethane is to be addressed in R.11-05-005. However, CRNG contends that cost barriers should be kept in mind as the Commission decides "what constitutes true, non-discriminatory and open pipeline access…." (*Ex*. 5 at 11.) CRNG's summary of what it perceives to be cost barriers are described in Exhibits 5 and 6.

second difference is that the raw biogas undergoes a "scrubbing" or treatment process to become biomethane. CRNG notes that the GTI reports conclude that pipeline quality biomethane "is at least equal to and often exceeds the quality of traditional natural gas." (*Ex*. 5 at 9.) CRNG also notes that the CARB acknowledges that "the cancer risk and toxicity levels of biomethane are far less than those of fossil-fuel natural gas." (*Ex*. 5 at 9.)

CRNG contends that fossil natural gas and biogas both have trace constituents, and that many of the constituents from each of these two gas streams are the same, such as hydrogen sulfide and carbon dioxide. CRNG also states that "many of the current sources of raw, untreated natural gas that ultimately enter natural gas pipelines contain constituents of concern at much higher concentrations than the same constituents found in biogas, and contain some constituents that, if not removed, pose a far greater risk to health, safety and pipeline integrity than any constituent found in biogas." (*Ex*. 5 at 7.) According to CRNG, the constituents that are found in raw, untreated natural gas include: hydrogen sulfide; mercury; arsenic; benzene, toluene, ethylbenzene, and xylene; radon and other radioactive materials; and organometallic compounds such as methymercury, organoarsenic, and organolead.

CRNG also states that the "same gas processing equipment that is used to remove constituents of concern from collected fossil natural gas is used to remove constituents of concern from biogas." (*Ex*. 5 at 7.) CRNG contends that if this gas processing equipment is removing carbon dioxide, it is also removing the constituents of concern from the fossil natural gas. CRNG contends that if the biogas to biomethane treatment process uses the same type of equipment to remove carbon dioxide, the process will also remove the trace constituents from

the biogas. CRNG asserts that "it is impossible to remove [carbon dioxide] without also removing those same trace constituents." (*Ex*. 5 at 3.)

CRNG contends that these fossil natural gas suppliers are not subject to any ongoing testing or monitoring requirements, whereas biomethane suppliers would be subject to ongoing testing and monitoring if the utilities' recommendations are adopted. CRNG requests that the biogas into biomethane process be treated the same as the pipeline specifications and monitoring that are in place for fossil natural gas. CRNG contends that in other states, the current gas pipeline tariffs "do not differentiate between renewable natural gas and fossil fuel natural gas." (*Ex*. 5 at 9.) CRNG also contends that the biomethane projects in other states are successful commercial enterprises, and cites examples that such projects have "operated safely and without incident," and that routine inspections of the pipelines in New York from such projects "have repeatedly rendered results concluding that biomethane injection is not responsible for any additional incremental corrosion other than what is expected from the fossil natural gas that already populates the same pipelines." (*Ex*. 6 at 6.)

CRNG is in agreement with the utilities, "that the ultimate goal of this proceeding is the safe introduction of biomethane into a common carrier pipeline." (*Ex*. 6 at 4.) CRNG contends that the Commission's adoption of standards and testing and monitoring requirements should pertain to the conditioned biomethane that will be injected into the gas pipeline, and should not apply to the raw biogas, or the processes that biogas goes through before being converted into biomethane. CRNG notes that it "would be detrimental to a successful business model to produce a fuel that harmed the pipeline infrastructure, or by extension the public at large,"and that CRNG's "members

stake their reputations and financial well-being on biomethane being safe, clean and affordable." (*Ex*. 6 at 5.)

In adopting the standards required by AB 1900, CRNG contends the Commission should also "keep in mind that thousands of people are exposed to raw biogas every day," and those "who work on and around landfills are exposed to small quantities of uncollected raw landfill gas and the trace constituents contained therein on a daily basis." (*Ex*. 5 at 8.)

Based on the scientific reports of GTI, and the state policies of encouraging renewable energy and a diverse energy portfolio, CRNG contends that burdensome requirements should not be imposed on biogas or biomethane. To do so will result in barriers to the productive use of biogas and biomethane in California.

CRNG contends that no other state requires extensive testing and monitoring for trace constituents. For example, CRNG points out that the biomethane project in New York City is monitored by a gas chromatograph which analyzes for methane, carbon dioxide, oxygen, nitrogen, and total sulfur. In Atlanta, Georgia, biomethane only needs to meet a heating value standard of 950 btu/scf, and is tested to meet the standards for the Wobbe index, carbon dioxide, oxygen, total inerts, nitrogen, hydrogen sulfate, total sulfur, and moisture content. As for moisture content, CRNG contends "that biomethane from processed landfill gas is dehydrated and does not and will not introduce or form liquid in the pipeline." (*Ex*. 5 at 3.)

CRNG also contends that operational experience and regulatory standards in other states demonstrate that testing for constituents that are not

present in biomethane are too burdensome, and will "result in significant additional costs and unnecessary risks of false readings and laboratory error."[20] (*Ex*. 5 at 3.) Accordingly, CRNG recommends that the following constituents listed in the gas specification tariffs of SoCalGas, SDG&E, and PG&E be eliminated, except for the spot sampling as recommended in the Joint Report: aldehydes and ketones, formaldehyde, ammonia, biologicals, halocarbons, hydrogen, mercury, volatile metals, PCBs, pesticides, pharmaceuticals, animal products, VOCs, SVOCS, PAHs, and volatile fatty acids.[21] Also, if testing for metal is required, CRNG recommends that it be similar to the spot testing that is proposed in the Joint Report.[22]

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[20] CRNG notes that in order for biomethane suppliers in California to interconnect with the utilities' pipelines, that the interconnection cost for each biomethane project will cost anywhere from $1.5 million to $3 million. CRNG contends that in other states, the same type of interconnection costs between $75,000 and $275,000.

[21] CRNG notes in its brief that the four utilities' pro forma tariffs no longer propose the inclusion of PCBs, pesticides, pharmaceuticals, and animal products, PAHs, and volatile fatty acids, as constituents of concern. CRNG agrees that these constituents should not be included in the list of constituents of concern adopted by the Commission.

[22] In its opening brief, CRNG acknowledges that the testing and monitoring levels for ammonia and mercury as proposed by the utilities are reasonable, and may be met by biomethane producers to ensure pipeline and pipeline facility integrity and safety. However, CRNG states that biologicals and hydrogen should not be included, tested, or monitored because they do not substantially impact human health or pipeline and pipeline facility safety and integrity. CRNG asserts that the proposed action level for biologicals is far in excess of what is a reasonable level because it exceeds the high efficiency particulate air standard, which requires that filters remove 99.97% of all airborne particles as small as 0.3 micrometers in diameter. CRNG further asserts that the utilities' proposal for biologicals also exceed the World Health Organization's standard for filtration sterilization. CRNG also points out that in the May 2012 GTI study, the pipeline test results for biologicals in fossil natural gas exceed what the utilities now propose as the allowable limit for biologicals in biomethane. As for

Footnote continued on next page

CRNG also takes issue with the limit on siloxanes that are in the utilities' gas specification tariffs.[23] CRNG contends that the limits in the utilities' tariffs are unrealistic and unattainable, and that siloxane limits in other states is not typical. CRNG references the GTI reports on biomethane where "the levels of siloxanes present in all samples taken and tested were below any levels that would represent any problem for engines catalytic equipment or other end users of natural gas." (*Ex*. 5 at 3.) CRNG also points to a biomethane project in southern California that for 20 years supplied biomethane, with trace constituents removed but retained carbon dioxide, over a dedicated pipeline to a turbine generator at the University of California at Los Angeles (UCLA). (*See Ex*. 6, Attachment 27.) According to CRNG, this biomethane made up a significant percentage of the fuel used by this UCLA generator, and it "operated without any issues created by siloxanes."(*Ex*. 5 at 4.) CRNG also notes that the Point Loma biomethane project in San Diego "is not required to continuously monitor siloxane prior to pipeline injection." (*Ex*. 5 at 4.) CRNG also notes the the utilities proposed trigger level (0.01 mg Si/m^3) and lower action level (0.1 mg Si/m^3) for siloxane is much more stringent than the equipment manufacturers' recommendations for engines commonly used for industry.

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hydrogen, CRNG contends that if the Commission adopts a standard for hydrogen, the utilities' proposed trigger level for hydrogen at 0.1% as too low, and that it is more reasonable for the Commission to adopt a trigger level of 0.5% or higher.

[23] CRNG acknowledges that the utilities are no longer proposing continuous siloxane monitoring, except in a situation where the biomethane supplier's test result demonstrates an inability to control siloxane concentrations at or below the action level.

CRNG contends that the trigger and action levels proposed by the utilities for siloxanes are too low and should be increased because they are not consistent with the manufacturer's recommendations for engines commonly used in industrial applications. If the Commission adopts a siloxane limit, CRNG recommends that "the siloxanes limit be based on the typical natural gas fueled engine manufacturer's value, and testing should be done initially and then only periodically [thereafter]." (*Ex*. 5 at 4.) If siloxane is not present above the typical manufacturer's value for two straight years, CRNG recommends that no further testing be required.

CRNG contends that since Proposition 65 already requires warnings to natural gas customers about the risks of constituents, no new warning requirements by natural gas pipeline companies would be required with respect to any trace constituents present in the biomethane.

CRNG also opposes the utilities' recommendation to require a minimum heating value of 990 btu/scf. CRNG states that the Commission should take into account "that biomethane does not contain the higher chain hydrocarbons that are present in fossil natural gas" which typically gives "fossil natural gas a higher heating value or Btu content." (*Ex*. 5 at 10.) CRNG contends that if a minimum heating value of 990 btu/scf is required, that the biomethane from landfills will not be able to meet that standard. If a higher heating value fuel, such as propane, is blended with the biomethane before it is injected into the pipeline to achieve the 990 btu/scf, CRNG contends that such a solution may not be economically viable. CRNG states that the most common heating value that its members, who operate biomethane facilities, have been required to meet is 950 btu/scf. CRNG recommends that the Commission order the utilities "to amend their existing tariffs to lower the heating value requirements for

biomethane to between 950 - 970 [btu/scf], a range that can be achieved and is consistent with pipeline quality specifications required by investor-owned utility companies who transport biomethane for each of the thirty-nine High Btu biomethane facilities in operation across the nation." (*Ex.*6 at 3.) CRNG further states that if a minimum heating value of 970 btu/scf were adopted, "together with the permission for biomethane producers to blend their biomethane with a higher heating value fuel in advance of the point of injection into a California natural gas pipeline, this would represent an economically achievable heating value standard that would not serve as a barrier to the development of biomethane projects in California." (*Ex.* 5 at 10.)

CRNG cites two examples of how the minimum heating value standard has changed. First, CRNG notes that the legacy natural gas producers in California have been allowed to inject gas into the utility's pipeline with a minimum heating value of 970 btu/scf. Second, the 990 btu/scf standard was adopted at a time when large imports of liquefied natural gas (LNG) from foreign sources were being contemplated. Since the natural gas supply outlook has changed as a result of new recovery technologies, and because LNG as a source of gas in California has diminished, CRNG contends that the minimum heating value standard of 990 btu/scf should be reconsidered.

CRNG agrees with the arguments of the Southern California Generation Coalition (SCGC) that the Commission should reject the proposal of Southwest Gas to limit biomethane to a maximum of 25% pipeline capacity, and to establish a minimum heating value of 990 btu for biomethane. CRNG contends that Southwest Gas' proposal is arbitrary, and is contrary to the purposes of AB 1900 and this proceeding, which is to make it possible to develop biomethane projects within California. Although the purpose of Southwest

Gas's biomethane limitation is to prevent gas compression seals from leaking, CRNG contends that the utilities have failed to demonstrate whether there are other chemical compositions in biomethane that may affect seal integrity.

4.3.4. Consumer Federation

The Consumer Federation of California (CFC) did not submit prepared testimony, but it did file opening and reply briefs.

Although the CFC does not necessarily agree with the Joint Report's assertion regarding each of the ancillary benefits of biomethane, the CFC accepts the research done by the CARB and OEHHA, and the claim that if biomethane is treated to the standards contained in the Joint Report, that the biomethane will be safe for injection into common carrier pipelines. The CFC generally supports the Joint Report's findings and recommendations in this regard.

The CFC contends that in order to interconnect with the utility pipeline system, the biomethane supplier must provide merchantable biomethane that is capable of meeting the gas quality requirements adopted as a result of this proceeding. CFC opposes the biomethane producers request that the costs associated with testing should be borne by the utilities' ratepayers. To be consistent with Public Utilities Code Section 784, as added by AB 1900, CFC contends that the utilities' cost of monitoring and testing biomethane, to ensure compliance with the adopted gas quality standards, should be borne by the producers and suppliers of biomethane. The CFC contends that this cost responsibility is consistent with the costs that fossil natural gas producers must bear, and to shift such costs to utility ratepayers is unreasonable and not in the public interest.

The CFC also contends that the Commission should not adopt the utilities' request for extensive testing of biogas. Instead, the Commission should

only adopt the biomethane monitoring, testing, reporting and record keeping standards that are recommended in the Joint Report. If the Commission decides to expand on the suggested monitoring, testing, reporting and record keeping requirements that are in the Joint Report, the Commission should consider the impact that this will have on current rate structures and charges to utility ratepayers.

4.3.5. Green Power Institute

The Green Power Institute (GPI) contends that it is well known that methane, which is one of the products of the decomposition of organic wastes, "is a far more potent greenhouse gas than carbon dioxide (CO_2)." (*Ex*. 13 at 1.) As such, GPI contends that there is a strong environmental objective to collect and convert the methane so that it can be used productively.

Although converted biogas has been used to fuel small engines in the past, environmental regulations have placed limits on pollutants, which has reduced the use of biogas for such use. GPI contends that an alternative use for this biogas is to convert it into biomethane and inject it into the common carrier pipeline. GPI points out that the technology and process for converting biogas into biomethane "is fully demonstrated and in-service in various parts of the country, and it has been shown to be safe and effective." (*Ex*. 13 at 2.) However, GPI contends that such a process "is expensive due to the need to convert the biogas into biomethane prior to injection, and … the amount of energy that is required to compress the biomethane to pipeline pressure." (*Ex*. 13 at 2.)

GPI points out that the Joint Report states the following:

> In our review of the available data, the majority of the constituents of concern in the biogas were either not detected or reduced to concentrations below the OEHHA recommended health protective levels during the upgrading

> process to biomethane indicating that from a public health perspective, the injection of biomethane does not present additional health risk as compared to natural gas.
> (*Ex*. 13 at 3.)

Given the Joint Report's statement that the injection of biomethane does not present any additional health risk, GPI contends that the Commission's obligation under AB 1900 is to ensure that there are adequate engineering standards and protections in place at the pipeline interconnection to prevent the injection of biomethane that does not meet the specifications. GPI further contends that since the evidence shows that biomethane is less harmful and less risky to the integrity of the existing pipeline infrastructure, the biomethane should not be subject to greater scrutiny or costs.

GPI disagrees with the four utilities' argument that the Commission should allow the testing of biogas. GPI contends that none of the parties to this proceeding have suggested that raw biogas be injected into the common carrier pipeline, and the Commission would be overstepping its jurisdictional authority if it allowed such testing.

GPI further contends that since the controls and the equipment to provide the protections to meet the standards are "standard and proven, and the fact that biomethane production and injection is expensive compared to the current value of pipeline gas, there is a compelling reason for trying to minimize the monitoring and reporting burden that is imposed on producers of biogas." (*Ex*. 13 at 3.)

GPI also asserts that since the process of converting biogas into pipeline biomethane "is a proven commercial enterprise that has numerous operating units across the country," that it questions the level of preliminary testing and analysis of the biomethane that the utilities recommend be imposed.

(*Ex*. 14 at 1-2.) GPI also contends that the utilities' recommendation for this level of preliminary testing and analysis will add time and unnecessary expense, and should be rejected as being contrary to AB 1900.

GPI also questions the utilities' recommendation to install various probes and corrosion coupons in the gas pipeline. Although GPI acknowledges the benefits of such safety equipment, GPI believes that this is not the time to require such instruments because it may hinder the development of the biomethane industry.

4.3.6. Independent Storage Providers

Four independent gas storage providers (ISPs) submitted testimony in this proceeding.[24] The ISPs are concerned with the language in the initiating rulemaking that this proceeding will "result in orders that direct each gas corporation to implement just and reasonable standards and requirements, provide pipeline open access, and be subject to enforcement protocols." (*Ex*. 9 at 1.) The ISPs are concerned that AB 1900 will require them to adopt standards and requirements for biomethane, and to incur costs to implement such standards and requirements.

The ISPs point out that they do not transport gas except as incidental to their gas storage service. For that reason, the ISPs' focus in this proceeding is on the issue of who is a common carrier pipeline for the purpose of AB 1900. The ISPs do not take a position on the Joint Report's recommendations concerning

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[24] The operations of the four ISPs are located in northern California and consist of: Central Valley Gas Storage, LLC; Gill Ranch Storage, LLC; Lodi Gas Storage, LLC; and Wild Goose Storage LLC. They are referred to in this decision as the independent storage providers or ISPs.

the appropriate concentrations of constituents of concern in biomethane, or on the appropriate level of recordkeeping and reporting.

The ISPs contend they are not a common carrier pipeline under the Public Utilities Code because they do not provide gas transportation service for compensation. In addition, Health and Safety Code § 25420(f), as amended by AB 1900, defines a "common carrier pipeline" to be a "gas conveyance pipeline … owned or operated by a utility or gas corporation…." The ISPs contend they are gas storage providers, who have Commission authorization to provide underground natural gas storage services. The ISPs do not offer a separately tariffed transportation service. The customer gas is delivered by PG&E to the ISPs for injection into storage. When the gas is withdrawn from storage, the ISPs return the storage customer's gas to the PG&E system, and anything resembling "conveyance" or transportation is incidental to the storage service. The ISPs contend that these differences should exclude the ISPs from AB 1900's definition of a common carrier pipeline.

The ISPs contend that no party to this proceeding has presented evidence that AB 1900 was intended to apply to them, and the applicability of AB 1900 to the ISPs should be determined based on the language of the statute and the intention of the Legislature. The ISPs point to the Assembly Floor analysis, as described in the ISPs' supplemental testimony in Exhibit 10, which specifically referenced the investor owned utilities (IOUs) by name, but did not mention the ISPs. Since the IOUs provide standalone transportation of natural gas to end use customers, the ISPs contend that is why AB 1900 directs that new monitoring, testing, and reporting requirements be imposed on the IOUs.

The ISPs point out that no ISPs in California are connected to any system other than PG&E. The ISPs only move the customers' gas from PG&E's system

into storage, and then out of storage back onto PG&E's system. Since this gas "is or will be subject to PG&E's pipeline quality requirements for natural gas or biomethane, … and any required testing and monitoring will occur before customer gas in injected into the IOU pipeline," the ISPs contend that it would be redundant, unnecessary, and infeasible to impose the biomethane monitoring, testing, and reporting requirements on the ISPs. (*Ex*. 10 at 4.)

The ISPs recommend that the Commission should find that the ISPs are not a common carrier, and are not subject to the biomethane monitoring, testing, reporting, tariff and open access requirements that may be adopted in this proceeding. Alternatively, if the Commission decides not to address the applicability of AB 1900 to the ISPs at this time, the ISPs request that the Commission defer such determinations until such time that a biomethane producer seeks to interconnect directly with an ISP's facilities.

4.3.7. Shell Energy North America (US), L.P.

Shell Energy North America (US), L.P. (Shell Energy) did not submit any prepared testimony, but did file opening and reply briefs. Shell Energy states that its sells natural gas, power and environmental products, including biomethane, to wholesale and retail customers in California. Shell Energy purchases biomethane for resale to end use customers, including electric generators, which in turn use the biomethane for fuel.

Shell Energy requests that the Commission clarify that for the purposes of the gas quality standards, and the testing and monitoring protocols, that a "common carrier pipeline" refer to a gas utility located in California. Shell Energy also recommends that the Commission adopt gas quality specifications and gas quality monitoring protocols for deliveries of biomethane that are no

more restrictive than the specifications and monitoring protocols that apply to deliveries of natural gas.

Shell Energy contends that under AB 1900, a "common carrier pipeline" refers to an in state gas utility. This is an important issue to Shell Energy because under Health & Safety Code § 25421(c), as added by AB 1900, the adopted gas quality standards will apply exclusively to biomethane that is injected into a common carrier pipeline.

Shell Energy takes the position that the gas quality specifications for biomethane should be no more restrictive than the gas quality specifications for natural gas. Shell Energy notes that the new statutory provisions in Public Utilities Code Section 399.24(a) and Public Utilities Code Section 784 require the Commission to ensure that the gas quality specifications and gas quality testing and monitoring protocols adopted in this proceeding provide equal access to the utilities' systems for biomethane and other sources of natural gas.

Shell Energy also contends that the standards and protocols that apply to biomethane should not be confused with the standards and protocols that apply to biogas. The Joint Report compiled a list of constituents of concern that are found in raw biogas, and recommended health protective levels for these constituents. Shell Energy points out that the Commission is charged with adopting standards that specify the concentration levels for constituents of concern that may be found in biomethane. Since the Joint Report found that the majority of the constituents of concern in the biogas were either not detected, or reduced to concentrations below the OEHHA recommended health protective levels during the upgrading process to biomethane, the Joint Report concluded that from a public health perspective, the injection of biomethane into the gas utilities' system does not present additional health risk compared to natural gas.

In light of the Joint Report's finding, Shell Energy contends that the Commission should only impose the same kind of gas quality specifications for biomethane that apply to natural gas. Shell Energy contends that no evidence has been presented which supports imposing greater or more burdensome gas quality specifications on deliveries of biomethane to the utilities' systems.

