

**Potential Amendments to District
Requirements for Leak Detection and Repair (LDAR)
at Oil and Gas Production Facilities
(Rules 4401, 4409, 4455, 4623, 4624)**

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Decades of Stringent Air Quality Regulations

- District has long evaluated and implemented stringent control measures across all sources under its jurisdiction in efforts to attain federal standards
 - Adopted over 650 rules and rule amendments in order to control emissions from stationary sources and other local sources
 - District's New Source Review permitting regulation requires the use of the Best Available Control Technology (BACT)
- District stationary sources subject to Best Available Retrofit Control Technology (BARCT) since 1980s
- Robust and ongoing analysis necessary to demonstrate that District's rules continue to meet state and federal requirements, including BARCT
 - Increasingly stringent air quality standards
 - Control technologies continually evolving

BARCT Assessment for Rules 4401, 4409, 4455, 4623, and 4624 Under AB617

- AB 617 requires expedited Best Available Retrofit Control Technology (BARCT) review and implementation schedule for facilities in CARB's Cap-and-Trade Program
- BARCT is an air emission limit for existing sources and is maximum degree of reduction achievable, taking into account environmental, energy and economic impacts
- Based on results of comprehensive analysis, District proposing more stringent Leak Detection and Repair (LDAR) requirements for sources subject to Rules 4401, 4409, 4455, 4623, and 4624
- Current control technology requirements found to meet or exceed BARCT levels of control
 - No further requirements proposed

Rule 4401 Overview

- District Rule 4401 first adopted April 19, 1991
 - Has been subsequently amended 5 times
- Purpose of rule is to limit VOC emissions from steam-enhanced crude oil production wells
- District Rule 4401 requirements
 - VOC emissions from wells, or tanks if wells have closed vents, reduced by 99%
 - Leak detection and repair program required for minimizing leaks with specific repair thresholds and timelines
 - Vapor control required with VOC destruction or removal efficiency of at least 99%
 - Operator Management Plan describes components subject to the rule and schedule of inspections
 - Record keeping requirements
- With implementation of this rule, VOC emissions reduced by 99%



Image credit: Anton-Paar, 2020

Rule 4409 Overview

- District Rule 4409 adopted April 20, 2005
- Purpose of rule is to limit VOC emissions from light crude oil production facilities, natural gas production facilities, and natural gas processing facilities
- District Rule 4409 requirements
 - Leak detection and repair program for minimizing leaks with specific repair thresholds and timelines
 - Operator Management Plan describes components subject to the rule and schedule of inspections
 - Record keeping requirements
- With implementation of this rule, VOC emissions reduced by 65%



Image credit: BIC Magazine, Oct 2020

Rule 4455 Overview

- District Rule 4455 adopted April 20, 2005
- Purpose of rule is to control VOC emissions from leaking components at petroleum refineries, gas liquids processing facilities, and chemical plants
- District Rule 4455 requirements
 - Leak detection and repair program for minimizing leaks with specific repair thresholds and timelines
 - Operator Management Plan describes components subject to the rule and schedule of inspections
 - Record keeping requirements
- With implementation of this rule, VOC emissions reduced by 87%



Image credit: Corken 2020

Rule 4623 Overview

- District Rule 4623 first adopted April 11, 1991
 - Has been subsequently amended 4 times
- Purpose of rule is to limit VOC emissions from the storage of organic liquid in tanks with a capacity of 1,100 gallons or greater
- District Rule 4623 requirements
 - Control of organic liquid storage tanks by utilizing a pressure vacuum vent, installation of a vapor control system with 95% control efficiency, or use of a floating roof depending on tank size and True Vapor Pressure (TVP) of organic liquids stored
 - Components must be maintained in a leak-free condition
- With implementation of this rule, VOC emissions reduced by up to 95%



Image credit: alloiltank 2020

Rule 4624 Overview

- District Rule 4624 first adopted April 11, 1991
 - Has been subsequently amended 4 times
- Purpose of rule is to limit VOC emissions from the transfer of organic liquids
- District Rule 4624 requires
 - Use of a vapor control system to capture and reduce emissions by at least 95%
 - Leak detection and repair program required for minimizing leaks with specific repair thresholds and timelines
- With implementation of this rule, VOC emissions reduced by up to 95%



