

California's Oil and Gas Regulation, District Rules 2260 and 3156 Discussion and Implementation

COGR/2260 Requirements General

- As part of implementing AB32, on March 23, 2017, CARB adopted a regulation to reduce greenhouse gas/methane emissions from oil and gas facilities
- 70 - 80% of the affected facilities are located in the San Joaquin Valley
- Affected facilities already subject to District VOC rules and permits
- Affected facilities
 - Crude oil or natural gas production
 - Crude oil, condensate, and produced water separation and storage
 - Natural gas underground storage
 - Natural gas processing plants
 - Natural gas transmission and compressor stations

COGR/2260 General Requirements (cont'd)

- In order to implement CARB regulation District adopted Rules 2260 and 3156 in December 2017
 - Rule 2260 establishes and requires registration of equipment subject to COGR
 - Rule 3156 establishes a fee schedule, to be used only if CARB does not fund the program
- The CARB regulation and Rule 2260 make several requirements of subject facilities, including:
 - Administrative requirements
 - Applied requirements

COGR/2260 Administrative Requirements

- Application for Registration
 - Specific to this regulation, separate from District permitting
 - Application in “Spreadsheet” format, link on last slide
 - Application due (per 2260) March 1, 2018
 - Update as equipment is modified (online portal in process)
- Inventory Submission
 - Part of state requirement
 - Inventory uses same “Spreadsheet” format as registration
 - Inventory due (per 2260) July 1, 2018
 - Update annually, due March 1, 2019 onward
- Visit <https://www.valleyair.org/busind/pto/ptoforms/oil-and-gas-registration.htm> for applications and information pertaining to COGR

COGR/2260 Administrative Requirements (cont'd)

- Reporting Requirements – Electronic to ARB (oil&gas@arb.ca.gov)
 - Tank Flash Analysis Testing
 - Natural Gas Compressors
 - Reciprocating – LDAR and Flow Rates
 - Centrifugal – LDAR and Flow Rates
 - Natural Gas Powered Pneumatic Devices
 - LDAR and Flow Rates
 - Natural Gas Well Liquid Unloading (measured or calculated gas release)
 - Open Well Casing Vents (annual flow test for each well's vents)
 - Underground Natural Gas Storage (very detailed requirements)
 - Leak Detection and Repair
 - Results of quarterly inspections
 - Initial and final leak concentrations
- Most reports due by July 1 each year, flash testing due 90 days after

COGR/2260 Administrative Requirements (cont'd)

- Recordkeeping Requirements (must be available on request)
 - Separator and Tank Systems
 - Flash analysis results and throughput (DOGGR Form 110s)
 - Circulation Tanks for Well Stimulation
 - BMP plan
 - Natural Gas Compressors
 - Flow measurements
 - Operation hours
 - Parts/Service Orders (for LDAR)
 - Natural Gas Powered Pneumatic Devices
 - Emissions flow measurements

COGR/2260 Requirements Administrative (cont'd)

- Recordkeeping Requirements (must be available on request)
 - Liquids Unloading of Natural Gas Wells
 - Measured or calculated gas venting volume
 - Open Well Casing Vents
 - Flow rates from each well normally operating with open vents
 - Underground Natural Gas Storage
 - Detailed records required
 - Leak Detection and Repair
 - Inspection Records
 - Leak and Repair Records
 - Proof of Parts/Services ordered

COGR/2260 Requirements Separator and Tank Systems

- Key exemptions
 - Produced oil tanks with throughput < 50 BOPD
 - Produced water tanks with throughput < 200 BWPD in gas production
 - Tanks controlled (VRS or gas blanket)
 - Low use and temporary tanks
 - Gauge tanks (< 100 bbls)
- Tank Flash Analysis Testing (annually 3 years, then every 5 years)
 - Test to determine if annual emissions are > 10 Tons CH₄
 - Tanks over 10 Tons CH₄ must install Vapor Recovery System (requires District ATC)

COGR/2260 Requirements

Reciprocating Natural Gas Compressors

- Exemption
 - Compressors that operate < 200 Hours/Year
- Requirements (production facilities)
 - Perform LDAR per Section 95669 (including rod-packing seals)
 - Rod packing vent stacks must be controlled with VRS or repaired per LDAR (1/1/2019)
- Requirements (gas processing, transmission, boosting facilities)
 - Perform LDAR per Section 95669 (except rod-packing seals)
 - Flow rate from rod packing vent stacks must be measured annually
 - Rod packing vent stacks must be controlled with VRS or repaired per LDAR if > 2 scfm (1/1/2019)

COGR/2260 Requirements

Centrifugal Natural Gas Compressors

- Exemption
 - Compressors that operate < 200 Hours/Year
- Requirements (all facilities)
 - Perform LDAR per Section 95669 on wet and dry seals
 - Flow rate from wet seals must be measured annually
 - Vent stacks must be controlled with VRS or repaired per LDAR if > 3 scfm (1/1/2019)

COGR/2260 Requirements

Natural Gas Powered Pneumatic Devices & Pumps

- Continuous Bleed NG Pneumatic Devices must:
 - Not vent gas and must comply with LDAR by 1/1/2019
 - Devices installed before 1/1/2016 may be used provided they are measured annually to prove they vent < 6 scfh while idle and not actuating, must be tagged, and reported to CARB
 - Any device with measured emissions > 6 scfh must be repaired w/n 14 days
- Intermittent bleed NG pneumatic devices must comply with LDAR as of 1/1/2018 when the device idle and not venting
 - By 1/1/2019 pumps shall not vent NG and shall comply with LDAR
 - Continuous bleed NG powered pneumatic devices or pumps requiring replacement or retrofit shall either:
 - Collect vented gas to a vapor control system, or,
 - Use compressed air to operate

COGR/2260 Requirements

Well Casing Vents and Circulation Tanks

- Well casing vents
 - Beginning 1/1/2018 operators must measure the gas flow volume from each well that operates with open casing vents. These measurements are to be submitted annually and records kept
 - This is not a control requirement
- Circulation tanks for well stimulation treatments (not registered in 2260)
 - By 1/1/2018, each operator shall submit a Best Management Practices Plan to reduce methane emissions from well stimulation practices. The plan is to be reviewed by CARB. The District has no role in this approval.