Due to the Joint Report's finding that the injection of biomethane does not present additional health risk as compared to natural gas, Shell Energy also contends that the Commission should limit the testing and monitoring of potential constituents of concern that may be found in biomethane, and eliminate or limit the utilities' proposals for the testing and monitoring of the raw biogas. Shell Energy notes that SoCalGas currently has an application (Application (A.)12-04-024) before the Commission to offer biogas conditioning services to biogas producers on a tariffed basis. Shell Energy contends that if the Commission adopts more stringent and burdensome constituents, specifications, and testing requirements, that this will only make SoCalGas' biogas conditioning services more attractive to potential biogas producers.

Shell Energy is opposed to Office of Ratepayer Advocate's[25] (ORA's) proposal that the cost of the testing and monitoring protocols, including incremental protocols, be borne exclusively by biogas producers. Shell Energy contends that ORA's proposal would deny biogas producers equal access to the utilities' pipeline systems, and if adopted would place biogas producers at a competitive disadvantage compared to producers and transporters of fossil natural gas supplies in violation of Public Utilities Code Section 784.

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[25] The Office of Ratepayer Advocates (ORA) was formerly known as the Division of Ratepayer Advocates. (*See* Stats. 2013, Ch. 356, Section 42.)

Shell Energy agrees with ORA's position that the Commission should not subsidize one producer relative to another. However, Shell Energy contends that the subsidization of one class of producers is only avoided if the gas quality specifications, testing protocols, and monitoring requirements apply equally to all gas producers. Shell Energy contends that if the Commission adopts the utilities' proposal for more restrictive gas quality specifications for biomethane, or requires more frequent testing of biomethane, or the Commission orders the testing of raw biogas, the Commission will place biogas producers at a disadvantage relative to other producers and shippers of natural gas. In such an event, Shell Energy contends that the only way to level the playing field is to shift the costs of incremental testing and monitoring, and the cost of biogas testing to the utility ratepayers. Shell Energy contends that biogas producers should not be responsible for the cost of additional testing and monitoring that extends beyond what is necessary to protect human health and to ensure pipeline integrity and safety.

4.3.8. Southern California Generation Coalition

The SCGC did not submit testimony in this proceeding, but did file opening and closing briefs. SCGC supports the position of the biomethane proponents to require the utilities to accept delivery of biomethane that meets a heating value of between 950-970 btu/scf. SCGC also supports the proposal of some of the biomethane proponents to allow the biomethane producers to attain the 950-970 btu/scf heating value through the upstream blending of the biomethane with higher heat content hydrocarbons, such as ethane or propane, before delivering the biomethane to the utilities.

SCGC notes that the current SoCalGas and SDG&E tariffs in Rule 21 contain the specification for a minimum heating value of 990 btu/scf for gas

delivered into the SoCalGas and SDG&E systems. SCGC points out that neither the current PG&E nor Southwest Gas tariffs contain any provisions specifying the heating value for deliveries of biomethane. Instead, PG&E's tariff provides that the gas shall have a heating value that is consistent with the standards established by PG&E for each receipt point. The Southwest Gas tariff contains a provision stating that the gas delivered to Southwest Gas must meet the gas quality specifications required by the upstream pipeline supplier(s). SCGC points out that in this proceeding, Southwest Gas is now proposing a new Rule 22, biomethane gas, that would specify a 990 btu/scf minimum heating value for biomethane delivered to Southwest Gas.

Since PG&E does not have a systemwide specification, SCGC contends that the biomethane producers' proposal is effectively a proposal to establish a lower heating value in PG&E's tariff Rule 21 for the delivery of biomethane. For Southwest Gas, the biomethane producers' proposal is effectively a proposal to reject Southwest Gas' proposed 990 btu/scf heating value for biomethane, and instead require Southwest Gas to adopt a lower heating value for biomethane.

SCGC does not agree with the four utilities' argument that the issue about heating value is outside the scope of this proceeding. SCGC contends that the the proposals of the biomethane producers to lower the heating value specification is supported by the record. SCGC points to the rationale in Waste Management's (WM) testimony which states that "due to the potential presence of nitrogen from air introduced into the collected raw gas during the collection process," biomethane may not be able to meet a 990 btu/scf minimum heating value specification on a consistent basis in all cases. (*Ex*. 7 at 12.) WM also noted that if equipment is added to remove the nitrogen, and in turn, raise the heating value, that such equipment will increase the capital cost of the facility by

about 15%, and will add to the operating costs as well. In addition, CRNG stated that biomethane does not contain the higher chain hydrocarbons that are present in fossil natural gas, which typically gives fossil natural gas a higher heating value or btu content.

SCGC notes that WM stated that although upstream blending is less expensive than nitrogen processing, it is still cost prohibitive and will undercut the competitiveness of biomethane. SCGC acknowledges, however, that some blending of biomethane may be required to meet even a reduced minimum heating value of 950-970 btu/scf.

SCGC further contends that establishing a reduced minimum heating value for biomethane would be consistent with the criteria identified by the Commission when it established a higher Wobbe index for SoCalGas and SDG&E, and is consistent with the minimum heating value in other jurisdictions. SCGC also points out that the tariffs of SoCalGas and SDG&E already provide for deviations from their standard 990 btu/scf minimum heating value if the deviation does not have a negative impact on system operation.

4.3.9. Waste Management

WM has extensive operations in solid waste management, and the generation of energy from waste. WM owns and operates a biomethane facility in Waynesburg, Ohio. WM also supplies gas to third party facilities at nine landfills located in Georgia, Minnesota, Ohio, and Pennsylvania. That processed gas is then sold and delivered into natural gas pipelines. WM is interested in developing biomethane generation projects at all ten of its landfills in California that produce biogas.

WM points out that there are 60 biomethane projects operating in the United States, of which 33 are landfill projects located in 13 states. WM also notes that there is one biomethane project operating in California at the Point Loma wastewater treatment plant in San Diego, which injects biomethane into SDG&E's gas pipeline.

WM agrees with the Joint Report's statement that in the "review of the available data, the majority of the constituents of concern in the biogas were either not detected or reduced to concentrations below the OEHHA recommended health protective levels during the upgrading process to biomethane indicating that from a public health perspective, the injection of biomethane does not present additional health risk as compared to natural gas." (*Ex*. 7 at 5-6.) WM agrees with that statement, and contends it "correctly points out that biomethane pipeline injection is routine and ongoing in other states and has been demonstrated to be safe and reliable." (*Ex*. 7 at 6.)

WM takes issue with the utilities' proposed testing of raw biogas. WM contends it is not proposing to inject raw biogas into the pipeline. Instead, the testing for any constituents of concern should be performed on conditioned gas, *i.e.*, biomethane.

WM also points to the discriminatory and "onerous nature of certain testing and reporting requirements" for biogas, as compared to the testing of natural gas. (*Ex*. 7 at 20.) Although the four utilities want to test the raw biogas, WM contends that there is no such testing in place or proposed for raw natural gas, even though the evidence demonstrates that "raw natural gas contains numerous unsafe and damaging constituents for which there are no testing requirements…." (*Ex*. 8 at 6.) Thus, WM contends that the standards and any

testing adopted in this proceeding should be limited to biomethane, and not biogas.

WM also states that "A comparison of the constituents of concern (COCs) from biomethane and from natural gas shows that with few exceptions, natural gas has higher concentrations of COCs than biomethane and indicates that natural gas may have higher overall chemical health risk than biomethane." (*Ex.* 7 at 7.) Although AB 1900 did not direct the Commission to evaluate the chemical health risks of natural gas, WM requests that the Commission keep the standards for natural gas in mind when the standards for the monitoring and injection of biomethane are developed in this proceeding. WM recommends that the standards adopted in this proceeding should not impose any greater burdens on biomethane than experience and precedent demonstrate.

WM contends that with certain modifications, the constituents of concern in the Joint Report provide a conservative, but acceptable, list of constituents for the testing and monitoring necessary to protect health and safety as well as pipeline integrity. WM contends that the Commission should keep in mind that the Joint Report's recommended trigger, lower action, and upper action levels "are based on much higher safety factors with respect to public health risk than would result from realistic scenarios of exposure and strict imposition of existing guidelines." (*Ex.* 7 at 8.) WM contends that the Joint Report's recommended risk management levels result in standards that are two-to-four times more stringent than called for by CARB's Risk Management Guidelines for New and Modified Souces of Toxic Air Pollutants (Risk Management Guidelines). If the Joint Report had used the Risk Management Guidelines, WM contends that the trigger levels and upper action levels for the biomethane constituents would be significantly less stringent. WM requests that

biomethane should "not be held to a higher standard than other sources of natural gas." (*Ex.* 7 at 9.)

WM also contends that the Joint Report's recommended health protective standards assume "that a downstream recipient of pipeline gas will receive 100% biomethane on a continuous permanent basis." (*Ex*. 7 at 8.) However, WM asserts that the biomethane will be mixed with other sources of gas, and that "No downstream recipient of pipeline gas will receive 100% of the gas from a single source." (*Ex*. 7 at 9.)

WM recommends that, except for the spot sampling recommended in the Joint Report, the following constituents of concern recommended by the four utilities, be eliminated as constituents of concern: aldehydes and ketones; formaldehyde; ammonia; biologicals; halocarbons; hydrogen; mercury; volatile metals; PCBs; pesticides; pharmaceuticals and animal products; VOCs, SVOCs, PAHs; volatile fatty acids, and vinyl chloride.[26] WM contends that the "utilities appear to be under the false impression that these constituents, even if marginally present in raw landfill gas, are therefore present in treated and conditioned biomethane." (*Ex.* 7 at 17.) WM asserts that if these unwanted trace compounds are present in the raw biogas, and if the clean-up system is removing carbon dioxide, that these trace constituents will be removed from the biogas "due to the selectivity of the solvent being used and the clean-up system itself." (*Ex*. 7 at 17; *Ex*. 8 at 8.)

WM also opposes including siloxanes as a constituent of concern since WM does not believe siloxanes pose a health or pipeline safety and integrity

[26] See footnote 21.

issue. In addition, WM points out that continuous siloxane monitoring is not required at the Point Loma biomethane site.

WM asserts that the utilities recommended list of constituents of concern are unnecessary because WM has provided extensive evidence in the form of "monitoring and testing data, operational data and regulatory practice in other states showing that injection of biomethane causes no issues with regard to health, safety, or pipeline integrity…." (*Ex.* 8 at 7.) WM also contends that the utilities' list of constituents of concern are without support or explanation, while WM and CRNG provided support and a sound technical basis for their own proposals.

WM also takes issue with the Joint Report's recommendation to include copper as a constituent of concern, and questions the reliability of the positive copper test results from biomethane. The Joint Report stated that "Copper was not detected in any of the raw biogas but was detected in some samples of landfill biomethane, raising the possibility that it was introduced in either the upgrading equipment or the sampling apparatus used for testing." (*Ex*. 7 at 11; *Ex*. 8 at 8; *Ex*. 1 at 2.) Since copper was not found in any of the GTI raw landfill biogas samples, WM believes that there were quality assurance and quality control concerns as to the reliability of the positive copper test results.

WM also takes issue with the Joint Report's recommended standard for arsenic. The Joint Report's recommended trigger level for arsenic is 0.019 mg/m^3. WM contends that the Joint Report's recommended arsenic trigger level "is at the limits of instrument detection and may not be quantifiable." (*Ex.* 7 at 10-11; *Ex*. 8 at 8.) The GTI study reported arsenic concentrations in biomethane and natural gas at below the method detection limits of 0.020 and 0.030 mg/m^3. According to WM, the practical quantification

limit (PQL), which represents the lowest concentration that can be quantified, would be 0.100 and 0.150 mg/m^3. WM contends that there is a risk of false positives for the trigger level, *i.e.*, trace concentration above the method detection limit, but below the PQL.

Citing CRNG's testimony, WM asserts that other states do not require testing and monitoring for trace constituents. In New York biomethane is monitored for methane, carbon dioxide, oxygen, nitrogen, and total sulfur. In Atlanta, Georgia, biomethane is tested for a heating value of 950 btu/scf, CO_2, oxygen, total inerts, nitrogen, hydrogen sulfate, total sulfur and moisture content. In St. Louis, Illinois, biomethane is monitored for "major gas components only (*i.e.* methane, oxygen and nitrogen) and possibly hydrogen sulfites (H_2S). (*Ex*. 7 at 18-19.) WM contends that "Operational experience and regulatory standards in other parts of the country reveals the inappropriate nature of California's proposal to test for constituents that are not present and, if included in a tariff, result in significant additional costs and unnecessary risks of false readings and laboratory error." (*Ex.* 7 at 19.) WM recommends that the Commission adopt tariff specifications for the utilities based on the "operational experience, existing regulations and precedent that has resulted in successful biomethane projects in other states." (*Ex. 7* at 19.)

WM contends that if the recommendations of the utilities are adopted, that this will discourage the use of biomethane, and will be contrary to California's policies regarding the cap and trade program, the renewable portfolio standard, the low carbon fuel standard, and other environmental laws and regulations.

WM is also opposed to the utilities' recommended trigger levels, which expands the trigger levels that the Joint Report recommends. WM contends that

the utilities' recommendations for expanded trigger levels and the testing of raw biogas are arbitrary, discriminatory, and inappropriate. WM asserts that the testing of raw natural gas is not required, and to do so would drive up the cost of natural gas.

WM objects to the utilities' recommended trigger levels in the four utilities Biomethane Guidance Document. This document is derived from the utilities' review of biogas studies, and comparing raw biogas constituents to equipment manufacturer specifications. WM takes issue with the trigger levels in the Biomethane Guidance Document because they are arbitrarily set at 10% of the lower action level. The four utilities propose that if the trigger levels are present, then a producer will begin quarterly testing of all the constituents of the biomethane. WM contends that the utilities have not provided any basis for the establishment of the lower action levels, nor is there any basis for adopting the utilities' proposal that require the shut-down of a facility if the lower action levels are met three times in one year.

WM also contends that the utilities' recommended lower action levels are arbitrarily set at 20% or 40% of the upper action level. WM contends that if the constituents at these proposed levels present a problem for pipeline integrity without considering the blending of gases, the limits should apply to all gas sources. WM asserts that to apply such a requirement to biomethane only would be discriminatory.

WM is also concerned that the laboratory testing results "may not conclusively quantify the presence of the substance at or above a Trigger or Action Level," and that retesting may be needed to confirm the laboratory results. (*Ex*. 7 at 10.) WM also recommends that in situations where the laboratory results are below the method detection limit, that such results should

be accepted as being in compliance. WM attached its "Recommended Biomethane Constituent of Concern (COC) Monitoring and Reporting Protocols" to Exhibit 7, and recommends that those monitoring and reporting protocols be adopted, including the provisions for retesting and validation.

WM is opposed to the four utilities' recommended gas heating value of 990 btu/scf for biomethane. WM contends that its recommendation for a "slightly lower BTU standard for biomethane" is not a pipeline integrity issue, nor an issue of human health. WM recommends that a heating value of 950 btu/scf be adopted instead, which is only 4% less than the heating value recommended by the utilities. WM contends that its recommended heating value is consistent with the gas heating value that has been adopted in "nearly every other state in which there is a biomethane-to-pipeline facility…," and that the end user equipment in those other states work with the lower heating value gas. (*Ex*. 7 at 12.) WM also relies on a GTI document in which it states that the "more typical lower [higher heating value] tariff is 950 BTU/SCF." (*Ex.* 7 at 13.) WM further states:

> However, due to the potential presence of nitrogen from air introduced into the collected raw gas during the collection process, biomethane may not be able [to] meet this BTU standard on a consistent basis in all cases. Typical gas processing equipment does not remove nitrogen and any process to extract nitrogen from biomethane is very expensive, albeit a cost WM has decided to incur to better operations at all its new High-BTU biomethane facilities. Even so, the addition of equipment to remove nitrogen would not result in consistent compliance with a 990 BTU/scf standard. There are inherent inefficiencies in any process, and nitrogen removal is no different. While it is WM's policy to include nitrogen and oxygen removal equipment in new, High-BTU facilities and insist that third-parties that purchase gas from WM include the removal equipment as well, WM

> cannot guarantee a 990 BTU/scf HHV on a sustained continuous basis. With regard to cost, addition of the nitrogen removal system increases by about 15% the total capital cost of the facility, and adds to the operating costs as well. Despite our proactive and costly efforts to increase heating value, we strongly object to the utilities' unrealistic proposal of a 990 BTU/scf HHV for biomethane. (*Ex.* 7 at 15.)

WM also contends that blending biomethane to obtain a higher heating value gas is cost prohibitive. WM acknowledges that "a standard of 990 BTU/scf may be met by use of expensive blending," but that "process would undercut the competitiveness of biomethane as a fuel for use in California." (*Ex*. 7 at 14-15.) WM contends that if the price of biomethane is too high, this would be contrary to AB 1900's goal of having policies in place to promote the in-state production and distribution of biomethane.

WM also recommends "that pipeline owners be required to analyze the volume of biomethane to be injected versus the amount of natural gas in the pipeline to determine whether a lower heating value of biomethane could be accommodated, such that the combined quality of the gas in the pipeline still meets the 990 BTU/scf specification." (*Ex*. 7 at 15; *Ex*. 8 at 13.) WM also "proposes that generators accept an absolute minimum heating value of 950 btu/scf regardless of the results of the analysis." (*Ex*. 7 at 15.)

WM notes that Southwest Gas recommends that biomethane be limited in its pipeline to 25%. WM is unclear whether Southwest Gas is proposing to limit the amount of biomethane that is accepted. If the utilities intend to limit the amount of biomethane that is accepted, WM opposes such a limitation since no similar limit is imposed on other natural gas sources.

Regarding the costs associated for preparing biomethane for injection into the gas pipeline, WM contends that it is an "appropriate issue for the

Commission to consider when the cost burdens on biomethane producers reach a level that discourages development in direct opposition to the goal of AB 1900." (*Ex*. 7 at 22.) WM recommends that certain costs be paid for by the utility or its customers. These costs would include the cost of additional spot tests for constituents of concern that are taken at the discretion of the utility, development costs, and interconnection costs.

WM contends that having the utility or its customers pay for interconnection costs is analogous to having the "electric utilities pay for transmission line costs and costs to construct, operate, fuel and maintain fossil-fuel based generation to support grid stability for intermittent renewable electric power resources, such as wind and solar." (*Ex*. 7 at 22.) In addition, WM contends that it is reasonable for the utilities to bear the interconnection and monitoring costs because encouraging the interconnection of biomethane will avoid significantly higher cap and trade compliance costs.

4.3.10. Office of Ratepayer Advocates

ORA did not submit testimony, but filed an opening brief in this proceeding. ORA addressed the cost responsibility issues because some of the parties had discussed cost allocation issues in their testimony.

ORA contends that gas producers should continue to bear the costs of upgrading their gas supply to meet the gas specifications, and for any interconnection costs. ORA notes that fossil natural gas producers currently bear the costs of gas processing and interconnection. Although new sources of gas, such as biomethane, may have higher initial development costs, ORA asserts that it does not follow that ratepayers should subsidize the gas processing and interconnection costs for biomethane. ORA contends that in the case of existing fossil natural gas supplies, some sources are more expensive to

develop and to bring into production than others. ORA contends that the Commission does not, and should not, subsidize one producer relative to another. ORA argues that if gas from a particular source is economical to develop and bring to market, that the supplier of that source of gas will have an incentive to do so.

ORA contends that the current low prices for fossil natural gas may create economic challenges for biomethane producers. However, ORA asserts that natural gas prices are expected to rise in the future, which will improve the economics of biomethane. ORA also notes that California has market based solutions in place to price carbon, and that this will make biomethane production more economical over time without requiring the intervention of the Commission on behalf of biomethane producers. ORA contends that to the extent biomethane provides benefits to specific customers, such as electric generators whose use of biomethane can help achieve other goals, those electric generators will have an incentive to pay more for biomethane than for fossil natural gas. ORA also notes that in the comments of the utilities to the CARB about AB 32 and greenhouse gas compliance, the utilities mentioned various actions that they can take to reduce emissions, and such action is not limited just to biomethane.

ORA is opposed to WM's view that utility ratepayers should be responsible for both testing and interconnection costs. In support of that position, WM points to the State's support for renewables. Since utility ratepayers pay to support the costs of electric transmission lines, and to construct, operate, fuel, and maintain fossil based generation to support grid stability, WM believes there should be comparable ratepayer support of the biomethane producers. ORA asserts that such comparisons are neither accurate

nor germane to this proceeding. ORA points out that electric transmission line costs are not at issue in the current rulemaking, nor are such costs analogous to the commodity costs of biomethane. Instead, this rulemaking is to address the conditions and standards by which biomethane producers should be able to interconnect with the existing natural gas transmission and distribution infrastructure. ORA asserts that WM's comparison to electric transmission costs is not appropriate because electric and gas systems have different physical characteristics and regulatory structures. Even if electric and gas systems could be compared directly, ORA asserts that the biomethane costs would be analogous to electric generation costs, and not to transmission costs.

4.3.11. The Four Utilities

The four utilities contend that the goal of this proceeding is to establish and implement a framework to safely introduce biomethane into the utilities' common carrier pipelines. The four utilities contend that the biomethane standards to be adopted in this rulemaking need to be carefully developed to take into account the potential human health risks, as well as identifying and assessing the risks to pipeline integrity and system operations. To do this, the four utilities have proposed the constituents to be tested, acceptable constituent levels, initial gas quality review requirements, ongoing periodic testing and monitoring protocols, and recordkeeping requirements.

According to the four utilities, the intent of AB 1900 is to develop "incremental standards for non-traditional renewable gas supply." (*Ex*. 4 at 3.) The four utilities contend that because "biogas, and potentially biomethane, contain constituents that are not found naturally in conventional gas supply, the biomethane should be subjected to additional standards so that the biomethane is safe for customers and pipelines, and is interchangeable with conventional

gas supply." (*Ex*. 4 at 3-4.) As a result, the utilities contend that biomethane suppliers must meet the biomethane constituent specifications to be adopted in this proceeding, and the existing gas quality specifications that have been developed in prior proceedings.

