



# METHANE GAS ASSESSMENT REPORT

12300 Lakeland Avenue  
Santa Fe Springs, California 90670  
Assessor Parcel Number (APN): 8025-002-026

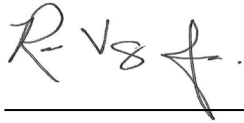
Duke Realty  
200 Spectrum Center Drive, Suite 1600  
Irvine, California 92618  
(949) 797-7048

**SCS ENGINEERS**

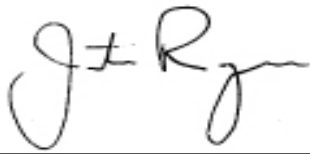
Project No. 01221236.00 | December 15, 2021

3900 Kilroy Airport Way, Suite 100  
Long Beach, California 90806  
(562) 426-9544

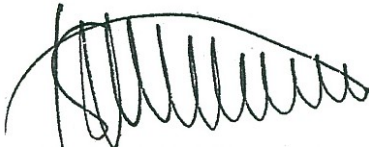
This Methane Gas Assessment Report dated December 15, 2021 for the property located at 12300 Lakeland Road, Santa Fe Springs, California was prepared and reviewed by the following:



Jay Vargas  
Staff Scientist  
**SCS ENGINEERS**



Justin Rauzon  
Project Manager  
**SCS ENGINEERS**



Kenneth H. Lister, Ph.D., C.E.G., C.H.G.  
Senior Technical Advisor  
**SCS ENGINEERS**



## Table of Contents

Section	Page
<b>DISCLAIMER .....</b>	<b>ii</b>
<b>1 INTRODUCTION .....</b>	<b>1</b>
<b>2 GENERAL BACKGROUND .....</b>	<b>1</b>
<b>3 SITE INVESTIGATION .....</b>	<b>1</b>
Methane Probe Installation.....	1
Methane Probe Monitoring .....	2
Methane Assessment.....	2
Monitoring Results.....	2
<b>4 CONCLUSIONS .....</b>	<b>3</b>
<b>5 RECOMMENDATIONS.....</b>	<b>3</b>

## Figures

- 1 Santa Fe Springs Methane Zone Map – Showing Property Location
- 2 Site Location Map
- 3 Google Aerial Image Showing Methane Probe Locations

## Tables

- 1 Summary of Methane Monitoring Results – November 12, 2021
- 2 Summary of Methane Monitoring Results – November 16, 2021

## Appendices

- A Santa Fe Springs City Ordinance No. 955: Requirement for a Soils Gas Study

## **DISCLAIMER**

This report has been prepared specifically for Duke Realty with specific application to methane gas assessment at the 12300 Lakeland Avenue, Santa Fe Springs, California. The report has been prepared in accordance with the care and skill generally exercised by reputable professionals, under similar circumstances, in this or similar localities. No other warranty, express or implied, is made as to the professional opinions presented herein. No other party, known or unknown to SCS, is intended as a beneficiary of this work product, its content or information embedded therein. Third parties use this report at their own risk.

Changes in site use and conditions may occur due to variation in rainfall, temperature, water usage, or other factors. Additional information that was not available to the consultant at the time of this investigation or changes that may occur on the site or in the surrounding area may result in modification to the site that would impact the summary and recommendations presented herein. This report is not a legal opinion.

# 1 INTRODUCTION

SCS Engineers (SCS) was retained by Duke Realty (Duke) to conduct a methane gas assessment at 12300 Lakeland Avenue, Santa Fe Springs, California (the “Property”). Investigation activities were conducted in accordance with SCS’s proposal dated November 5, 2021 (Proposal No. 011050221). A location map for the Property is presented as **Figure 1**.

Santa Fe Springs City Ordinance 955 (the “Ordinance”) requires that a methane investigation be conducted prior to new commercial/industrial construction. According to the Santa Fe Springs Methane Zone Map, the Property is located within the designated methane zone. A copy of the Methane Zone Map showing the location of the Property is included as **Figure 2**. A copy of the Ordinance is included in **Appendix A**.

# 2 GENERAL BACKGROUND

Current plans for the Property reportedly call for a transfer of ownership. In order to evaluate possible monitoring or protection measures that may be required, SCS conducted a methane gas assessment in accordance with the Ordinance. This methane gas assessment addresses current requirements of the Ordinance, which includes installation and monitoring of multiple-depth, subsurface methane gas probes.

The Property is located at the southeastern corner of the intersection of Lakeland road and Norwalk Boulevard. The Property is currently developed with an approximately 50,000-square-foot metal canopy structure and an approximately 5,300-square-foot office building both of which are occupied by Coast Iron & Steel (Coast Iron). Asphalt-paved areas are located throughout the Property, and a driveway is located on the eastern side of the metal canopy structure. Additionally, for at least 30 years, Coast Iron has leased the southwestern portion of the Property to the adjoining site to the west (historically B.F. Goodrich, now UTC Aerospace Systems [UTC]).

