ALISO CANYON GAS LEAK
Results of Air Monitoring and Assessments of Health

SUPPLEMENTAL REPORT:
Updated Results and Expanded Chemical Testing

February 13, 2016

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Public Health

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SECTION I. Introduction and Purpose

This report updates and expands information on results from the Expanded Air Monitoring Plan (EAMP) conducted within the Southern California Gas Company's Aliso Canyon storage facility and the surrounding community. The EAMP was implemented in response to a long-term leak of natural gas emissions from one of the wells (SS-25) at the facility. This report supplements information provided in a previous report, "Aliso Canyon Gas Leak: Results of Air Monitoring and Assessments of Health," which was published on February 5, 2016. The earlier report provided results for the primary chemicals of concern as well as results from a range of activities to assess health effects in residents, pets, and other animals in the community.

The EAMP is being conducted under the direction of the Los Angeles County Department of Public Health (Public Health) and partnering agencies, including Los Angeles County Fire Department (LACoFD), South Coast Air Quality Management District (SCAQMD), Los Angeles Unified School District (LAUSD), California Air Resources Board (CARB), and the Office of Environmental Health and Hazard Assessment (OEHHA). As part of the plan, the Southern California Gas Company (SoCalGas) has performed testing for a comprehensive list of chemicals that could be associated with the gas leak incident. In addition, SCAQMD and LAUSD conducted independent testing of a wide range of volatile organic compounds.

This report updates previous results by including information from the most recent air monitoring samples for methane and benzene. In addition, this report provides results for additional chemicals, including volatile organic compounds, an expanded list of hydrocarbons, polycyclic aromatic hydrocarbons, various sulfur-containing compounds, metals, and radon. Of note, this report is published on the day immediately after the date (February 11, 2016) on which Southern California Gas Company "controlled" emissions from the leaking well. "Control" has resulted from the successful interception of the leaking well through a relief well and the injection of mud and other fluids, leading to a cessation of emissions from the well. While cementing of the well and eventual confirmation by the California Division of Oil, Gas and Geothermal Resources (DOGGR) that the well has been permanently capped is pending at this time, it is possible that no further emissions will leak from the well.

Section II: Chemicals of Health Concern

The major chemicals of health concern resulting from the natural gas leak are methane, sulfur odorants, and benzene. Other compounds, including toluene, ethylbenzene, xylene, other volatile organic compounds, various hydrocarbons, metals and radon, are present in natural gas in very small amounts. The February 5, 2016 report provided information on the health effects of methane, sulfur odorants and benzene. Information on the health effects of the other chemicals is summarized below.

Toluene

Toluene is a clear, colorless liquid with a distinctive smell. It occurs naturally in crude oil and in the tolú balsam tree of South America. It is produced in the process of making gasoline and other fuels from crude oil and in other industrial processes. Toluene may cause irritation of the eyes and upper respiratory tract. Low to moderate exposure can cause dizziness, headache, fatigue, confusion, weakness, memory loss, nausea, and loss of appetite. Long-term daily inhalation exposure to high levels of toluene may cause loss of hearing and/or loss of color vision.

Ethylbenzene

Ethylbenzene is a colorless, flammable liquid that is found naturally in coal tar and crude petroleum. It is used as a component in the manufacturing of paints, varnishes, inks, pesticides, carpet glues, solvents, automotive and tobacco products, and for making the chemical, styrene. Ethylbenzene is an eye, skin, and mucous membrane irritant, and exposure to high levels in air may cause dizziness, headache, fatigue, irritability, sleepiness, and lack of muscle coordination. Evidence from animal studies indicates that ethylbenzene can cause cancer.

Xylene

Xylene is one of the top 30 chemicals produced in the United States (based on volume). It exists in three forms or isomers: meta (m-), ortho (o-), and para (p-) xylene, all of which are typically mixed with ethylbenzene to make commercial xylene. Classified as an aromatic hydrocarbon and volatile organic compound, xylene is a colorless, sweet-smelling liquid. It occurs naturally in petroleum and coal tar, and is used in several industries as a solvent and cleaning agent, and as a paint thinner. Xylene evaporates easily and is typically degraded by sunlight within two days. Short-term effects from inhalation include difficulty breathing; nose, throat, or eye irritation; nausea, vomiting, impaired short-term memory and an altered sense of balance. Exposure to high levels can be associated with neurological, reproductive and developmental effects.

Other Volatile Organic Compounds

Many volatile organic compounds (VOCs) are human-made chemicals that are used and produced in the manufacturing of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They often are compounds of fuels, solvents, hydraulic fluids, paint thinners, and dry-cleaning agents commonly used in urban settings. Environmental contamination by VOC is a health concern because many are toxic and are known or suspected human carcinogens.

Hydrocarbons

Methane is the primary hydrocarbon in natural gas. Other hydrocarbons, including ethane, propane, and butane, are colorless and either odorless or faintly petroleum-smelling gases. They are used in many industries and are by-products of natural gas processing and petroleum refining. These gases are flammable and inhalation in very high concentrations can cause dizziness, confusion, drowsiness, excitation, unconsciousness, and asphyxia. Chronic exposure to butane can cause symptoms related to effects in the central nervous system.

Metals

Natural gas from the Aliso Canyon storage facility may contain trace levels of heavy metals. Chronic inhalation exposure to metal dusts is linked to the development of respiratory and neurological diseases, as well as a variety of cancers.

Polycyclic Aromatic Hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) are a group of more than 100 different chemicals that form during incomplete combustion of coal, oil, gas or other organic materials. PAHs are typically found as a mixture (e.g., soot) that contains two or more of these compounds. PAHs are colorless, white, or pale yellow solids. A few are used in medicines, dyes, plastics and pesticides. Depending on the type of PAH, inhalation exposure can have harmful effects on the skin, body fluids and the ability of the human body to fight disease. Some PAHs have caused cancer in laboratory animals following inhalation exposure.

Hydrogen Sulfide

Hydrogen sulfide is a colorless gas with a characteristic odor of rotten eggs. It is poisonous, corrosive, flammable, and explosive. Acute effects can include nausea, tearing of eyes, headaches, loss of sleep, breathing problems, fatigue, and respiratory tract irritation. Hydrogen sulfide can cause serious injuries to the body, with exposure to high levels resulting in collapse and death. Long-term health effects, including cardiovascular problems, can occur in persons with high levels of exposure.