The four utilities contend that the constituents of concern fall into two categories. The first category of constituents are those to protect human health. The proposed human health constituents of concern have been developed by CARB and OEHHA, and are contained in the Joint Report. The second category of constituents include those to protect the safety and integrity of the pipelines and pipeline facilities. The proposed safety and integrity constituents of concern were developed by the four utilities and are based on biogas studies, equipment manufacturer recommendations, and industry literature. In addition, the four utilities state that they have been involved in biomethane projects, and participated in a number of GTI studies related to dairy biogas, landfill gas, and the presence and levels of constituents found in biogas and biomethane.

The four utilities contend that in adopting a list of constituents of concern to protect human health and safety, the Commission should keep in mind the following five considerations.

The first consideration is General Order 58A, which addresses the standards for gas service in California, and among other things, addresses the purity of gas and heating value.

The second consideration is the tariff rules of the four utilities which set forth the "Commission-approved gas quality standards for the transportation and delivery of merchantable and nonhazardous gas on the Utilities' pipeline system." (*Ex*. 2 at 6.) The four utilities note that these gas quality specifications

"are based on experience gained by the Utilities during many years of operating pipeline systems," and are "representative of gas quality that has been determined safe for customer use and protects both the extensive pipeline infrastructure and customer end-use equipment." (*Ex*. 2 at 6.)

The third consideration relates to existing California Occupational Safety and Health Administration regulations which govern the exposure of utility employees to airborne contaminants, as set forth in Section 5155 of Title 8 of the California Code of Regulations.

The fourth consideration is California's Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986), which requires businesses to provide notice about potential exposure to any chemical known to cause cancer, birth defects, or other reproductive harm. In order to properly notify customers and employees, the four utilities assert that they need to know what constituents are in the gas that is transported and delivered through their systems. To gain this knowledge, the four utilities contend that appropriate gas quality testing must be in place and carried out in order to verify that the biomethane is safe for utility customers and employees, and to notify the public about the chemicals listed in Proposition 65.

The fifth consideration the Commission should keep in mind is the biomethane guidelines that SoCalGas and SDG&E currently have in place to assist suppliers of biomethane, excluding landfill biomethane. A copy of the constituents in the biomethane guidelines appears at 8 of Exhibit 2. The biomethane test parameters in the biomethane guidelines were "based on biogas studies and analytical results available as of 2009," and the "action levels were initially based on detection limits from the studies and/or published limits for constituents in air…, and then "reviewed and adjusted in 2011 based upon a

better understanding of the constituents' potential presence and effects." (*Ex*. 2 at 8-9.) As noted in Exhibit 2 at 9, "It has been SoCalGas and SDG&E's experience that the constituent concentration levels for non-landfill biomethane are normally below a level of concern, or can be monitored and mitigated…."

With respect to the health protective standards that OEHHA and CARB recommend in the Joint Report, the four utilities state that "the standards and framework developed by CARB and OEHHA appear appropriate to prevent potentially adverse impacts to human health." (*Ex*. 3 at 5.) However, the four utilities propose that the recommendations in the Joint Report be modified "to expand safety protections and protect pipeline integrity and system operations." (*Ex*. 3 at 6.)[27] The four utilities' recommended modifications consist of the following: testing for all constituents for each biomethane supplier; adding additional levels for other constituents; and expanding the testing to include, at a minimum, annual comprehensive biomethane analysis.

The following table is an abbreviated version of the four utilities' recommended biomethane constituents and levels.[28] This table reflects the available information, studies, and analyses that the four utilities reviewed or participated in.

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[27] The three utilities note that some of the constituents of concern that are in the Joint Report are already included in existing rules and regulations.

[28] The complete version of the utilities' recommended biomethane constituents table, which is entitled "Utility Biomethane Guidance Document," appears in Appendix A of Exhibit 3. The complete table includes additional columns for the sampling method and test methods.

Constituent	Trigger Level	Lower Action Level	Upper Action Level
VOCs/Halocarbons/ SVOCs			
p-Dichlorobenzene	0.95 ppm	9.5 ppm	24 ppm
Ethylbenzene	6 ppm	60 ppm	150 ppm
Vinyl Chloride	0.33 ppm	3.3 ppm	8.3 ppm
Toulene	240 ppm	2400 ppm	12000 ppm
n-Nitroso-di-npropylamine	0.006 ppm	0.06 ppm	0.15 ppm
Volatile Metals			
Arsenic	0.019 mg/m^3	0.19 mg/m^3	0.48 mg/m^3
Antimony	0.60 mg/m^3	6.0 mg/m^3	30 mg/m^3
Copper	0.06 mg/m^3	0.6 mg/m^3	3 mg/m^3
Lead	0.075 mg/m^3	0.75 mg/m^3	3.8 mg/m^3
Aldehydes and Ketones			
Methacrolein	0.37 ppm	3.7 ppm	18 ppm
Ammonia	0.001%	--	--
Biologicals	4×10^4/scf (qPCR per group) and Free of <0.2 micron filter	--	--
Hydrogen	0.1%	--	--

Mercury	0.08 mg/m³	--	--
Siloxanes	0.01 mg Si/m³	0.1 mg Si/m³	--

As reflected in the above table, the four utilities propose adding ammonia, biologicals, hydrogen, mercury, and siloxanes as additional constituents to the Joint Report's constituents of concern. The four utilities recommend that these constituents be added because of the potential risks that they pose to pipeline integrity and system operations.

In Exhibit 3 at 3, the four utilities have included a table ("Constituents and Potential Risks") which illustrates the potential risks to pipeline integrity and system operations from these five constituents, as well as the risks from other constituents. That table is reproduced below.

Constituents and Potential Risks

Constituent	Pipeline Integrity/System Operations Risks
Metals	• corrosion • catalyst poisoning • deposition
Biologicals	• corrosion • clogging and erosion of processing plant lines and components
Hydrogen	• stress cracking • material embrittlement
Ammonia	• damage to gas processing equipment • odor masking and fading • stress corrosion cracking

Siloxanes[29]	• equipment damage • catalyst poisoning
Halocarbons	• gas processing problems • produce noxious and corrosive compounds
Aldehydes and Ketones	• operational problems with gas processing equipment • odor masking and fading
Heavy Hydrocarbons	• lack of heavier hydrocarbons can cause elastomeric seals in steel and plastic fittings to shrink and lead to leaking
VOCs and SVOCs	• can cause swelling of elastomeric materials and lead to insufficient closure, stoppage, and bleed-through

The four utilities have recommended action levels for most of the constituents. According to the four utilities, the trigger levels are "based on biogas studies, equipment manufacturer specifications, and information on constituent impacts published in handbooks and professional association materials." (*Ex*. 3 at 6.) The four utilities state that their recommended trigger levels "do not just impact testing, but signify levels where the Utilities are able to take additional action depending on the constituents and constituent concentration." (*Ex*. 3 at 6.) Thus, "if a constituent is above the trigger level, the Utilities would be able to assess the risk and, depending on the results, increase

[29] According to the utilities in Exhibit 2 at page 23, siloxanes are commonly found in personal hygiene, health care, and industrial products. When "siloxane is combusted, silicon dioxide is formed and silica deposits can accumulate on customer appliances," and the silica deposits can "negatively impact the performance of internal combustion engines, turbines, and catalysts."

utility testing frequency, install additional monitoring equipment at the interconnect, warn the supplier of the levels, and/or establish a supplier-specific constituent shut-off limit." (*Ex*. 3 at 7.) The lower action level would be "used to screen suppliers during the initial gas quality review and serve as an ongoing screening level during periodic testing. Before injecting biomethane into the utilities' pipeline system, the biomethane supplier will need to demonstrate that the biomethane constituent levels are below the lower action levels during the initial gas quality review. For subsequent tests, "if the supplier exceeds the lower action level three times in a twelve month period, that supplier will be shut-off and subject to shut-off and retest procedures." (*Ex*. 3 at 7.) The upper action level is a shut-off level that indicates the need "to deny access until the supplier can demonstrate compliance with gas quality and constituent requirements." (*Ex*. 3 at 7.)

The four utilities have left blank some of the lower action and upper action levels for ammonia, biologicals, hydrogen, mercury, and siloxanes.

The biomethane proponents have suggested that the heating value standard can be addressed by upstream blending before the processed biomethane is injected into the pipeline, or that it can be accounted for in the blending that takes place downstream of the biomethane injection point. Since the objective of the gas specification standards is to have merchantable gas at the point of interconnection, the four utilities are okay with upstream blending by the biomethane suppliers. However, they are opposed to downstream blending because it is difficult to control and it is not guaranteed to occur on a continuous basis.

Due to the recommendations of the four utilities and in the Joint Report, the four utilities are proposing to update and modify their respective tariffs.

These gas quality tariff rules provide the general terms and conditions applicable to the transportation of customer-owned gas over their pipeline systems. The supplier of the gas is responsible for meeting the gas quality tariff rule specifications.

For SoCalGas and SDG&E, modifications to Section I of Rule 30 are being proposed. The proposed modifications to Rule 30 would "remove existing limits to biomethane acceptance, add a limitation on the acceptance of hazardous waste landfill gas, and add the lower and upper action levels discussed in this supplemental testimony." (*Ex*. 3 at 12.) For the testing and recordkeeping procedures to be adopted in this proceeding, SoCalGas and SDG&E anticipate including detailed testing and recordkeeping procedures in the agreements between the utility and the supplier. SoCalGas and SDG&E do not propose any modification to Rule 39, which provide for non-discriminatory open access to the pipeline system and prohibits unduly discriminating against or in favor of gas supplies coming from any source.

PG&E proposes that its Gas Rule Number 1 be modified to add the definitions of biogas and biomethane, and to incorporate biomethane into the definition of "gas." PG&E also proposes that its Rule 14 be modified to address non-discriminatory open access for biomethane supplies. PG&E also proposes that Rule 21 be modified as follows: require a minimum instantaneous flow rate of five decatherms per hour to ensure accurate measurement of gas volumes at the receipt point; incorporate the biomethane lower and upper action levels discussed in the utilities' supplemental testimony; add a limitation on the acceptance of hazardous waste landfill gas; and address non-discriminatory open access for biomethane supplies.

Southwest Gas proposes to add Rule 22 to address biomethane gas. Southwest Gas also proposes to modify its existing Rules 2 and 21 to conform to the addition of Rule No. 22. Rule 22 would require the maintenance of a ratio of 25% biomethane and 75% traditional natural gas. Southwest Gas recommends this ratio because it has historically installed plastic compression and other plastic fittings with soft seals in its distribution systems. According to the four utilities, "There are documented occurrences of similar seals leaking due to the lack of heavy hydrocarbons in [liquefied natural gas] causing the seals to shrink." (*Ex*. 3 at 14.) Since biomethane has little or no heavy hydrocarbons, Southwest Gas believes that this ratio of "biomethane to natural gas will insure that the seals within its distribution systems retain sealing integrity." (*Ex*. 3 at 14.)

The four utilities note that if the Joint Report's recommendation to include vinyl chloride as a constituent of concern is adopted, that General Order 58A will need to be modified as well. General Order 58A addresses the standards for gas service in California, and among other things, addresses the purity of gas and heating value.

The four utilities oppose the biomethane proponents' requests to change the existing gas quality specifications, especially the requests to revise the gas heating value standard downwards. The four utilities contend that the requests of the biomethane proponents to change the existing gas quality specifications are outside the scope of this proceeding. The four utilities point out that the existing gas quality specifications were developed in prior proceedings with participation by other industry stakeholders. Two of these prior proceedings resulted in D.06-09-039 and D.13-09-002. The four utilities point out that the gas specifications addressed in those two decisions are not the subject of AB 1900 or

of this proceeding, and that it "would be inappropriate to modify gas quality specifications applicable to all producers in a Rulemaking on biomethane constituents; especially when the Commission has already extensively reviewed … the gas quality standards and determined them to be reasonable." (*Ex*. 4 at 6.) In addition, the four utilities contend that the rules are different for each gas utility due to their "different systems, operations, gas supplies, and customer equipment." (*Ex*. 4 at 5.) For example, General Order 58A requires the four utilities "to identify a heating value range for each distinct distribution system area, provide for verification of the average heating value of the gas supplied to each area, maintain the heating value within the heating value range established for the area, and assure adequate accuracy for customer billing." (*Ex*. 4 at 4-5.)

The four utilities also take issue with the biomethane proponents' argument concerning the statement in the Joint Report which states that "the injection of biomethane does not present additional health risk as compared to natural gas." The four utilities contend that this finding in the Joint Report is dependent on the statement in the same report that the majority of the constituents of concern in the biogas are removed, or reduced to concentrations below the OEHHA recommended health protective levels during the upgrading process. In addition, the Joint Report's finding is dependent on the Joint Report's statement that the recommendations "do not supersede any other requirements relating to pipeline integrity, heating value, and other requirements not related to health-based standards." (*Ex*. 4 at 3; *See Ex*. 1 at 2-3, 66.)

The four utilities contend that the first step in determining how to safely introduce biomethane is to identify trace constituents in biogas and biomethane

that may adversely impact pipeline integrity or system operations. By including biogas constituents, the four utilities contend this will allow them to determine the baseline constituents, and to "develop a testing and monitoring regimen that takes into consideration both the biogas and biomethane constituent concentrations." (*Ex*. 3 at 2.) The four utilities contend that identifying the biogas constituents is important because "the Utilities have no control over the conditioning and upgrading facilities responsible for converting raw biogas into pipeline quality biomethane." (*Ex*. 3 at 2.)

To assess the potential risk of biomethane to pipeline integrity and system operations, the four utilities have identified the following methods to assess the potential risk of biomethane to pipeline integrity and system operations:

- Evaluate equipment pieces that have been exposed to landfill gas or other biogas.
- Install corrosion coupons at landfills.[30]
- Install corrosion coupons downstream of conditioned biogas from biomethane facilities.
- Install electrical resistance probes to measure resistance in order to determine the corrosion rate in the pipe.
- Review equipment manufacturer recommendations.
- Review of other published studies and reports.

The four utilities recommend that once the pipeline and system operations risks have been identified and assessed, that a framework be developed to prevent and mitigate risk. Such a framework would include the

[30] The four utilities describe a corrosion coupon as a metal strip, screen, or ring that is inserted into the pipe. After a set period of time it is removed and checked for pits, cracks and metal loss. This information is then used to determine the corrosion rate, and the type of corrosion.

development of appropriate constituent levels, and related monitoring and testing protocols.

The biomethane proponents' oppose the proposal of the four utilities to require additional steps for the initial gas quality review, beyond what the Joint Report recommends. The four utilities contend that they are not proposing extensive testing and monitoring of raw biogas. Instead, they are proposing one test prior to construction of the interconnection facilities, and one test prior to the development of constituent testing and monitoring protocols. The four utilities contend that this will help to determine the quality of the gas that is being processed in the biogas to biomethane treatment facility, and will enable the four utilities to design and implement a testing and monitoring process that is specific to the specific risks associated with each biomethane producer. The four utilities contend that, contrary to what the biomethane proponents have stated, similar steps are taken for conventional natural gas providers.

The four utilities disagree with the position of the biomethane proponents that the Commission should not adopt the Joint Report's recommendation for regulating copper and arsenic. The four utilities contend that the sampling tests for arsenic can be modified to provide for appropriate detection levels. If test results are outside the lab's analytical testing range, then the sample can be diluted or retested and modified by changing the sampling volume or test method with consideration of the expected value. With respect to copper, the four utilities contend that testing for copper should occur because copper has a potentially harmful impact on health, safety, and pipeline integrity.

The four utilities also disagree with CRNG's position regarding biologicals, hydrogen and siloxanes. CRNG argues that biologicals should not be included, tested or monitored because they do not substantially impact

human health or pipeline and pipeline facility safety and integrity, and that the proposed levels of the four utilities are far in excess of reasonable limits. The four utilities contend that their proposed trigger levels are based on existing reports and studies, and are intended to monitor against microbial influenced corrosion, which is a risk the May 2012 GTI report noted. The four utilities contend that this GTI report acknowledges that this type of corrosion can degrade the integrity, safety, and reliability or pipeline operations, and is one of leading causes of pipeline failure in the oil and gas industry.

With respect to hydrogen, the four utilities contend that their proposed trigger level for hydrogen is appropriate and reasonable. The four utilities contend that the 2009 GTI report found that "hydrogen can be problematic when in contact with steel; hydrogen stress cracking or hydrogen embrittlement may occur." (Four Utilities Reply Brief at 12; *Ex.* 6, Att. 6 at 17.)

On siloxanes, the four utilities contend that their proposed trigger and action levels for siloxanes are appropriate and reasonable. The 2009 GTI report notes the risks associated with siloxane, and states that "while there are no generally accepted pipeline specification for siloxane concentrations in natural gas, its introduction into the gas system is to be avoided." (Four Utilities Reply Brief at 13; *Ex*. 6, Att. 6 at 18.) The four utilities assert that their proposed trigger and lower action level proposals are intended to achieve the intent of GTI's report of avoiding siloxanes, and is consistent with the equipment manufacturer's recommendations and recent studies.

With respect to the biomethane proponents' request to lower the heating value, the four utilities contend that this issue is outside the scope of this proceeding, and lacks sufficient evidence to resolve this issue. The four utilities point out that heating value, and the associated gas interchangeability issues,

were addressed in past Commission proceedings, and are governed by existing rules and regulations. In those other proceedings, the four utilities note that they involved extensive testing, research, and hearings regarding safe levels, interchangeability ranges, and end use equipment functionality. The four utilities also note that General Order 58A requires that btu levels be established by each of the utilities to identify a heating value range for each distinct distribution system area, and for the verification of the average heating value of the gas supplied to each area, and to maintain the heating value within the range established for the area. The four utilities contend that the receipt of biomethane at a lower btu level than what is established for end use equipment in specific local areas may hinder the reliable and safe operation of end use equipment and compromise customer billing accuracy. The four utilities also note that the biomethane proponents are requesting the lower heating value, based solely on the fact that some other states allow a heating value of 950 btu/scf. The utilities contend that this is not a valid basis to change the heating value requirement since the allowable btu level in any particular area in California is dependent on the historical quality of gas delivered to customers and the capabilities of end use equipment.

The four utilities also contend that the heating value requirement is not imprudent, nor unnecessarily stringent. The 2012 GTI report notes that low btu gas may have a detrimental effect on end use equipment and may not be compatible with many systems. (*Ex*. 6, Att. 6 at 7.) The utilities also state that the safety risks associated with the introduction of non-compliant gas has been acknowledged by the Commission. The utilities point out that in D.10-09-001 at 32, the Commission stated that "the safety risks associated with appliance performance from unblended non-compliant gas are flame lifting, yellow

tipping, and the formation of carbon monoxide. " The four utilities also contend that the minimum heating level also protect against incomplete combustion, nitrogen oxide emissions, and carbon monoxide emissions. (*See* D.06-09-039 at 149.) The Commission further stated that "due to the danger of flame lifting and flame out, strict monitoring and enforcement of the gas of those California producers who are directly connected to SoCalGas' transmission and distribution system is needed."(D.10-09-001 at 36.) The four utilities contend that any request to change the heating value requires an analysis of the impact on end use customer equipment, which the biomethane proponents did not present in this proceeding.

The four utilities also contend that the 2012 GTI report concluded that landfill gas can meet the minimum heating value through the use of existing technology to condition and upgrade the biogas. The four utilities also state that they are not opposed to the upstream blending by the biomethane producer prior to the biomethane being injected into the utilities' pipelines.

Currently, PG&E's tariff does not specify a numerical heating value. Instead, PG&E's Rule 21 tariff provides that the "gas shall have a heating value that is consistent with the standards established by PG&E for each receipt point." PG&E contends that due to the regional differences in the heating values of gas that have historically been delivered into its service territory, PG&E's Rule 21 does not include a system wide minimum or maximum heating value for gas to be accepted into a receiving pipeline. However, any gas delivered with a heating value above or below the specified range, which is determined using the assumed adjustment gas and the interchangeability program, may endanger public safety. For PG&E, the suitability of any new gas supply in its service territory is assessed by location on a case by case basis

depending on the heating value characteristics of the receiving pipeline system. In accordance with PG&E's tariffs, interconnection agreements and normal pipeline operations, gas supply received at any interconnect must be interchangeable with gas flowing at the interconnect.

4.4. Discussion

4.4.1. Introduction

Health and Safety Code § 25421, as added by AB 1900, contains two subdivisions which require the Commission to take certain action before December 31, 2013. First subdivision (c) provides that concentration standards are to be adopted for the constituents of concern that may be found in biomethane, and that such standards are to protect human health, and the integrity and safety of the pipeline and pipeline facilities.

4.4.2. The Meaning of a Common Carrier Pipeline

Before discussing the adoption of what standards should apply to the constituents of concern that are found in biomethane, and what monitoring, testing, reporting, and recordkeeping requirements should apply, there is the preliminary issue of deciding who is a "common carrier pipeline" for the purpose of AB 1900. The ISPs and Shell Energy raise this issue because they want to ensure that their operations are excluded from having to adhere to the two subdivisions listed above. No objections to the positions of the ISPs and Shell Energy were raised.

Health and Safety Code § 25420(f), as amended by AB 1900 states that a " 'Common carrier pipeline' means a gas conveyance pipeline, located in California, that is owned or operated by a utility or gas corporation, excluding a dedicated pipeline." The term "gas corporation" is also defined in subdivision (i) of Health and Safety Code § 25420 to have "the same meaning as defined in

Section 222 of the Public Utilities Code and is subject to rate regulation by the commission." Subdivision (g) of Health and Safety Code § 25420 defines "dedicated pipeline" to mean "a conveyance of biogas or biomethane that is not part of a common carrier pipeline system, and which conveys biogas from a biogas producer to a conditioning facility or an electrical generation facility."