COGR/2260 Requirements

Natural Gas Wells and Underground Storage

- Liquids unloading of natural gas wells (not registered by Rule 2260)
 - By 1/1/18 collect all vented NG to a control system, or
 - Measure the volume of the vented NG, or
 - Calculate the volume of the vented NG
 - Annually report volumes vented, or calculated, and venting method to CARB
- Natural gas underground storage facility monitoring requirements
 - These facilities are registered and will be inspected annually
 - Extensive monitoring requirements included in plan submitted to and approved by CARB. The District does not have authority over the plan, but will ask if it is being followed during our inspection.
- Control devices if required
 - Sales, fuel, disposal well (DOGGR), VR. New must be non-destructive or Low NO_x, and will require a District permit

COGR/2260 Requirements

Leak Detection and Repair (LDAR)

- By 1/1/18 all subject components, including those found on tanks, separators, wells, and pressure vessels, shall be inspected and repaired according to the timelines specified in the regulation
 - All components, including hatches, PRVs, well casings, stuffing boxes, and pump seals shall be inspected audio-visually daily (if site visited daily), or weekly (at sites not visited daily)
 - Inspect unsafe to monitor or inaccessible components annually
 - Leaks detected this way must be repaired, or inspected according to EPA Method 21 within 24 hours (by the end of the next business day if detected after hours, on a weekend or holiday)
 - Leaks detected via M 21 shall be repaired according to regulation timelines

COGR/2260 Requirements

LDAR (cont'd)

- By 1/1/18 all subject components, including those found on tanks, separators, wells, and pressure vessels, shall be inspected and repaired according to the timelines specified
 - All components must be inspected quarterly using EPA M 21 (Type I Survey)
 - You may not use a PID for this work
 - You may use Optical Gas Imaging (such as a FLIR camera) as a screening device, **but not in lieu of quarterly inspections with EPA M 21**
 - Leaks detected by OGI shall be inspected via EPA M21 within 2 calendar days of detection (14 calendar days for inaccessible or unsafe to monitor)
 - Leaks detected via M 21 shall be repaired according to regulation timelines
 - Inaccessible and unsafe to monitor must be inspected annually via EPA M 21
 - OEL must be capped or sealed in 14 days and if leaking, repair per timelines

COGR/2260 Requirements

LDAR (cont'd)

- Key Exemptions

- Components specifically subject to District LDAR (Rules 4401, 4409, 4623, 2201), as of 1/1/2018
 - Exemptions to District LDAR mean subject to CARB LDAR (4401)
- Components, including those found on tanks, separators, wells, and pressure vessels used exclusively for the production of crude (and associated water) with gravity < 20° API
 - This exemption does not apply to gas lines coming from tanks that move the gas to sales, as fuel, or to disposal, and TEOR systems
- Buried components (this exemption does not include well casings)
- Open casing vents (subject to testing under 95668)
- Closed casing vents serving wells with gravity < 20° API

COGR/2260 Requirements

LDAR (cont'd)

- Facility LDAR requirements
 - Inspect all subject components as required (daily, weekly, quarterly, annually)
 - Repair leaks in timeframes specified
 - Keep records of LDAR inspections
 - Submit annual LDAR summary to CARB (Tables A4 and A5 in regulation)
- Additional repair time
 - Repairs that require parts, equipment, or crews can be extended 30 days (where proof of ordering the parts, equipment, or crews is provided)
 - Repairs requiring more than 30 days must contact District staff
 - Components considered by CARB to be “Critical” have up to one year

COGR/2260 Requirements

LDAR (cont'd)

- The regulation establishes the mechanism by which affected facilities may designate certain components as “critical” allowing for extended repair times
 - A critical process unit “must remain in service because of its importance to the overall process that requires it to continue to operate, and has no equivalent equipment to replace it or cannot be bypassed, and it is technically infeasible to repair leaks from that process unit without shutting it down and opening the process unit to the atmosphere”
 - A critical component is one that “would require the shutdown of a critical process unit if that component was shutdown or disabled”
 - Approved critical components found to be leaking must be repaired upon turnaround or within 12 months, whichever is sooner
 - Separate provisions for components that are temporarily critical to reliable public gas system operation
 - CARB retained authority to approve or deny critical component requests

COGR/2260 Requirements LDAR (cont'd)

**Table 1 - Allowable Number of Leaks
January 1, 2018 through December 31, 2019**

Leak Threshold	200 or Less Components	More than 200 Components
10,000-49,999 ppmv	5	2% of total inspected
50,000 ppmv or greater	2	1% of total inspected

**Table 2 - Repair Time Periods
January 1, 2018 through December 31, 2019**

Leak Threshold	Repair Time Period
10,000-49,999 ppmv	14 calendar days
50,000 ppmv or greater	5 calendar days
Critical Components and Critical Process Units	Next scheduled shutdown or within 12 months, whichever is sooner

Per components inspected, tagged leaks found during facility inspection not counted in District inspection

COGR/2260 Requirements LDAR (cont'd)

**Table 3 - Allowable Number of Leaks
On or After January 1, 2020**

Leak Threshold	200 or Less Components	More than 200 Components
1,000-9,999 ppmv	5	2% of total inspected
10,000-49,999 ppmv	2	1% of total inspected
50,000 ppmv or greater	0	0

