SCAQMD Proposed Rule 1148.3
Natural Gas Underground Storage Facilities

Working Group Meeting #1
January 26, 2017
Agenda

• Rule Development Process
• Aliso Canyon Leak
• Underground Natural Gas Storage Process
• State and Local Agency Response to Aliso Canyon Leak
• Development Approach for SCAQMD Proposed Rule (PR) 1148.3
• Next Steps
• Comments
Rule Development Process

- Information Gathering
- Stakeholder Meetings
- Develop Rule Concepts
- Draft Proposed Rule Language
Rule Development Process – Public Input

Public Workshop

Written Comments

Working Group Meetings

SCAQMD Governing Board Public Hearing
Working Group Meetings

• Comprised of stakeholders including industry, environmental groups, community members, and agencies

• Provides stakeholders opportunity to discuss elements of proposed rule with staff

• Assist staff in understanding
  • Key issues and concerns
  • Industry terms, industry practices, etc.

• Working group meetings held throughout the rule development process and open to the public

• Allows the rule development process to be transparent
Background – Aliso Canyon Natural Gas Underground Storage Field

• Owned and operated by Southern California Gas Company (SoCalGas)
• Oil reservoir modified into an injection/withdrawal field for natural gas
• Provides natural gas to residential, industrial, and commercial customers
• Largest storage capacity in South Coast Air Basin
  • ~90 billion cubic feet of natural gas
  • ~115 wells
Background – Aliso Canyon Leak

• October 2015, SoCalGas discovered a leaking injection/withdrawal well

• Leak determined to be from surface casing located 500 feet below the surface

• SCAQMD received over 2,000 complaints alleging odors related to the leak

• Emitted an estimated 94,500 tons of non-combusted gas into the atmosphere

• Natural Gas Underground Storage is mostly an unregulated air quality source
Types of Natural Gas Underground Storage Fields

- Depleted Oil or Gas Reservoir
- Salt Caverns
- Depleted Aquifers
90% of natural gas stored underground in Southern California comes from out of state.

- Used to balance gas supply with demand.
- Gas is injected when there is less demand and withdrawn when demand is high.
- Storage enables gas to be purchased during low demand periods when price is lower.

Range of weekly natural gas storage net changes (2003-14)

- April through October is considered injection season.
- Net injections.
- Net withdrawals.

bilion cubic feet

-300
-200
-100
0
100
200
300
-400
-300
-200
-100
0
100
200
300
400
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

net
injections
net
withdrawals
California Agency Response to Aliso Canyon Leak

**DOGGR**

- Emergency Regulations for Underground Natural Gas Storage (order specific to Aliso Canyon)
- Amended Section 1724.9 Underground Natural Gas Storage Projects
  - Effective 2/5/2016
  - New requirements for **subsurface** testing and monitoring
- Proposed Section 1726 Underground Natural Gas Storage Projects
  - Released 7/8/2016; Proposal planned for 2017
  - New **subsurface** requirements to compliment Section 1724.9

**CARB**

- Proposed GHG Emission Standards for Oil & Gas Sources (includes Natural Gas Underground Storage)

**SCAQMD**

- Proposed Rule 1148.3 – will focus on regulating aboveground operations at Natural Gas Underground Storage facilities
CARB Proposed Regulation – Greenhouse Gas Emission Standards for Crude Oil & Natural Gas Facilities

- Reduces methane emissions from oil and gas production, processing, storage, and transmission compressor stations by limiting vented and fugitive emissions
- Some methane reductions are already achieved as co-benefits of local air district regulations governing emissions of volatile organic compounds
- Public Hearing held on July 21, 2016
- Board Proposal scheduled for Spring 2017
CARB Proposed Regulation – Key Natural Gas Underground Storage Requirements

• Submittal of monitoring plan
  • Install & operate continuous ambient methane monitors
  • Perform daily screening (Optical Gas Imaging (OGI) or Method 21), or install continuous monitoring of wellhead/surrounding areas (more details in next slide)

• Monitoring at wellhead using EPA Method 21

• Notification to agencies upon methane exceedance detected by:
  • Ambient monitors
  • Method 21 inspections
Leak Detection – EPA Method 21

• Currently, most common acceptable method used to detect VOC leaks
• Determination of VOC leaks from process equipment from sources such as valves, flanges, pumps, compressors
• Detection by use of portable instrument that typically utilized flame ionization, infrared absorption, and photoionization
• Measures in parts per million (ppm)
• Requires that instrument physically measures directly at the source of the leak
Leak Detection – Optical Gas Imaging (OGI)