For the purpose of Health and Safety Code § 25421, we conclude that the California Legislature did not intend for that subdivision to apply to the ISPs' pipelines. We reach that conclusion based on the following three reasons. First, the term "common carrier pipeline" refers to a "gas conveyance pipeline." The plain meaning of the term "gas conveyance pipeline" suggests that the pipeline operator's principal business is to move and deliver gas from one point to another. Unlike the pipeline systems of the four utilities, the ISPs' pipeline systems are designed to receive the gas of the ISP customer from PG&E's pipeline system, whose gas is then injected into the ISPs' underground storage for a period of time. When the gas is withdrawn from storage, the ISPs then redeliver the gas over the ISPs' pipeline systems into PG&E's pipeline system. The principal purpose of the ISPs' pipeline systems are to receive and deliver the gas of the ISPs' customers for injection and withdrawal from storage.

Second, since the ISPs' pipelines are connected to PG&E's gas pipeline system, and receive all of the gas destined for storage over PG&E's pipeline system, there will be no biomethane injected directly into the ISPs' pipeline system. Whatever gas the ISPs receive will come from PG&E's gas pipeline system. Similarly, since the ISPs' gas storage facilities will not be producing any biogas or biomethane, the ISPs are not injecting any biomethane into PG&E's pipeline system. Accordingly, the ISPs should not be required to implement the Health and Safety Code § 25421(c) concentration standards for the incoming gas

that the ISPs receive. In addition, the ISPs should not have to ensure that the outgoing storage gas meets the concentration standards for the adopted constituents of concern before it enters the PG&E pipeline system.

Third, subdivisions (f) and (i) of Health and Safety Code § 25420 state that the gas conveyance pipeline needs to be located in California, "is owned or operated by a utility or gas corporation," and that the gas corporation "is subject to rate regulation." Although the ISPs are considered gas corporations within the meaning of Public Utilities Code Section 222, the ISPs' underground storage rates are not subject to rate regulation by the Commission. Accordingly, since the ISPs' storage rates are not regulated by the Commission, the ISPs' pipeline systems are not considered a "common carrier pipeline" under Health and Safety Code § 25420. Therefore, the ISPs are not required to comply with the concentration standards for the constituents of concern that are found in biomethane (Health and Safety Code § 25421(c)), and do not have to follow the monitoring, testing, reporting, and recordkeeping requirements imposed by Health and Safety Code § 25421(d).

Next, we address Shell Energy's concern that the Commission should clarify that for the purposes of the gas quality standards, and the testing and monitoring protocols, the term "common carrier pipeline" refers to a gas utility located in California.

As noted earlier, subdivision (f) of Health and Safety Code § 25420 defines a "common carrier pipeline" to mean "a gas conveyance pipeline, located in California, that is owned or operated by a utility or gas corporation…." The plain language of the definition of a common carrier pipeline makes clear that AB 1900 intended for the concentration standards, and the testing and monitoring requirements, to apply only to biomethane that is being injected into

a gas pipeline that is located in California, and which is owned or operated by a gas utility or gas corporation.

4.4.3. Constituents of Concern

4.4.3.1. Introduction

The next area to address is the adoption of standards that specify the level of concentrations for constituents of concern that may be found in biomethane.

Before discussing the recommendations in the Joint Report of what standards of concentration and constituents of concern should be adopted, and the recommendations of the other parties, it must be kept in mind that Health and Safety Code § 25421(c) provides that in adopting the standards for the constituents of concern, the Commission is to ensure both of the following factors. First, that the standards protect human health, and second, that the standards provide for the integrity and safety of the pipeline and pipeline facilities.

To ensure the protection of human health, subdivision (c)(1) of that code section provides that the Commission "shall give due deference to the determinations of the [CARB] pursuant to paragraph (4) of subdivision (a)" of Health and Safety Code § 25421. Giving due deference to CARB's determinations in the Joint Report, for the purpose of protecting human health, makes sense. As the Legislative Counsel's Digest to AB 1900 notes, existing law requires OEHHA "to evaluate the environmental and health risks posed by various hazardous substances." With the background of activities that OEHHA and CARB are involved in, OEHHA and CARB, in consultation with the three other state agencies, have the expertise to assess the impact of how the concentrations of the constituents of concern affect human health. As set forth in Health and Safety Code § 25421(a), OEHHA and CARB are responsible for

determining what the health protective levels should be, to identify realistic exposure scenarios, and to identify the health risks associated with those exposure scenarios.

In discussing what standards should be adopted for the constituents of concern that may be found in biomethane, we need to keep this deference in mind for the constituents of concern that may affect human health. Such deference is an important consideration when we consider the arguments of the biomethane proponents, and of the four utilities, as to why they believe certain recommendations in the Joint Report should be changed.

With respect to the directive in Health and Safety Code § 25421(c)(2) that the standards to be adopted for biomethane are to ensure the integrity and safety of the pipeline and pipeline facilities, that provides the Commission with more flexibility about what evidence should be considered, including the four utilities' concerns about the possible damage that certain constituents can cause, and the response of the biomethane proponents to the additional constituents of concern that the four utilities recommend be included.

4.4.3.2. Adopted Constituents of Concern

The Joint Report recommends that the Commission adopt the following 12 constituents of concern: antimony, arsenic, copper, p-Dichlorobenzene, ethylbenzene, hydrogen sulfide, lead, methacrolein, n-Nitroso-di-n-propylamine, mercaptans (alkyl thiols), toluene, and vinyl chloride. The Joint Report states that these 12 constituents "can potentially be present in raw biogas that if not sufficiently removed during the cleaning and upgrading processes may present health concerns." (Exhibit 1 at 2.)

The four utilities recommend that the following five additional constituents of concern be added to the Joint Report's recommendations:

ammonia, biologicals, hydrogen, mercury, and siloxanes. As summarized above in the position of the parties, the four utilities recommend that these five constituents be added to the Joint Report's list of constituents of concern because they pose potential risks to the integrity and safety of the gas pipelines and pipeline facilities. These five additional constituents can lead to a variety of problems, including the following: damage, clogging, and erosion of gas processing equipment and end use equipment; masking of odors; corrosion; cracking and embrittlement; and operational problems.

The biomethane proponents oppose the four utilities' recommendation to include these five additional constituents. The biomethane proponents also generally oppose adopting methacrolein, formaldehyde, halocarbons, hydrogen, mercury, PCBs, pesticides, pharmaceuticals, animal products, VOCs, SVOCs, PAHs, volatile fatty acids, vinyl chloride, and volatile metals (which consist of arsenic, antimony, copper, and lead) as constituents of concern. As noted earlier in a footnote to this decision, the four utilities have removed PCBs, pesticides, pharmaceuticals, animal products, PAHs, and volatile fatty acids from their proposed testing and monitoring framework.[31]

The biomethane proponents essentially contend that these constituents should not be adopted as part of the constituents of concern because the biomethane projects operating in other states are not required to test for these constituents of concern, that certain constituents are not found in processed biomethane, or because biomethane does not present an additional health risk as compared to natural gas. However, Health and Safety Code § 25421(c)

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[31] *See* footnote 21.

expressly authorizes the Commission to adopt the standards for concentrations of constituents of concern that are "reasonably necessary to ensure both" the protection of human health, and pipeline and pipeline facility integrity and safety. Contrary to the arguments of the biomethane proponents, the Joint Report and the four utilities have demonstrated that their recommended constituents of concern may pose harm to the integrity and safety of the pipeline and pipeline facilities, as well as to human health. Furthermore, the details set forth in the 2009 and 2012 GTI reports support the adoption of the constituents of concern that the Joint Report and the four utilities have recommended. The biomethane proponents have not provided any evidence to substantiate its argument that these 17 constituents of concern will not harm human health, or affect the integrity and safety of the pipeline and pipeline facilities. As the 2009 GTI report notes in the "Task 2 Report" section, "Depending upon the characteristics and source of the biomass, resulting biomethane may contain a variety of organic and inorganic compounds, as well as other constituents." (Exhibit 6, 2009 GTI Study, Task 2 Report at 5.) That report also states that through consideration of the recommendations set forth in the Task 2 Report, "natural gas transmission and distribution companies can be more assured that biomethane of a consistent and suitable quality is supplied to their system, and biomethane producers will be able to verify their product as meeting gas company specifications." (*Ibid*.)

In addition, the constituents of concern that are recommended for adoption in the Joint Report, are the result of the collaborative efforts of OEHHA and the CARB, who have the expertise and background in determining the health protective levels for constituents of concern. In accordance with

Health and Safety Code § 25421(c)(1), we give due deference to the list of constituents of concern that the CARB has recommended be adopted.

The biomethane proponents contend that the cost of testing for constituents of concern should be a consideration before such a list of constituents of concern is adopted. They also contend that AB 1900 was intended to make it easier for biomethane suppliers to inject biomethane into the common carrier pipelines, and adopting stricter barriers which limit the injection of biomethane in a cost effective manner would be contrary to AB 1900. We are not persuaded that those arguments should be our primary guiding force in adopting the concentration standards for the constituents of concern. We would not be fulfilling our duty under AB 1900 if we allowed cost considerations to exclude certain constituents of concern from being adopted. As Health and Safety Code § 25421(c) clearly states, and which the OEHHA and CARB have endeavored to fulfill, the standards for the concentrations of constituents of concern are those that are reasonably necessary to ensure the protection of human health, and for the integrity and safety of the pipeline and pipeline facilities.

Accordingly, we adopt the following as the constituents of concern for biomethane, which include the 12 constituents recommended by CARB and OEHHA and the five constituents recommended by the four utilities: arsenic, p-Dichlorobenzene, ethylbenzene, n-Nitroso-din-propylamine, vinyl chloride, antimony, copper, hydrogen sulfide, lead, methacrolein, alkyl thiols (mercaptans), toluene, ammonia, biologicals, hydrogen, mercury, and siloxanes. As discussed in section 4.4.3.3, these constituents of concern for biomethane will be incorporated into the tariffs of the four utilities, and will replace the Rule 30

Biomethane Gas Delivery Specifications Limits and Action Levels document that SoCalGas and SDG&E have relied on in the past.

4.4.3.3. Adopted Concentration Standards

Next, we address the adoption of standards for the concentrations for these constituents of concern. These standards of concentrations will establish the allowable levels for the constituents of concern, and the testing and shut-off protocols.[32]

As described in section 4.2.2 of this decision, the Joint Report recommended risk management levels for its 12 constituents of concern. The Joint Report's recommended concentration amounts are based on the established OEHHA guidelines and recommended health values to estimate the potential cancer risks and non-cancer health impacts for these constituents of concern. The four utilities' recommended risk management levels for their five recommended constituents of concern are described in section 4.3.11 of this decision, and are based on biogas studies, equipment manufacturer specifications, and published information on the impact of these constituents.

These recommended risk management levels utilize the following three levels of action: trigger level, lower action level, and upper action level. These three action levels set forth the concentration amounts for the 17 constituents of concern.

The trigger level is the acceptable concentration level for each constituent. If the trigger level is exceeded for a constituent, routine monitoring of the constituent of concern is required.

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[32] The testing and shut-off protocols are discussed later in this decision.

The lower action level is used to screen biomethane suppliers during the initial gas quality review and as an ongoing screening level during the periodic testing. During the initial gas quality review, the constituents of concern in the biomethane will need to be below the lower action level before biomethane can be injected into the pipeline. Afterwards, if a constituent exceeds the lower action level concentration three times within a 12-month period, the biomethane supplier will be shut-off and will be required to repair its biogas processing facility until the biomethane meets the trigger level.

The upper action level establishes the point at which an immediate shut-off of the biomethane supply occurs. This occurs when the concentration amount for a constituent reaches that level. The pipeline will shut-off access when the upper action level is reached, and the biomethane supplier will be required to shut-off the biomethane supply, and to repair its biogas processing facility until the biomethane meets the trigger level concentrations.

In general, the biomethane proponents contend that the concentration levels recommended in the Joint Report and by the four utilities are too stringent. In particular, they believe that the trigger level for arsenic should be revised upwards because the recommended trigger level may be beyond detection and may not be quantified. In addition, they contend that the siloxane trigger level is too low, and recommend a trigger level of 3.8 mg/m^3 instead of the .01 mg Si/m^3 that the four utilities recommend.

We have reviewed the concentration limits that the Joint Report and the four utilities recommend be adopted for the 17 constituents of concern. We have also considered the arguments of the biomethane proponents that the concentration limits are arbitrary, discriminatory, and inappropriate.

We are not persuaded by the argument that the recommended concentration levels are arbitrary, discriminatory, or inappropriate. As the GTI reports note, and as the biomethane proponents acknowledge, the gas composition of fossil natural gas and processed biomethane are different, and the chemical compounds found in each of those two sources vary. Some of the chemical compounds which have been adopted as the 17 constituents of concern are found only in biogas and biomethane. Health and Safety Code § 25421(c) recognizes this difference, and states that standards are to be adopted "for constituents that may be found in that biomethane." Accordingly, establishing concentration standards for these constituents that are found in biomethane are not arbitrary, discriminatory, or inappropriate.

Furthermore, we are not persuaded by arguments that the trigger level for arsenic is too close to detection limits. As the four utilities point out, detection limits can vary depending on lab technology and procedures. For instance, collecting a larger sample of gas may allow for more accurate testing. As for copper, we are not persuaded to exclude it as a constituent of concern at this time since copper was included in the Joint Report as a constituent of concern.

Based on the health protective levels that OEHHA developed, and the recommended concentrations that the CARB recommends be adopted, we give due deference to the CARB's recommended concentrations for its 12 constituents of concern, and adopt the Joint Report's recommended concentrations for those twelve constituents as described in section 4.2.2. of this decision, as well as the Joint Report's view of how the trigger level for hydrogen sulfide and mercaptans (alkyl thiols) interact with the natural gas tariffs for these two compounds.

With respect to the concentration standards for the other five constituents that the four utilities recommended be included, we will adopt the concentration standards that the four utilities recommend for ammonia, biologicals, hydrogen, and mercury. The biomethane proponents have not presented any evidence to suggest that the concentration limits for these four constituents should be changed.

Regarding the concentration standard for siloxanes, the biomethane proponents oppose the recommendation of the four utilities. According to the four utilities, siloxanes pose an end user safety issue. When siloxanes are "combusted, silicon dioxide is formed and silica deposits can accumulate on customer appliances." (*Ex.* 2 at 23.) Such deposits can "negatively impact the performance of internal combustion engines, turbines, and catalysts." (*Ex*. 2 at 23; *Ex*. 5, Attachment 26 at 1.) In addition, the "silica deposits can severely affect the maintenance intervals of the internal combustion equipment." (*Ex*. 5, Attachment 25 at 3.) The four utilities note that studies are currently being done on the impact of siloxanes on residential appliances.

For the concentration standard for siloxanes, the four utilities recommend a trigger level of 0.01 mg/m^3, and a lower action level of 0.1 mg/m^3. SoCalGas currently uses a lower action level of 0.1 mg/m^3 for siloxanes, which is "based on review of engine manufacturer limits on siloxane in biogas and the detection limit of an on-line siloxane analyzer from approximately 3 years ago." (*Ex.* 2 at 23.) At that lower action level, the four utilities contend that siloxanes should not cause any operational problems in residential appliances.

CRNG recommends a trigger level of 3.8 mg/m^3. CRNG argues that its recommended trigger level for siloxane is the same as what Caterpillar recommends for its equipment.

We have considered the position of the parties regarding the trigger level for siloxane, and have also considered the impact that siloxane could have on end use equipment. To limit the detrimental effects of siloxane on end use equipment, and to ensure the integrity and safety of pipeline facilities, we adopt the concentration limits for siloxane that the four utilities recommend. Accordingly, for siloxane, a trigger level of 0.01 mg/m^3, and a lower action level of 0.1 mg/m^3, are adopted.

With respect to the unspecified lower action and upper action levels for ammonia, biologicals, hydrogen, mercury, and siloxanes, we agree that these unspecified limits may lead to situations where the utilities have the discretion to shut off the flow of biomethane if the concentration limits exceed the trigger level for ammonia, biologicals, hydrogen, and mercury, or if it exceeds the lower action level for siloxanes. As a safeguard to prevent this type of discretionary abuse, we will require the four utilities to specify the lower action and upper action levels for these five constituents of concern in the next update proceeding.

In addition, if biomethane is injected into a utility's pipeline, the utility shall keep a record of each instance in which the trigger level has been exceeded for ammonia, biologicals, hydrogen, and mercury, and in which the lower action level has been exceeded for siloxanes. The utility shall also list what type of action it took in response to each exceedance. These records shall be made available to the Commission and to the biomethane suppliers.

In the event the biomethane supplier believes that the utility is abusing its discretion with respect to the unspecified action levels for these five constituents of concern, the biomethane supplier can file a complaint pursuant to Rule 4.1 of the Commission's Rules of Practice and Procedure.

For ease of reference, Table 1 below shows the 17 constituents of concern and the applicable concentration standards that are adopted in today's decision in accordance with Health and Safety Code § 25421(c).

Table 1

Constituent of Concern	Trigger Level	Lower Action Level	Upper Action Level
Arsenic	0.019 (0.006)[33]	0.19 (0.06)	0.48 (0.15)
p-Dicholorobenzene	5.7 (0.95)	57 (9.5)	140 (24)
Ethylbenzene	26 (6.0)	260 (60)	650 (150)
n-Nitroso-din-propylamine	0.033 (0.006)	0.33 (0.06)	0.81 (0.15)
Vinyl Chloride	0.84 (0.33)	8.4 (3.3)	21 (8.3)
Antimony	0.60 (0.12)	6.0 (1.2)	30 (6.1)
Copper	0.060 (0.02)	0.60 (0.23)	3.0 (1.2)
Hydrogen Sulfide	30 (22)	300 (216)	1,500 (1,080)
Lead	0.075 (0.009)	0.75 (0.09)	3.8 (0.44)
Methacrolein	1.1 (0.37)	11 (3.7)	53 (18)
Alkyl Thiols (Mercaptans)	n/a (12)	n/a (120)	n/a (610)
Toulene	904 (240)	9,000 (2,400)	45,000 (12,000)
Ammonia	0.001%	--	--
Biologicals	4 x 10 [4] / (qPCR per group) and free	--	--

[33] The first number in this table are in mg/m³, while the second number in ( ) is in parts ppmv.

	of <0.2 micron filter		
Hydrogen	0.1%	--	--
Mercury	0.08 mg/m³	--	--
Siloxanes	0.01 mg Si/m³	0.1 mg Si/m³	--

Thus, in order for a biomethane supplier to interconnect with a utility's gas pipeline system, and consistent with Health and Safety Code § 25421(f)(1), the biomethane supplier must meet the existing gas quality requirements in the utility's tariff, as well as the adopted incremental biomethane constituent specifications listed in the table above. These biomethane constituent specifications replace the Rule 30 Biomethane Gas Delivery Specifications Limits and Action Levels document that SoCalGas and SDG&E have relied on it the past. In accordance with Health and Safety Code § 25421(f)(2), the four utilities are directed to incorporate these adopted constituents of concern, and concentration standards, into their respective tariffs to permit the interconnection of processed biomethane which meets the above specifications.[34] The four utilities shall submit tier two advice letters within 30 days of the effective date of this decision to incorporate these changes into their tariffs.

[34] Since Health and Safety Code § 25421(f)(2) requires the "gas corporation tariffs to condition access to common carrier pipelines on the applicable customer meeting the standards and requirement adopted by the Commission," the adopted constituents of concern and concentration standards, and the adopted monitoring, testing, reporting, and recordkeeping requirements, shall be reflected in the respective tariffs of each of the four utilities. This represents a move away from the use of informal biomethane guidance documents, such as the document that SoCalGas and SDG&E has used in the past.

We also note that General Order No. 58A will need to be revised to reflect the adopted trigger level of 0.33 ppm for vinyl chloride. Section 7.e. of that General Order is based on former Health and Safety Code § 25421, which was repealed by AB 1900. AB 1900 did away with the restriction in that former code section on the purchase of landfill gas that contains vinyl chloride in a concentration greater than 1170 parts per billion by volume. As a result of AB 1900, and today's decision, General Order No. 58A will need to be amended to eliminate the restriction on vinyl chloride. Other sections of General Order 58A should be reviewed to determine if additional revisions are needed. After consulting with the Energy Division, the Gas Safety and Reliability Branch of the Safety and Enforcement Division, and the ALJ Division, the Commission should consider revising General Order 58A.

4.4.4. Heating Value

The current tariffs of SDG&E and SoCalGas set the minimum heating value of gas at 990 btu/scf. SDG&E and SoCalGas propose that this minimum heating value be retained. Southwest Gas proposes to add a new gas tariff Rule No. 22 that would require biomethane gas to have a minimum heating value of 990 btu/scf. PG&E proposes that its gas Rule No. 21 remain unchanged about heating value. PG&E's Rule No. 21 currently provides that for heating value, "The gas shall have a heating value that is consistent with the standards established by PG&E for each Receipt Point."

BAC, CASA, and WM propose that the minimum heating value be set at 950 btu/scf, while CRNG proposes that the minimum heating value be set at 970 btu/scf.

The four utilities contend that the heating value should not be lowered in this proceeding because that issue was decided in another proceeding which

involved a much broader group of interested stakeholders. The biomethane proponents contend that the heating value should be lowered because biogas and processed biomethane do not contain high percentages of higher heat hydrocarbons, and other states that have operational biomethane projects only require a heating value of 950 btu/scf or close to that number. In addition, the biomethane proponents argue that it would be cost prohibitive to add a higher heat hydrocarbon, such as propane, to raise the heating value of the biomethane.

We are not persuaded by the arguments of the biomethane proponents that the minimum heating value for gas injected into the utilities' pipelines should be lowered to 950 btu/scf. There are several reasons why we reach that conclusion.

First, as the four utilities note in their testimony, the development of the heating value requirement was adjudicated in a rulemaking proceeding that involved many different interested stakeholders. This proceeding resulted in D.06-09-039. As part of the evidence evaluated in that decision, the Commission was made aware of a paper authored by the National Gas Council (NGC), in conjunction with "representatives of LNG suppliers, natural gas pipelines, utilities, power generators, industrial process gas users, appliance manufacturers, and natural gas processors." (D.06-09-039 at 147.) The objective of that paper was to "to define acceptable ranges of natural gas characteristics that can be consumed by end users while maintaining safety, reliability, and environmental performance." (D.06-09-039 at 148.) That paper also examined the impact of changing natural gas quality on end use equipment. On June 15, 2006, the Federal Energy Regulatory Commission (FERC) issued a policy statement on natural gas quality in which FERC recommended that interstate

gas pipelines and their customers use this paper as a reference point for resolving gas quality disputes. (D.06-09-039 at 152.)

