

DEC 17 1992

Decision 92-12-062 December 16, 1992

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Commission's own motion to develop  
revisions to General Orders and  
rules applicable to allowable  
concentrations of vinyl chloride  
in natural gas.

**ORIGINAL**

1.90-09-010

(Filed September 12, 1990)

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O P I N I O N

Background

On September 16, 1988, Assembly Bill (AB) 4037 added Chapter 6.92, §§ 25420-25422, Landfill Gas, to the Health and Safety (H&S) Code. Section 25421(b) requires the Public Utilities Commission to specify, on or before January 1, 1990, the maximum amount of vinyl chloride that may be found in landfill gas. Until this determination is made, § 25421(a) prohibits a gas producer from selling to a gas corporation landfill gas containing vinyl chloride in an amount which exceeds the operative "no significant

risk" level set forth in the California Code of Regulations.<sup>1</sup> These regulations specify that the maximum level of vinyl chloride permissible in air that poses no significant risk is 0.3 microgram per day.<sup>2</sup> The Commission's task in this proceeding is to determine the maximum concentration of vinyl chloride in landfill gas received by a gas utility that will result in persons receiving a dose not exceeding the California Environmental Protection Agency (Cal EPA) air standard.

On September 12, 1990, several months after the legislative deadline to establish a standard, we instituted this proceeding. However, the lateness in setting the required standard has not affected public safety. In 1988, H&S Code § 25421(a) prohibited gas suppliers from selling and gas utilities from buying landfill gas containing amounts of vinyl chloride which exceed the no significant risk standard. No gas utility has indicated that it has purchased landfill gas since the enactment of AB 4037 in 1988. Violation of this prohibition is punishable by a fine of \$2,500 per day, enforceable by the Attorney General, District Attorney or city attorney in a civil action brought in a court of competent jurisdiction. (H&S Code § 25422.) Therefore, it appears that no one has been exposed to vinyl chloride in natural gas supplied by a gas utility while this proceeding has been pending.

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1 The "no significant risk" regulations referenced in H&S Code § 25421 were adopted in compliance with Proposition 65 approved by the voters in 1986. Proposition 65 required a warning be given to persons exposed to toxic substances which can cause the death of one in 100,000 persons over a period of 70 years. Thus, warnings such as those found on gasoline pumps and in public places where tobacco is smoked have become common. However, AB 4037 is more strict than Proposition 65 requires. The requirement is to warn of exposure to toxic substances. The statute prohibits exposure exceeding the "no significant risk" level.

2 In this proceeding, we take official notice that this level is revised to 3.0 micrograms per day, effective October 24, 1992.

Before the Commission issued the order instituting investigation, the Commission Advisory and Compliance Division (CACD) circulated its proposal for comment. The order in this proceeding contained CACD's formal proposal to amend General Order 58-A to include the maximum allowable level of vinyl chloride in natural gas of 1.66 parts per billion (ppb). The order was mailed to all gas utilities and potentially interested parties, and the parties were afforded an opportunity to file formal comments.

On October 28, 1990, four parties filed comments on the proposed standard: Southern California Gas Company (SoCalGas), Southwest Gas Corporation (Southwest), Pacific Gas and Electric Company (PG&E), and GSF Energy, Inc. (GSF). Only Southwest supported CACD's recommendations. Southwest requested that a time limit be set for the air quality district to review the testing procedures used by landfill projects.

Even though SoCalGas has not purchased landfill gas since 1985 and 1986 and has no present plans to purchase or transport landfill gas, it believes this proceeding is important for the precedents it may set in adopting a methodology to determine the exposure to any toxic substance in any natural gas delivered by the utility. Therefore, SoCalGas proposed a different method to set a standard and a different standard than proposed by CACD. PG&E and GSF agree on the method but initially offered different variables resulting in widely varying proposed standards: SoCalGas, 520 ppb; PG&E, 72 ppb; and GSF, 90.6 parts per million (ppm). Opponents to CACD's proposed standard requested hearings to examine CACD's proposed standard and present their recommendations.