# 3 SITE INVESTIGATION

## METHANE PROBE INSTALLATION

Under the direction of SCS, H&P Mobile Geochemistry Inc. (H&P) of Carlsbad, California installed 43 methane monitoring probes at 22 boring locations (designated SV1 through SV22) on November 10 and 11, 2021. Boring locations were selected to provide coverage across the Property, while minimizing the impact to the ongoing business operations. In accordance with the Ordinance, probes were installed 5 and 15 feet below ground surface (bgs) with the exception of seven locations (SV7, SV9, SV10, SV12, SV13, SV19, and SV21) at which the shallower probe was installed at 3 feet bgs due to low flow at 5 feet. At location SV16, a probe was only set at 5 feet bgs. Methane monitoring probe locations are shown on **Figure 3**.

The probes were installed using a rotohammer and hand tools or a direct-push rig, which drove hollow steel rods to the target depth. At the target depth the steel rods were retracted from each boring and new (clean) 1/8-inch diameter Nylaflo tubing with a filter placed on the bottom end was inserted to the desired depths. Clean #2/12 Monterey sand was placed in a 1-foot vertical interval around each filter. The annular space above and between each probe interval was sealed with hydrated bentonite. A two-way valve was placed at the end of each probe and tubing marked with a label identifying well designation and probe depth (e.g. SV1-5').

## METHANE PROBE MONITORING

Gas probes were monitored on November 12 and 16, 2021. They were monitored for methane (CH<sub>4</sub>), carbon dioxide (CO<sub>2</sub>), and/or oxygen (O<sub>2</sub>) using a GEM™5000 manufactured by CES-Landtec. This instrument was used for field monitoring because it is capable of detecting methane over the full possible range of concentrations that may be encountered. As part of the gas monitoring, a GEM™5000 was used to measure the vacuum/pressure within each probe. Prior to field use, both instruments were calibrated using laboratory-certified calibration gas.

The GEM™5000 measures CH<sub>4</sub> and CO<sub>2</sub> by a dual wavelength infrared cell, and O<sub>2</sub> by an internal electrochemical cell. Calibration gas components for the GEM™5000 consisted of CH<sub>4</sub> at 39.66%, O<sub>2</sub> at 2% and CO<sub>2</sub> at 40.3% with a nitrogen balance. The GEM™5000 is capable of measuring CH<sub>4</sub> concentrations in the range of 0.1 to 100% by volume in air.

## METHANE ASSESSMENT

Methane is potentially explosive when it reaches a concentration of between 5% and 15% in air; 5% is also known as the Lower Explosive Limit (LEL). Regulatory agencies are generally concerned that methane will seep or migrate through soil and accumulate in structures. If the methane should permeate flooring materials or flow through cracks, accumulate in enclosed spaces (rooms, utility vaults, wall spaces) at concentrations above the LEL, and then be subject to an ignition source (e.g., pilot flame, electrical spark, cigarette), a fire or explosion could result. Although subsurface methane is present in large areas of Southern California, fires associated with methane are extremely rare.

Methane concentrations can be expressed in terms of either percent by volume, percent of the LEL, or parts per million by volume (ppmv). For reference, 5% methane, or 50,000 ppmv, in air is equivalent to 100% of the LEL; 1% methane, or 10,000 ppmv, in air is equivalent to 20% of the LEL; and 0.05%, or 500 ppmv, in air is equivalent to 1% LEL.

For properties with existing structures, the Ordinance has established specific monitoring requirements. If methane levels are lower than 2.5% of the LEL (i.e. 0.125% by volume in air or 1,250 ppmv) during an initial monitoring event, the Ordinance indicates that a request may be made of the Fire Chief to waive future quarterly and/or annual monitoring requirements. If monitoring reveals methane in excess of 25% of the LEL, the Ordinance requires the installation of a protective mitigation system for any building.

## MONITORING RESULTS

Field monitoring results from the November 12 and 16, 2021 sampling events are presented in **Tables 1** and **2**, respectively. Readings were successfully collected from 33 of the 43 monitoring probes during the two sampling events. Due to low flow conditions associated with tight low-permeability soils 10 of the probes could not be monitored, as shown in **Tables 1** and **2**. Negative pressure (vacuum) readings, expressed as inches of water column in the tables, were identified in probes at SV12 (3 feet bgs), SV14 (5 and 15 feet bgs), and SV16 (5 feet bgs) on November 12. All remaining probes contained positive pressure during the monitoring periods of less than 1 inches of water (i.w.).

As shown in **Tables 1** and **2**, methane was not detected in any of the probes monitored.