Second, D.06-09-039 considered the effects of heating value on end user equipment. That decision acknowledged that the NGC paper stated that heating value could have an effect on auto-ignition, flashback, and combustion dynamics. (D.06-09-039 at 149.) In addition, the paper "found that understanding the historical composition of gas in a region is essential to establishing acceptable interchangeability standards," and that for home appliances, that the "Appliance performance degrades when the appliance is operated with gas that is not interchangeable with the gas used to tune the appliance when it was first installed." (D.06-09-039 at 150.) Based on all those considerations, the Commission adopted a minimum heating value of 990 btu/scf for SDG&E and SoCalGas, but did not adopt a heating value number for PG&E. (D.06-09-039 at 154, 161.)

Third, the proponents of biomethane have not introduced any scientific evidence in this proceeding to demonstrate that lowering the heating value to 950 or 970 btu/scf will not cause end use equipment problems. Instead, the biomethane proponents rely on the argument that since other states allow biomethane to have a minimum heating value of 950 btu/scf, or close to that number, that California should likewise lower its minimum heating value. That argument is insufficient justification to lower the heating value when such a change could affect the integrity and safety of end use equipment.

Fourth, General Order 58A provides that the gas utilities are to establish distinct distribution system areas in which a uniform quality of gas is to be supplied, and to identify a heating value range for each area and verification of the average heating value. As the parties to this proceeding note, a lower

heating value will impact a customer's gas bill since gas is billed on a per therm basis. General Order 58A recognizes that different distribution areas may receive gas with varying heating values. PG&E's current and proposed gas tariff Rule No. 21 provides that for heating value, "The gas shall have a heating value that is consistent with the standards established by PG&E for each Receipt Point." The proponents of biomethane have not presented any evidence to show how a lower heating value will affect the distribution system areas of PG&E and the other gas utilities.

Fifth, the biomethane proponents contend that lowering the heating value to 950 btu/scf will only result in a four percent change in the heating value. However, they overlook the negative impacts that a lower heating value could have on the safety and integrity of end use equipment. In addition, several parties argue that blending a higher heating value fuel, such as propane, with the biomethane before it is injected into the pipeline, can increase the heating value of the gas to meet the standards in utility tariffs. However, this has cost implications. As stated above, we do not believe we would be fulfilling our duty under AB 1900 if we allowed cost considerations to drive the appropriate adoption of standards, especially when the standards have health or safety impacts. We will be considering cost issues related to the requirement pursuant to AB 1900 in the second phase of this proceeding.

Based on the above discussion, it is reasonable to maintain the current standards for heating value. We decline to adopt the recommendations of the biomethane proponents to lower the minimum heating value to 970 or 950 btu/scf. Similarly, we do not adopt a minimum heating value number for PG&E and Southwest Gas. Consistent with D.06-09-039, the minimum heating

value for gas entering the pipelines of SDG&E and SoCalGas shall remain at 990 btu/scf.

We note that if the biomethane proponents or any other party wants to change the heating value of gas entering the gas utilities pipeline systems, they are free to file a petition for rulemaking pursuant to Rule 6.3 of the Commission's Rules of Practice and Procedure. Such a petition should be served on the service list from D.06-09-039, and in this proceeding. In the event the Commission grants such a petition and opens a new rulemaking, the biomethane proponents should be prepared to present evidence that supports why a lower minimum heating value will not have a detrimental effect on the safety and integrity of the pipeline and pipeline facilities, including end use equipment.

There are two other issues related to the minimum heating value issue. One issue is the biomethane proponents' argument that they should be allowed to use either upstream blending, or downstream blending to meet the minimum heating value. The other related issue is the proposal of Southwest Gas to limit the injection of biomethane to no "more than 25% of the minimum daily-localized volume of the Company's natural gas stream at the point of interconnection into the Company's system." (*Ex*. 3, Appendix G, Southwest Gas proposed Rule No. 22.)

Regarding upstream blending, the four utilities do not oppose allowing biomethane suppliers to blend their biomethane supply in order to meet the minimum heating value, or to meet other gas specifications, before the biomethane is injected into the common carrier pipeline. As for downstream blending, the biomethane proponents contend that they should be allowed to inject biomethane into the common carrier pipeline that does not meet the

minimum heating value, and that through blending with other sources of gas, the gas that reaches an end user will meet the minimum heating value. The four utilities oppose the downstream blending proposal "because it is difficult to control and ultimately not guaranteed to occur continuously." (*Ex*. 4 at 7.)

We will permit the biomethane suppliers to engage in upstream blending as part of their processing of the biogas to turn it into biomethane that meets all of the adopted gas and biomethane specifications.

As for downstream blending, we will not permit the biomethane suppliers to use downstream blending to avoid meeting the gas and biomethane specifications at the time the biomethane is first injected into the common carrier pipeline. Such specifications are designed to prevent the entry of non-merchantable gas into the utilities' gas pipeline systems. In addition, if the minimum heating value for biomethane is to be met through downstream blending after the biomethane is injected into the common carrier pipeline, this will shift the burden onto the utilities. Meeting the minimum heating value should be the responsibility of the entity supplying the gas. With downstream blending, the utilities will have to ensure that they have sufficient volumes of gas on hand, with higher heating values, in order to blend the biomethane to meet the minimum heating value. Accordingly, we decline to adopt the downstream blending proposal of the biomethane proponents.

The biomethane proponents oppose the proposal of Southwest Gas to limit biomethane entering the pipeline of Southwest Gas to 25%. Southwest Gas contends that such a limitation is necessary because it "has historically installed plastic compression and other plastic fittings with soft seals in its distribution systems," and cites an instance in Maryland of "similar seals leaking due to the lack of heavy hydrocarbons in LNG causing the seals to shrink." (*Ex*. 3 at 14.)

Since biomethane has little or no heavy hydrocarbons, Southwest Gas contends that the proposed 25% limitation on "biomethane to natural gas will insure that the seals within its distribution systems retain sealing integrity." (*Ibid.*)

We have considered Southwest Gas' proposal to limit biomethane on its pipeline system to 25%. We do not believe that such a limitation is warranted at this time. First, Southwest Gas does not receive any LNG on its system. Although biomethane may lack heavy hydrocarbons, and in that respect is similar to LNG, Southwest Gas currently receives all of its gas from pipeline companies. Second, the biomethane that may be injected in Southwest Gas' pipeline must still meet the gas quality specifications and biomethane specifications. Except for the reference to the Maryland situation in which LNG caused leakage to occur, the four utilities have not explained why compliance with the existing gas quality and adopted biomethane specifications will cause similar leakage problems to occur on the pipeline systems of all four utilities. Accordingly, we do not adopt the proposal of Southwest Gas to limit the biomethane injection on its system to no "more than 25% of the minimum daily-localized volume of the Company's natural gas stream at the point of interconnection into the Company's system." (*Ex.* 3, Appendix G, Southwest Gas proposed Rule No. 22.) If the utilities' operational experience with the injection of biomethane into their pipelines demonstrates that the lack of heavy hydrocarbons in biomethane is causing a problem, or if additional studies or information on this issue is developed, the Commission may revisit this biomethane limitation issue in a future update proceeding.

5. Monitoring, Testing, Reporting, and Recordkeeping

5.1. Introduction

Subdivision (d) of Health and Safety Code § 25421 addresses the second action required of the Commission. That subdivision provides as follows:

> To ensure pipeline and pipeline facility integrity and safety, on or before December 31, 2013, the commission, giving due deference to the board's determinations, shall, by rule or order, adopt the monitoring, testing, reporting, and recordkeeping requirements identified pursuant to paragraph (5) of subdivision (a).

The CARB, in collaboration with the other state agencies, carried out its assigned tasks in Health and Safety Code § 25421(a)(5) and identified monitoring, testing, reporting, and recordkeeping requirements. The four utilities recommend that additional requirements be adopted.

5.2. The Joint Report

5.2.1. Introduction

The CARB recommends in the Joint Report that there be two forms of monitoring and testing. The first monitoring and testing involves pre-injection startup testing, while the second involves periodic testing.

The CARB's recommendations for monitoring and testing are based on the results of the data shown in Table V-5 of the Joint Report. CARB states that is does "not believe more frequent testing by the utilities should be necessary to demonstrate compliance with the recommended risk management strategy, except in special situations where the [Commission], in consultation with [CARB] and OEHHA, agree that more frequent monitoring is appropriate." (*Ex*. 1 at 70.) The Joint Report also states that any additional utility testing should count towards the recommended periodic testing requirements.

The Joint Report also contains the CARB's recommendations on reporting and recordkeeping requirements, which are described in more detail below.

5.2.2. Monitoring and Testing Recommendations

5.2.2.1. Pre-Injection Startup Testing

The CARB recommends that there be initial monitoring and pre-injection startup testing before any biomethane is injected into the pipeline.[35] Prior to the injection of any biomethane, the Joint Report recommends that "a representative sample of the biomethane should be tested for the constituents of concern specific to that biogas source... to determine the presence of constituents above detection levels, and where found, the associated concentrations of constituents." (*Ex.* 1 at 65.) The particular test methods that the CARB recommends be used for the testing of the constituents of concern are set forth in Table V-4 in the Joint Report at 66.

For this pre-injection startup testing, the CARB recommends that two tests be conducted over a two to four week period once the production facility is operational and before the biomethane is first injected into the pipeline. According to the Joint Report, such tests will ensure the stability and performance of the biogas to biomethane upgrading system. The CARB recommends that the "utility and the biomethane production facility should agree upon a continuous monitoring method to verify the the upgrading process is operating effectively." (*Ex.* 1 at 65.) If they cannot agree upon a monitoring method, the CARB recommends that the utility's "tariff requirements for natural

[35] The Joint Report specifically states that "these testing requirements do not supersede any other requirements relating to pipeline integrity, heating value, and other requirements not related to health-based standards." (*Ex.* 1 at 66.)

gas be used as an indicator that the upgrading system is operating effectively." (*Ex*. 1 at 65.)

The Joint Report notes that if during the pre-injection testing, any constituent of concern in the biomethane is found to be above the lower action level, "then the biomethane cannot be injected into the natural gas pipeline and the operator should make modifications to the upgrading system to lower the concentrations of the constituent of concern to levels below the lower action level." (*Ex.* 1 at 66.)

The Joint Report further states that "If all the constituents of concern in the biomethane are found to be below the detection level, or measured in concentrations below the lower action level in both pre-injection tests, then the biomethane may be injected into the common carrier pipeline, subject to compliance with the periodic testing requirements specified below." (*Ex*. 1 at 66.)

The Joint Report recommends at pages 66-67 that the pre-injection startup testing be repeated for all constituents of concern, with some slight modifications, when the following occurs:

- There is a change in the biogas source at the facility or the upgrading of the equipment design that the Commission, in consultation with the CARB and OEHHA, determines will potentially increase the level of any constituent of concern over the previously measured baseline levels. Replacing a component with a functionally equivalent component should not constitute a change in equipment design.
- Shut-off of biomethane to the pipeline due to testing that indicates a total potential cancer or non-cancer risk for the constituents of concern in biomethane above the upper action level, or 3 exceedances of the lower action level in a 12 month period.

The Joint Report at page 67 describes CARB's modified startup procedure as follows:

> Under a modified startup procedure, it would not be necessary to conduct two tests over a 2-4 week period prior to reintroducing the biomethane into the pipeline. If the first test demonstrates that all the constituents are below the [lower action level] then injection can resume and it is not necessary to retest prior to injection. However, all the constituents of concern would be reevaluated with regard to periodic testing. This would mean compounds that may have been tested biennially (because they were found to be below a trigger level twice in annual testing) or annually (because the compound is part of a group of compounds whose collective risk below the lower action level four consecutive times – see group 2 compounds below) would have to again go through the testing required to demonstrate eligibility for less frequent testing.

5.2.2.2. Periodic Testing

The CARB also recommends that there be periodic testing for the constituents of concern using the testing methods set forth in Table V-4 of the Joint Report. The CARB recommends that the frequency for the periodic testing take place as follows:[36]

- Constituents of concern not found above the test method detection levels in biomethane or below the trigger level (*i.e.*, group 1 compounds) should be monitored at least once for every 12 months of injection into the common carrier pipeline. Individual constituents found to be

[36] A flow chart of the CARB's recommended monitoring plan is set forth in Figure V-1 at 69 of the Joint Report. According to the Joint Report, this flow chart provides a general structure for monitoring procedures, and does not address all potential testing scenarios.

below trigger levels during two consecutive annual tests can then be tested once every two years.

- Any constituents of concern found at or above the trigger level for that constituent of concern (*i.e.*, group 2 compounds) should be monitored quarterly (at least once every 3 months of injection into the common carrier pipeline) and the total potential cancer risk and non-cancer risk eliminated.
    - The total potential cancer risk for group 2 compounds can be estimated by summing the individual potential cancer risk for each carcinogenic constituent of concern found in Table V-3 of the Joint Report.[37]
    - If the quarterly testing over a 12 month period demonstrates that an individual constituent of concern within the group 2 compounds is below the trigger level four consecutive times, then monitoring for that constituent can be reduced to once every 12 months of injection.
    - If the quarterly testing over a 12 month period demonstrates that the total potential cancer risk or non-cancer risks for the group 2 constituents being monitored is at a level below the lower action level, monitoring can be reduced to once for every 12 months of injection for all the constituents of concern.
- If, in a 12 month period, there are three exceedances of the lower action level for the constituents of concern (with the exceedances being lower than the upper action level), the operator will shut-off the supply of the biomethane and determine necessary adjustments to bring the potential

[37] The Joint Report at 67describes the formula for figuring out how to calculate the risk, and also states that the CARB staff will develop a spreadsheet tool that biomethane producers can use to calculate the combined cancer or non-cancer chronic risk.

cancer and non-cancer risks for the constituents of concern to levels below the lower action level.

If any test result indicates the potential cancer or non-cancer risks for the constituents of concern is above the upper action level, the operator will shut-off the supply of the biomethane to the pipeline and determine necessary adjustments/modifications to bring the potential cancer and non-cancer risk levels to below the lower action level.

The Joint Report at 70 states that: "Based on the available data, for most biomethane projects, it is unlikely that the constituents of concern will be above the trigger level." This statement is based on the conclusions drawn from Table V-5 of the Joint Report at at 70. That table compared the recommended trigger levels and lower action levels, to the observed maximum concentration that was noted for each biomethane source in the data that was analyzed. The Joint Report states the table shows that "for most compounds, the maximum values found are well below the trigger levels." The Joint Report at 70 further states that: "In all cases, the maximum levels are below the lower action level which indicates that from a public health perspective, the injection of biomethane does not present additional health risk as compared to natural gas."

The Joint Report also addresses hydrogen sulfide, and copper, which are two of the constituents of concern.

For hydrogen sulfide, the Joint Report states that the high level noted for hydrogen sulfide (187 ppm) in Table V-5 of the Joint Report "is an anomaly because the raw biogas at this site was subjected to only partial clean up and was not intended to produce a pipeline quality product gas." (Joint Report at 70.)

With respect to copper, The Joint Report at 71 notes that "Copper was not found in any of the raw biogas samples analyzed, and only in a few of the biomethane samples in a 2009 GTI report." Copper "was found in one of the field blanks in a 2012 GTI report," which according to the Joint Report, "raises the possibility that it was introduced in either the upgrading equipment or the sampling apparatus used for testing." (*Ex*. 1 at 71.) The Joint Report further states that "We intend to further investigate copper as the [Commission] rulemaking progresses to determine whether it is appropriate to require monitoring of this compound, or if the risk management approach needs to be adjusted." (*Ex*. 1 at 71.)

The CARB recommends that the Commission consider the cost of testing for constituents of concern as a possible impediment to the use of biomethane in California. CARB recommends that the Commission "explore ways to minimize the testing cost burden to the biomethane producer, while at the same time ensuring that reasonable and prudent testing is conducted to protect both public health and pipeline integrity and safety." (*Ex*. 1 at 5.) These recommendations arose as a result of the concerns "that the cost of testing for the constituents of concern may impede the economic viability of some biomethane production facilities." (*Ex*. 1 at 4.) For that reason, CARB's monitoring approach "balanced the need to demonstrate the removal efficiency of a conditioning process in the early stages of operation and to reduce testing once the functionality of a system was verified." (*Ex*. 1 at 4.) The Joint Report states that if all of the costs for testing and monitoring of the health based standards, and to maintain pipeline integrity and safety, are placed on the biomethane producer, that this may limit the number of viable biomethane production facilities.

5.2.3. Reporting and Recordkeeping Recommendations

For the reporting and recordkeeping requirements, the CARB recommends the following, as described in the Joint Report at at 71 to 72:

- Biomethane producers shall notify the Commission (and the Commission shall notify the CARB and OEHHA) within 30 days of the date when they first inject into the common carrier pipeline, the producer company name, contact person, location of facility and injection point.
- The testing entity (utility or producer) shall provide the Commission (and the Commission shall provide the CARB and OEHHA) with the "Startup Testing" results (concentrations of constituents of concern and associated test methods and concentrations of any additional constituents beyond those recommended in the Joint Report, if applicable) within 30 days of receiving the test data. The testing entity will also note whether monitoring and recordkeeping of hydrogen sulfide and mercaptans conducted subject to utility tariff requirements will be used to meet the monitoring and recordkeeping recommended in the Joint Report for constituents of concern.
- The testing entity (utility or producer) shall maintain records of all test results (concentrations of constituents of concern and associated test methods) for at least 3 years from the date when the tests were conducted. These records would not be required for hydrogen sulfide and mercaptans when these compounds are monitored continuously, or more frequently than recommended for constituents of concern in this document, and are subject to utility tariff monitoring and reporting requirements.
- The producers and utility shall provide an annual report to the CPUC (and the CPUC shall provide the report to CARB and OEHHA) containing the following information:

- All test data (concentrations of constituents of concern and identification of associated test methods) received during the report period.
- Annual biomethane production rate.
- Monitoring parameters used to ensure that the upgrading system is operating effectively.
- Dates of any shutoff events, the reason for the shutoff, the actions taken to resume injection into the pipeline, and the start of re-injection into the pipeline (if applicable).

- If the utility is the testing entity, the utility shall provide the following test data to the producer:
  - Test results of constituents of concern within two weeks of receiving the data.
  - Test results of constituents of concern within 24 hours of receiving the data when it results in shutoff of biomethane to the pipeline.
  - If the producer is the testing entity, the producer shall provide the above information to the utility.

CARB expects that some of the details of the reporting and recordkeeping would be further developed through the Commission's "regulatory process to ensure that the recordkeeping and reporting associated with ensuring public health aligns with the requirements to ensure pipeline integrity." (*Ex*. 1 at 71.)

5.3. Position of the Parties

5.3.1. BAC

Although BAC generally supports the health based standards in the Joint Report, BAC believes that the Joint Report's testing and monitoring requirements are "quite burdensome and could be counter-productive if the costs prevent additional biomethane injection." BAC also notes that the Joint Report states that "Given the broader public benefits from the increased use of

biomethane, we recommend that the CPUC explore ways to minimize the testing cost burden to the biomethane producer." (*Ex*. 11 at 6.)

BAC suggests three possible ways of reducing the costs of testing and monitoring.[38]

First, BAC contends that the Joint Report recommends significantly higher trigger and action level thresholds for individual compounds than what is referenced in the Risk Management Guidelines.

Second, BAC contends that the trigger level for arsenic should be revised because the trigger level for some constituents of concern may not be quantifiable. BAC notes that a GTI study reported biomethane analyses for arsenic at the below detection limit of 0.03 mg/m^3, which is higher than the trigger level of 0.010 mg/m^3. Since BAC alleges that the recommendations for biomethane in the Joint Report are more stringent than the CARB's own guidelines, BAC contends that results "below the Method Detection Limit should be deemed in compliance and retesting should be allowed for minor variations and temporary problems with equipment." (Ex. 11 at 6.)

Third, as noted earlier, BAC contends that copper should not be included as a constituent of concern because it was not found in raw biogas, and because there are potential quality assurance and quality control concerns.

BAC also recommends that the Commission needs "to more clearly define the types of changes that trigger repeating the start-up testing," and to "clarify whether injection needs to be suspended while start-up testing occurs." (*Ex*. 11 at 9.)

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[38] BAC also raised these three suggestions in connection with the adoption of the constituents of concern, and the concentration standards for those constituents.

BAC is also opposed to the utilities proposed testing and monitoring of the raw biogas. BAC contends that the biogas is not the substance that is being injected into the common carrier pipeline, and that such testing and monitoring requirements would be a barrier to the pipeline injection of biomethane and undermine the goal of AB 1900 to facilitate and promote pipeline biomethane.

BAC contends that the testing and reporting protocols should be reasonable and nondiscriminatory, and therefore supports WM's recommendations for testing and reporting. In the alternative, BAC recommends that the testing and reporting protocols in the Joint Report be adopted. BAC also supports WM's recommendation that independent, third party and certified laboratories should be required to perform all testing procedures. BAC also supports WM's recommendation that retesting be allowed, and that parties should be given the opportunity to verify and validate results.

5.3.2. CASA

CASA contends that the testing and reporting protocols should be reasonable and nondiscriminatory. CASA supports the recommendations of BAC and WM to adopt WM's proposed testing protocols. In the alternative, CASA recommends that the testing and protocols in the Joint Report be adopted. CASA also supports the recommendations that independent, third party, and certified laboratories be required to perform all testing procedures, that retesting should be allowed, and that parties should be given the opportunity to verify and validate results.

5.3.3. Consumer Federation of California

The CFC did not submit any prepared testimony but did file an opening brief. The CFC recommends that the testing protocols in the Joint Report be adopted.