On February 5, 1991, GSF filed comments accompanied by a motion to receive the late-filed comments. GSF explained that it had no knowledge of the proceeding until December 1990. GSF believed that other potentially interested suppliers may not have notice of the proceeding. GSF requested that additional parties be notified of this proceeding. On March 29, 1991, the assigned

administrative law judge (ALJ) granted this request. All gas utilities were ordered to supply the names and addresses of known suppliers of landfill gas, and potentially interested government agencies and individual parties. A supplemental mailing list was compiled and a copy of the order was mailed to each name on the list. The comment period was extended to allow late-notified parties to comment. No comments from late-notified parties were received.

At the first prehearing conference the parties presented their widely varying positions and indicated the desire to meet with CACD to discuss their differences. CACD agreed to meet with parties to explain the basis of its proposal and attempt to narrow the disputed issues. If no agreement could be reached, the parties were directed to answer in further comments eight clarifying questions propounded by the assigned ALJ before a ruling on the request for hearings could be made. The questions explored the status of landfill gas purchases and requested clarification of comments. SoCalGas indicated it would personally request the Cal EPA to offer advice to the Commission or participate in the proceeding.

CACD later reported that the parties were unable to reach an agreement. Further comments were filed, a ruling granting the request for hearings was issued, and a second prehearing conference was scheduled.

At the second prehearing conference, a hearing schedule was established. SoCalGas and PG&E informed the Commission that Cal EPA had given notice of its intent to revise the state standard of vinyl chloride in air from 0.3 microgram per day to 3.0 micrograms per day. This standard is the starting point for deriving the maximum amount of vinyl chloride in natural gas. Parties agreed that, should the standard for vinyl chloride in air be revised, their recommendations could easily be adjusted during

the hearings. SoCalGas also reported that Cal EPA had declined to participate in the proceeding.

After the distribution of written direct testimony and prior to evidentiary hearings, CACD indicated in a letter to all parties that it concurred with SoCalGas' recommendation which was a proposed standard of 294 ppb, corrected during the proceeding to 117 ppb or 1,170 ppb should the air quality standard be revised.

Evidentiary hearings were held on October 19-20, 1992 in San Francisco. SoCalGas, PG&E and GSF presented witnesses. Cambrian Energy Systems distributed written testimony but did not appear at the hearing. Therefore, its testimony was placed in the formal correspondence file. Southwest and CACD did not participate in the hearing.

The Proposed Decision of ALJ Bennett was filed on November 16, 1992. No timely comments on the proposed decision were filed. Therefore, we adopt the proposed decision without changes.

Summary

Initially, CACD proposed a standard of 1.66 parts of vinyl chloride per billion parts of natural gas. CACD derived its standard by estimating the amount of vinyl chloride released into the air of a commercial kitchen from a gas pilot light, divided by the total volume of air in an average workplace. However, prior to evidentiary hearings, CACD indicated that it concurred with SoCalGas' recommendations.

Therefore, CACD, SoCalGas, PG&E, and GSF ultimately agree that the following equations represent the maximum allowable amount of vinyl chloride in natural gas:

Equation 1:

$$Y = \frac{UXE(L + FC)}{VA}$$

Equation 2 (transposes equation 1 to find X):

$$X = \frac{YVA}{UE(L + FC)}$$

Where: Y is the micrograms (ug) of vinyl chloride (VC) per cubic foot (ft3) of air per day

U is the human respiratory retention factor

X is the ug of VC/ft3 in gas

E is the exposure time factor

L is the leakage of gas from non-stove pilot sources

F is the destruction survival fraction of VC after exposure to the pilot flame

C is the pilot flame consumption rate

V is the volume of air within the average-sized dwelling

A is the air change per hour

Parties agree on the following values for factors within the two equations above:

Y = 0.00042 ug/ft3  
U = 1  
E = 1  
C = 0.6 ft3/hr  
V = 10,600 ft3  
A = 1.1

GSF disagrees with SoCalGas' estimate for gas leaks and the estimate for vinyl chloride surviving the pilot flame. Based upon their respective selection of values, this is a comparison of the parties' recommendations:

V A L U E S  
(cubic foot per hour)

<u>Factors</u>	<u>SoCalGas</u>	<u>GSF</u>	<u>PG&amp;E</u>
Y exposure limit	0.00042	0.00042	0.00042
U respiratory retention	1.0	1.0	1.0
E exposure time	1.0	1.0	1.0
L leakage	0.47	0.02	0.47
F survival in pilot flame	0.18	0.01	0.18
C gas flow and consumption	0.6	0.6	0.6
V volume of air in house	10,600	10,600	10,600
A air changes per hour	<u>1.1</u>	<u>1.1</u>	<u>1.1</u>
X Standard (0.3)	117 ppb	2,599 ppb	100 (rounded)
X Standard (3.0)	1,170 ppb	25,999 ppb	1,000 ppb

The parties also agree that the standard should be applied to the first customer supplied landfill gas.