**Table 4 - Repair Time Periods
On or After January 1, 2020**

Leak Threshold	Repair Time Period
1,000-9,999 ppmv	14 calendar days
10,000-49,999 ppmv	5 calendar days
50,000 ppmv or greater	2 calendar days
Critical Components and Critical Process Units	Next scheduled shutdown or within 12 months, whichever is sooner

COGR/2260 Requirements

LDAR (cont'd)

- OEL provisions are found in the LDAR section of the regulation
- Open-ended lines and valves located at the end of lines must be sealed with a blind flange, plug, cap, or second closed valve at all times, except during operations requiring liquid or gaseous process fluid flow
 - This requirement does not apply to vent stacks used to vent natural gas from equipment that cannot be sealed for safety reasons
- 14-day repair time applies to both District- and facility-conducted LDAR inspections
 - Open-ended lines that are capped or sealed and found leaking must be repaired in accordance with the applicable timeframe

COGR/2260 Requirements

LDAR (cont'd)

- For facility inspections the requirements are:
 - Conduct LDAR as required
 - Repair leaks per timelines
 - Keep records (5 years)
 - Report annually to CARB
- CARB/District will not enforce greater than allowable leaks found during operator inspection, even during 4th Quarter
- Greater than allowable number of leaks is enforceable during CARB/District inspection

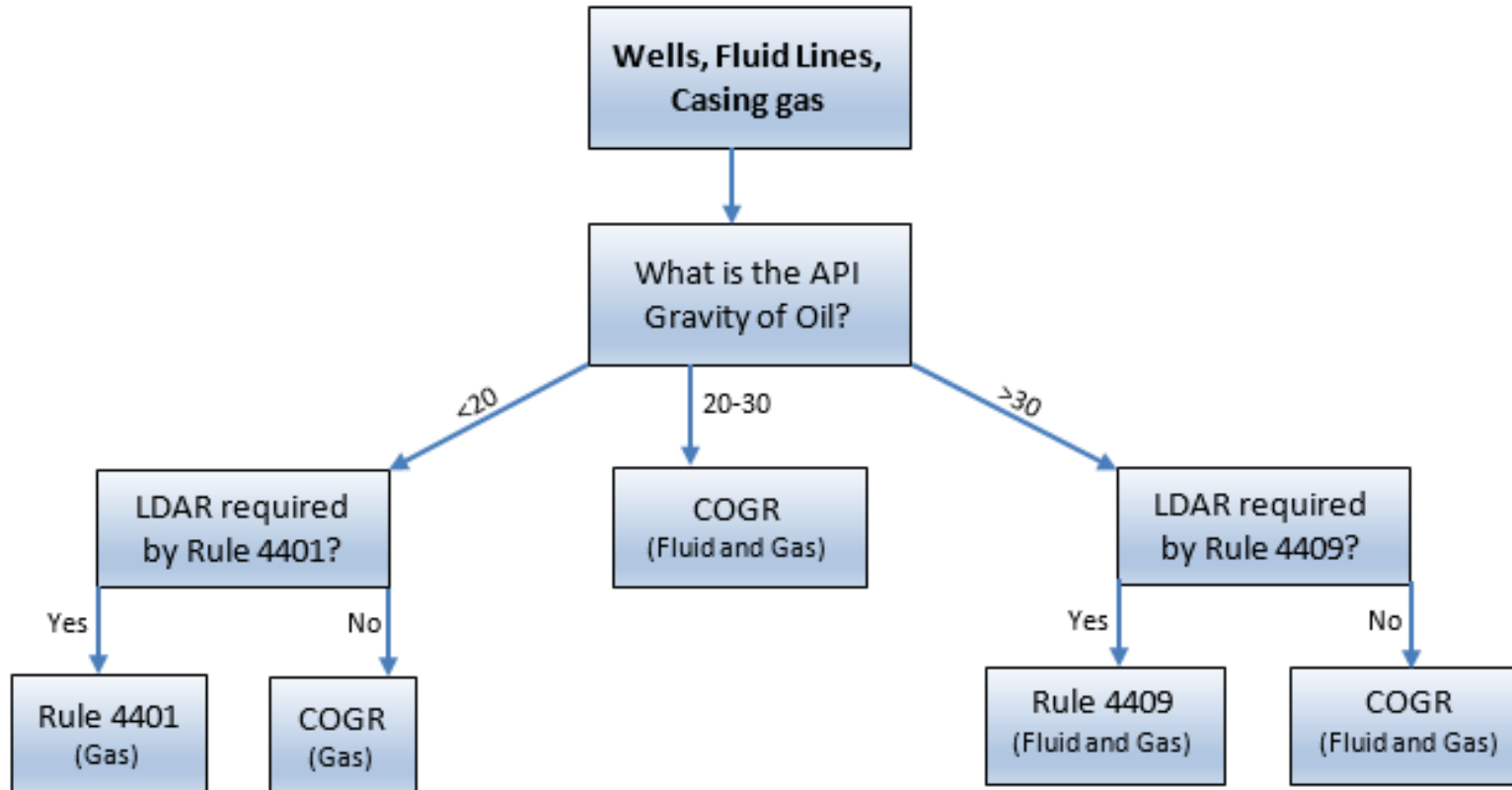
COGR/2260 Requirements

LDAR (cont'd)

- The CARB regulation overlaps equipment that can be subject to District Rules and applicability questions should be directed to District staff
- Key considerations:
 - Produced oil gravity
 - If LDAR is required by District as of 1/1/2018
 - This includes LDAR required by Rule 2201
 - Definition of component – ***subject to LDAR unless specifically exempt***
 - Valve, fitting, flange, threaded-connection, process drain, stuffing box, pressure-vacuum valve, pressure-relief device, pipes, seal fluid system, diaphragm, hatch, sight glass, meter, open-ended line, well casing, natural gas powered pneumatic device and pump, or reciprocating compressor rod packing or seal