The CFC is opposed to the four utilities' proposal to test biogas. CFC contends that it is unreasonable to test the biogas because that biogas is not being injected into the common carrier pipeline. Instead, it is processed biomethane that will be injected into the pipeline, and any testing should be restricted to the biomethane. CFC contends that any requirements beyond this will present significant artificial cost barriers to the entry of biomethane producers, and may violate the nondiscriminatory open access provision in Public Utilities Code § 784 as added by AB 1900.

CFC also contends that the extensive studies referenced in the Joint Report focused on the constituent content of biogas from various sources. The Joint Report stated that biomethane is "cleaner" and does not present additional risk as compared to natural gas. If that is the case, the CFC contends that the four utilities should only be allowed to test the biomethane to meet the standards in the Joint Report.

5.3.4. CRNG

CRNG recommends that the Commission give due deference to, and adopt, the Joint Report's monitoring, testing, reporting, and record keeping requirements with the following modifications.

First, CRNG requests that the Commission increase the lower action level for siloxanes from the 0.1 recommended in the Joint Report to 10. CRNG contends that siloxanes are not usually listed in the gas pipeline quality specifications in other states, "and in the few instances where they are, they are

not as low as suggested both in CARB/OEHHA's recommendations and proposed for adoption in the joint investor-owned utilities Supplemental Testimony." (*Ex*. 6 at 6.)

Second, CRNG requests that copper be removed from the Joint Report's list of elements to be tested for. CRNG contends that the testing method that was relied on in the Joint Report may have introduced copper into the gas that was tested. CRNG also states that "no evidence has been introduced to indicate that copper is a constituent of concern in biogas," and that it is costly to test for copper. (*Ex*. 6 at 7.)

And third, CRNG requests that toluene not be included in any testing. CRNG contends that the Joint Report's proposed limits on toluene "are in such extreme excess of anything that has been found in any of the gas tested that inclusion would cause undue costs in testing and reporting without any corresponding benefit in terms of improved safety." (*Ex.* 6 at 7.)

CRNG also contends that the proposed testing and monitoring contains "multiple safety factors that are intrinsic in the calculation of the reference exposure limits that are used to calculate the hazard quotients." (*Ex*. 6 at 7.) CRNG asserts that the hazard quotients are at an extremely conservative level, and that an additional safety factor of ten was added to the allowable hazard quotient level. CRNG contends that a lower "safety factor could be used without any compromise to health and safety of the product gas." (*Ex.* 6 at 7.)

The Joint Report recommends that if the biomethane fails to meet certain standards over a period of time and prescribed tests, that the biomethane will be shut-out from injecting into the utility's pipeline. CRNG contends that "the costs associated with potential shut-ins and shut-offs, including total loss of revenue during any such occurrence, is sufficient incentive for biomethane

producers to ensure the quality of their product prior to injection without any additional enforcement."[39] (*Ex*. 5 at 12.)

CRNG takes the position that any monitoring and testing should be limited to the conditioned biomethane. CRNG opposes the four utilities' recommendation that the monitoring protocol and testing regimen be expanded to include biogas. CRNG notes that it supplied the utilities with "multiple raw biogas samples, detailed information, data, related studies and reports, and even responded to two questionnaires they supplied [to CRNG] on the subject of raw biogas prior to treatment." (*Ex*. 6 at 6.) CRNG contends that the additional start up testing that the four utilities recommend for biogas is an unnecessary impediment to interconnection, and could lead to situations where the utilities could require testing for each specific project before interconnection could occur.

CRNG notes that if the utilities are concerned about what the raw biogas contains, CRNG questions why a utility is seeking approval before the Commission for a conditioning service tariff that would treat and process the same type of biogas into biomethane for injection into a utilities' pipeline.[40] CRNG asserts that such a compression service "presumes a working knowledge

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[39] CRNG refers to a "shut-in" as a situation where a standard is exceeded and an alarm will go off at the biomethane processing facility, which will prevent biomethane from flowing from the plant into the utility's pipeline. A "shut-off" situation occurs when the utility's alarm will trigger if a standard is exceeded, and the biomethane will be prevented from entering the pipeline.

[40] Although CRNG did not mention which utility was seeking Commission approval for a conditioning service tariff, it appears that CRNG was referencing SoCalGas' application for biogas conditioning and upgrading services in A.12-04-024.

of how to treat the very same biogas they claim to know little or nothing about, and are uncomfortable injecting into their pipeline systems." (*Ex.* 6 at 6.)

CRNG also contends that the utilities should be required "to pay the costs for any additional testing, or incremental monitoring performed at their own discretion, above and beyond a) the monitoring frequency or testing schedule required by regulation, commensurate with implementation of AB 1900 and or b) the monitoring frequency or testing schedule performed by investor-owned utilities for fossil-fuel natural gas." (*Ex.* 5 at 4.) CRNG also asserts that the utilities should bear the costs for the maintenance of any additional testing or monitoring. In addition, CRNG contends that all of the testing should be done by an independent, third-party, certified laboratory.

CRNG also agrees with WM that the adopted procedures should provide for retesting and verification before further action occurs. CRNG contends that allowing for retesting and verification will address quality assurance and quality control issues that might complicate the interpretation of results.

To the extent the utilities want to add upgrades to the gas pipelines downstream from the injection point, such as electrical resistance probes and corrosion coupons, CRNG does not object so long as such upgrades are not tied to the injection of biomethane into the same pipelines. Similarly, CRNG does not object to the utilities' review of the manufacturers' equipment recommendations so long as it is not tied to, or delays, the injection of biomethane.

CRNG recommends that the Commission "consider the total costs already borne by developers, including costs associated with testing, sampling and monitoring, and adopt regulations that reflect[s] reasonable frequency, no more stringent than the schedule proposed by CARB and OEHHA." (*Ex.* 5 at 4.)

5.3.5. GPI

GPI recognizes that major producers of biogas are interested in processing their biogas into biomethane and injecting that biomethane into common carrier pipelines. This interest is being driven by environmental regulations which restrict the ability to use biogas to run small engines. GPI notes that the pipeline injection of processed biomethane is expensive because of the conversion process to turn biogas into biomethane, and the energy needed to compress the biomethane to pipeline pressure.

GPI contends that the successful implementation of AB 1900 depends on keeping the compliance costs associated with biomethane injection as low as possible. GPI suggests that reasonable rules and regulations be formulated that minimize the burden on the biomethane suppliers, including the monitoring, testing, reporting and recordkeeping requirements. GPI opposes the proposal of the four utilities to test the biogas, rather than the processed biomethane that will be injected into the pipeline.

GPI notes that concurrent with the injection of biomethane into the pipelines, the utilities are proposing to add upgrades to the pipeline system, such as installing various probes and corrosion coupons. GPI questions whether such upgrades are needed, and believes it would be counterproductive to tie the system upgrades to the AB 1900 testing requirements.

GPI contends that since biomethane is a renewable fuel, the Commission should work with CARB and other agencies to ensure that whatever reporting requirements are adopted for biomethane, should be capable of being used to support a renewable energy claim in programs for which biomethane is eligible. GPI contends that this will ensure that the right data is being collected at the right time, without unnecessary duplication.

5.3.6. Los Angeles County Integrated Waste Management Committee/Integrated Waste Management Task Force (LA County Task Force)

Testimony was submitted by the LA County Task Force, and by Mike Mohager in his role as a commissioner of the LA County Task Force. They have concerns with the Joint Report's recommended level of frequency for the monitoring of biomethane. The Joint Report recommends that the operators of the major sources of biogas monitor the levels of certain constituents of concern on a quarterly or annual basis. The LA County Task Force contends that the recommendation for quarterly or annual testing "is partly based on concerns over the costs related to the monitoring and how it might hamper the economic viability of biomethane projects." (*Ex*. 16 at 2; *Ex*. 17 at 2.)

The LA County Task Force contends that the risks to public health should not be determined on the economic viability of biomethane projects. Instead, "public health should be the main consideration for the frequency of monitoring," and "Economic viability should only be considered by the facility after a monitoring, testing, and reporting protocol has been established that can provide a high level of assurance that the public's health and safety can be protected effectively. " (*Ex*. 16 at 2; *Ex*. 17 at 2.)

The LA County Task Force recommends that the adopted testing and reporting protocol "should include, at a minimum, an annual comprehensive biomethane analysis to ensure that all constituents of concern are being adequately monitored." (*Ex*. 16 at 2; *Ex*. 17 at 2.) The LA County Task Force contends that such a method will ensure the protection of public health and safety, and the integrity of the pipelines.

The LA County Task Force also contends that the utilities "should have the ability to install additional monitoring equipment at the interconnect to warn suppliers of constituent levels as well as establish supplier specific constituent shut-off limits." (*Ex*. 16 at 2; *Ex*. 17 at 2.)

With respect to the Joint Report's recommendations concerning reporting and record keeping requirements, the LA County Task Force recommends that the Joint Report be clarified as to which entity is responsible for the testing of biomethane, and for the testing of untreated biogas. The LA County Task Force recommends that the "testing of biomethane should be the responsibility of the utilities while the testing of untreated biogas should be the responsibility of the supplier." (*Ex*. 16 at 2; *Ex*. 17 at 2.)

5.3.7. Shell Energy

Shell Energy notes that Health and Safety Code § 25421(d) requires the Commission to adopt monitoring, testing, reporting, and recordkeeping requirements, giving due deference to the CARB's determinations under § 25421(a)(5). In contrast to the concentration standards that apply to biomethane that is injected into the gas utilities' systems, Shell Energy notes that the monitoring, testing, reporting, and recordkeeping requirements referenced in subdivision (a)(5) apply to each source of untreated biogas.

Shell Energy contends that if the Commission adopts the monitoring, testing, reporting, and recordkeeping requirements for each source of biogas, the costs of such activities should be borne by the utility's ratepayers instead of by the gas producer. Shell Energy's rationale is that these costs are being incurred to meet the informational requirements imposed by AB 1900, and are not costs associated with the production or delivery of pipeline quality biomethane. However, for the testing and monitoring of biomethane that is

being injected into the utility pipeline, Shell Energy contends that the biomethane producer should be responsible for such costs. Shell Energy notes that such treatment is appropriate because the producers and pipelines delivering natural gas into the utilities' pipelines currently pay the cost of testing and monitoring of the delivered gas.

5.3.8. WM

WM opposes the recommendations of the four utilities to adopt their testing and monitoring protocols, which would expand the protocols that are recommended in the Joint Report. WM contends that some of the utilities' testing and monitoring requirements would apply to raw biogas. In addition, the utilities' five extra constituents of concern will result in additional testing and monitoring protocols. WM contends that the utilities' recommended testing and monitoring rules are unnecessary, discriminatory, and will act as a barrier to allowing biomethane to be injected into the utilities' pipelines.

WM contends that the Commission does not have the authority to consider testing and monitoring requirement for biogas. WM contends that the plain language of AB 1900 only gives the CARB and OEHHA the authority to consider testing and monitoring of the constituents found in biogas. In contrast, WM contends that AB 1900 only provides the Commission with the authority to consider the constituents in biomethane. In addition, since Health and Safety Code § 25421(d) provides that the Commission is to give due deference to the CARB's determinations when adopting monitoring , testing, reporting, and record keeping requirements, the Commission lacks the authority to adopt additional requirements without compelling justification. WM contends the four utilities have not provided any evidence, other than an unsubstantiated

fear that raw gas will be injected into the pipeline, for imposing additional testing and monitoring requirements on biogas.

WM recommends that the Commission adopt the "Recommended Biomethane Constituent of Concern (COC) Monitoring and Reporting Protocols" that was submitted as Attachment A in WM's supplemental testimony which was received into evidence as Exhibit 7. WM contends that the proposed protocols in that attachment provide a fair and nondiscriminatory approach to testing, monitoring and recordkeeping for biomethane producers. In the alternative, WM contends that the Commission should adopt the Joint Report's recommendation for monitoring, testing, reporting and recordkeeping, provided that third party certified laboratories perform the testing, that retesting is allowed, and that there is an opportunity to verify and validate results before action is taken.

5.3.9. Four Utilities

The utilities recommend that before a biomethane supplier is allowed to interconnect to the utilities' pipeline system, that the biomethane supplier "be subject to the testing and monitoring applicable to all producers and additional testing and monitoring for biomethane constituents." (*Ex*. 3 at 7.) For the biomethane constituents, the utilities recommend that there be two phases of biomethane testing. The first testing that the utilities recommend is an initial gas quality review. A flowchart of the utilities' recommended initial gas quality review is set forth in Appendix B of the utilities' supplemental testimony in Exhibit 3. The second testing that the utilities recommend is ongoing periodic testing. A flowchart of the utilities' recommended periodic testing is set forth in Appendix C of Exhibit 3.

The utilities "note that robust testing and monitoring, the utilization of appropriate equipment, and other safeguards likely can mitigate both the health and safety and pipeline integrity risks associated with biomethane constituents." (*Ex*. 2 at 14-15.) This is based on the utilities' experience with non-landfill biomethane, in which constituent concentrations have normally been below a level of concern, or can be mitigated using various tools.

The utilities' initial gas quality review testing is similar to what the Joint Report recommends, but includes certain additional steps. The utilities contend that "Since the quality of gas and constituents in biomethane may vary greatly by supply source and type of feedstock, each biomethane project should be tested, treated, and monitored on a case-by-case basis." (*Ex*. 2 at 10.) The utilities' recommended initial gas quality review consists of the following six steps.

The first step is for the biomethane supplier to do initial testing of representative raw biogas samples. The utility would have the option to observe the taking of the samples, and the samples are to be sent to certified independent laboratories for analysis. The results of the biogas analysis are shared with the utility to assist in determining baseline constituent levels, and preparing a preliminary recommendation for biomethane testing and on-line monitors.

The second step is for the biomethane supplier to complete a survey. The supplier is required to complete the survey which will provide preliminary information on the upgrading and conditioning process, the expected quality of the biomethane, and the expected biomethane output.

Step three consists of collecting samples of the processed biomethane for testing, once the upgrading and conditioning facilities have been completed.

The utility would have the option to observe the taking of the samples, and the samples are to be sent to certified independent laboratories for analysis. The results of the analysis will allow the utility to finalize the biomethane testing and monitoring protocols.

Step four consists of a 24-hour startup test, which will take place if the Step 3 results demonstrate compliance with the general gas quality specifications, and the specific biomethane constituent lower action levels. During the startup test, the biomethane will flow through the utility's interconnect, and the utility will use its on-line monitors to check the biomethane quality and constituent levels. If the on-line monitors confirm that the biomethane meets these continuously monitored gas quality specifications, the utility will gather samples of the biomethane for trace constituent analysis, and stop the flow of biomethane until the trace constituent testing has been completed. If the biomethane does not meet the continuously monitored gas quality specifications, then the flow will stop and the supplier will be asked to take corrective action and arrange for a new 24-hour startup test.

For step five, when the results of the step 4 biomethane constituent analysis has been received, and the tested biomethane is below gas quality limits and constituent lower action levels, the flow will be resumed and the biomethane will be tested again. While waiting for the results of this biomethane analysis, the biomethane is allowed to flow into the utility system. If the second test demonstrates compliance with the gas quality limits, and biomethane constituent lower action levels, the biomethane will be accepted by the utility subject to ongoing monitoring and periodic testing.

Step six involves periodic testing based on the constituents found, and the concentrations of those constituents. If the biomethane constituents were below

the trigger level for each biomethane test during the initial gas quality review, then the supplier will be subject to standard gas quality tests and annual testing of biomethane constituents.[41] If the biomethane constituents were above the trigger levels, the biomethane supplier will be subject to constituent testing consistent with the utilities' proposed periodic biomethane testing. For testing in the instances where the constituents are above the trigger levels, the utilities contend that such additional testing "is not overly burdensome or potentially restrictive" because it prevents harm to customers and protects the utility pipeline. (*Ex*. 4 at 8.) For the annual testing, the utilities contend this will help analyze constituent consistency, and develop constituent information for various biogas sources.

The utilities recommend that if "at any time during the initial gas quality review the biomethane tests above the lower action level, the supplier should be subject to the shut-off and retest procedures" described in step three of the utilities' periodic testing recommendation. (*Ex*. 3 at 10.)

The utilities' recommended second phase of biomethane testing is for periodic testing. The utilities' recommended periodic testing differs from the Joint Report's recommendation in that the utilities' recommendations include some modifications and added testing flexibility. The utilities' periodic testing recommendation consists of the following three steps.

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[41] The utilities recommend annual testing for constituents because meeting the trace constituent trigger level may depend on the change-out period of the upgrading and conditioning equipment. That is, the "process may have high removal efficiency for a year, and then a breakthrough of constituents may occur." (*Ex*. 3 at 10.)

Step One: If the biomethane constituents did not test below the trigger level throughout the initial gas quality review, the biomethane should be tested quarterly for those constituents testing above the trigger level. If the biomethane constituent subsequently tests below the trigger level for four consecutive tests, then that biomethane constituent may be tested annually.

Step Two: If the biomethane constituents test above the lower action level three times in a twelve month period, or above the upper action level once, then the supplier would be subject to the shut-off and retest procedures as set forth in step three.

Step Three: If the biomethane supplier is required to shut-off and retest, the supplier is to take corrective action and then proceed to modified startup testing. The supplier will test the biomethane. After receiving the results of these tests, and if the biomethane is below the lower action level, flow will resume and the utility will verify the supplier test results by testing the biomethane at the interconnect. If the utility's test verifies constituent level compliance, flow may continue and the biomethane constituent is tested quarterly. Thereafter, if the biomethane constituent tests below the trigger level four consecutive times then testing frequency may be reduced to an annual basis.

The utilities also recommend that if "at any time during annual testing the biomethane tests above the lower action level, the testing should revert back to quarterly testing until the biomethane again tests below the trigger level four consecutive times." (*Ex*. 3 at 11.) The utilities also recommend that the biomethane suppliers "be required to communicate any changes to the biomethane source or modification to the upgrading and conditioning facilities." (*Ex*. 3 at 11.) Such changes "may require additional testing to

determine if the modification has changed the quality of the biomethane." (*Ex*. 3 at 11.)

With respect to the biomethane proponents' criticisms of the utilities' testing and monitoring protocols, the utilities respond that their protocols are reasonable, and that their recommendations for "additional testing and monitoring of constituents of concern…" will "maintain and protect human safety, pipeline integrity, and system operations." (*Ex*. 4 at 7.) The four utilities point out that the biomethane proponents' opposition to the four utilities' additional testing and monitoring protocols is because other states have less stringent testing and monitoring. However, the four utilities contend that the biomethane proponents' argument "fails to take into account how, in California, pipelines, pipeline systems, end-use equipment, local air district emissions limits, existing gas supply and tuning of customer equipment differ, not only from these other states, but also region by region within California." (*Ex*. 4 at 8.) The utilities contend that proper pipeline engineering practices consist of gas specifications which are site specific, and based on each utility's pipeline system and gas supply.

BAC, CRNG, and WM recommended that the testing and monitoring requirements be removed for the following: aldehydes and ketones, formaldehyde, ammonia, biologicals, halocarbons, hydrogen, mercury, volatile metals, PCBs, pesticides, pharmaceuticals and animal products, VOCs, SVOCs, PAHs, and volatile fatty acids.

In Exhibit 4 at 10, the four utilities clarified that the Biomethane Guidance Document, which is attached to the utilities' supplemental testimony in Exhibit 3, is intended to replace the existing Rule 30 Biomethane Gas Delivery Specifications Limits and Action Levels document that is used by SoCalGas and

SDG&E. The Biomethane Guidance Document removes PCBs, pesticides, pharmaceuticals and animal products, PAHs, and volatile fatty acids from the proposed testing and monitoring framework. The four utilities state that the "other constituents have been retained for their potential health, pipeline integrity, or systems operation impact," and that these constituents include the following: aldehydes and ketones, formaldehyde, ammonia, biologicals, halocarbons, hydrogen, mercury, volatile metals, VOCs, SVOCs, and siloxanes. (*Ex.* 4 at 10.) The four utilities contend that the biomethane proponents make two arguments as to why these constituents should not be tested and monitored. First, they argue that the carbon dioxide removal system will remove trace constituents during the biomethane conditioning process. Second, the biomethane proponents argue that other states do not require testing for these constituents. The four utilities contend that the biomethane proponents have failed to offer any health and safety reasons as to why these constituents should be removed from the utilities' testing and monitoring recommendations.

The four utilities contend that the testing and monitoring of these constituents are reasonable because of the potential risks that these constituents pose, and which may be found in biogas and biomethane. The utilities contend that the GTI has found many of these constituents in biomethane. Even if the carbon dioxide removal system can remove these constituents from biogas, the utilities contend that monitoring is necessary to ensure that these constituents have been removed, or are below the proposed or established limits.

CRNG recommends limiting or removing the utilities' proposed siloxane monitoring and testing requirement because it does not involve health or pipeline safety and integrity, and is unrealistic. The four utilities assert that the testing and monitoring of siloxanes is relevant to this proceeding because

siloxanes can impact end use equipment, which is a potential integrity and safety issue. The four utilities clarified in Exhibit 4 that they are no longer proposing continuous siloxane monitoring, which was described in Exhibit 3. Instead, the utilities are recommending basic testing protocols that include trigger and action levels and periodic testing. The four utilities contend that the "proposed siloxane limits are not unreasonable and are consistent with equipment manufacturer recommendations, recent studies, and reports on siloxanes." (*Ex.* 4 at 12.)

BAC and WM recommend that the arsenic trigger level be revised, and that copper be removed from the constituent list. The BAC and WM recommendations are based on the arguments that the proposed arsenic trigger level is at an instrument detection level and may not be quantifiable, and that copper should be removed because it appears to be a testing error.

The four utilities contend that testing for arsenic at the proposed trigger level can be measured by modifying the sampling process as follows: "if the sample collection method is via gas sampled through a solution, the lowest amount of the analyte detectable in the solution, divided by the gas volume sampled, is the detection limit." (*Ex.* 4 at 13.)

As for the request of BAC and WM to remove copper, the four utilities contend that in the GTI reports and the utilities' laboratory results, "copper has been detected in biogas, biomethane, and the field blank." Since copper can harm pipeline facilities and has been detected, the four utilities contend that continued testing is appropriate, and such testing is also consistent with the Environmental Protection Agency's test protocols.