In summary, we find SoCalGas' methodology and proposed standard reasonable and adopt it.

Methodology

SoCalGas presented the testimony of Dr. Edelman and PG&E presented the testimony of Dr. Furtado. These witnesses sponsored the development of their respective standard and explained the methodology and general process of assessing the risk of injury from exposure to chemicals. Their methodology is the same and is undisputed.

Both Edelman and Furtado have the education, background, and experience to qualify as experts in the field of chemical risk assessment. Edelman is a medical doctor certified in Occupational Medicine and in Medical Toxicology. He is an instructor of risk assessment and has published papers on chemical injury and injury

prevention. He is Chief of Toxicology and Medical Director of one of California's seven Regional Poison Centers. Edelman is a member of numerous state, national, and international committees which are involved in chemical safety.

Furtado is PG&E's manager of its Environmental Services Department which oversees compliance with environmental law. Furtado has a Ph.D. in Civil Engineering and is a certified Industrial Hygienist with over 25 years of experience in environmental issues. He is a member of several committees involved with industrial health.

Based upon the testimony of Edelman and Furtado, we derive the following discussion of risk assessment. Although, initially intended to challenge CACD's methodology, these descriptions provide support for adopting a method which is scientific and based upon standard statewide assumptions and values.

Risk assessment is a scientific process to develop a health standard and apply that standard. In the case of a regulatory agency, the application is often to limit the release of harmful chemicals. However, risk assessment is also used by water quality and toxic waste agencies to control hazardous waste sites. Since risk assessments are used for many regulatory purposes, a body of accepted procedures has developed.

The process of risk assessment is not merely the application of an equation to a given scenario, although an equation and a specific site or environment is used. In applying facts to obtain values of factors in an equation, scientific judgment, ground rules and basic proven assumptions are used. Therefore, while the process tends to generate a single value, such as a standard, it is universally recognized that the single value represents a range of judgments and assumptions.

In risk assessment, exposure becomes a scenario which describes how an individual could potentially be exposed to the



agent in question. From the context of the exposure scenario, we derive the various elements which impact the risk level. Exposure involves the actual level (concentration of the chemical), duration, mode (ingestion, absorption, inhalation) and the body's reaction. In making assumptions, SoCalGas and PG&E used assumptions specified in regulations pursuant to Proposition 65.

The elements are then, usually, combined in a mathematical form called a model. In supplying estimates for factors within the model, or equation, it is preferable to use actual field or laboratory data. However, if this cannot be done, the next choice is to mathematically predict the unknown characteristics. As a last resort, a surrogate chemical agent similar to the one in question may be substituted. Since there is no actual data showing the effect on humans exposed to vinyl chloride in landfill gas supplied to residences or commercial places, SoCalGas and PG&E used the second method to develop a standard, predicting the reaction in these scenarios.

#### Undisputed Variables

SoCalGas uses Cal EPA's standard model for assessing indoor air quality. Although SoCalGas, PG&E, and GSF calculated a standard for both residential and commercial scenarios, they agree that the more conservative standard derived from the residential scenario should be adopted.

Parties also agree that SoCalGas' variables for air ventilation (A), volume of air within the average-sized dwelling (V), pilot flame consumption rate (C), exposure time factor (E), and human respiratory retention rate (U) are reasonable. We describe the basis for each of the undisputed variables and agree that SoCalGas' justification and selection of values for these variables are reasonable.

SoCalGas evaluates the possible ways vinyl chloride can enter a room in a residence or commercial kitchen. SoCalGas excludes the possibility of entry through furnace or hot water

heater pilot lights because these appliances are required by building standards to be vented to outside air. This leaves entry through residential or commercial stove pilot lights and undetected breaks in the pipeline. GSP disputes SoCalGas' estimated values for both entry through pilot light and undetected leaks but agrees that these factors are a necessary part of the equation.