## 4 CONCLUSIONS

SCS conducted a methane assessment of the Property to determine if additional methane monitoring or mitigation measures would be required in accordance with the Ordinance. SCS concludes the following with regard to this Methane Gas Assessment:

- The Property lies within the designated Santa Fe Springs Methane Zone.
- Methane was NOT detected above the instruments detection capabilities of 0.1% by volume in air during either of the two monitoring events.

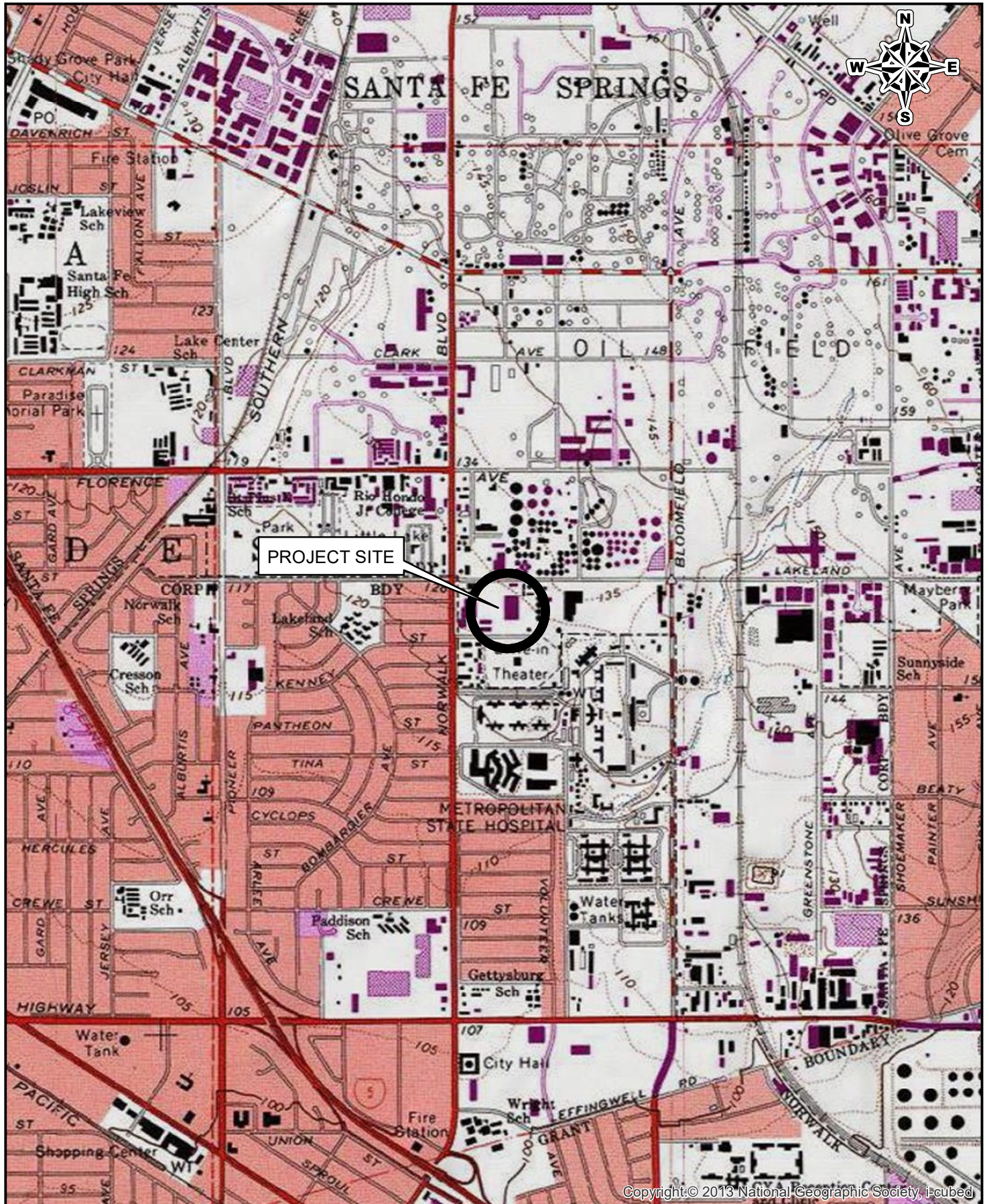
## 5 RECOMMENDATIONS

SCS recommends that this Methane Gas Assessment report be submitted to the Santa Fe Springs Fire Department (SFSFD), with a copy to the Department of Planning and Development, to fulfill requirements related to the Ordinance.