The four utilities also take issue with the biomethane proponents' argument that the recommendations in the Joint Report for testing and

monitoring are overly conservative. The four utilities point out that to develop the Joint Report's recommendations, CARB used a risk management, decision-making approach that was based on CARB's Risk Management Guidelines. The four utilities contend that the Joint Report's testing and monitoring recommendations do not err on the conservative side because the Risk Management Guidelines, for the reasons explained in Exhibit 4 at 9, are not overly conservative. The four utilities assert that since the testing and monitoring recommendations in the Joint Report do not err on the side of conservatism, the four utilities' testing and monitoring recommendations should be adopted by the Commission.

With respect to the reporting and recordkeeping requirements, the four utilities recommend that the Joint Report's recommendations be adopted, subject to clarification of who the testing entity is. The four utilities clarify that for biomethane testing at the utility's interconnect, the testing entity is the utility, who will collect the samples and send them to independent certified laboratories for constituent analyses. The results from the laboratories will be shared with the biomethane supplier.

For the raw biogas testing, and testing of the biomethane prior to interconnection, the four utilities clarify that the testing entity should be the supplier of the biogas or biomethane. The supplier will be responsible for gathering the sample, and the utility has the right to observe the collection of the sample. The supplier will send the sample an independent certified laboratory for constituent analysis. The results from the laboratories will be shared with the utilities.

BAC, CRNG, and WM request that the Commission provide an opportunity to retest to validate compliance. The four utilities do not oppose

retesting or a verification process if there are issues with quality assurance or quality control, discrepancies, or qualifiers set forth in certified laboratory testing results. However, the four utilities contend that the retesting should be at the expense of the biomethane supplier, and the result of such a restest are to be shared simultaneously with the supplier and the utility. The four utilities also note that during the retesting, the biomethane "producer should remain shut-off if already required to do so in order to mitigate the risk of harm to human health and pipeline facilities." (*Ex*. 4 at 13.)

5.4. Discussion

The parties have essentially developed three different methods to address the monitoring, testing, reporting, and recordkeeping requirements. The first approach is the protocols described in the Joint Report (Exhibit 1) in section V, and which are summarized above in section 5.2 of this decision. The second approach is the protocols described in section III of the four utilities' supplemental testimony (Exhibit 3), and which are summarized above in Section 5.3.9 of this decision. The third approach is the protocols described in WM's supplemental prepared testimony (Exhibit 7), in particular Attachment A (Recommended Biomethane Constituent of Concern (COC) Monitoring and Reporting Protocols), and which is described in section 5.3.8 of this decision.

We have reviewed these three different protocols, and compared them to each other. In general, WM's protocols incorporate some of the recommendations that have been addressed earlier in this decision, but which we did not adopt. In addition, WM's protocols do not contain any provisions for startup testing, except to mention that the testing entity shall provide the Commission with the "Startup Testing" results. The four utilities' protocols are

similar to the Joint Report's protocols but contain testing of the biogas at the outset, more frequent periodic testing, and more stringent re-start testing.

In deciding what type of monitoring, testing, reporting, and recordkeeping requirements should be adopted, we are guided by several considerations. First, Health and Safety Code § 25421(d) provides in part that the Commission give due deference to CARB's determinations. Pursuant to subdivision (a)(5) of that code section, the CARB is to "identify reasonable and prudent monitoring, testing, reporting, and recordkeeping requirements, separately for each source of **biogas**, that are sufficient to ensure compliance with the **health protective standards**…." (*Emphasis* added.) Health and Safety Code § 25421(d) allows the Commission to adopt monitoring, testing, reporting, and recordkeeping requirement that ensure the integrity and safety of the pipeline and pipeline facilities. Based on the plain language of Health and Safety Code § 25421(a)(5) and (d), the Commission could adopt monitoring, testing, reporting and recordkeeping requirements for biogas if there is a compelling pipeline integrity and safety rationale for doing so. Although the four utilities contend that startup testing of the biogas source will allow the utilities to develop a baseline of the different constituents found in each biogas source, and to recommend appropriate biomethane processing equipment specific to the risks associated with each producer, we are not persuaded that there is a compelling need to test the biogas prior to startup. As the proponents of biomethane point out, it is processed biomethane that will be injected into the

common carrier pipeline. In addition, it is the processed biomethane which must meet the concentration standards for the 17 constituents of concern.[42]

Second, we agree with the recommendations in the Joint Report and the four utilities that startup testing is needed before the processed biomethane is allowed to be injected into the common carrier pipeline. The proposal of WM does not address the startup testing procedures. The startup procedures that the four utilities and that the Joint Report recommends are similar, except that the four utilities' protocol calls for the testing of the raw biogas, and that the results of the biogas analysis be shared with the utility. In addition, the four utilities' protocol calls for the biogas supplier to complete a biomethane supplier survey, which provides "preliminary information on the upgrading and conditioning process, the expected quality of the biomethane, and the expected biomethane output." (*Ex*. 3 at 8.)

The third consideration is the frequency of the monitoring and testing requirements for the constituents of concern. The protocol of WM recommends that the same periodic monitoring and testing procedures as recommended in the Joint Report be adopted.[43] Generally speaking, the Joint Report recommends that the periodic monitoring and testing take place on an annual or biennial basis if the testing of the constituents of concern are below the trigger

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[42] We recognize that the raw biogas information could assist OEHHA and the CARB in their studies and analyses of the possible human health effects of biogas and biomethane. We encourage the biogas suppliers to provide this type of raw biogas information to the OEHHA and to the CARB.

[43] WM's recommended protocol states that the "monitoring program shall include appropriate and consistent sampling and analytical procedures and methods … as prescribed in the AB 1900 Report [Exhibit 1] Tables V-3 and V-4 and Figure V-1." (*Ex*. 7, Att. A.)

level. If the testing is above the lower action level, but below the upper action level, quarterly testing is to occur until there are four consecutive tests below the lower action level at which time it would revert back to annual testing. If the testing is above the upper action level, the Joint Report recommends shut-off and retesting. The four utilities periodic testing, as shown in Appendix C of Exhibit 3, is similar to what the Joint Report recommends, but would not allow biennial testing.

Based on our comparisons and analysis of the three recommended protocols, we adopt the monitoring and testing protocol that the Joint Report recommends be adopted. The adopted monitoring and testing protocol consists of both the startup testing and the periodic testing as summarized in this section of the decision, and more fully detailed in the Joint Report. The adopted monitoring and testing protocol shall use the concentration standards that we have adopted, and which are reflected in the trigger levels, lower action levels, and the upper action levels for the 17 constituents of concern which are shown in Table 1 at the end of the discussion in section 4.4.3.3 of this decision. In addition, the test methods that the CARB recommended be used for its 12 constituents of concern, and the test methods that the four utilities recommended be used for the other five constituents of concern, are adopted. The adopted monitoring and testing protocol will ensure the protection of human health, as well as the integrity and safety of the pipelines and pipeline facilities by requiring the processed biomethane to meet the concentration standards for the 17 constituents of concern. The adopted monitoring and testing protocols are reasonable because they balance the competing concerns of all the parties as to whether testing of the biogas is needed, and the frequency of the monitoring and testing.

We also clarify that all of the testing is to be done by independent certified third party laboratories. In addition, retesting shall be allowed, with the cost of retesting borne by the entity requesting the retest. Furthermore, the testing protocol shall allow the involved biomethane supplier and the utility the opportunity to verify and validate the results.

We will also permit the utilities to install electrical resistance probes and corrosion coupons in their pipelines to monitor for possible adverse effects from the injection of the processed biomethane. Allowing the utilities to do so is reasonable because such actions will allow the utilities to monitor for possible pipeline integrity and safety issues. However, this additional monitoring is to be done at the utility's expense, and does not limit the biomethane supplier's ability to inject into the common carrier pipeline.

Next, we address the reporting and recordkeeping requirements that should be adopted. The Joint Report recommends that the reporting and recordkeeping requirements described in section V.C. of the Joint Report, and summarized in section 2.3.2.3 of this decision, be adopted. WM's recommended reporting and recordkeeping protocol, as set forth in Attachment A to Exhibit 7, is identical to the Joint Report's recommendation.

The four utilities, with two clarifications, support the adoption of the reporting and recordkeeping protocol recommended in the Joint Report. The four utilities contend that the protocol needs to clarify who the testing entity is. First, when the biomethane testing takes place at the utility's interconnect, the testing entity will be the utility, who will collect the samples and send the samples to the independent certified laboratories for constituent analyses. The results from the laboratories will then be shared with the biomethane supplier. The second clarification is that for raw biogas testing, and the testing of

biomethane prior to interconnection, that it is the supplier of the gas who will be the testing entity.

We have reviewed the reporting and recordkeeping protocol contained in the Joint Report, along with the comments and arguments of the parties. We adopt the Joint Report's reporting and recordkeeping protocol, along with the clarification of the four utilities that when the biomethane is tested prior to interconnection that the testing entity is the supplier of the gas, and when the testing takes place at the utility's interconnect, that the testing entity is the utility.

Consistent with the above discussion and adoption of the reporting and recordkeeping requirements, as well as Health and Safety Code § 25421(f)(2), the four utilities shall file tier 2 advice letters to incorporate the adopted monitoring, testing, reporting, and recordkeeping protocols into their respective gas tariff rules.

The Commission's Energy Division will need to establish internal procedures to handle the adopted reporting and recordkeeping tasks, and to coordinate the passing on of information to OEHHA and the CARB.

6. Review and Update Procedures

Subdivision (e) of Health and Safety Code § 25421 provides for the following:

> Every five years, or earlier if new information becomes available, the commission shall review and update the standards for the protection of human health and pipeline integrity and safety adopted pursuant to subdivision (c), as well as the monitoring, testing, reporting, and recordkeeping requirements adopted pursuant to subdivision (d).

Subdivision (e) mandates that the Commission provide for a review and update of the standards that the Commission adopted for the allowable

constituent concentrations that may be found in biomethane, and for the monitoring, testing, reporting, and recordkeeping requirements that the Commission adopted. This review and update procedure is to take place every five years, or before the five year period if new information becomes available.

The Commission's review and update procedure needs to be viewed in the context of Health and Safety Code § 25421(a)(2), (a)(3), (a)(4), and (a)(5). Those subdivisions require OEHHA and the CARB to update the health protective levels, the exposure scenarios, the appropriate concentrations of constituents of concern, and the monitoring, testing, reporting, and recordkeeping requirements. These updates are to take place at least every five years.

Most of the parties to this proceeding did not spend time addressing the updating requirement. The four utilities noted that the biomethane standards may need to be changed as experience is gained, and the technology develops. According to the four utilities, this may result in more constituents being included, which may result in increased testing, monitoring, and additional safeguards.

Since Health and Safety Code § 25421(e) requires the Commission to review and update the standards for constituents of concern, and the monitoring, testing, reporting, and recordkeeping, we need to discuss the process for how this will occur.

Subdivision (e) requires that this update procedure take place every five years, or earlier if new information becomes available. To ensure that this update procedure takes place, we will require the four utilities, either individually or jointly, to file a new application every five years, or earlier if new information becomes available, to have the Commission consider proposals

to make changes to the list of constituents and concentrations that may be found in biomethane that impact human health, or that may affect the integrity and safety of the pipeline and pipeline facilities.

If the OEHHA or CARB believes that an update should occur before the five year period, they can notify the Commission's Executive Director and the Energy Division Director that the Commission should conduct an update proceeding. If such a notification is received, the ALJ Division will initiate a proceeding to address such a request.

The five year update application shall be filed five years from the effective date of today's decision, or sooner if new information becomes available, or a request is made by OEHHA or CARB. Once the new application or other proceeding resolves the update issues, a new five year period will be triggered. When the new application is filed, or if OEHHA or CARB request that an update proceeding take place, the application or request shall be served on the service list in this proceeding.

7. Nondiscriminatory Open Access

AB 1900 added Public Utilities Code Section 784. That code section provides as follows:

> For each gas corporation, the commission shall adopt pipeline access rules that ensure that each gas corporation provides nondiscriminatory open access to its gas pipeline system to any party for the purposes of physically interconnecting with the gas pipeline system and effectuating the delivery of gas.

The proponents of biomethane generally contend that imposing additional requirements on the biomethane suppliers, as compared to natural gas suppliers, may be discriminatory. The four utilities contend that the additional requirements that are adopted and imposed on biomethane suppliers

are not discriminatory because AB 1900 recognizes that biogas and biomethane may contain constituents of concern that pose a danger to human health, or which may affect the integrity and safety of the pipeline and pipeline facilities.

As discussed in this decision, biogas and biomethane are different from fossil natural gas. There are also certain constituents that are found in biogas and biomethane that are not found in fossil natural gas. As discussed earlier, these 17 constituents of concern may potentially affect human health, and the integrity and safety of the pipelines and pipeline facilities. Since there are differences in the composition of biogas and biomethane, as compared to fossil natural gas, it is reasonable, rational, and in the public interest to impose additional requirements on biomethane which is injected into a common carrier pipeline. Indeed, as Health and Safety Code § 25421(c) recognizes, the Commission shall "adopt standards that specify, for constituents that may be found in that biomethane, concentrations that are reasonably necessary to ensure…" the protection of human health, and pipeline and pipeline facility integrity and safety. (*Emphasis* added.) We conclude that the additional requirements that we adopt in today's decision, and which we impose on the biomethane suppliers who want to interconnect to a common carrier pipeline, is not discriminatory, and that these additional requirements do not violate Public Utilities Code Section 784.

8. Gas From A Hazardous Waste Landfill

8.1. Introduction

Subdivision (g) of Health and Safety Code § 25421 contains two provisions that are within the jurisdiction of this Commission to implement. Subdivision (g) of that code section provides as follows:

(1) A person shall not knowingly sell, supply, or transport, or knowingly cause to be sold, supplied, or transported, biogas collected from a hazardous waste landfill to a gas corporation through a common carrier pipeline.

(2) A gas corporation shall not knowingly purchase gas collected from a hazardous waste landfill through a common carrier pipeline.

8.2. Position of the Parties

With respect to biogas from hazardous waste landfills, the LA County Task Force agrees with the utilities that such landfills should be prohibited from being connected to the common carrier pipelines. The LA County Task Force recommends that regulations be developed to define a hazardous waste landfill, and that biomethane suppliers be required to disclose whether they have ever accepted hazardous waste.

WM recommends that the state agencies that have authority over hazardous waste landfills should decide what constitutes a hazardous waste landfill. WM agrees that hazardous waste landfills should be excluded as a source of biomethane. However, WM opposes the four utilities' recommendation that the Commission define what a hazardous and nonhazardous landfill should be. WM contends that the Commission does not have the authority to decide that issue.

The four utilities recommend that biomethane from a hazardous waste landfill should not be allowed to connect to the utilities' pipeline systems. The four utilities note that in determining whether a landfill is hazardous or nonhazardous may be a problem in a situation where a landfill is currently nonhazardous, but in the past accepted hazardous waste.

To avoid potential adverse effects, the four utilities recommend that the Commission develop a definition of a hazardous waste landfill that prevents the

introduction of biomethane from hazardous sources, and to implement rules requiring biomethane suppliers to disclose whether they ever accepted hazardous waste.

8.3. Discussion

The intent of Health and Safety Code § 25421(g)(1) and (g)(2) is to prohibit the introduction of biomethane into a common carrier pipeline that comes from landfill biogas collected at a hazardous waste landfill. To prevent the entry of biomethane that comes from a hazardous waste landfill, we will require the four utilities to include in their respective gas tariff rules a prohibition against the purchasing of such gas. In addition, and as discussed below, we will require the four utilities to include in their gas tariff rules that before a biomethane supplier can interconnect with the utility's pipeline, the biomethane supplier will need to prove to the utility that the origin of the biogas that is to be processed and injected into the pipeline was not collected from a hazardous waste landfill.

Health and Safety Code § 25421(g) raises the issue of what is considered a hazardous waste landfill. In Health and Safety Code § 25420(j), as amended by AB 1900, a "hazardous waste landfill" is defined as "a landfill that is a hazardous waste facility, as defined in Section 25117.1." Health and Safety Code § 25117.1 provides the following:

> Hazardous waste facility' means all contiguous land and structures, other appurtenances and improvements on the land used for the treatment, transfer, storage, resource recovery, disposal, or recycling of hazardous waste. A hazardous waste facility may consist of one or more treatment, transfer, storage, resource recovery, disposal, or recycling hazardous waste management units, or combinations of these units.

A hazardous waste facility must be permitted by the Department of Toxic Substances Control. (*See* Health and Safety Code § 25200.)

To ensure that the processed biomethane does not originate from biogas collected from a hazardous waste landfill, the biomethane supplier will need to demonstrate that the biogas did not come from a hazardous waste facility unit or units permitted by the Department of Toxic Substances Control.

9. Other Issues

9.1. Cost Issues

The parties to this proceeding have raised arguments about whether the biogas and biomethane suppliers should pay for certain costs, or whether the utility's ratepayers should have to pay for some of the costs associated with biomethane. These cost issues also raise whether utility ratepayers should subsidize part of the cost of the biomethane that is injected into common carrier pipelines.

As noted in the May 2, 2013 Scoping Ruling, the cost issues associated with meeting the Commission-adopted standards and requirements will be addressed in a separate phase of this proceeding, after the Commission has adopted the concentration standards for the constituents of concern that may be found in biomethane, and the monitoring, testing, reporting, and recordkeeping requirements. This phasing of the issues was appropriate in order to timely address the adoption of the concentration standards for the constituents of concern, and the monitoring, testing, reporting and recordkeeping requirements. Accordingly, a ruling will be issued in the near future outlining the cost phase of this proceeding, and this proceeding will remain open to consider such issues.

As for the issue of the adoption of "policies and programs that promote the in-state, production and distribution of biomethane,"[44] and whether utility ratepayers should subsidize such policies and programs, those are issues that are to be addressed in R.11-05-005. However, the Scoping Ruling left the door open to possibly addressing biomethane promotion policies and possible subsidies in this proceeding, depending on the progress of addressing such issues in R.11-05-005.

9.2. Biomethane From Other Sources

The focus of today's decision is on biomethane that comes from the three largest sources of biogas, *i.e.,* landfills, dairies, and sewage treatment plants or POTWs. Using existing and available technology, biomethane can also be produced from other organic sources of biogas such as crop residuals, food waste, woody biomass, and energy crops.

The proponents of biomethane recommend that the Commission move quickly to allow the injection of biomethane from these other organic biogas sources. One recommendation is to have the Commission "adopt the same health-based and pipeline integrity standards for these other waste sources as for wastewater treatment facilities." (*Ex*. 11 at 8.) The reasoning for adopting such an approach is because the biogas from these other organic waste sources are equivalent to the biogas found at wastewater treatment facilities. That is, since the wastewater treatment facilities co-digest food and water treatment wastes, this is similar to biogas generated from agricultural, food, and other organic waste sources. In addition, since the biogas from landfills is created

[44] Public Utilities Code § 399.24, as added by AB 1900.

from both organic and nonorganic waste, the biogas created from organic waste sources should not contain some of the constituents of concern which are found only in landfill biogas.

Based on current knowledge, the four utilities assert that the injection of biomethane should not be limited to landfills, dairies, and wastewater treatment facilities. The four utilities are agreeable to the injection of processed biomethane from these other organic waste sources so long as the recommendations of the four utilities' also apply to these other organic waste sources. The four utilities note that their recommendations for biogas analysis, and annual comprehensive biomethane constituent analysis, should provide additional information on trace constituents that may be found in these other organic waste sources that could impact human health, and the integrity and safety of the pipelines and pipeline facilities.

We agree with the biomethane proponents that biomethane from other organic waste sources should be allowed to be injected into the common carrier pipelines. The processed biomethane that comes from these other organic waste sources shall meet the specifications for natural gas, as well as all of the concentration standards that we have adopted for POTWs. That biomethane will also be subject to the monitoring, testing, reporting, and recordkeeping requirements adopted in today's decision. The utilities' gas tariff rules shall allow the injection of biomethane from other organic waste sources so long as the processed biomethane meets the aforementioned conditions.

9.3. PG&E Minimum Flow Rate

PG&E proposed that its Rule 21 be modified to require a minimum instantaneous flow rate of five decatherms per hour to ensure accurate measurement of gas volumes at the receipt point, up from 50 decatherms per

day. PG&E did not adequately justify this request in the testimony of the four utilities, and that request is denied without prejudice.

10. Comments on Proposed Decision

The proposed decision of Commissioner Peterman in this matter was mailed to the parties in accordance with Pub. Util. Code § 311, and comments are allowed pursuant to Rule 14.3. Opening comments were filed on _____, and reply comments were filed on _____.

11. Assignment of Proceeding

Carla J. Peterman is the assigned Commissioner, and John S. Wong is the assigned ALJ in this proceeding.

Findings of Fact

1. This Rulemaking was initiated on February 13, 2013 to implement certain provisions of AB 1900.

2. AB 1900 directed OEHHA and the CARB, in consultation with other state agencies, to perform certain tasks related to the human health effects of biogas and biomethane.

3. On May 15, 2013, the CARB and OEHHA transmitted their Joint Report to the Commission, which contained their recommendations regarding the health protective standards for the injection of biomethane into the common carrier pipeline.

4. The parties to this proceeding had the opportunity to submit their testimony and comments on the Joint Report.

5. The terms "biogas" and "biomethane" as used in AB 1900 are defined in Health and Safety Code § 25420.

6. The largest sources of biogas come from landfills, dairies, and sewage treatment plants, and these three sources have the greatest potential to

economically inject processed biomethane into the natural gas pipeline in California.

7. The term "common carrier pipeline," as used in Health and Safety Code § 25421, refers to a gas conveyance pipeline, which suggests that the pipeline operator's principal business is to move and deliver gas from one point to another.

8. Since all of the ISPs' pipelines are connected to PG&E's gas pipeline system, and receive all of the gas destined for storage over PG&E's pipeline system, no biomethane is injected directly into the ISPs' pipelines.