There is no dispute over the consumption rate of gas by each pilot light. Based upon its customer service staff estimates, SoCalGas assumes that a residence has one stove with two top pilot lights and one oven pilot light. Actual field experience also shows that the typical commercial stove has a maximum of 15 pilots. Adding the consumption for each pilot, the average consumption rate (C) for a residential stove is 0.6 cubic foot per hour and for a commercial stove, 7.5 cubic feet per hour.

After calculating the amount of vinyl chloride entering the space, SoCalGas divides the result by the estimated volume of air space and air ventilation. SoCalGas bases its estimates of the average volume of space in a residence (V) on the residential averages used in the study, "Simulation of Indoor Nitrogen Dioxide Concentrations." This study was conducted by SoCalGas and the Gas Research Institute in 1988. The study estimates the volume of space in the average home to be 10,600 cubic feet in an average residence of 1,325 square feet with an 8-foot ceiling. Estimates of the average commercial space are the judgment of SoCalGas commercial customer service staff based upon their field experience. They estimate the average commercial space to be 800 cubic feet.

SoCalGas bases its residential estimate of air ventilation on its own studies and those of the Gas Research Institute. These sources indicate that the average residential ventilation rate is 1.1 air exchanges per hour (A). This average includes a low of 0.59 air exchange per hour in the summer and 1.69 in winter when homes have fewer open doors and windows. For the

commercial scenario, SoCalGas bases its estimate on the recommended restaurant ventilation rates for acceptable air quality determined by the American Society of Heating, Refrigerating, and Air Conditioning Engineers.

The total amount of vinyl chloride, leaks plus amount surviving combustion, is multiplied by the length of exposure and the lung retention rate to obtain the total exposure over a lifetime. SoCalGas uses Cal EPA's standard exposure periods for adults in residences and commercial places. Cal EPA assumes a lifetime exposure to a cancer-causing chemical and does not promulgate a separate standard for children. Cal EPA's exposure period for continuous exposure in residences is 24 hours per day, 365 days per year for a 70-year lifetime. The corresponding standard for occupational or commercial places is 40 hours per week, 50 weeks per year for a working lifetime of 40 years.

The estimate for lung retention was removed after SoCalGas learned that Cal EPA had included this adjustment in its standard daily exposure limit of 0.3 microgram per day. Therefore, in its written testimony, SoCalGas revised its estimate to remove the uptake factor (U).

#### Disputed Variables

GSP disputes SoCalGas' estimates for undetected leaks (L) and vinyl chloride surviving the pilot flame (F). The leak rate and survival factor are added to obtain the total amount of vinyl chloride in natural gas entering the space. The difference in these two estimates is the reason for the wide differences between GSP and SoCalGas' proposed standards.

#### Leak Rate

SoCalGas uses a leak rate based upon its own room odorization tests conducted over the last 2-1/2 years. The tests indicate the average person smells gas when it reaches a concentration level of 40 ppm parts of gas in a room. Initially, SoCalGas recommended an estimate based upon the measurements of

leak flows taken from customer repair reports. However, SoCalGas' written testimony relies on its room odor tests of the past 2-1/2 years. This revision substantially lowered SoCalGas' proposed standard. The abandoned estimate is now recommended by GSF.

SoCalGas estimates a leak rate of 0.47 cubic foot per hour. SoCalGas does not attempt to define the source of the leak. It may be from an undetected broken pipe or a pilot light that is unlit. SoCalGas assumes that the leaking gas is evenly distributed and is undetected for a period of 70 years in a residence and 40 years in a commercial place.

GSF disputes the leak rate and the assumptions surrounding the leak rate. GSF questions the accuracy and validity of SoCalGas' room odorization tests because they are not validated by a third party and its witness is unfamiliar with the details of the tests. GSF points out that the parties agree that actual measured data is preferred over equations and assumptions. GSF contends that SoCalGas should use its 400 actual field measurements and similar PG&E data which are collected during customer leak complaint service calls. These data indicate that customers detect leaks at flow rates as low as 0.02 cubic foot per hour. GSF uses this lower flow rate in its proposed standard.

GSF contends that SoCalGas' use of odorization tests in which average people detect gas at concentrations of 40 ppm within 30 seconds to two minutes after exposure conflicts with its basic assumption that a gas leak will be undetected for 70 years. In addition, GSF considers the length of the undetected period to be unreasonable.