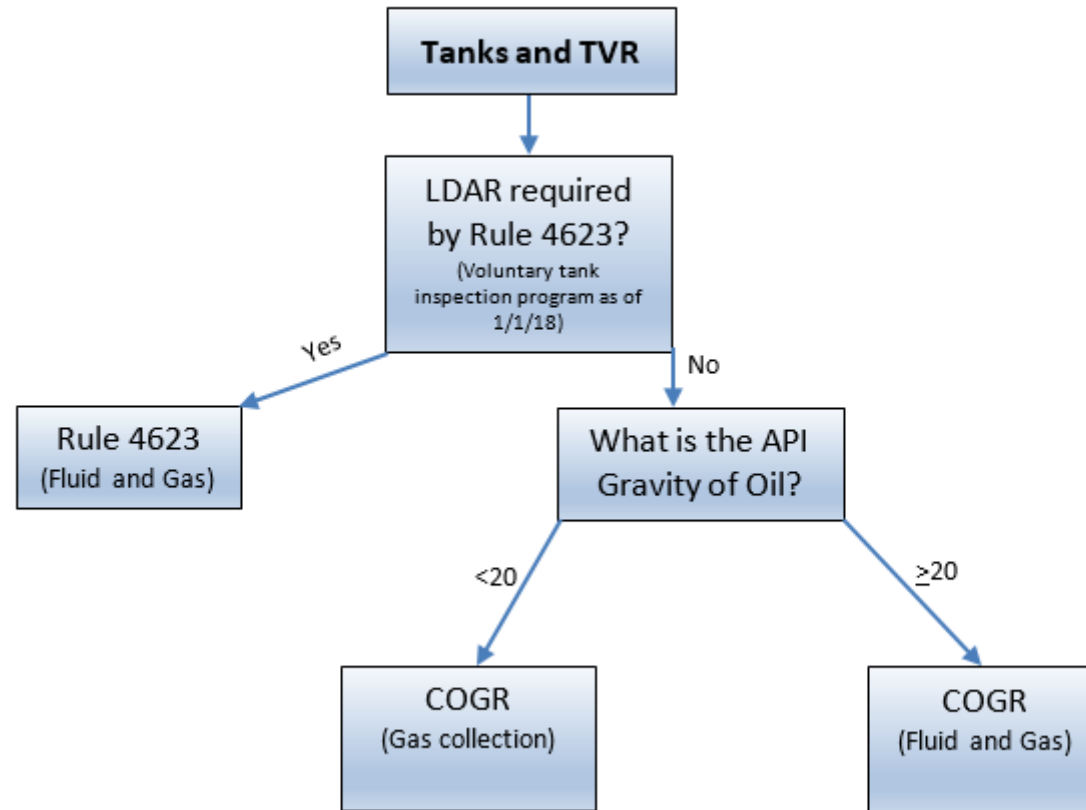
COGR/2260 Requirements

LDAR Required – Well Flowchart



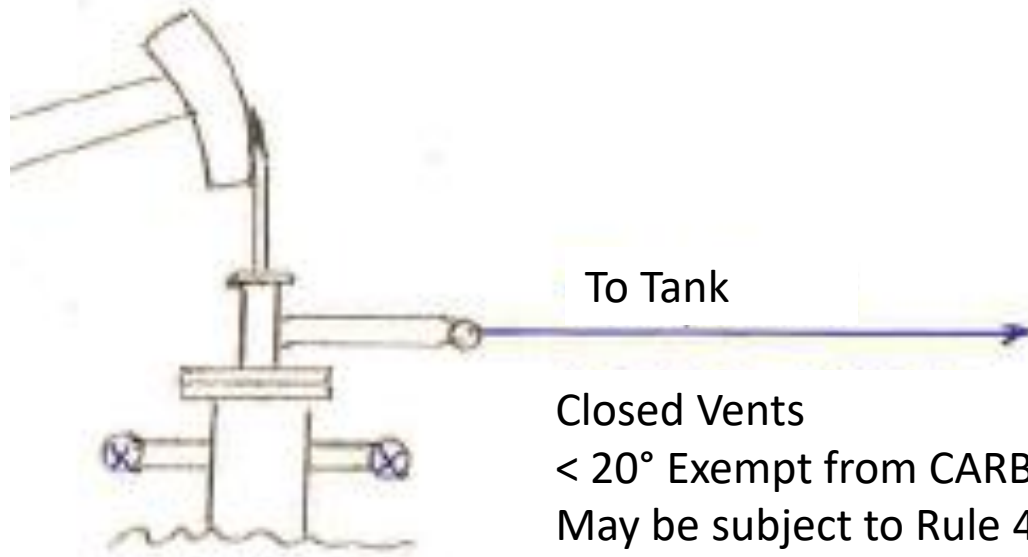
COGR/2260 Requirements

LDAR Required – Tank Flowchart



COGR/2260 Requirements

LDAR Simplified Diagrams - Wells



Closed Vents

< 20° Exempt from CARB LDAR

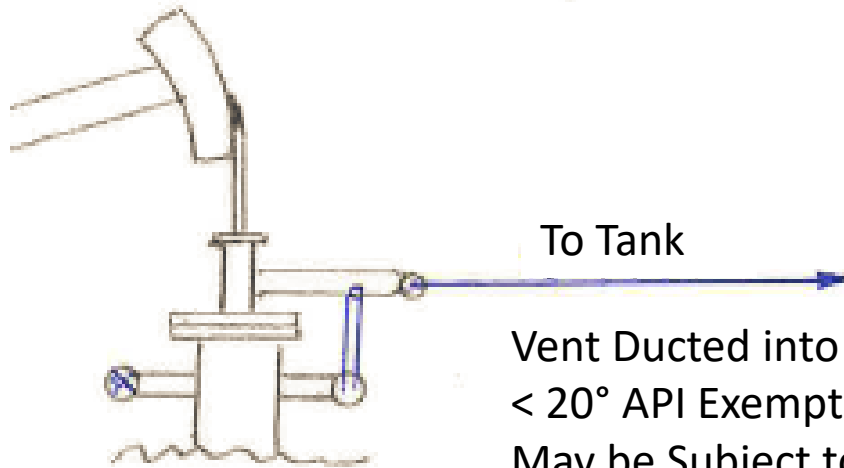
May be subject to Rule 4401

> 20° Subject to CARB LDAR

> 30° Subject to Rule 4409

COGR/2260 Requirements