Radon

Radon is an odorless, colorless and radioactive gas that is produced as a result of the natural decay of uranium and thorium that is present in soil and rock. Radon is present in low concentrations in outdoor air and can accumulate in indoor air in certain situations. Exposure to elevated levels of radon for long periods of time can lead to lung cancer. Some studies have linked radon to other types of cancers as well.

SECTION III. Summary of Activities to Monitor Air Quality related to the Expanded List of Chemicals

Since the onset of the gas leak, SoCalGas and other agencies have collected air samples to determine the levels of various chemicals in the air. In addition to the primary chemicals of concern described in earlier reports, SoCalGas sampled for other hydrocarbons (e.g. ethane, butane, styrene) and AQMD tested for volatile organic compounds. Due to the possible presence of other trace chemicals in natural gas, Public Health requested samples near the SS-25 well be tested for a broader list of volatile organic compounds, semi-volatile organic compounds, polycyclic aromatic hydrocarbons, and metals. Public Health also requested that an outdoor air radon sample be collected near the SS-25 well. In addition, LAUSD tested indoor air at two local schools for radon. Additional information on the collection of air samples is provided below.

SoCalGas

From November 10 to December 20, 2015, SoCalGas tested routinely for hydrocarbons in all of the grab samples collected from within the Aliso Canyon facility and throughout the community. Due to different laboratory lists for hydrocarbons and the use of multiple laboratories, the frequency of testing for each hydrocarbon compound varied. The Results section below presents information on the levels of hydrocarbons that were detected.

In addition to testing for other hydrocarbon compounds, Public Health directed SoCalGas to collect three 12-hour samples downwind of the SS-25 well location. Concurrently, a 12-hour sample was collected from a single upwind location. These samples were collected on January 27, 2016 and analyzed for volatile organic compounds, polycyclic aromatic hydrocarbons, and metals (see **Figure 1**).

From January 22 through January 29, 2016, SoCalGas tested for radon downwind of the well SS-25. Under agency oversight, SoCalGas performed a 7-day radon test using sampling devices called electrets.

LAUSD

LAUSD collected air samples at 16 schools and conducted real-time air monitoring using handheld monitors at 20 schools. Indoor air from two schools in the community were sampled for radon. Chemicals measured include methane, sulfur compounds, benzene, toluene, ethylbenzene, xylene, and radon.

SCAQMD

SCAQMD conducts independent air sampling and monitoring activities, including periodic “grab” samples in the community in response to odor complaints and 24-hour sampling in the community every three days. Samples are tested for methane, and/or benzene along with other volatile organic compounds. Cumulative average results (and range) for SCAQMD air sampling are included as the final bar on Figures 1 through 6.

SECTION IV. Results of Activities to Monitor Air Quality and Assess Health Effects

Methane and Benzene

Figures 1 and 2 display the weekly maximum, minimum and average methane and benzene concentrations, respectively, in the community. For the most recent week of air sampling (January 28 - February 3, 2016), the average <u>methane</u> concentration in the community was 5.2 parts per million (ppm) (range: 1.3 - 9.7). The cumulative average concentration of methane across the entire period of monitoring is

8.4 ppm. These levels are far below the flammability limit of 50,000 ppm. For the most recent week, the average benzene concentration was 0.11 parts per billion (ppb) (range: 0.07 - 0.39). The cumulative average benzene concentration across the entire period of monitoring is 0.24 ppb. These levels are well below the chronic exposure limit (1.0 ppb). Two 12-hour integrated samples were collected from a location (Dearborn Park) that is distant from the Aliso Canyon storage facility to provide an estimate of the prevailing benzene level within the San Fernando Valley. Samples collected on February 3 and February 4, 2016 measured the benzene level as 0.12 ppb and 0.21 ppb, respectively. These levels are comparable to the most recent weekly average (0.11 ppb) measured in the community, suggesting that benzene levels in the community are currently at background levels.

Toluene, Ethylbenzene and Xylene

Table 1 summarizes the number of samples collected and analyzed for toluene, ethylbenzene and xylene compounds. Overall, test results for the large majority of the 1847 samples collected were below detection limits. Because the averages shown for samples from within the facility and the community only include those samples with detectable levels, the actual average levels are well below those shown. While the average concentrations detected in outdoor air from within the facility are greater than those within the community, all levels are below health protective levels. These results indicate that no health effects are expected from exposure to these chemicals.

Figure 3 displays the weekly maximum, minimum, and average toluene levels detected in “grab” samples collected by SoCalGas from within the community. Toluene levels remain below levels of concern (70 ppb) and do not pose an increase in health risk. The SCAQMD results of samples collected from the community show an average of 0.9 ppb which is similar to the SoCalGas average of 1.0 ppb. Overall, the chart shows that there has been a trend of decreasing toluene levels since mid-December, which is comparable to the trends observed for methane and benzene in Figures 1 and 2.

Figure 4 displays the weekly maximum, minimum, and average ethylbenzene levels detected in “grab” samples collected by SoCalGas from within the community. Ethylbenzene levels remain below the level of concern (400 ppb) and do not pose an increase in health risk. The SCAQMD results show an average of 0.01 ppb which is lower than the SoCalGas average of 0.2 ppb. Overall, the chart does not show an observable trend in the levels of ethylbenzene since the beginning of the incident.

Figure 5 displays the weekly maximum, minimum, and average m,p-xylene levels detected in “grab” samples collected by SoCalGas from within the community. Levels of m,p-xylene remain below the level of concern (200 ppb) and do not pose an increase in health risk. The SCAQMD results show an average of 0.2 ppb which is lower that the SoCalGas average of 0.4 ppb. Higher levels of m,p-xylene were detected in air during the week of December 24, 2015. Overall, the chart does not show an observable trend since the beginning of the incident and the current levels do not pose an increase in health risk.