- OGI allows for a visual observation of emissions invisible to the naked eye from much further distances than EPA Method 21.
- SCAQMD staff uses OGI technology to assist in identifying leaks at oil fields, refineries, tank farms, and natural gas underground storage facilities.
CARB Regulation – Leak Detection and Repair (LDAR)

- Audio-visual inspection of various components once every 24 hours
- Operator shall conduct quarterly inspection of components and repaired in accordance to the schedule

<table>
<thead>
<tr>
<th>Effective 2018</th>
<th>Effective 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leak Rate (ppm)</td>
<td>Leak Rate (ppm)</td>
</tr>
<tr>
<td>10,000-49,999</td>
<td>1,000-9,999</td>
</tr>
<tr>
<td></td>
<td>14 calendar days</td>
</tr>
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</tr>
<tr>
<td>Critical Components</td>
<td>&gt;50,000</td>
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<tr>
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</table>
SCAQMD regulates air emissions for much of the oil and gas industry, however, existing rules do not regulate all aspects of natural gas underground storage.

Implementation of VOC rules has co-benefits of decreasing odor nuisance.

PR 1148.3 will consider elements of existing VOC rules such as:

- Rule 1148.1 – *Oil and Gas Production Wells*
- Rule 1173 – *Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities*
SCAQMD Existing Oil and Gas Regulation – Natural Gas

- Rule 1148.1 – Natural gas distribution, transmission and associated storage operations are not subject to the requirements of rule

- Rule 1173 – Components exclusively handling commercial natural gas are exempt
Gas Processing at Natural Gas Underground Storage Facilities

- Many aboveground natural gas processing operations are permitted
  - Internal Combustion Engines used at the facility are required to meet emission limits
  - Components for storage tanks associated with oil and gas production are required to be inspected periodically
- Regulated emissions include VOCs, NOx, CO, sulfur compounds and refrigerants
- Existing SCAQMD regulations do not apply to natural gas emissions
- PR 1148.3 will address natural gas emissions at natural gas underground storage facilities
PR 1148.3 Approach

• Build on CARB’s *Oil and Gas Regulation*
  • Requiring additional specificity to monitoring plan
  • More stringent leak thresholds
  • More stringent repair periods
  • More immediate implementation dates
  • Provide monitoring data to the public
  • Requirements will also consider standards established at the Aliso Canyon Storage Field

• Scope of PR 1148.3 is aboveground operations at natural gas underground storage facilities
  • Underground operations related to the integrity of the well casing are within DOGGR’s jurisdiction
Purpose of PR 1148.3

Purpose

• Reduce TOCs and toxics emissions from Natural Gas Underground Storage facilities, and additionally prevent public nuisance to nearby receptors
• Will utilize TOC emissions as an indicator of leaks to identify issues and correct them before they become significant

Applicability

• This rule applies to any operator of a natural gas underground storage facility
PR 1148.3 Affected Sources

• Four natural gas underground storage facilities in the South Coast Air Basin
  • Aliso Canyon
  • Honor Rancho
  • Montebello (being phased out)
  • Playa del Rey

• All four owned and operated by SoCal Gas
Information regarding storage capacity and the number of wells for a facility are based on SCAQMD visits by Compliance Staff.

Total number of wells listed are a combination of different types of wells including:

- Withdrawal and Injection Wells
- Observation Wells
- Water Injections Wells
- Oil Production Wells
- Gas Lift Wells
- Brine Disposal Wells
Aliso Canyon

Site Details
• Total Storage Capacity: 90 BCF
• 129 wells (onsite)
Honor Rancho

Site Details

• Total Storage Capacity: 24.2 BCF
• 46 wells (onsite)
Montebello

Site Details

- Total Storage Capacity: 14 billion cubic feet (BCF)
- 51 wells (onsite and located in community)
Playa del Rey

Site Details

• Total Storage Capacity: 7.06 BCF
• 54 wells (onsite and located in the community)
# Comparison of Natural Gas Underground Storage Facilities

<table>
<thead>
<tr>
<th>Natural Gas Underground Storage Facility</th>
<th>Storage Capacity</th>
<th>Number of Wells</th>
<th>Onsite or Community Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aliso Canyon</td>
<td>90 BCF</td>
<td>129 wells</td>
<td>Onsite</td>
</tr>
<tr>
<td>Honor Rancho</td>
<td>24.2 BCF</td>
<td>46 wells</td>
<td>Onsite</td>
</tr>
<tr>
<td>Montebello</td>
<td>14 BCF</td>
<td>51 wells</td>
<td>Both</td>
</tr>
<tr>
<td>Playa del Rey</td>
<td>7.06 BCF</td>
<td>54 wells</td>
<td>Both</td>
</tr>
</tbody>
</table>
## CARB’s Monitoring Approach for Natural Gas Storage