This methane assessment was conducted for due diligence purposes to investigate potential concerns associated with methane seepage into building on the Property. Investigation activities were conducted in effort to meet all requirements of the SFSFD Ordinance. As written, strict adherence to the Ordinance calls for quarterly methane monitoring at the Property for one year (and possibly annual monitoring thereafter) if methane was detected above 2.5% of the LEL during this assessment. As shown, methane was not detected in any of the probes analyzed during the two monitoring events. Therefore, SCS recommends that the findings of this report be presented to the SFSFD Fire Chief with a request that they waive the quarterly monitoring requirements stipulated in the Ordinance and any mitigation controls to the Property.

## Figures





Copyright: © 2013 National Geographic Society, i-cubed

# SCS ENGINEERS

3900 KILROY AIRPORT WAY, SUITE 100  
LONG BEACH, CALIFORNIA 90806

SITE:

12300 Lakeland Road  
Santa Fe Springs, California 90670

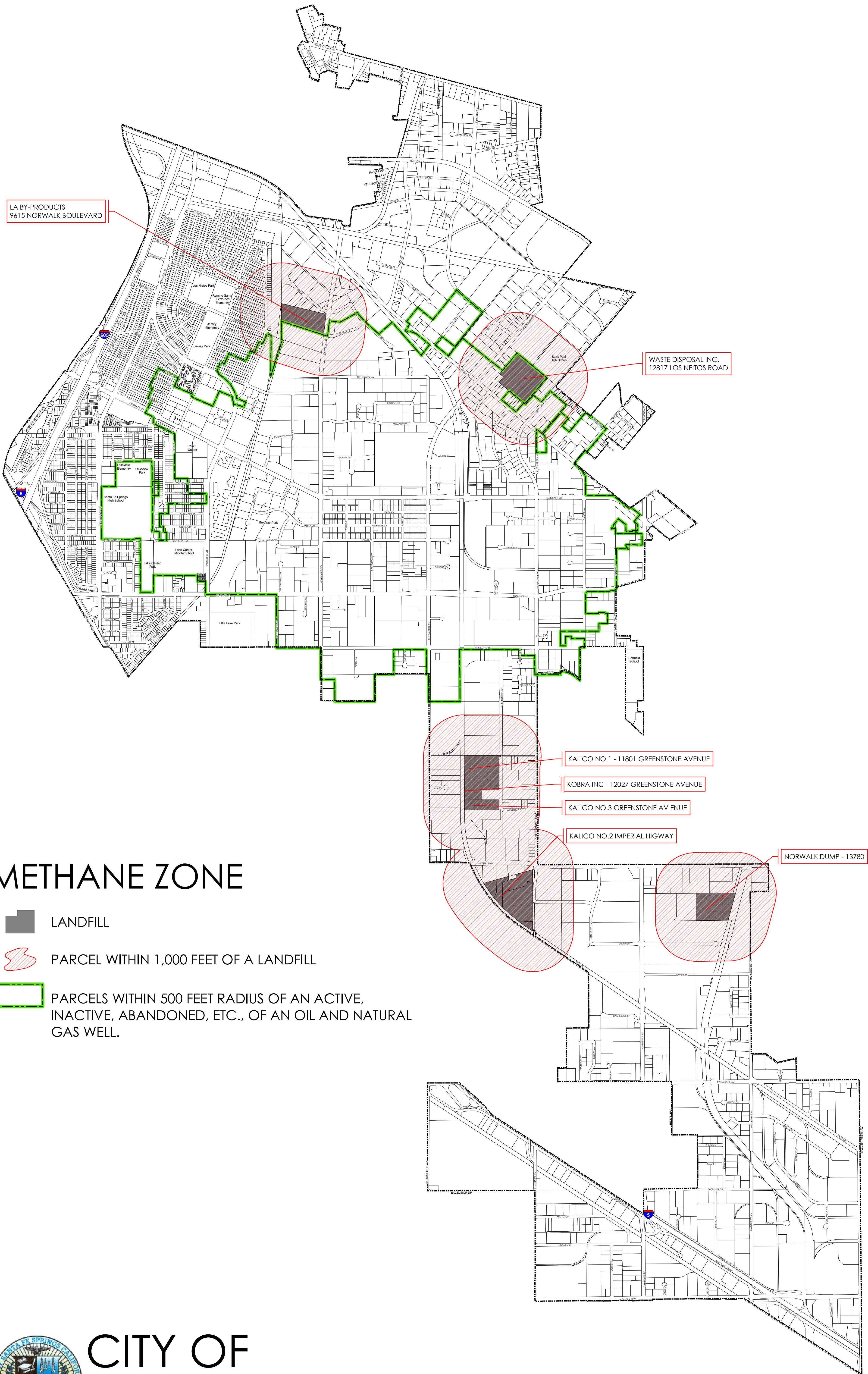
Job No.: 01221236.00

Title: SITE LOCATION MAP

FIGURE

1



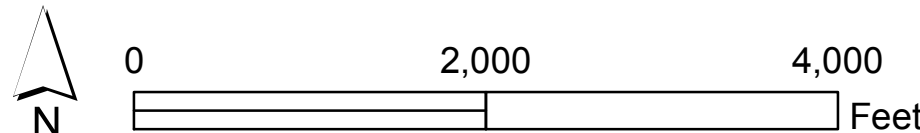


# METHANE ZONE

- LANDFILL
- PARCEL WITHIN 1,000 FEET OF A LANDFILL
- PARCELS WITHIN 500 FEET RADIUS OF AN ACTIVE, INACTIVE, ABANDONED, ETC., OF AN OIL AND NATURAL GAS WELL.