SoCalGas responds that the leak measurements in the field are not as accurate as a controlled odorization tests. Flow rates in the field are the repairman's estimate of movement of the dial in the gas meter from visual observation. Therefore, there is much subjective judgment in measuring the leak flow rate. In addition, measuring the leak is not the primary purpose of a repair visit

and, therefore, leak measurement may be performed in haste. We agree that the most accurate information, the odorization test results, should be used as the basis of estimating gas leaks.

SoCalGas' witness, Sostek, indicated that leak data show that most leaks are not caused by unlit pilots but by breaks in pipes under the floors, in walls, and in crawl spaces. This means gas is often located in a place where the odor is not readily detectable. Because of the location of leaks and because some customers have no sense of smell, SoCalGas believes many leaks are not discovered for long periods of time and others are never reported. In view of this uncertainty, SoCalGas believes the best estimate of leaks is the highest reasonable one. We agree.

#### Combustion Rate

In order to determine the amount of vinyl chloride entering the space through a pilot light, we must consider the amount of vinyl chloride burned by the pilot flame. The amount of vinyl chloride burned is subtracted from 100% to give the percentage of vinyl chloride that survives the flame. SoCalGas believes that a conservative rate of 82% combustion should be used, giving a survival rate of 18%. GSF argues that the combustion rate of 99% is closer to SoCalGas' test results, giving a survival rate of 1%.

SoCalGas and GSF rely on the same combustion tests to derive their estimates. In 1983 and 1985, SoCalGas sponsored combustion studies. Science Applications, Inc. was hired to conduct tests on the destruction of vinyl chloride in gas in a range top burner and pilot light flame. Approximately 30 different tests were run, using a variety of burner conditions, including maladjusted burners. Only one test on a pilot flame was performed. In this test, the combustion was roughly 99%. In all but one of the burner tests, vinyl chloride was totally destroyed by the flames. The detection level was 1 ppb in the 1983 tests and .1 ppb in the 1985 tests. In one burner flame test in 1983, some vinyl

chloride was detected, although the level was so low that it could not accurately be measured. Under the level of accuracy available, the destruction rate was 82%.

In addition, the South Coast Air Quality Management District (SCAQMD) data on the destruction of vinyl chloride in flares at landfills was reviewed. A flare has a larger flame than a range burner or pilot light; however, its temperature is lower. There may be little comparability between flare tests and those on burners and pilot lights; however, the SCAQMD data are the only other tests available on combustibility of vinyl chloride. SCAQMD performed some of its tests on Cambrian Energy System flares. These tests resulted in one destruction rate of 91.3% and four at 99% or greater. Other SCAQMD tests showed combustion rates ranging from 96% to over 99%. SoCalGas' witness, Sostek, admitted he selected the most conservative estimate of all the data and chose not to use an average because there was only one test on a pilot light.

GSP argues that a rate in the high 90% range should be used. We cannot agree. With only one test on a pilot light, knowing that the variance in heat may affect the results, yet not understanding how, and with no analysis to explain the varying results, even an average of these test results is not reliable. Nor is there any reasonable justification for using the highest results, a 1% destruction rate. There is clearly a lack of pilot light test results. Therefore, we believe a conservative estimate should be used and find 82% reasonable.

Attenuation Adjustment

SoCalGas and PG&E recommend that after a standard is set, gas utilities should be allowed on a case-by-case basis to apply for permission to receive landfill gas with a higher vinyl chloride concentration. The gas utility must demonstrate that dilution with other system gas will result in no customer receiving gas with a concentration of vinyl chloride exceeding the standard.

We believe this is a reasonable request that allows application of this attenuation factor only after Commission review of all the surrounding circumstances. Applicants for this treatment must file an application demonstrating that granting authority will not endanger public health. Use of the application process will allow notice to the public and interested parties and the opportunity to comment on the request.

Because of the Commission's concern for public safety, it is reasonable to require that gas utilities immediately report to the Commission Safety Division any occurrence of supplying natural gas to a customer which exceeds the adopted standard, what measures are being taken to alleviate this occurrence, and when this situation is terminated.