9. Since the ISPs' gas storage facilities will not produce any biogas or biomethane, the ISPs are not injecting any biomethane into PG&E's pipeline system.

10. Although the ISPs are considered gas corporations within the meaning of Public Utilities Code § 222, the ISPs' underground storage rates are not subject to rate regulation by the Commission.

11. Giving due deference to the CARB's determinations regarding the protection of human health makes sense since the determinations about the constituents of concern were made with the assistance of OEHHA, who has the responsibility for evaluating the environmental and health risks posed by various hazardous substances.

12. Due deference is an important consideration when we consider the arguments of the biomethane proponents, and of the four utilities, as to why they believe certain recommendations in the Joint Report should be changed.

13. The provision in Health and Safety Code § 25421(c)(2) that the concentration standards to be adopted for biomethane are to ensure the integrity and safety of the pipeline and pipeline facilities, provides the Commission with

more flexibility about what evidence should be considered, including the possible damage that certain constituents can cause.

14. The Joint Report recommends the adoption of 12 constituents of concern, while the four utilities recommend that five additional constituents of concern be added to the Joint Report's recommendation.

15. The Joint Report and the four utilities have demonstrated that their recommended constituents of concern may pose harm to the integrity and safety of the pipeline and pipeline facilities, as well as to human health.

16. Under Health and Safety Code § 25421(c), the adopted concentration standards for the constituents of concern that are adopted are those that are reasonably necessary to ensure the protection of human health, and for the integrity and safety of the pipeline and pipeline facilities.

17. The standards of concentrations to be adopted in this decision will establish the allowable levels for the constituents of concern, and the testing and shut-off protocols.

18. The Joint Report's recommended risk management levels are based on the established OEHHA guidelines and recommended health values to estimate the potential cancer risks and non-cancer health impacts for the constituents of concern.

19. The four utilities recommended risk management levels for their five recommended constituents of concern are based on biogas studies, equipment manufacturer specifications, and published information on the impact of those constituents.

20. The recommended risk management levels utilize three levels of action (trigger level; lower action level; and upper action level) which set forth the concentration amounts for each of the constituents.

21. The trigger level is the acceptable concentration level for each constituent, and if the trigger level is exceeded for a constituent, routine monitoring of the constituent of concern is required.

22. The lower action level is used to screen biomethane suppliers during the initial gas quality review, and for ongoing screening during periodic testing.

23. The upper action level establishes the point at which an immediate shut-off of the biomethane supply occurs.

24. The composition of fossil natural gas and processed biomethane are different, and the chemical compounds found in each of those two sources vary.

25. Health and Safety Code § 25421(c) recognizes the difference between fossil natural gas and biomethane, and provides that standards are to be adopted for constituents that may be found in that biomethane.

26. The biomethane proponents have not presented any evidence to suggest that the concentration limits for ammonia, biologicals, hydrogen, and mercury should be changed.

27. When combusted, siloxanes can result in silica deposits on end use equipment, which can negatively impact the performance of internal combustion engines, turbines, and catalysts.

28. The unspecified lower action and upper action levels for ammonia, biologicals, hydrogen, mercury, and siloxanes may lead to situations where the utilities have the discretion to shut off the flow of biomethane.

29. Table 1 in section 4.4.3.3 of this decision sets forth the adopted constituents of concern and the applicable concentration standards.

30. The vinyl chloride provision in section 7.e of General Order 58A needs to be revised in light of the repeal and replacement of former Health and Safety Code § 25421 by AB 1900, and the adoption of a trigger level of 0.33 ppm.

31. The current gas tariff rules of SDG&E and SoCalGas set the minimum heating value of gas at 990 btu/scf, while the current gas tariff rules of PG&E and Southwest Gas do not list a minimum heating value number.

32. The development of the heating value requirement was adjudicated in a rulemaking proceeding that involved many different interested stakeholders, and resulted in D.06-09-039 which referenced the NGC paper.

33. D.06-09-039 considered the effects of heating value on end user equipment, and acknowledged that the NGC paper stated the heating value could have an effect on auto-ignition, flashback, and combustion dynamics, and that understanding the historical composition of gas in a region is essential to establishing acceptable interchangeability standards.

34. The proponents of biomethane have not introduced any scientific evidence in this proceeding to demonstrate that lowering the heating value to 950 or 970 btu/scf will not cause end use equipment problems.

35. The argument that since other states allows biomethane to have a lower heating value is insufficient justification to lower the heating value when such a change could affect the integrity and safety of end use equipment.

36. A lower heating value will impact a customer's gas bill since gas is billed on a per therm basis.

37. If parties believe that the minimum heating value should be changed, a petition for a rulemaking may be filed pursuant to Rule 6.3 of the Commission's Rules of Practice and Procedure.

38. Upstream blending of biomethane with a higher heat hydrocarbon, such as propane, can raise the heating value of biomethane to meet the standards in utility tariffs but has cost implications.

39. Related to the minimum heating value issue is whether upstream blending or downstream blending should be permitted, and whether Southwest Gas should be allowed to limit the injection of biomethane to no more than 25%.

40. The adopted gas and biomethane specifications are designed to prevent the entry of non-merchantable gas into the utilities' gas pipeline systems.

41. Downstream blending would shift the burden onto the utilities to ensure that they have sufficient volumes of gas on hand with higher heating values in order to blend the biomethane to meet the minimum heating value.

42. The four utilities have not demonstrated that Southwest Gas' proposal to limit biomethane injection to 25% is warranted.

43. As described in section 5.2 of this decision, the CARB recommends in the Joint Report that there be two forms of monitoring and testing: pre-injection startup testing, and periodic testing.

44. The pre-injection startup testing consists of two tests over a two to four week period once the biomethane production facility is operational and before the biomethane is first injected into the pipeline, and a representative sample of the biomethane is to be taken each time to test for the constituents of concern and the concentration amounts.

45. The CARB's recommendation provides for a modified startup procedure when there is a change in the biogas source at the facility, when there is an upgrade of the equipment design that may potentially increase the level of any constituent of concern, or when a shut-off situation occurs.

46. The CARB's recommendation for periodic testing describes the frequency of the periodic testing, and the testing methods to be used.

47. The CARB's recommendations for reporting and recordkeeping are described in the Joint Report at 71 to 72, and in section 5.2.3 of this decision.

48. The four utilities recommendations for the monitoring, testing, reporting, and recordkeeping protocols are described in section III of the four utilities' supplemental testimony, and summarized in section 5.3.9 of this decision.

49. WM's recommendations for the monitoring, testing, reporting, and recordkeeping protocols are described in Attachment A of WM's supplemental prepared testimony, and summarized in section 5.3.8 of this decision.

50. WM's recommendations for the monitoring, testing, reporting, and recordkeeping protocols does not contain any provisions for startup testing, and incorporates some of WM recommendations that were addressed earlier but were not adopted.

51. The four utilities recommendations for the monitoring, testing, reporting, and recordkeeping protocols are similar to the Joint Report's protocols, but contain testing of the biogas at the outset, more frequent periodic testing, and more stringent re-start testing.

52. Health and Safety Code § 25421(d) provides in part that the Commission is to give due deference to CARB's determinations regarding the monitoring, testing, reporting, and recordkeeping protocols.

53. It is processed biomethane, and not biogas, that is to be injected into the common carrier pipeline, and that biomethane must meet the concentration standards for the 17 constituents of concern.

54. Startup testing is needed before the processed biomethane is allowed to be injected into the common carrier pipeline.

55. The recommendation of the four utilities for periodic testing is similar to what the Joint Report recommends, but would not allow for biennial testing.

56. The adopted monitoring and testing protocols are reasonable as it balances the competing concerns of all the parties as to whether testing of the biogas is needed, and the frequency of the monitoring and testing.

57. The adopted monitoring and testing protocol will ensure the protection of human health, and the integrity and safety of the pipelines and pipeline facilities by requiring the processed biomethane to meet the concentration standards for the 17 constituents of concern.

58. The recommendations of the different parties concerning the reporting and recordkeeping requirements essentially recommend that the Joint Report's recommendations be adopted with clarifications as to who the testing entity is.

59. When the biomethane is tested prior to the interconnection, the testing entity is the supplier of the gas, and when the testing takes place at the utility's interconnect, the testing entity is the utility.

60. The Commission's Energy Division will need to establish internal procedures to handle the adopted reporting and recordkeeping tasks, and to coordinate the passing on of information to OEHHA and the CARB.

61. Health and Safety Code § 25421(e) mandates that the Commission provide for a review and update of the standards that the Commission adopted for the allowable constituent concentrations that may be found in biomethane, and for the monitoring, testing, reporting, and recordkeeping requirements that the Commission adopted.

62. Similar review and update procedures are also required of OEHHA and CARB.

63. Most of the parties to this proceeding did not spend time addressing the updating requirement.

64. Once the new application or other proceeding resolves the update issues, a new five year period will be triggered.

65. The definition and description of a hazardous waste landfill is set forth in Health and Safety Code § 25420(j) and Health and Safety Code § 25117.1, and a hazardous waste facility must be permitted by the Department of Toxic Substances Control.

66. As noted in the May 2, 2013 Scoping Ruling, the cost issues associated with meeting the Commission-adopted standards and requirements for biomethane are to be addressed in a separate phase of this proceeding.

67. The issue of the adoption of policies and programs that promote the in-state production and distribution of biomethane, and whether utility ratepayers should subsidize such policies and programs, are to be addressed in R.11-05-005.

68. Using existing and available technology, biomethane can be produced from other organic sources of biogas such as crop residuals, food waste, woody biomass, and energy crops.

69. PG&E did not adequately justify its request to modify its Rule 21 to require a minimum instantaneous flow rate of five decatherms per hour.

Conclusions of Law

1. Pursuant to Health and Safety Code § 25421(c), the Commission is required to adopt standards that specify the constituents that may be found in biomethane, and the concentrations that are reasonably necessary to protect human health, and to ensure pipeline and pipeline facility and integrity.

2. In adopting the standards that are reasonably necessary to protect human health, the Commission is to give due deference to CARB's determinations.

3. To ensure pipeline and pipeline facility integrity and safety, Health and Safety Code § 25421(d) requires the Commission to adopt monitoring, testing, reporting, and recordkeeping requirements, giving due deference to CARB's determinations.

4. The California Legislature did not intend for the provisions of Health and Safety Code § 25421 to apply to the ISPs' pipelines, and therefore the ISPs are not required to comply with subdivisions (c) and (d) of that code section.

5. The plain language of the definition of a common carrier pipeline in Health and Safety Code § 25420(f) makes clear that AB 1900 intended for the concentration standards, and the testing and monitoring requirements, to apply only to biomethane that is being injected into a gas pipeline that is located in California, and which is owned or operated by a gas utility or gas corporation.

6. We would not be fulfilling our duty under AB 1900 if we allowed cost considerations to exclude certain constituents of concern from being adopted.

7. It is reasonable to adopt the following 17 constituents of concern that may be found in biomethane: arsenic, p-Dichlorobenzene, ethylbenzene, n-Nitroso-din-propylamine, vinyl chloride, antimony, copper, hydrogen sulfide, lead, methacrolein, alkyl thiols (mercaptans), toluene, ammonia, biologicals, hydrogen, mercury, and siloxanes.

8. The recommended concentration limits for the 17 constituents of concern are not arbitrary, discriminatory, or inappropriate.

9. Due deference is given to the CARB's recommended concentration standards for its 12 constituents of concern.

10. It is reasonable to adopt the concentration standards that the CARB recommended in the Joint Report for its 12 constituents of concern.

11. It is reasonable to adopt the concentration standards that the four utilities have recommended for ammonia, biologicals, hydrogen, and mercury.

12. To limit the detrimental effects of siloxanes on end use equipment, and to ensure the integrity and safety of the pipeline facilities, it is reasonable to adopt the trigger level of 0.01 mg Si/m^3, and the lower action level of 0.1 mg Si/m^3, as recommended by the four utilities.

13. The four utilities should be required to specify the lower action and upper action levels for ammonia, biologicals, hydrogen, mercury, and siloxanes in the next update proceeding.

14. Each utility should be required to keep a record (which shall be made available to the Commission and to biomethane suppliers) of each instance in which the trigger level has been exceeded for ammonia, biologicals, hydrogen and mercury, and in which the lower action level has been exceeded for siloxanes, as well as what type of action the utility took in response to each exceedance.

15. If the biomethane supplier believes that the utility is abusing its discretion with respect to the unspecified action levels for these five constituents of concern, the biomethane supplier can file a complaint.

16. In order for a biomethane supplier to interconnect with a utility's gas pipeline system, and consistent with Health and Safety Code § 25421(f)(1), the biomethane supplier must meet the gas quality requirements in the utility's existing tariff, as well as the incremental biomethane constituent specifications listed in Table 1 of section 4.4.3.3 of this decision.

17. In accordance with Health and Safety Code § 25421(f)(2), the four utilities should be directed to incorporate the 17 adopted constituents of concern and the

concentration standards into their respective tariffs to permit the interconnection of processed biomethane which meets the above specifications.

18. After consulting with the different divisions, the Commission should draft a new rulemaking to revise General Order 58A.

19. The Commission should not adopt the recommendations to lower the minimum heating value to 970 or 950 btu/scf.

20. It is reasonable not to adopt a minimum heating value number for PG&E and Southwest Gas.

21. Consistent with D.06-09-039, the minimum heating value for gas entering the pipelines of SDG&E and SoCalGas shall remain at 990 btu/scf.

22. To meet all of the adopted gas and biomethane specifications, biomethane suppliers should be permitted to engage in upstream blending, but downstream blending shall not be permitted to meet the adopted specifications.

23. The proposal of Southwest Gas to limit biomethane injection on its system to no more than 25% of the minimum daily-localized volume of Southwest Gas' natural stream at the point of interconnection into Southwest Gas' system is not adopted.

24. Based on the plain language of Health and Safety Code § 25421(a)(5) and (d), the Commission could adopt monitoring, testing, reporting, and recordkeeping requirements for biogas if there is a compelling pipeline integrity and safety rationale for doing so.

25. The four utilities have not demonstrated that there is a compelling need to test the biogas prior to startup.

26. The monitoring and testing protocols that the Joint Report recommends are adopted, and those protocols shall use the adopted concentration standards

for the 17 constituents of concern which are shown in Table 1 at the end of the discussion in section 4.4.3.3 of this decision.

27. All of the testing should comply with the following: the testing is to be done by independent certified third party laboratories; retesting shall be allowed, with the cost of retesting borne by the entity requesting the retest; the biomethane supplier and the utility shall have the opportunity to verify and validate the results.

28. The utilities should be permitted to install electrical resistance probes and corrosion coupons in their pipelines to monitor for possible pipeline integrity and safety issues resulting from the injection of the processed biomethane.

29. The reporting and recordkeeping protocols that the Joint Report recommends should be adopted, along with the clarifications of who the testing entity is.

30. The four utilities should file tier 2 advice letters to incorporate the adopted monitoring, testing, reporting, and recordkeeping protocols into their respective gas tariff rules.

31. To ensure that the update procedure takes place, the four utilities should be required, either individually or jointly, to file a new application every five years, or earlier if new information becomes available, to have the Commission consider proposals to make changes to the list of constituents and concentrations that may be found in biomethane that impact human health, or that may affect the integrity and safety of the pipeline and pipeline facilities.

32. If the OEHHA or CARB believes that an update should occur before the five year period, they should notify the Commission's Executive Director and the Energy Division Director that the Commission should conduct an update

proceeding, and the ALJ Division will initiate a proceeding to address such a request.

33. Since there are differences in the composition of biogas and biomethane, as compared to fossil natural gas, it is reasonable, rational, and in the public interest to impose additional requirements on biomethane which is injected into a common carrier pipeline.

34. It is not discriminatory, nor a violation of Public Utilities Code Section 784, to impose additional requirements on the biomethane suppliers who want to interconnect to a common carrier pipeline.

35. The intent of Health and Safety Code § 25421(g)(1) and (g)(2) is to prohibit the introduction of biomethane into a common carrier pipeline that comes from landfill biogas collected at a hazardous waste landfill.

36. To prevent the entry of biomethane that comes from a hazardous waste landfill, the four utilities shall be required to include in their respective gas tariffs that before a biomethane supplier can interconnect with the utility's pipeline, the biomethane supplier will need to prove to the utility that the origin of the biogas that is to be processed and injected into the pipeline was not collected from a hazardous waste facility unit or units permitted by the Department of Toxic Substances Control.

37. A ruling should be issued in the near future outlining the cost phase of this proceeding, and this proceeding will remain open to consider such issues.

38. Biomethane produced from other organic waste sources should be allowed to be injected into the common carrier pipelines so long as that biomethane meets all of the adopted concentration standards that have been adopted in this decision for wastewater treatment plants, and meets all of the

monitoring, testing, reporting, and recordkeeping requirements adopted in today's decision.

39. The utilities' gas tariff rules should allow the injection of biomethane from other organic waste sources so long as the processed biomethane meets the conditions set forth in the preceding Conclusion of Law.

40. PG&E did not adequately justify its proposal to change the minimum instantaneous flow rate in its tariff.

O R D E R

IT IS ORDERED that:

1. As shown in Table 1, which appears in section 4.4.3.3 of this decision, the 17 constituents of concern that may be found in biomethane, and the concentration standards listed in that table, are adopted.

2. As clarified in this decision, we adopt the monitoring, testing, reporting, and recordkeeping protocols that were recommended for adoption in the May 15, 2013 "Recommendations to the California Public Utilities Commission Regarding Health Protective Standards for the Injection of Biomethane into the Common Carrier Pipeline."

3. Consistent with Health and Safety Code § 25421(f)(1), in order for a biomethane supplier to interconnect with a utility's gas pipeline system, the processed biomethane must meet the gas quality requirements in the utility's existing tariff, as well as the incremental biomethane constituent specifications adopted in today's decision, and which are listed in Table 1 of Section 4.4.3.3 of this decision. In addition, the biomethane supplier is to adhere to the adopted monitoring, testing, reporting, and recordkeeping protocols.

4. Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southern California Gas Company, and Southwest Gas Corporation shall submit their respective tier 2 advice letters, within 30 days of the effective date of this decision, to incorporate the adopted constituents of concern, the concentration standards, and the monitoring, testing, reporting, and recordkeeping requirements, into their respective gas tariffs.

5. The Commission's Energy Division shall establish the appropriate procedures to handle the reporting and recordkeeping tasks adopted in Ordering Paragraph 2 above.

6. Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southern California Gas Company, and Southwest Gas Corporation shall keep a record (which shall be made available to the Commission and to biomethane suppliers) of each instance in which the trigger level has been exceeded for ammonia, biologicals, hydrogen, and mercury, and in which the lower action level has been exceeded for siloxanes, as well as what type of action the utility took in response to each exceedance.

7. Pursuant to Health and Safety Code § 25421(e), Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southern California Gas Company, and Southwest Gas Corporation, either individually or collectively, shall file an application within five years from the effective date of this decision, or earlier if new information becomes available, or as directed by the Commission in the future, for the Commission to carry out its review and update responsibilities under that code section.

8. If the Office of Environmental Health Hazard Assessment (OEHHA) or the California Air Resources Board (CARB) believes that an update proceeding should occur before the five year period, OEHHA or the CARB may notify the

Commission's Executive Director and the Energy Division Director that an update proceeding should be conducted.

9. Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southern California Gas Company, and Southwest Gas Corporation shall propose in the next update proceeding to specify the lower action and upper action levels for ammonia, biologicals, hydrogen, mercury, and siloxanes, and shall maintain the records of the exceedances discussed in section 4.4.3.3 of this decision.

10. When the new application is filed, or the Office of Environmental Health Hazard Assessment (OEHHA) or the California Air Resources Board (CARB) notifies the Commission that an update proceeding is needed, the application or request by OEHHA or CARB shall be served on the service list in this proceeding.

11. The Commission's Energy Division shall establish the necessary procedures to notify the Commission's Administrative Law Judge Division when the Office of Environmental Health Hazard Assessment or the California Air Resources Board notifies the Commission's Executive Director and the Energy Division Director that an update proceeding is needed pursuant to Health and Safety Code § 25421(e).

12. To prevent the injection of biomethane that comes from a hazardous waste landfill, Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southern California Gas Company, and Southwest Gas Corporation shall submit respective tier 2 advice letters, within 30 days of the effective date of this decision, to include in their respective gas tariffs: (1) a prohibition against the purchasing of such biomethane, and (2) before a biomethane supplier can interconnect with the utility's pipeline, the biomethane supplier

will need to demonstrate that the origin of the biogas that is to be processed and injected into the utility's pipeline was not collected from a hazardous waste facility unit or units permitted by the Department of Toxic Substances Control.

13. Biomethane from other organic biogas sources, such as crop residuals, food waste, woody biomass, and energy crops, may be injected into a utility's gas pipeline so long as it meets the specifications for natural gas, as well as the concentration standards that we have adopted for biomethane from wastewater treatment plants as set forth in Table 1 of Section 4.4.3.3 of this decision. That biomethane shall also be subject to the monitoring, testing, reporting, and recordkeeping requirements adopted in today's decision.

14. Pacific Gas and Electric Company, San Diego Gas & Electric Company, Southern California Gas Company, and Southwest Gas Corporation shall submit their respective tier 2 advice letters, within 30 days of the effective date of this decision, to change their respective gas tariffs to allow biomethane from other organic sources to be injected into the utility's gas pipeline so long as the specifications for natural gas, and the concentration standards that have been adopted for biomethane from wastewater treatment plants are met. In addition, the supplier of such biomethane shall also be subject to the monitoring, testing, reporting, and recordkeeping requirements adopted in this decision.

15. After consulting with the Energy Division, the Gas Safety and Reliability Branch of the Safety and Enforcement Division, and the Administrative Law Judge Division, the Commission shall draft a new rulemaking to revise General Order No. 58A.

16. Rulemaking 13-02-008 remains open to consider the cost issues.

This decision is effective today.

Dated _____, at San Francisco, California.