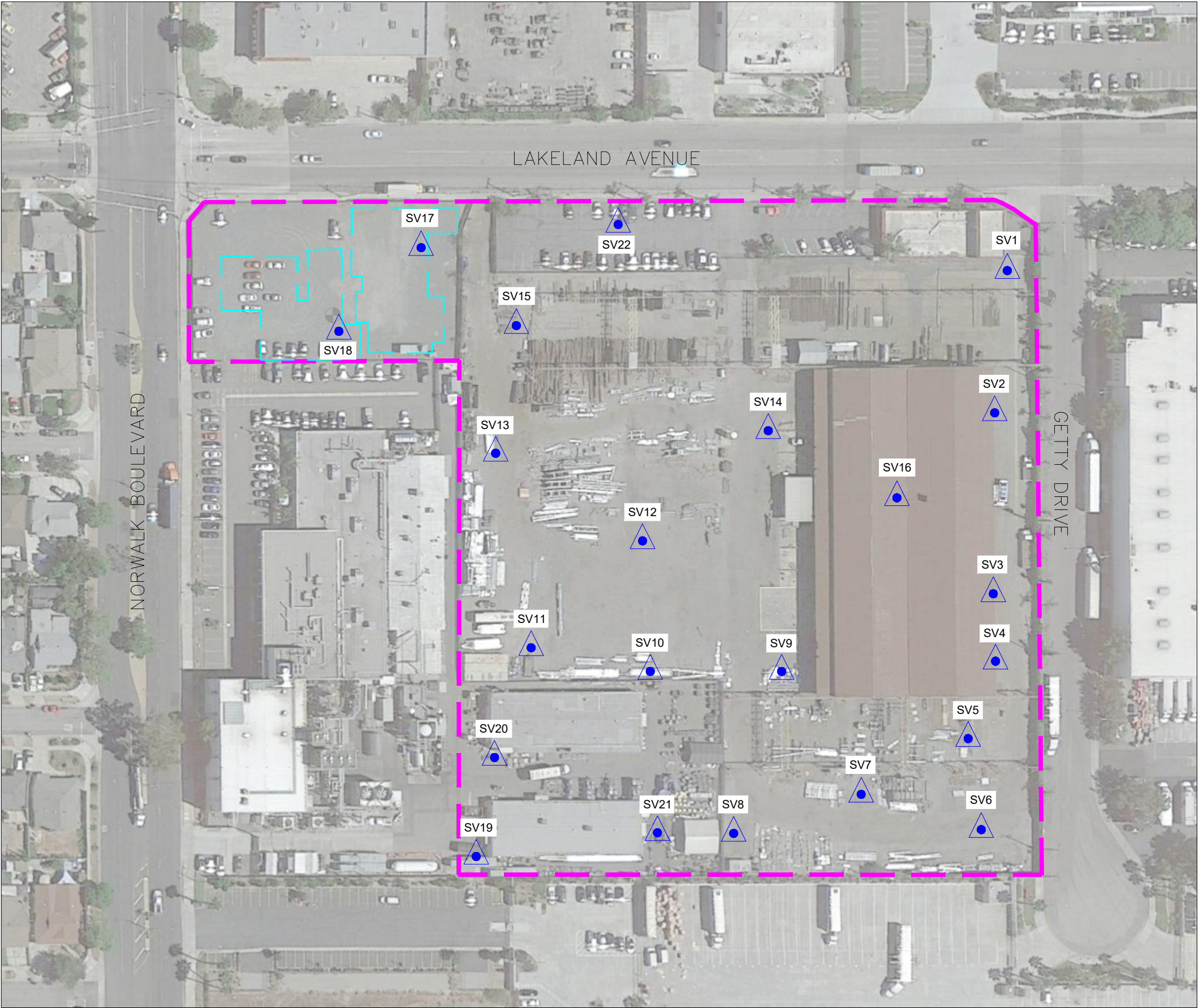


CITY OF  
SANTA FE SPRINGS





\\bc-fs01\DATA\PROJECTS\01221236.00\Methane Report\Figures\Figure 2.dwg Dec 06, 2021 -- 3:12pm By: 4592/\_v