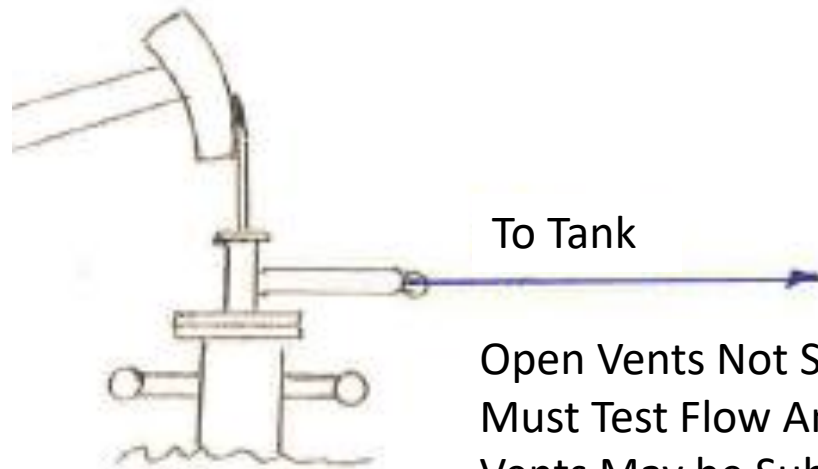
LDAR Simplified Diagrams - Wells



Vent Ducted into Production At Wellhead
< 20° API Exempt COGR LDAR
May be Subject to District Rule 4401
≥ 20° API < 30° Subject to COGR LDAR
> 30° API Subject to District Rule 4409

COGR/2260 Requirements

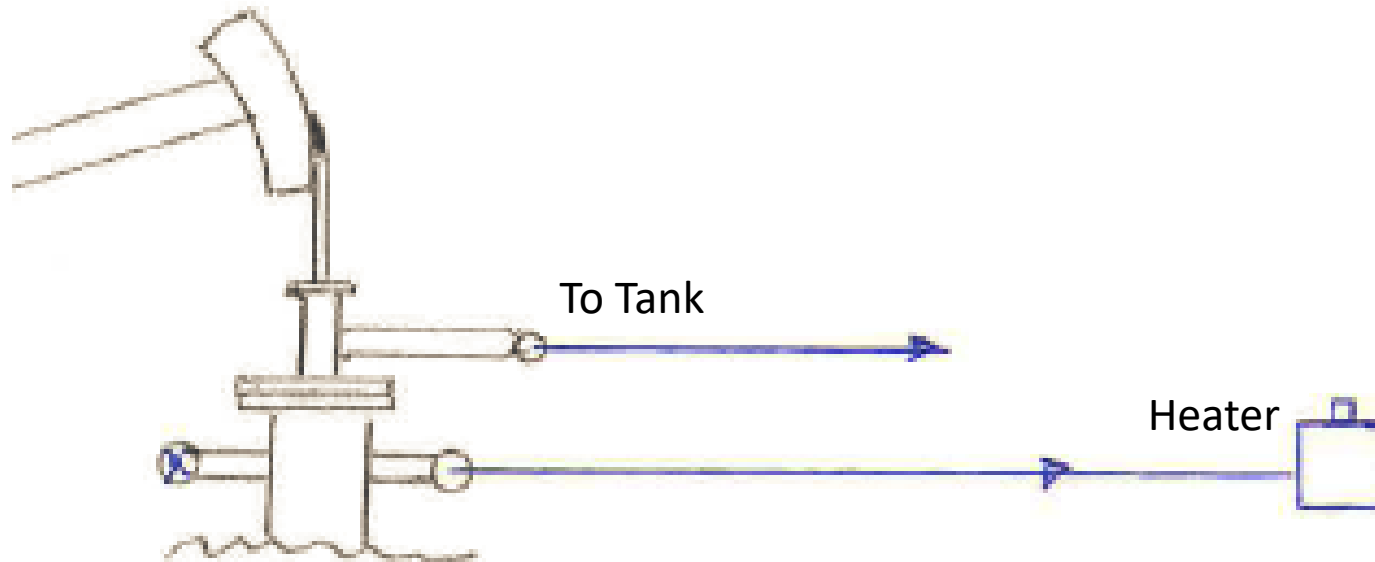
LDAR Simplified Diagrams - Wells



Open Vents Not Subject to CARB LDAR
Must Test Flow Annually
Vents May be Subject to District Rules 4401 or
4409