Figure 6 displays the weekly maximum, minimum, and average o-xylene levels detected in “grab” samples collected by SoCalGas from within the community. Levels of o-xylene remain below levels of concern (200 ppb) and do not pose an increase in health risk. The SCAQMD results show an average of 0.02 ppb which is lower than the SoCalGas average of 0.3 ppb. There is a gap in the graph during December 2015 due to poor laboratory detection limits, which were not able to detect and measure presumably low levels of o-xylene in the air samples. Overall, the chart does not show an observable pattern over time.

Hydrocarbon Compounds

Table 2 displays results of tests for hydrocarbons from air samples collected within the facility and the community. Overall, for 94% of the samples, the concentration of hydrocarbon was at a level below the instrument detection limit; for only 6% of tests, the level was above the limit. Hydrocarbon compounds with the highest frequency of detection include ethane (51%), dodecane (37%), and 2-methylpentane (30%). For the majority of compounds, the average concentration measured within the facility is greater than within the community. This suggests that most of these compounds may be being emitted into outdoor air during the gas leak incident. Many of these compounds do not have established health protective standards because they are more commonly associated with flammability hazards as opposed to short- and long-term toxicity.

Metals, PAHs and Volatile Organic Compounds

Table 3 displays the sample results for four 12-hour samples that were collected at the Aliso Canyon storage facility on January 27, 2016. Three of the samples were collected from locations downwind of the SS-25 well, while one was collected from an upwind location. Orange shading indicates levels measured in downwind locations that are above the levels measured at the upwind location, which may suggest that these chemicals are being emitted during this incident. Among the seventeen metals being tested, five were detected in samples collected downwind of well SS-25: barium, copper, lead, molybdenum, and zinc. Five of 11 PAHs were detected in samples collected downwind of the well SS-225: dibenzofuran, fluorine, 1-methylnaphthalene, naphthalene, and phenanthrene. For all detected metals, all detected PAHs, and for all but one of the VOCs, downwind levels were greater than upwind levels. All measured levels are well below the permissible occupational exposure limits and therefore do not pose an increase in health risks to employees onsite. Laboratory tests for metals and PAHs have not been conducted for any samples collected in the community; this remains a limitation in the data available to comprehensively assess community health risks.

Hydrogen Sulfide

From within the facility, hydrogen sulfide was detected in five (5) of 1073 grab samples, with levels ranging from 6.6 to 29.1 ppb (average of 14.6 ppb). These detections occurred on four days in mid-November (November 13 – November 28). The occupational permissible exposure limit for hydrogen sulfide is 20,000 ppb.

A total of 1851 "grab" samples were collected from locations within the community and analyzed for hydrogen sulfide. Six (6) samples resulted in detectable levels of hydrogen sulfide (range 3.8 to 183 ppb). Of note, the 183 ppb measure appears to be an outlier as the next highest measured value was 16 ppb. Additionally, hydrogen sulfide was analyzed in 35 community samples with 12-hour sample collection times from January 29, 2016 to February 4, 2016. Hydrogen sulfide was not detected above the laboratory limits which ranged from 5.4 to 13 ppb. While these results suggest that hydrogen sulfide was not at levels likely to have caused any health effects, limitations in the number and quality of the tests performed suggest that further study may be needed. Of note, the Reference Exposure Limit for hydrogen sulfide is 10,000 ppb.

Radon

Multiple air samples were collected in early December for radon testing from two schools in the Porter Ranch community (Porter Ranch Community School and Castlebay Lane Elementary School). Thirty-four samples were collected from Porter Ranch Community School and 24 were collected from Castlebay Lane Elementary School. Results for 28 (48%) of the 58 samples were below the instrument detection limit (0.4 pCi/L) and all of the test results were below the USEPA action level for radon gas (4.0 pCi/L). The maximum level detected in any sample was 1.2 pCi/L.

A twelve-hour radon sample collected on January 19, 2016 from within the Aliso Canyon storage facility, indicated an outdoor air radon concentration level of 1.7 pCi/L, which is below the USEPA action level (4.0 pCi/L).

SECTION V: Summary

Health effects resulting from exposure to chemicals emitted from the Aliso Canyon natural gas leak are likely to be a source of continuing concern to members of the affected communities. As noted in the February 5, 2016 report, a large number of persons living in the community have experienced a variety of symptoms resulting from the exposure. While information and data collected to date indicate that the observed health effects are expected to be short-term in nature, concern about long-term health effects as well as concern about any new short-term symptoms will persist into the near future. The extraordinary scope of this leak, the large number of households that have been relocated (>6,000), and the lack of prior experience with a situation similar to this one will add to the level of concern going forward. Therefore, on-going collection and analysis of data related to chemicals that may have been released is essential to responding to these concerns.

Data collected to date about the levels of chemical emissions on the facility and in community environments are substantial and informative. The level of emissions of methane on the facility serve as a valuable proxy of the level of other emissions over time and has demonstrated a marked decrease in emissions since the leak first occurred, even prior to control of the leak on February 11, 2016. In addition, the gradient observed across the on-facility—facility-boundary—in-community continuum provides a picture that fits with expectations and supports an interpretation that the measured values are valid. These observations taken together allow us to better understand the dynamics of the release over time.

The levels of chemicals of primary concern (methane, odorants, and benzene) have been either non-detectable (odorants) or consistently below levels that are associated with health effects (methane and benzene). As a result of the Expanded Air Monitoring Plan which was initiated in January 2016, SoCalGas conducted tests on a wide range of additional chemicals both on the facility and from community locations. These chemicals included toluene, ethylbenzene, xylene, a long list of hydrocarbons, volatile organic compounds, polycyclic aromatic hydrocarbons, metals, and radon. All results suggest that chemical exposures experienced by residents as a result of the gas leak are below the levels of concern that have been established by various regulatory agencies. This observation stems from two primary factors. First, the primary component of natural gas (methane) does not cause harmful effects in a wide range of concentrations, including those present in the surrounding community. Second, all other components are present in relatively small concentrations. Coupled with the dilution that results from dispersion of the gas across a wide geographic area, these chemicals are present only at very low levels within the community. Collectively, then, the low measured levels make sense.