**LEGEND**

--- PROPERTY LINE

--- APPROXIMATE AREA OF FORMER STRUCTURES

▲ METHANE PROBE LOCATION

● APPROXIMATE ABANDONED WELL LOCATION

0 100 200

GRAPHIC SCALE

SCALE IN FEET

N

SHEET TITLE: GOOGLE AERIAL IMAGE SHOWING METHANE PROBE LOCATIONS		PROJECT TITLE: 2300 LAKELAND ROAD SANTA FE SPRINGS, CALIFORNIA 90670	
CLIENT: DUKE REALTY 200 SPECTRUM CENTER DRIVE, SUITE 1600 IRVINE, CALIFORNIA 92618		<b>SCS ENGINEERS</b> ENVIRONMENTAL CONSULTANTS 3900 KILROY AIRPORT WAY, SUITE 100 LONG BEACH, CA 90806 PH: (562) 426-9544 FAX: (562) 427-0805 PROJECT NO: 01221236.00 DATE: DECEMBER 2021 SCALE: 1" = 100' FIGURE NO. 3	
DESIGN BY: J.VARGAS	DRAWN BY: J.VARGAS	CHECK BY: J.RAUZON	APPROVED BY: J.RAUZON

## Tables 1 and 2

**TABLE 1**  
**SUMMARY OF METHANE MONITORING RESULTS**  
**12300 LAKELAND AVENUE, SANTA FE SPRINGS, CALIFORNIA**

Project Name: Methane Gas Assessment: 12300 Lakeland Avenue, Santa Fe Springs

Personnel: J. Vargas

Monitoring Instrument: GEM 5000

Project Address: 12300 Lakeland Road, Santa Fe Springs, California

Sample Date: November 12, 2021

SCS Job No.: 01221236.00

Calibration Date: November 11, 2021

Probe ID	Probe Depth	(+) Pressure or (-) Vacuum	GEM 5000			
	feet bgs	inches of water (DL = +/-0.01 in)	Total Methane (CH <sub>4</sub> ) % by volume (DL = 0.1%)	LEL Methane (CH <sub>4</sub> ) % LEL (DL = 1% LEL)	Carbon Dioxide (CO <sub>2</sub> ) % by volume (DL = 0.1% )	Oxygen (O <sub>2</sub> ) % by volume (DL = 0.1% )
SV1	5	0.00	0.0	0	1.4	19.0
	15	0.01	0.0	0	5.5	17.4
SV2	5	0.16	0.0	0	3.4	16.4
	15	0.01	0.0	0	5.9	15.4
SV3	5	0.02	0.0	0	4.5	15.4
	15	0.03	0.0	0	5.9	15.1
SV4	5	0.18	0.0	0	6.1	16.5
	15	0.04	0.0	0	5.6	14.4
SV5	5	0.42	No Flow			
	15	0.06	0.0	0	9.7	10.9
SV6	5	0.18	0.0	0	0.2	19.0
	15*	--	--	--	--	--
SV7	3	0.10	0.0	0	7.9	9.0
	15	0.09	0.0	0	11.1	7.5
SV8	5	0.04	No Flow			
	15	0.03	0.0	0	4.4	16.9
SV9	3	0.14	0.0	0	6.1	10.6
	15	0.04	0.0	0	7.2	10.2
SV10	3	0.03	No Flow			
	15	0.04	0.0	0	4.2	16.4
SV11	5	0.08	No Flow			
	15	0.07	0.0	0	3.2	19.8
SV12	3**	-0.03	No Flow			
	15	0.07	0.0	0	9.9	0.4
SV13	3	0.02	0.0	0	0.2	16.7
	15	0.04	0.0	0	7.1	9.4
SV14	5	-0.03	0.0	0	6.5	12.0
	15	-0.01	0.0	0	8.1	11.5
SV15	5	0.03	No Flow			
	15	0.03	0.0	0	4.4	17.0
SV16	5	-0.01	No Flow			
SV17	5	0.02	0.0	0	0.2	20.2
	15	0.08	0.0	0	2.5	19.3
SV18	5	0.02	0.0	0	0.6	19.9
	15	0.02	0.0	0	2.2	18.8
SV19	3	0.01	0.0	0	2.4	18.4
	15	0.05	0.0	0	3.4	19.1
SV20	5	0.48	No Flow			
	15	0.76				
SV21	3	0.12	0.0	0	2.2	18.9
	15	0.04	0.0	0	5.7	12.5
SV22	5	0.06	No Flow			
	15	0.01	0.0	0	4.2	18.7

Values recorded on this table are actual field-instrument readings. The detection limit (DL) of each constituent is provided at the top of the column.

\* = Probe valve destroyed upon arrival.

\*\* = Probe valve open upon arrival.