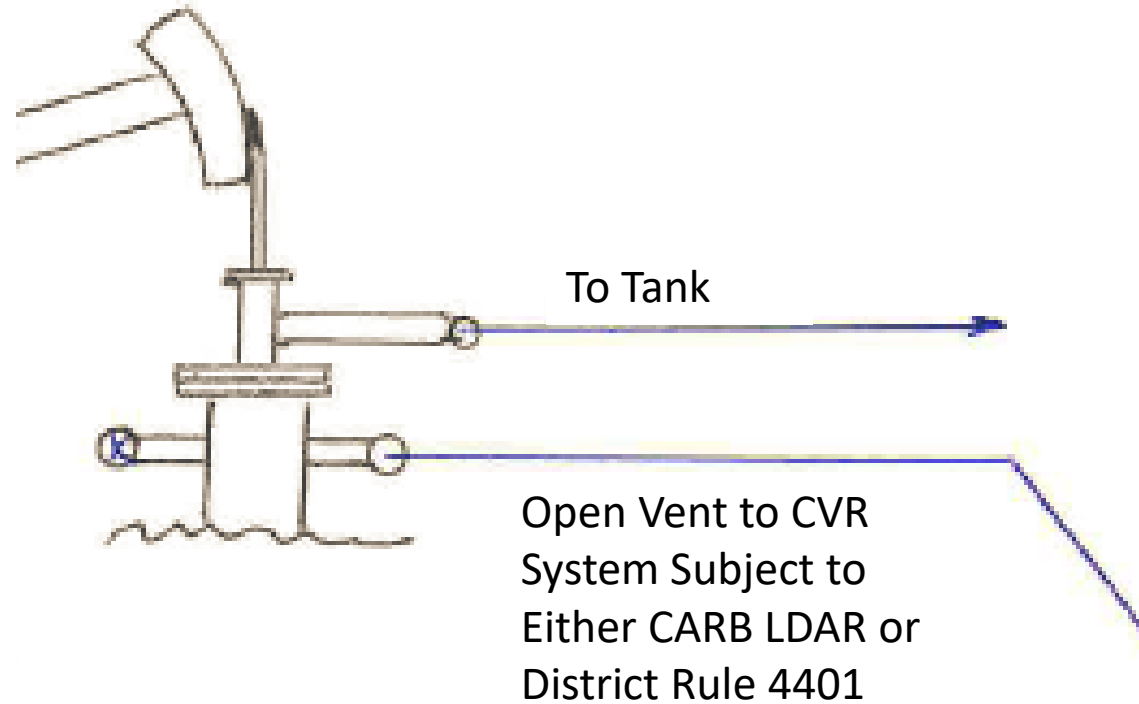
COGR/2260 Requirements

LDAR Simplified Diagrams - Wells



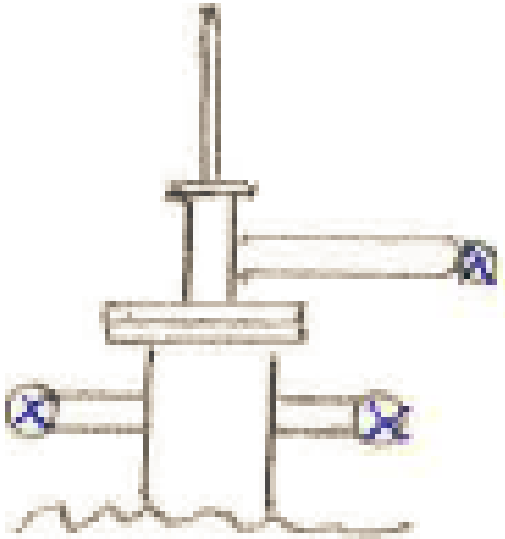
Gas Line Not Subject to District Rules Would be Subject to CARB LDAR