Image credit: Schnider 2020

Current Vapor Control Requirements in District Rules

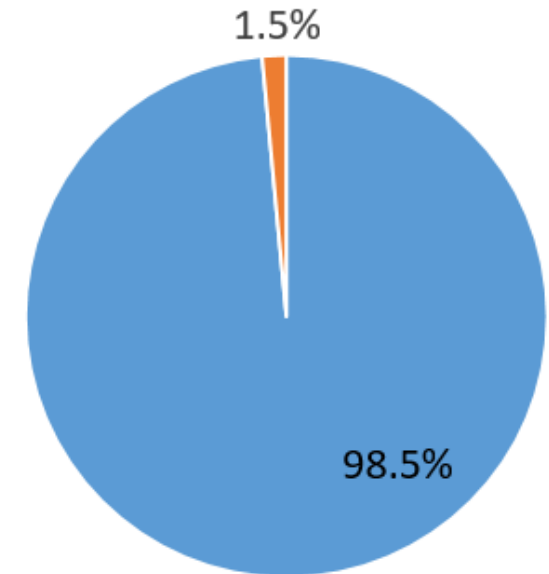
District Rules	Current Vapor Control Requirements
Rule 4623 – Organic Liquid Storage	Pressure Vacuum Relief Valve, Internal Floating Roofs (IFR), External Floating Roofs (EFR), or Vapor Recovery System (VRS) with control efficiency of 95%
Rule 4624 – Transfer of Organic Liquids	Bottom loading, closed VOC emission control system, Vapor Collection and Control System (VCCS), or containers and VRS that meet Rule 4623
Rule 4401 – Steam Enhanced Wells	VOC collection and control system with 99% VOC destruction or removal
Rule 4409 – Light Oil/Gas Plants Rule 4455 – Petroleum Refineries, Gas Processing Facilities, and Chemical Plants	These are LDAR rules only

Control technology requirements found to meet or exceed BARCT levels of control and no further requirements being proposed

Affected Oil and Gas Production Operations

- District Rules 4401, 4409, 4455, 4623, and 4624 apply to oil and gas production facilities
 - Rule 4401 (Steam enhanced production wells): 48 facilities
 - Rule 4409 (Components at Light Crude Oil Production Facilities, Natural Gas Production Facilities, and Natural Gas Processing Facilities): 61 facilities
 - Rule 4455 (Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants): 17 facilities
 - Rule 4623 (Storage of Organic Liquid): 335 facilities
 - Rule 4624 (Transfer of Organic Liquid): 58 facilities
- VOC emissions from these sources: 4.54 tons per day (tpd)

All VOC Emissions in the Valley
Mobile, Stationary, & Areas Sources



■ Other VOC Sources ■ VOC from LDAR components

Proposed Regulatory Updates

- Instead of creating a new leak detection and repair rule as previously proposed at the last workshop; due to the complexity of combining requirements from five unique Rules (Rules 4401, 4409, 4455, 4623, and 4624), District is proposing to amend each individual rule as follows:
 - Lower leak thresholds
 - Require more frequent inspections
 - Clarify definitions

Proposed Amendments to Rule 4401

- Lower leak threshold from 2,000 ppmv to 500 ppmv for gas leaks
 - Maintain leak threshold for Pressure Relief Devices at 400 ppmv
- Change frequency of inspection from an annual inspection to quarterly inspections
- Establish an extended repair period (up to 30 days) for rare instances where a rig-up operation is required to complete repair
 - Consistent with State California Oil and Gas Regulations
- Update/clarify/add definitions for consistency across other District LDAR Rules

Proposed Changes to Rule 4409

- Lower leak threshold from 2,000 ppmv for Gas/Vapor and 1,000 ppmv for liquid service components down to 500 ppmv
 - Maintain leak threshold for Pressure Relief Devices at 200 ppmv
- Maintain quarterly inspection frequency requirement
- In rare instances, allow an extended repair period (up to 30 days) where a rig-up operation is required to complete repair
 - Consistent with State California Oil and Gas Regulations
- Update/clarify/add definitions for consistency across other District LDAR Rules