-- = Not monitored

For reference: 100 ppmv = 0.01% methane = 0.2% LEL.  
1,000 ppmv = 0.1% methane = 2% LEL.  
10,000 ppmv = 1% methane = 20% LEL.  
50,000 ppmv = 5% methane = 100% LEL

ppm = parts per million  
ppmv = parts per million by volume  
bgs = below ground surface

**TABLE 2**  
**SUMMARY OF METHANE MONITORING RESULTS**  
**12300 LAKELAND AVENUE, SANTE FE SPRINGS, CA**

Project Name: Methane Gas Assessment: 12300 Lakeland Avenue, Santa Fe Springs

Personnel: J. Vargas

Monitoring Instrument: GEM 5000

Project Address: 12300 Lakeland Road, Santa Fe Springs, California

Sample Date: November 16, 2021

SCS Job No.: 01221236.00

Calibration Date: November 11, 2021

Probe ID	Probe Depth	(+) Pressure or (-) Vacuum	GEM 5000			
	feet bgs	inches of water (DL = +/-0.01 iw)	Total Methane (CH <sub>4</sub> )	LEL Methane (CH <sub>4</sub> )	Carbon Dioxide (CO <sub>2</sub> )	Oxygen (O <sub>2</sub> )
			% by volume (DL = 0.1%)	% LEL (DL = 1% LEL)	% by volume (DL = 0.1%)	% by volume (DL = 0.1%)
SV1	5	0.05	0.0	0	6.1	16.4
	15	0.04	0.0	0	6.0	16.2
SV2	5	0.09	0.0	0	6.1	16.3
	15	0.04	0.0	0	6.2	16.4
SV3	5	0.08	0.0	0	5.4	15.1
	15	0.11	0.0	0	6.3	14.9
SV4	5	0.21	0.0	0	6.2	16.7
	15	0.07	0.0	0	6.2	14.3
SV5	5	0.24	0.0	0	6.1	15.8
	15	0.07	0.0	0	9.5	11.4
SV6	5	0.06	0.0	0	0.4	17.1
	15*	0.10	0.0	0	8.4	13.4
SV7	3	0.24	0.0	0	8.7	8.5
	15	0.25	0.0	0	12	6.8
SV8	5	0.26	No Flow			
	15	0.12	0.0	0	5.2	15.1
SV9	3	0.19	0.0	0	4.4	15.3
	15	0.19	0.0	0	7.7	9.0
SV10	3	0.14	No Flow			
	15	0.18	0.0	0	4.6	15.2
SV11	5	0.19	No Flow			
	15	0.19	0.0	0	3.5	18.6
SV12	3**	0.10	No Flow			
	15	0.40	0.0	0	10.5	0.5
SV13	3	0.08	0.0	0	0.7	15.6
	15	0.22	0.0	0	7.5	8.8
SV14	5	0.16	0.0	0	7.7	11.2
	15	0.14	0.0	0	7.8	10.9
SV15	5	5.81	No Flow			
	15	0.18	0.0	0	4.7	16.2
SV16	5	0.17	No Flow			
SV17	5	0.08	0.0	0	0.5	20.8
	15	0.14	0.0	0	3	19.6
SV18	5	0.07	0.0	0	0.7	20.6
	15	0.05	0.0	0	2.6	19.3
SV19	3	0.14	No Flow			
	15	0.11	0.0	0	3.5	20.1
SV20	5	0.49	0.0	0	0.1	21.3
	15	0.07	No Flow			
SV21	3	0.13	No Flow			
	15	0.07	0.0	0	6.3	13.1
SV22	5	0.08	No Flow			
	20	0.01	0.0	0	4.1	18.5

Values recorded on this table are actual field-instrument readings. The detection limit (DL) of each constituent is provided at the top of the column.


\* = Probe valve replaced 11/16/2021.

\*\* = Probe valve open upon arrival.

-- = Not monitored

For reference: 100 ppmv = 0.01% methane = 0.2% LEL.  
1,000 ppmv = 0.1% methane = 2% LEL.  
10,000 ppmv = 1% methane = 20% LEL.  
50,000 ppmv = 5% methane = 100% LEL

ppm = parts per million  
ppmv = parts per million by volume  
bgs = below ground surface



## Appendix A

### Santa Fe Springs City Ordinance No. 955: Requirement For A Soils Gas Study



## **§ 117.131 REQUIREMENT FOR A SOILS GAS STUDY OR METHANE MITIGATION SYSTEM.**

(A) A soil gas investigation to identify the concentration of methane gas in the subsurface is required if any of the following situations apply:

(1) Construction within the city's methane zone which meets either of the following (subsequently referred to "regulated construction"):

(a) New commercial/industrial construction.

(b) Modification to existing structures when the valuation of the modification is equal to or greater than 25% of the assessed value of the existing structures.