COGR/2260 Requirements LDAR Simplified Diagrams - Wells



COGR/2260 Requirements

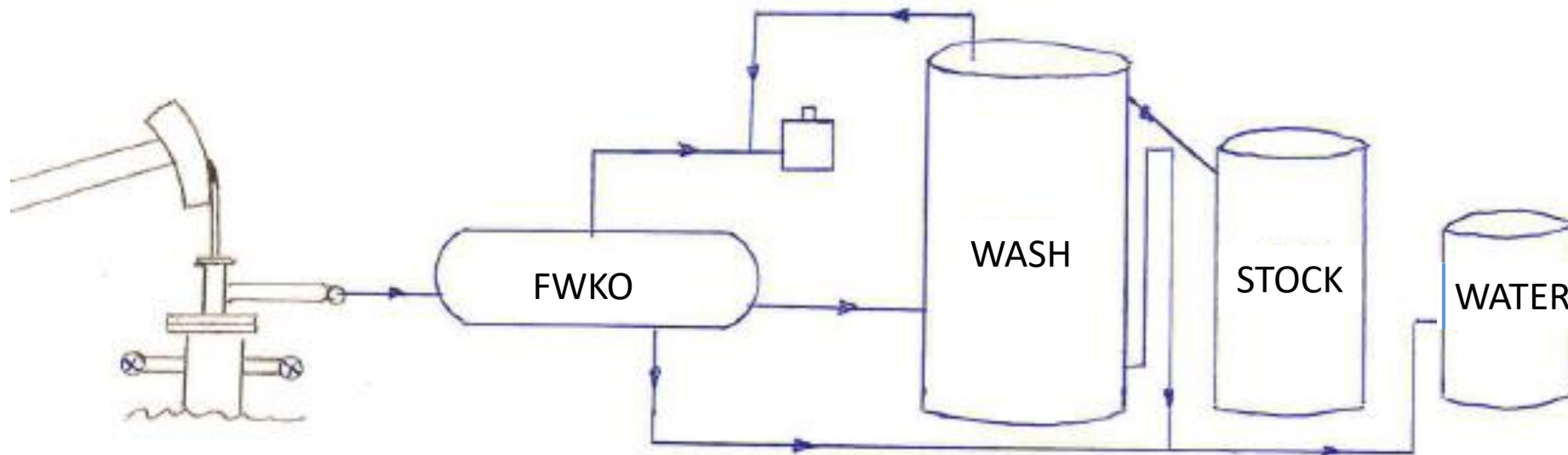
LDAR Simplified Diagrams - Wells



Idle Wells Not Exempt from CARB LDAR
or District LDAR Requirements

COGR/2260 Requirements

LDAR Simplified Diagrams - Tanks

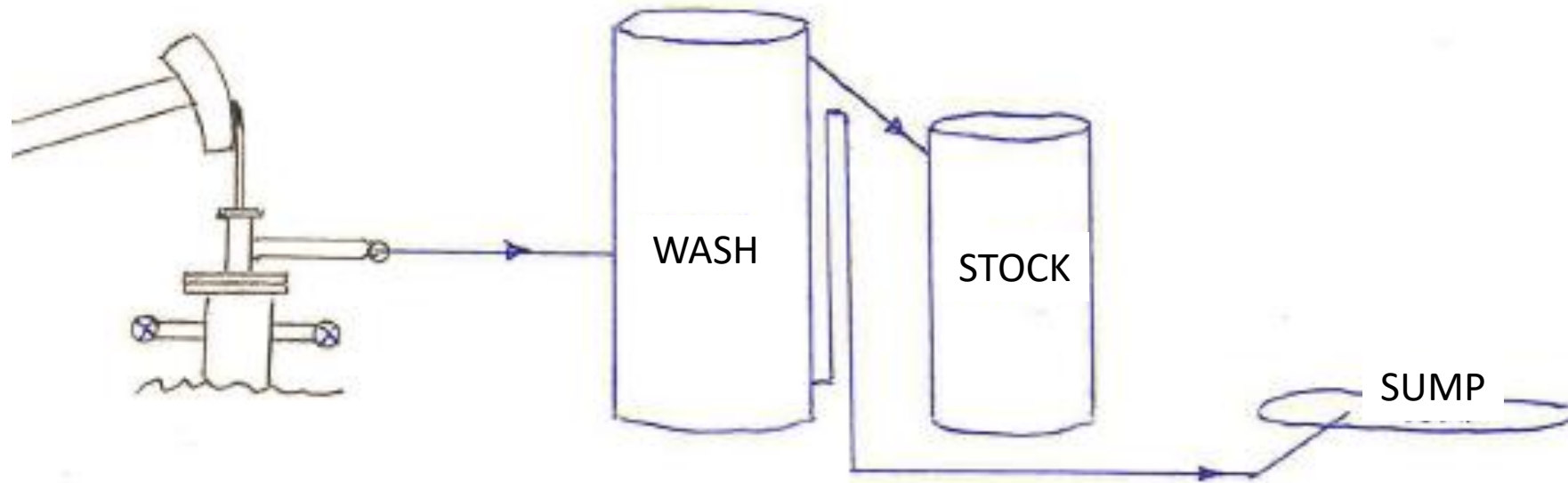


< 20° API All Gas Lines Subject to CARB LDAR

≥ 20° API Gas Lines, Flowlines, and Tanks are Subject to CARB LDAR

COGR/2260 Requirements

LDAR Simplified Diagrams - Tanks



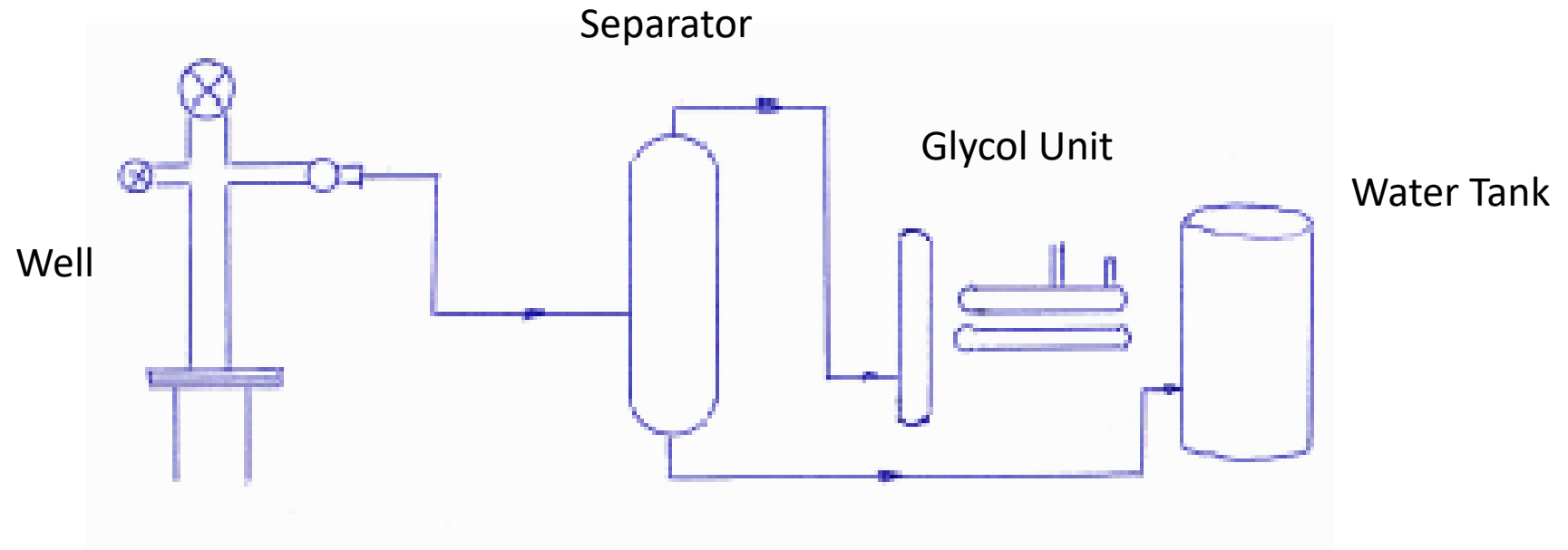
< 20° API All Gas Line Components Subject to CARB LDAR

≥ 20° API Gas Line, Flowline, and Tank Components are Subject to CARB LDAR

Do CARB LDAR or EPA M 21 apply to sumps? Not defined in Method, not defined in components, you do not have to sniff sumps. OEL do not have to be sealed during times requiring liquid flow.

COGR/2260 Requirements

LDAR Simplified Diagrams – Gas Prod.