Several challenges remain, however. First, gaps in data collection for some of the chemicals, especially in the early period of the gas leak, leave open the possibility that exposures may have occurred at a level that would be of concern. Review of the measured levels in comparison with the levels of concern indicate a wide protective gap and suggest that this possibility may be unlikely. Second, the possibility remains that some chemicals were present for which no tests were conducted. Some have suggested, for example, that methane dispersed into the atmosphere may have been converted by sunlight into other chemicals, and that these may have contributed to the observed symptoms. Finally, the frequency distribution of symptoms reported in the February 6th report do not completely match those expected from odorants alone and suggest uncertainty about the cause. While the complaint registry maintained by Public Health was not intended for the rigorous analysis and interpretation applied in the earlier report, the observed results suggest that further study into these possibilities may be warranted.

Public Health will continue to evaluate additional data as these become available. In particular, information on the ambient levels of chemicals in the Los Angeles basin will enhance our ability to understand the results provided in this report and may indicate the need for further study. In addition, follow-up studies on health effects, such as the one mandated by SCAQMD in its instructions to SoCalGas on January 23, 2016, are likely to better define and improve our understanding of the health effects caused by the gas leak.

Appendix

(Tables and Figures)

Table 1. Summary of Toluene, Ethylbenzene and Xylene Results

Source: Southern California Gas Company
Type: "Grab" samples
Dates: November 1, 2016 – February 4, 2016

	Number Detected / Total Samples	% Detects	Community Average	Facility Average	Health Protective Levels*	Units
Toluene	505 / 1847	27%	1.0	2.0	70	ppb
Ethylbenzene	67 / 1847	4%	0.20	0.40	400	ppb
m,p-Xylenes	221 / 1847	12%	0.38	1.12	200	ppb
o-Xylene	55 / 1847	3%	0.32	0.60	200	ppb

ppb = parts per billion
*Chronic Reference Exposure Limits. Health protection levels are established by the US EPA and/or Cal EPA.

Table 2. Summary of Hydrocarbon Compound Results*

Source: Southern California Gas Company
Type: "Grab" samples
Dates: November 10 thru December 20, 2015

	Detects / Total	% Detect	Community Average	Facility Average	Health Protective Levels**	Units
Acetylene	39 / 385	10%	0.0015	0.0030	NC	ppm
1,2,4-trimethylbenzene	38 / 449	8%	0.22	0.43	1.5	ppb
Butane	174 / 1136	15%	0.005	0.067	NC	ppm
Cyclohexane	54 / 449	12%	0.68	3.1	1700	ppb
Decane	31 / 235	13%	0.14	0.25	NC	ppb
2,3-Dimethylbutane	14 / 235	6%	0.39	0.85	NC	ppb
Dodecane	86 / 235	37%	0.21	0.37	NC	ppb
Ethane	380 / 743	51%	0.58	4.9	NC	ppm
Ethylene	48 / 599	8%	0.0018	0.0027	NC	ppm
Hendecane	43 / 235	18%	0.16	0.32	NC	ppb
Heptane	30 / 449	7%	0.45	1.8	NC	ppb
Hexane	79 / 630	13%	0.0008	0.0031	200	ppb
Isobutane	150 / 802	19%	0.005	0.051	NC	ppm
Isopentane	137 / 802	17%	0.005	0.015	NC	ppm
Isoprene	16 / 235	7%	0.68	0.53	NC	ppm
Methylcyclohexane	51 / 235	22%	0.57	2.61	1700	ppb
Methylcyclopentane	49 / 235	21%	0.61	2.30	NC	ppb
2-Methyl Hexane	16 / 235	7%	0.46	0.83	NC	ppb
2-Methylpentane	70 / 235	30%	0.57	2.36	NC	ppb
3-Methylhexane	21 / 235	9%	0.38	0.87	NC	ppb
3-Methylpentane	27 / 235	11%	0.60	1.7	NC	ppb
Styrene	54 / 449	12%	0.2	0.2	200	ppb
2,2,4-Trimethylpentane (Isoctane)	28 / 449	6%	0.46	0.87	NC	ppb

NC = No criteria established by California EPA or US EPA

ppm = parts per million; ppb = parts per billion

*This is a preliminary data summary. Variations among various laboratories are being reconciled.

**Chronic Reference Exposure Limits. Health protection levels are established by the US EPA and/or Cal EPA.

Table 3. Summary of Results Collected Downwind of Gas Leak Location (SS-25)

Source: Southern California Gas Company
Type & Location: 12-Hour "integrated" samples within the Facility
Date: January 27, 2016

	Monitoring Location Site Sample Name				**Health Protection Levels***	**Units**
	Upwind	**Downwind 1**	**Downwind 2**	**Downwind 3**		
	(SS-1)	(SS-3H)	(SF-1)	(SF-2/5)		
Metals						
Barium	0.0085	0.029	0.011	0.011	2.2	ug/m^3
Copper	0.051	0.13	0.015	0.035	NC	ug/m^3
Lead	0.0014	0.0019	0.0015	0.0015	NC	ug/m^3
Molybdenum	0.0019	0.005	ND (0.0013)	ND (0.0016)	0.5	ug/m^3
Zinc	0.015	0.020	0.015	0.014	NC	ug/m^3
Polycyclic Aromatic Hydrocarbons						
2-Methylnaphthalene	ND (0.0039)	0.38	0.039	0.034	70	ug/m^3
Dibenzofuran	ND (0.0024)	0.0048	ND (0.0025)	ND (0.0029)	NC	ug/m^3
Fluorene	ND (0.0030)	0.018	0.0035	ND (0.0035)	700	ug/m^3
Naphthalene	ND (0.0053)	0.23	0.028	0.026	13	ug/m^3
Phenanthrene	ND (0.0032)	0.012	0.0056	ND (0.0038)	NC	ug/m^3
Volatile Organic Compounds						
1,1,2-Trichlorotrifluoroethane	0.069	0.068	0.061	0.074	130000	ug/m^3
1,2,4-Trimethylbenzene	ND	0.32	ND	ND	31	ug/m^3
Benzene	0.1	3.5	0.42	0.43	13	ug/m^3
Carbon Tetrachloride	0.068	0.067	0.06	0.073	180	ug/m^3
Chloromethane	0.2	0.2	0.19	0.23	390	ug/m^3
Cyclohexane	ND	5	0.57	0.57	26,000	ug/m^3
Diethyl phthalate	ND (0.0032)	ND (0.0034)	0.0046	ND (0.0040)	NC	ug/m^3
D-n-butyl phthalate	ND (0.0034)	0.0088	0.0082	0.0092	NC	ug/m^3
Dichlorodifluoromethane	0.38	0.38	0.35	0.42	440	ug/m^3
Ethylbenzene	ND	0.39	ND	ND	4,400	ug/m^3
m,p-Xylenes	ND	1.9	0.21	0.24	440	ug/m^3
Napthalene	ND (0.0053)	0.23	0.028	0.026	13	ug/m^3
n-Heptane	ND	2.1	0.26	0.26	NC	ug/m^3
n-Hexane	ND	5.6	0.7	0.7	3100	ug/m^3
n-Nonane	ND	0.43	ND	ND	NC	ug/m^3
n-Octane	ND	0.92	ND	ND	500,000	ug/m^3
o-Xylene	ND	0.5	ND	ND	440	ug/m^3
Toluene	ND	5.1	0.56	0.62	5400	ug/m^3
Trichlorofluoromethane	0.22	0.22	0.19	0.24	NC	ug/m^3