Findings of Fact

1. The Commission is required by AB 4037 passed in 1988 to establish the maximum amount of vinyl chloride in natural gas supplied by gas utilities. Until this standard is established, gas producers are prohibited from selling to a gas corporation landfill gas containing vinyl chloride in an amount which exceeds the operative "no significant risk" level set forth in the California Code of Regulations. Prior to October 24, 1992, these regulations specify that the maximum level of vinyl chloride permissible in air that poses no significant risk is 0.3 microgram per day.

2. Effective October 24, 1992, the "no significant risk" standard of 0.3 microgram per day is revised to 3.0 micrograms per day.

3. This proceeding was instituted after the legislative deadline for establishing the vinyl chloride standard. However, gas utilities participating in this proceeding report no purchases of landfill gas since the enactment of AB 4037.

4. The order in this proceeding included a proposed standard prepared by CACD. The proposed standard was 1.66 ppb vinyl chloride to natural gas.

5. Comments filed by SoCalGas, PG&E, and GSF opposed CACD's proposed methodology, offered an alternate method, and estimated the standard which would result under the alternative method.

6. Initially, SoCalGas, PG&E, and GSF proposed the same alternate methodology, but because of different values for factors, estimated widely varying standards to replace CACD's recommendations.

7. During the proceeding, SoCalGas, PG&E, and GSF revised their estimates. The final proposed standards are, respectively: 1,170 ppb; 1,170 ppb, rounded to 1,000; and 25,999 ppb, rounded to 26 ppm.

8. After these revisions and prior to evidentiary hearings, CACD indicated it accepted SoCalGas' recommendations as reasonable and adequate to protect public health. CACD did not participate further in the proceeding.

9. A comparison exhibit prepared by the parties indicates agreement on the equation which represents the appropriate standard and agreement on various variables. The undisputed equation is:

$$X = \frac{YVA}{UE(L + FC)}$$

Where: Y is the micrograms (ug) of vinyl chloride (VC) per cubic foot (ft<sup>3</sup>) of air per day

U is the respiratory retention factor

X is the ug of VC/ft<sup>3</sup> in gas

E is the exposure time factor

L is the leakage of gas from non-stove pilot sources

F is the destruction survival fraction of VC after exposure to the pilot flame

C is the pilot flame consumption rate



V is the volume of air within the average-sized dwelling

A are the air changes per hour

10. Parties agree that the standard estimated under the residential scenario should be used. The standards established under the commercial scenario are less than those under the residential scenario.

11. Parties agree that the following values for factors within the undisputed equation above for the residential scenario:

$$Y = 0.00042 \text{ ug/ft}^3$$

$$U = 1$$

$$E = 1$$

$$C = 0.6 \text{ ft}^3/\text{hr}$$

$$V = 10,600 \text{ ft}^3$$

$$A = 1.1$$

12. SoCalGas' air ventilation rate (A) is based upon its studies and those of the Gas Research Institute indicating an average residential ventilation rate of 1.1 air exchanges per hour.

13. SoCalGas' residential exposure period estimate (E) is the same as the standard periods used by environmental agencies, 24 hours per day, 365 days per year for a 70-year lifetime.

14. SoCalGas' pilot flame consumption rate (C) is based upon the assumption that a residence has one stove with two top pilot lights and one oven pilot light. Adding the consumption for each pilot, the average consumption rate for a residential stove is 0.6 cubic foot per hour.

15. SoCalGas' human respiratory rate (U) is deleted because it has been used in Cal EPA's calculation of the daily maximum.

16. SoCalGas' volume of air within the average-sized dwelling (V) is based upon the residential averages used in the study, "Simulation of Indoor Nitrogen Dioxide Concentrations." This study was conducted by SoCalGas and the Gas Research Institute in 1988. The study estimates the volume of space in the average home to be

10,600 cubic feet for an average residence of 1,325 square feet, with an 8-foot ceiling.

17. SoCalGas provides reasonable justification for its selection of the undisputed estimates for air ventilation (A), volume of air within the average-sized dwelling (V), pilot flame consumption (C), exposure time (E), and human respiratory retention rate (U).

18. GSF disputes SoCalGas and PG&E's estimates for leaks. GSF believes that the results of data collected in the field while repairing customer leaks are more reliable than experimental odorization tests. The difference in the two sources of data represents the major reason GSF's standard is significantly higher than SoCalGas'.