### Monitoring Plan

<table>
<thead>
<tr>
<th>Two Parts</th>
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<tbody>
<tr>
<td>• Ambient Monitors and</td>
</tr>
<tr>
<td>• Choice of:</td>
</tr>
<tr>
<td>• Daily screening using Method 21 or Optical Gas Imaging or other; OR</td>
</tr>
<tr>
<td>• Continuous monitors with audible and visible alarm system</td>
</tr>
</tbody>
</table>

### Audio Visual Inspections

| Daily audio visual inspections of components |
| Repair within 24 hours. If cannot be repaired within 24 hours |
| • Measure w/Method 21 and |
| • Repair times based on Leak Detection and Repair (LDAR) requirements |

### LDAR Requirements

| Quarterly test all components using Method 21 |
| Repair times range from 2 to 14 days |
| Two step compliance: Jan 2018 and Jan 2020 |
| Includes provision for critical components |
## Key Requirements – Ambient Monitoring Plan

<table>
<thead>
<tr>
<th>Proposed CARB Regulation</th>
<th>PR 1148.3 Ambient Monitoring Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Submit a monitoring plan by January 1, 2018</td>
<td>Submit a monitoring plan by (XX) days after adoption.</td>
</tr>
<tr>
<td>Require submission of monitoring plan</td>
<td>Specific requirements of what is required to be part of monitoring plan</td>
</tr>
<tr>
<td>Requires onsite monitors that continuously monitor the facility</td>
<td>Specify minimum number of monitors necessary to continuously monitor the facility and location</td>
</tr>
</tbody>
</table>
Ambient Monitors

- Monitors used at Aliso Canyon are Infrared Open Path Detector for Hydrocarbon Gas Application
- SCAQMD staff is looking for input from stakeholders regarding other types of ambient monitors
  - Ambient Hydrocarbon Air Monitors
  - Other monitoring technology
## Key Requirements – Daily Screening

<table>
<thead>
<tr>
<th>Proposed CARB Regulation</th>
<th>PR 1148.3 Daily Screening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform daily screening or have continuous monitoring of the wellhead and the surrounding area</td>
<td>• Perform daily screening of the wellhead and the surrounding area utilize OGI, Method 21, or approved inspection technology to detect leaks on an early basis</td>
</tr>
<tr>
<td></td>
<td>• Continuous monitoring if well head is (XX) feet of a sensitive receptor</td>
</tr>
<tr>
<td>Leaks detected via OGI shall be inspected using Method 21</td>
<td>Same</td>
</tr>
</tbody>
</table>
### Key Requirements – Leak Detection and Repair (LDAR)

<table>
<thead>
<tr>
<th>Proposed CARB Regulation</th>
<th>PR 1148.3 LDAR Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quarterly leak inspection of components</td>
<td>Same</td>
</tr>
<tr>
<td>Daily audio-visual inspection of potential high emitting components, perform Method 21 to quantify leak</td>
<td>Same</td>
</tr>
<tr>
<td>Allowance for critical component’s extension</td>
<td>Excludes allowance for critical component’s extension</td>
</tr>
</tbody>
</table>
Leaks detected from either daily screening/inspection or quarterly are required to be repaired within a specific repair period.

- Shorter repair times for larger leaks.
- PR 1148.3 will pattern repair periods after SCAQMD R1173.
## Comparison of Rule 1173 and CARB’s Final Leak Detection and Repair Times

<table>
<thead>
<tr>
<th>Light Liquid Gas Vapor (ppm)</th>
<th>SCAQMD Rule 1173</th>
<th>CARB’s Proposed Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Repair Time</td>
<td>Extended Repair Time</td>
</tr>
<tr>
<td>500 to 10,000</td>
<td>7 calendar days</td>
<td>7 calendar days</td>
</tr>
<tr>
<td>10,000 to 25,000</td>
<td>2 calendar days</td>
<td>3 calendar days</td>
</tr>
<tr>
<td>&gt;25,000</td>
<td>1 calendar day</td>
<td>None</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Leakage Rate (ppm)</th>
<th>Effective 2020</th>
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### Key Requirements – Air Quality Notification Plan

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<th>PR 1148.3 Air Quality Notification Plan</th>
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<tr>
<td>Notify appropriate agencies when exceedances or malfunctions occur</td>
<td>Notify appropriate agencies and local residents of any event at the facility that results in a significant gas leak or elevated ambient air concentrations of TOC</td>
</tr>
</tbody>
</table>
PR 1148.3: Next Steps

• Working Group Meeting in February
• Governing Board Hearing – Summer 2017

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