ug/m^3 = micrograms per cubic meter; ppb = parts per billion

*Occupational health screening levels for potential non-cancer chronic health effects. Health protection levels are established by the US EPA and/or Cal EPA.

Figure 1. Average Weekly Methane Concentrations in the Community

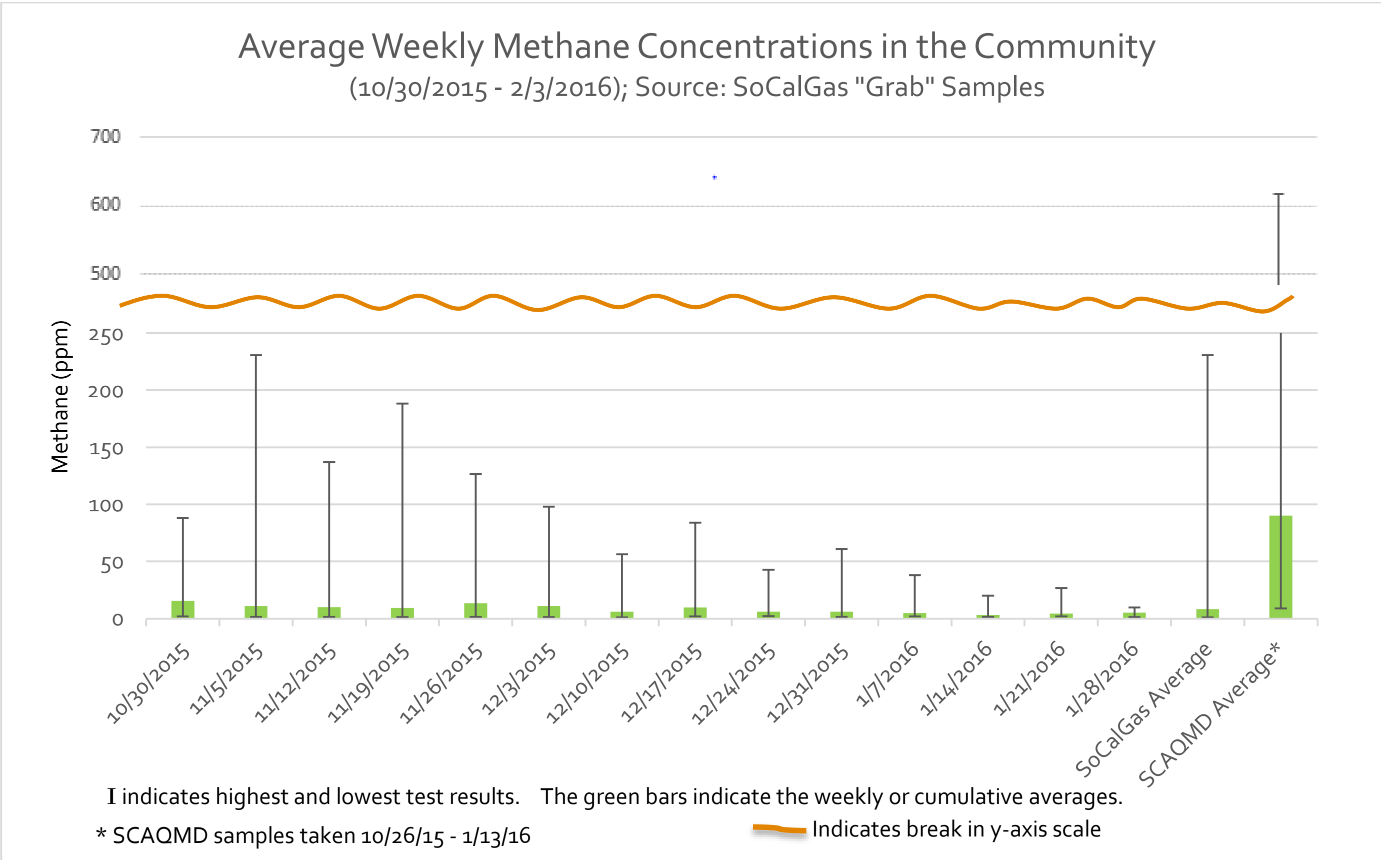
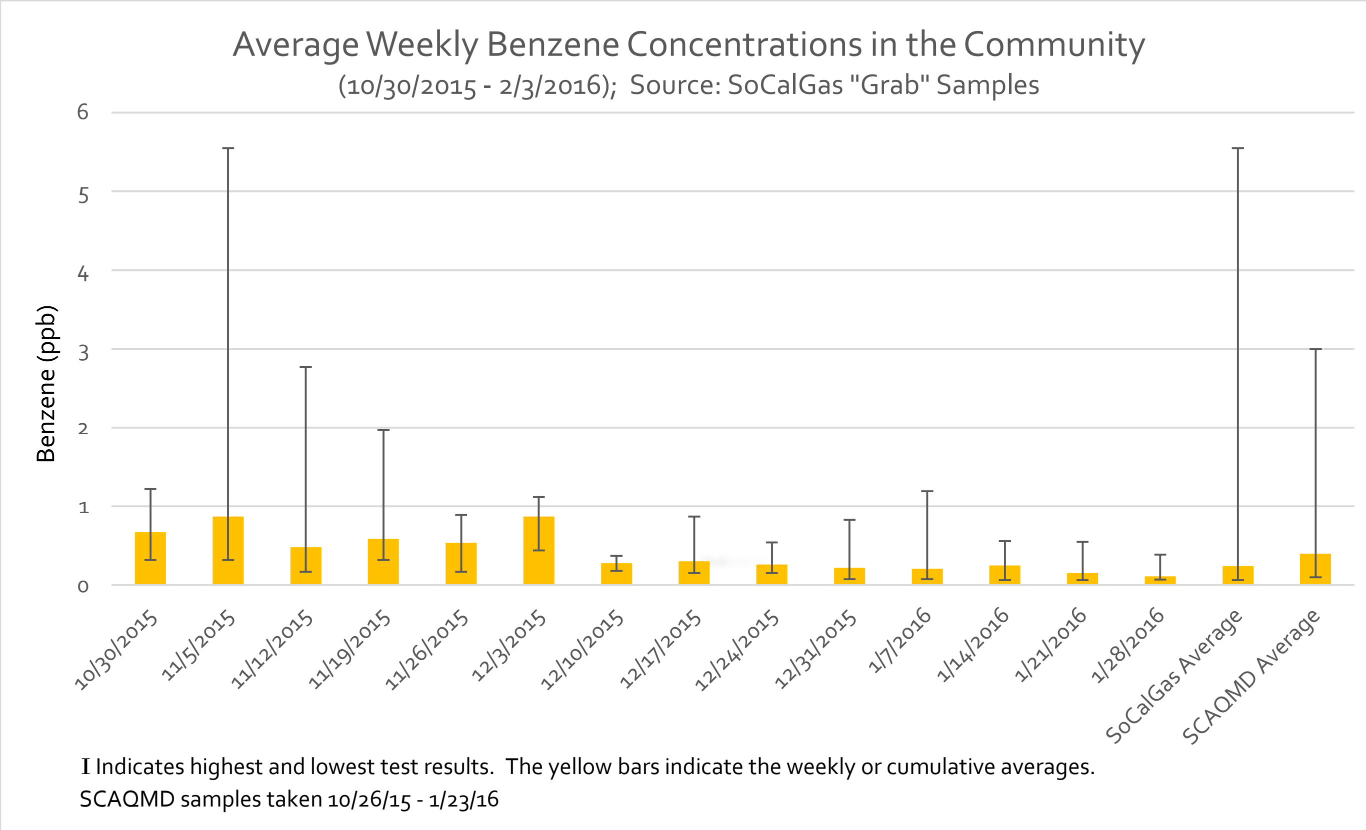
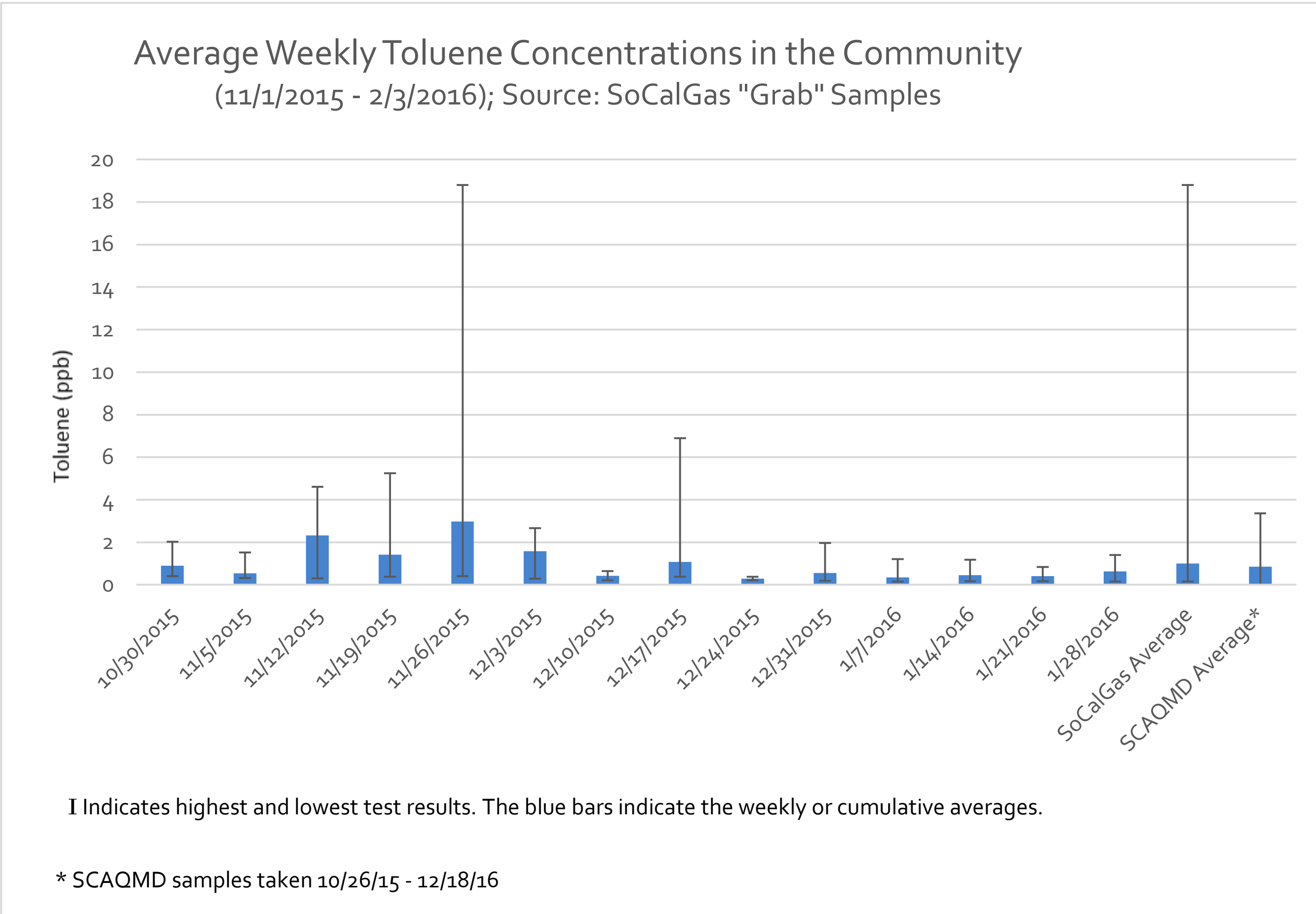