Unless subject to Rule 4409, all gas production equipment subject to CARB LDAR
Water tank may be subject to Flash Testing if > 200 BWPD

COGR/2260

District Inspections

- Purpose
 - To determine compliance with these requirements as well as associated permitted operations
- Format
 - Each inspection will include record review (tests, flow rates, LDAR)
 - Each inspection will include equipment subject to the registration
 - Primarily LDAR using EPA M 21 (we may use a FLIR camera for screening)
- Streamlining Measures
 - To save facility time, to the extent possible, these inspections will coincide with facility inspections
 - Developed inspection report forms

EPA Method 21

- This method is applicable for the determination of VOC leaks from process equipment
- The sources measured are process equipment comprised of valves, flanges and other connections, pumps and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals etc
- This method is intended to locate and classify leaks only, and is not to be used as a direct measure of mass emission rate from individual sources.
- A leak definition concentration is based on a reference compound specified for each applicable regulation

LDAR

- Assesses the local VOC concentration at the surface of a leak source that indicates that a VOC emission (leak) is present
- The leak is measured with an instrument meter reading based on a reference compound
- Detector types used can include catalytic oxidation, flame ionization, infrared absorption, and photoionization
- The instrument shall be capable of measuring the leak definition concentration specified in the regulation
- The scale of the instrument meter shall be readable to ± 2.5 percent of the specified leak definition concentration
- The instrument shall be intrinsically safe for operation in explosive atmospheres as appropriate

Instrument Sample Collection Criteria

- A response factor must be determined for each compound that is to be measured, either by testing or from reference sources, and this test is required before placing the analyzer into service.
- Calibration of the instrument with a specified reference compound is required. A total of three measurements by alternating between the calibration gas and zero gas and the response factor for each repetition and the average response factor must be calculated.
- The calibration precision test must be completed prior to placing the analyzer into service and at subsequent 3-month intervals or at the next use, whichever is later.
- The calibration precision must be equal to or less than 10 percent of the calibration gas value.
- The instrument response time must be equal to or less than 30 seconds. The instrument pump, dilution probe (if any), sample probe, and probe filter that will be used during testing shall all be in place during the response time determination

Type I—Leak Definition Based on Concentration

- Place the probe inlet at the surface of the component interface where leakage could occur.
- Move the probe along the interface periphery while observing the instrument readout. If an increased meter reading is observed, slowly sample the interface where leakage is indicated until the maximum meter reading is obtained.
- Leave the probe inlet at this maximum reading location for approximately two times the instrument response time.
- If the maximum observed meter reading is greater than the leak definition in the applicable regulation, record and report the results as specified in the regulation reporting requirements.

Type I Survey

- **Valves.** The most common source of leaks from valves is the seal between the stem and housing. Place the probe at the interface where the stem exits the packing gland and sample the stem circumference. Also, place the probe at the interface of the packing gland take-up flange seat and sample the periphery. In addition, survey valve housings of multipart assembly at the surface of all interfaces where a leak could occur.
- **Flanges and Other Connections.** For welded flanges, place the probe at the outer edge of the flange-gasket interface and sample the circumference of the flange. Sample other types of nonpermanent joints (such as threaded connections) with a similar traverse.
- **Pumps and Compressors.** Conduct a circumferential traverse at the outer surface of the pump or compressor shaft and seal interface. If the source is a rotating shaft, position the probe inlet within 1 cm of the shaft-seal interface for the survey. If the housing configuration prevents a complete traverse of the shaft periphery, sample all accessible portions. Sample all other joints on the pump or compressor housing where leakage could occur.

Type I Surveys (cont'd)

- Pressure Relief Devices. The configuration of most pressure relief devices prevents sampling at the sealing seat interface. For those devices equipped with an enclosed extension, or horn, place the probe inlet at approximately the center of the exhaust area to the atmosphere.
- Process Drains. For open drains, place the probe inlet at approximately the center of the area open to the atmosphere. For covered drains, place the probe at the surface of the cover interface and conduct a peripheral traverse.
- Open-ended Lines or Valves. Place the probe inlet at approximately the center of the opening to the atmosphere.

Alternative Screening Procedure

A screening procedure based on the formation of bubbles in a soap solution that is sprayed on a potential leak source may be used if:

- Sources that do not have continuously moving parts,
- Sources do not have surface temperatures greater than the boiling point or less than the freezing point of the soap solution, and
- Sources do not have open areas to the atmosphere that the soap solution cannot bridge, or that do not exhibit evidence of liquid leakage
- Sources that have these conditions present must be surveyed using the instrument technique of Method 21
- If a potential leak is identified due to bubbling, Method 21 leak check must be conducted immediately

Use of a Forward Looking Infrared camera is not an allowed screening alternative under Method 21

Recent Updates to FAQ

- Q14 – updated to reflect new information from CARB regarding open well vents
 - Open well casing vents are subject to the requirements of the regulation
 - Registration is required within 60 days of operating the well casing vent in an open manner
 - Flow rate measurement is necessary to complete the initial registration application form
 - Casing vents need not be continuously open to maintain registration
 - Casing vents that are operated in an intermittently open/closed manner would be subject to LDAR requirements (including applicable leak standards and repair times) when closed

Recent Updates to FAQ (cont'd)

- Q29, Q30 – updated to clarify the applicability of leak standards and flow rate limits as well as repair times to the following equipment:
 - Continuous-bleed pneumatic valves
 - Intermittent-bleed pneumatic valves
 - Natural gas-powered pumps
 - Reciprocating compressors (incl. rod packing/seal vents)
 - Centrifugal compressors (incl. wet seals)

COGR/2260

Questions? Contacts

District Website, COGR Page, Includes registration/inventory forms, A COGR FAQ document, and links to CARB regulation

<http://www.valleyair.org/busind/pto/ptoforms/oil-and-gas-registration.htm>

EPA Method 21

https://www.epa.gov/sites/production/files/2017-08/documents/method_21.pdf

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