(2) The granting of a subdivision map, conditional use permits necessitating ground disturbance, or development plan approval, when the property falls within the city's methane zone.

(3) Existing conditions at the site warrant a soil gas investigation in the opinion of the Fire Chief or his designee.

(B) The methane zone is that area depicted on the city's methane zone map. The methane zone encompasses land in the city which is within 1,000 feet of a landfill or within 500 feet of an existing or abandoned oil well. The city's methane zone map is adopted by reference as if set forth in full in this section. A copy of the city's methane zone map is available for public inspection on the city's website or at city offices during regular business hours.

(C) A minimum of two soil gas monitoring wells are required for all regulated construction. Additional monitoring wells are required based on the size of the proposed project. One additional monitoring well is required per 10,000 square feet of building area for buildings exceeding 20,000 square feet. An alternative proposal as to the number of monitoring wells may be considered at the discretion of the Fire Chief.

(D) General monitoring and mitigation requirements for regulated construction within the methane zone:

(1) Prior to construction, obtain approval from the Fire Department for a soil gas investigation showing the proposed location(s) and design of the monitoring wells, in accordance with § 117.131(C).

(a) Monitoring wells shall initially be sampled at least two times within a period of seven days.

(b) The initial sampling shall not occur within two days of precipitation for first sampling event or at any time between the first and second sampling event.

(2) Soil gas shall be monitored quarterly after construction is complete. All soil gas monitoring reports required by this section shall be sent to the Fire Chief. If the permanent monitoring well locations are different than the location of the initial monitoring wells, approval from the Fire Department is required prior to installation of the permanent monitoring wells. If the quarterly monitoring reveals methane levels less than 25% of the lower explosive limit (i.e., 1.25% by volume in air or 12,500 ppm/v) during the first year, the system shall be monitored annually thereafter. In cases where methane levels are less than 2.5% of the lower explosive limit (i.e., .125% by volume in air or 1,250 ppm/v) the Fire Chief may waive the annual monitoring requirement upon written request. The granting of the waiver shall be at the discretion of the Fire Chief.

(E) Based on the results of the soils gas monitoring or on information available on surrounding properties, property owners shall implement any other mitigation measures as required by the Fire Chief.

(F) In lieu of the initial soil gas investigation, a methane mitigation system approved by the Fire Department may be installed.

(G) Methane mitigation systems shall be required for any regulated construction if any of the following apply:

(1) The initial monitoring reveals methane levels in excess of 25% of the lower explosive limit (i.e., 1.25% by volume in air or 12,500 ppm/v).

(2) The regulated construction will impede access to an abandoned oil well.

(3) Quarterly or annual monitoring reveals methane levels greater than 25% of the lower explosive limit (i.e., 1.25% by volume in air or 12,500 ppm/v).

(H) Where regulated construction takes place in the methane zone and which incorporates sensitive land uses (e.g., residential developments, places of public assembly, hospitals, restaurants, schools, and the like), a methane mitigation system may be required regardless of the methane levels detected at the discretion of the Fire Chief.

(I) The design of a methane mitigation system for property within the methane zone shall be in accordance with the requirements of the Los Angeles County Department of Public Works and City Fire Department.

(J) If required by the Fire Department, the building owner shall be responsible for ensuring that annual inspections of the methane mitigation systems are completed. Reports of these inspections shall be conducted under the oversight of a registered petroleum engineer or other qualified persons and submitted to the Fire Department. A fine shall be charged, as established by resolution of the City Council, for each methane mitigation system found to be inoperative or improperly maintained.

(K) Methane barrier systems shall include permanent monitoring vapor probes above and below the barrier unless an alternative design is approved by the Fire Chief.



(L) In extraordinary cases, e.g., where methane in excess of 25% of the lower explosive limit (i.e., 1.25% by volume in air or 12,500 ppm/v) can be demonstrated to be a non-repetitive incident, a registered petroleum engineer or other qualified persons may request a waiver by the Fire Chief for the installation of a methane mitigation system. The granting of the waiver shall be at the discretion of the Fire Chief.

(M) Where gas detection systems are used, they shall be designed by and installed under the supervision of registered engineers. The design and installation shall be inspected and approved by the Fire Department.

(1) Following installation, a readily visible sign shall be posted which reads: "Gas Detection Alarm. In the event of an alarm, evacuate the building and call the Fire Department, 911. Do not disconnect under penalty of law."

(2) The property owner shall provide Fire Department access to the alarm panel and the building in which it is installed as well as the alarm reset code by means of an approved key box system. Keys shall be clearly and permanently identified.

(Ord. 1104, passed 8-8-19) Penalty, see § 10.97

**Cross-reference:**

*Misdemeanor offenses, see § 117.004*