19. SoCalGas' field data indicates leaks are repaired that measure a flow of 0.02 cubic foot per hour. However, the measurement of leaks is not a priority in responding to customer complaints of leaking gas. Therefore, these measurements are not reliable.

20. For its estimate of gas leak flow rates, SoCalGas reasonably relies on room odor tests indicating that gas is detected when it reaches a concentration level of 40 ppm parts of gas in air. SoCalGas assumes that this gas is distributed evenly and is not detected.

21. GSF disputes SoCalGas and PG&E's value for the destruction of vinyl chloride by a pilot flame. GSF contends that the one pilot test indicates 99% destruction and that the recommended 82% derived is unreasonable. However, since there is only one test of pilot flame destruction, it is reasonable to use a conservative estimate instead of the highest estimates of burner and flare tests or an average of these tests.

22. The parties recommend the following proposed standards be established: SoCalGas, 1,170 ppb; PG&E, 1,170 ppb, rounded to 1,000 ppb; GSF, 25,999 ppb or 26 ppm.

23. SoCalGas' proposed standard of 1,170 ppb is reasonable.

24. SoCalGas, PG&E, and GSP request that a gas utility be allowed to request permission to receive landfill gas with a content of vinyl chloride higher than the standard adopted in this proceeding. It is reasonable to allow this request in an application intended to demonstrate that dilution of the requested gas within the utility system will not result in any customer receiving gas with a concentration level of vinyl chloride exceeding the Commission-adopted standard.

25. Southwest requested that the air quality district be ordered to review vinyl chloride testing procedures used by landfill projects within a specified period of time. The air quality district and landfill projects are not within our jurisdiction. Therefore, we cannot grant this request.

Conclusions of Law

1. Cal EPA mandates that vinyl chloride in air may not exceed 3.0 micrograms per day, effective October 24, 1992.

2. SoCalGas' methodology for developing a standard for the maximum amount of vinyl chloride in natural gas is reasonable.

3. General Order 58-A should be revised to include SoCalGas' proposed standard for vinyl chloride concentration in natural gas and existing testing and reporting requirements.

4. Gas utilities should be required to notify the Commission of the beginning and end of hazardous conditions caused by vinyl chloride.

ORDER

IT IS ORDERED that General Order 58-A, Standards For Gas Service In The State of California, is revised to include the following section:

7. Purity of Gas

e. Vinyl Chloride

No regulated gas utility shall knowingly purchase landfill gas if that landfill gas, when supplied to any existing gas customer, contains vinyl chloride in a concentration greater than 1,170 parts per billion by volume. This value is adopted as instructed by Section 25421(b) of the California Health and Safety Code as the maximum amount of vinyl chloride that may be found in landfill gas supplied to a gas utility customer pursuant to Section 25421(a). Testing for vinyl chloride shall be performed as specified by Section 25421(d) of the Health and Safety Code. When vinyl chloride exceeds the limits set forth herein, the gas utility shall notify the Commission and commence remedial action immediately. The gas utility shall notify the Commission when the level of vinyl chloride is reduced to allowable limits. Direct delivery for industrial use of landfill gas is exempted from these requirements as provided by Section 25421(e). A gas utility desiring to purchase landfill gas with a vinyl chloride content that exceeds the Commission-adopted standard shall file an application with the Commission. The application shall demonstrate that dilution of landfill gas exceeding the Commission's standard with other natural gas in the utility's system shall not result in any customer

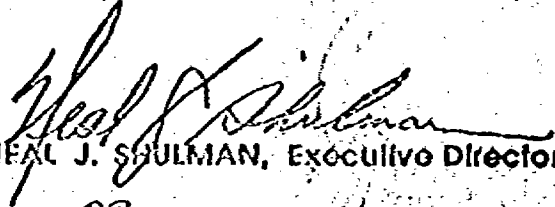
receiving gas with a vinyl chloride  
concentration level exceeding the  
Commission's standard.

This order is effective today.

Dated December 16, 1992, at San Francisco, California.

DANIEL Wm. FESSLER  
President  
JOHN B. OHANIAN  
PATRICIA M. ECKERT  
NORMAN D. SHUMWAY  
Commissioners

I CERTIFY THAT THIS DECISION  
WAS APPROVED BY THE ABOVE  
COMMISSIONERS TODAY

  
NEAL J. SHULMAN, Executive Director