Figure 2. Average Weekly Benzene Concentrations in the Community



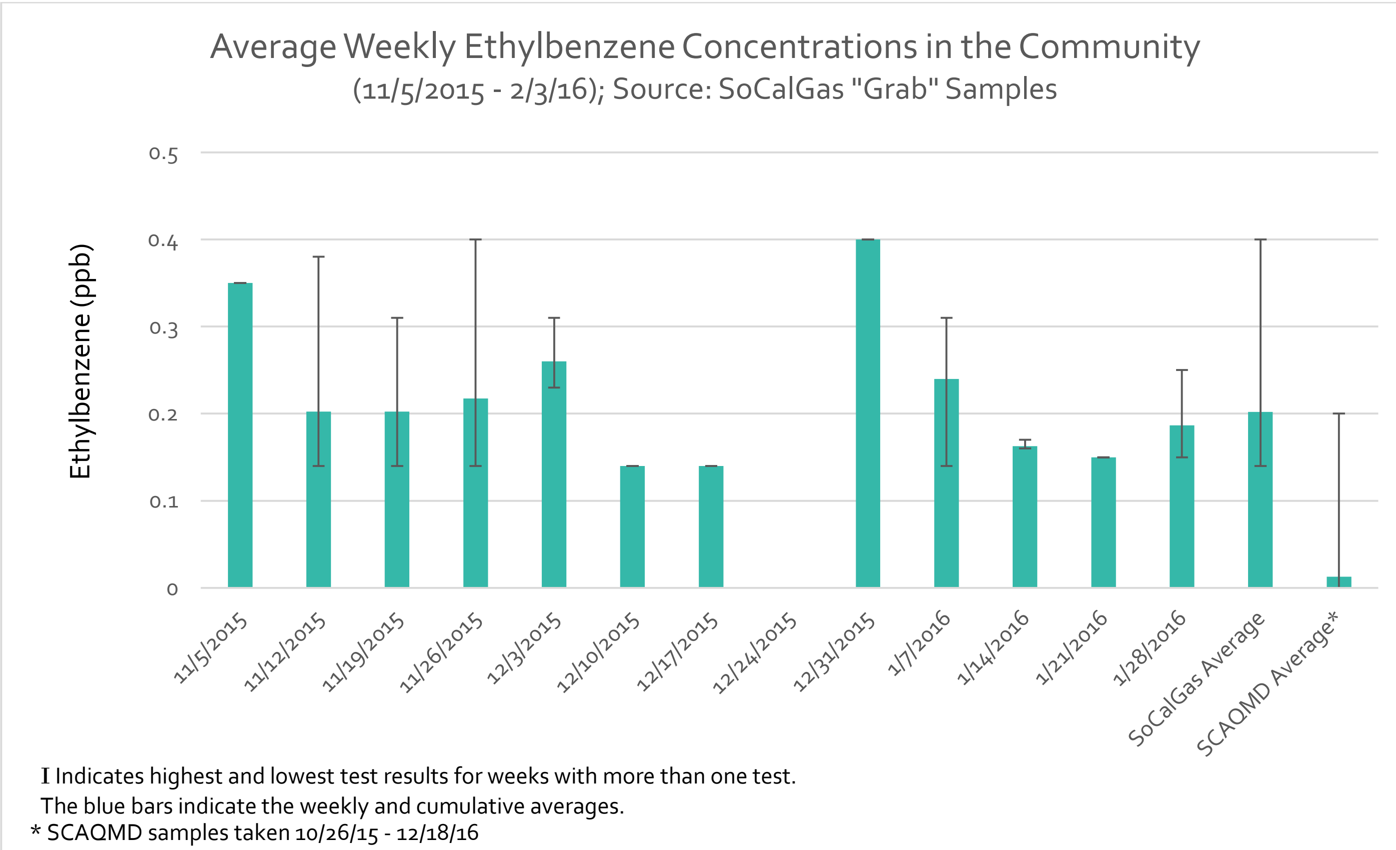
Benzene health protective level, established by the US EPA and/or Cal EPA, is 1.0 ppb.