Proposed Amendments to Rule 4455

- Lower leak thresholds for pumps, compressors, other component types from 1,000 ppmv to 500 ppmv for components in gas/vapor service
 - Maintain lower leak thresholds for other components (100 ppmv to 500ppmv)
- Maintain quarterly inspection frequency requirement
 - Remove option for annual inspections
- Update/clarify/add definitions for consistency across other District LDAR Rules

Proposed Changes to Rule 4623

- Establish a leak threshold starting at 500 ppmv
- Establish allowable number of leaks (between 500ppmv - 10,000 ppmv)
 - 5 allowable leaks for 200 components or less
 - 2% allowable leaks for more than 200 components
- Establish quarterly inspection requirement for fixed roof tanks
- Update Voluntary Tank Preventive Inspection & Maintenance Tank Interior Cleaning Program to only include Floating Roof Tanks
- Fixed Roof Tanks will be required to comply with maintenance and tank cleaning provisions
- Update/clarify/add definitions for consistency across other District LDAR Rules

Proposed Changes to Rule 4624

- Establish a leak threshold of 500 ppmv
- Establish allowable number of leaks (between 500 ppmv > 1,000 ppmv)
 - 5 allowable leaks for 200 components or less
 - 2% allowable leaks for more than 200 components
- Establish quarterly inspection requirement for fixed roof tanks
- Update/clarify/add definitions for consistency across other district LDAR Rules

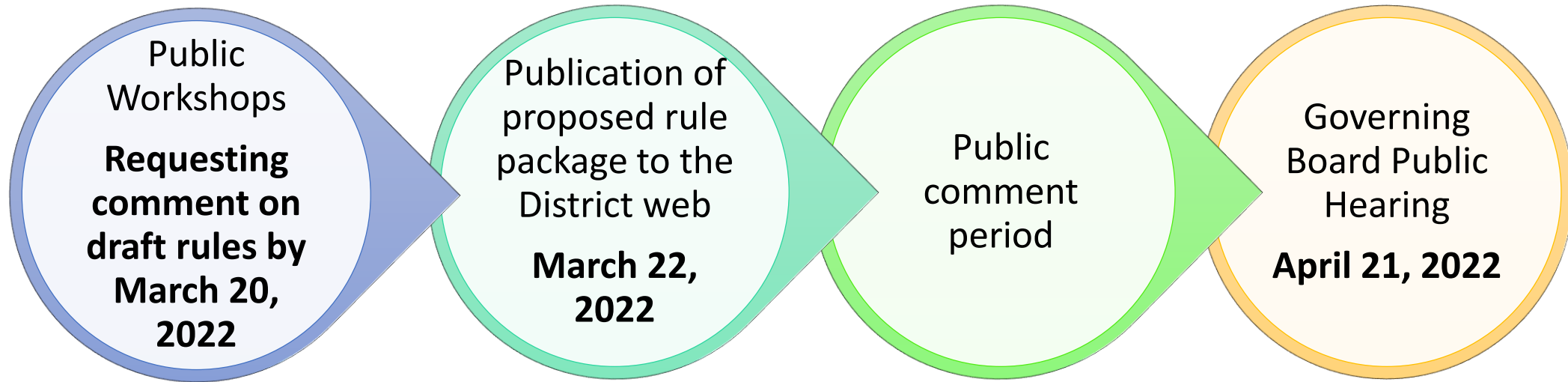
Estimated VOC Emission Reductions and Cost-effectiveness

- Emission Reductions from Rule 4401 & 4409 combined
 - 0.207 tons/day, 75 tons/year
- Emission Reductions from Rule 4623
 - 0.951 tons/day, 347 tons/year
- Emission Reductions from Rule 4624
 - 0.184 tons/day, 67 tons/year
- Emission Reductions from Rule 4455 (under evaluation)
- Total Estimated VOC Emission Reductions 1.34 tons/day and 490 tons/year
- Average Cost-effectiveness of \$67,285 for rule compliance

Proposed Compliance Deadlines

- Proposed new LDAR requirements would be effective starting January 1, 2024
- Authority to Construct (ATC) applications will be required January 1, 2023

Public Engagement Process for Rule Amendments



Public Participation and Comment Invited throughout Process

Contact

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Comments/Questions

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