Figure 3. Average Weekly Toluene Concentrations in the Community



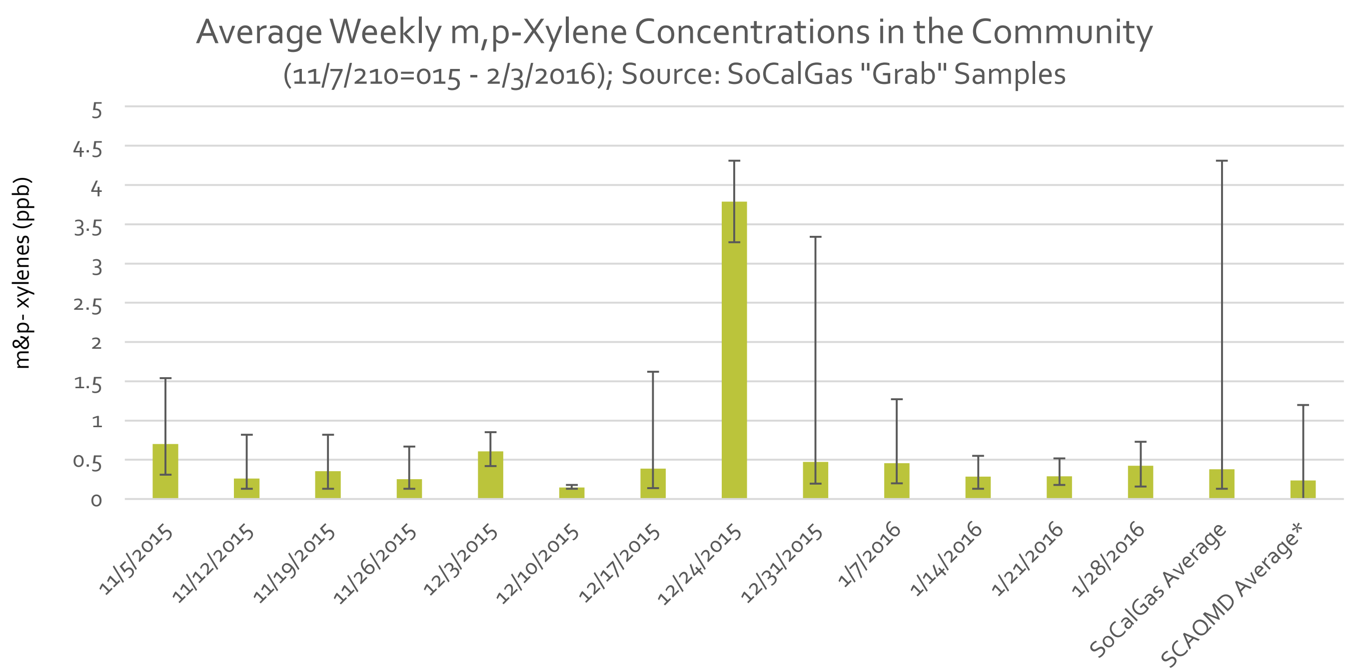
Toluene health protective level, established by the US EPA and/or the Cal EPA, is 70 ppb.

Figure 4. Average Weekly Ethylbenzene Concentrations in the Community



Ethylbenzene health protective level, established by the US EPA and/or the Cal EPA, is 400 ppb.

Figure 5. Average Weekly m,p-Xylene Concentrations in the Community

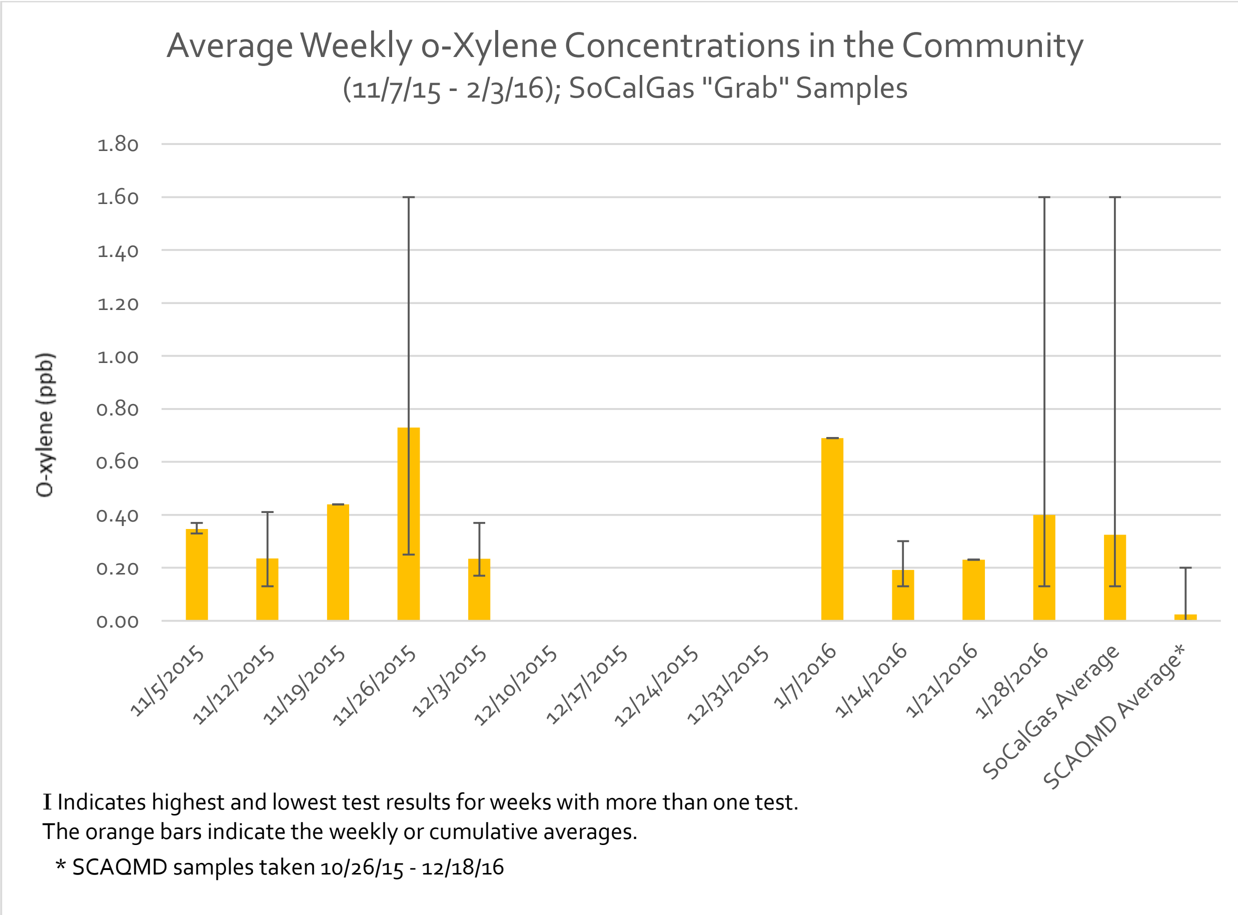


I Indicates highest and lowest test results. The green bars indicate the weekly and cumulative averages.

* SCAQMD samples taken 10/26/15 - 12/18/16

m,p-Xylenes health protective level, established by the US EPA and/or the Cal EPA, is 200 ppb.

Figure 6. Average Weekly o-Xylene Concentrations in the Community



o-Xylene health protective level, established by the US EPA and/or the Cal EPA, is 200 ppb.