Statewide Rule 36: H2S

Sam Birdwell, State H2S Coordinator
August 2019
RRC Jurisdiction

- Oil and natural gas industry
- Intrastate Pipelines, natural gas and hazardous liquid pipeline industry
- Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG), and Liquid Natural Gas (LNG)
- Natural gas utilities
- Coal and uranium surface mining operations
Oil and Gas District Offices

- Abilene
- Corpus Christi
- Houston
- Kilgore
- Midland
- Pampa
- San Angelo
- San Antonio
- Wichita Falls
Regulatory Authority
Texas Administrative Code (TAC)
Title 16, Part 1, Chapter 3
§3.36
Oil, Gas, or Geothermal Resource Operation in Hydrogen Sulfide Areas

SWR 36 Mission
• Designed to protect public from hazards of hydrogen sulfide gas (H2S)
• Education and training are the best defenses
• Industry must protect themselves, public
• Denver City H2S tragedy, February 1975
Our mission is to serve Texas by our stewardship of natural resources and the environment, our concern for personal and community safety, and our support of enhanced development and economic vitality for the benefit of Texans.
Known Hydrogen Sulfide Areas

Permian Basin

Smackover

Eagle Ford Shale

Known Hydrogen Sulfide Areas
• Exploration, production and transportation of hydrocarbon fluids that contain hydrogen sulfide gas
  – 100 ppm or greater concentration
• Exceptions:
  – Gathering, storing and transporting stabilized liquid hydrocarbons
  – Refining, petrochemical and chemical plants
  – Operations where concentration of H2S is less than 100 ppm
• Testing to determine H2S concentration in operation/system
  – Color metric tubes (Storage Tanks Only)
  – Tutweiler (titration method) is the most flexible
  – Tutweiler is also the preferred method
• The required testing must be conducted at random sites/wells
• The well must be in production a minimum of 24 hours prior to the test.
• The test must be performed onsite. Samples cannot be taken into a lab.
• Testing sites or locations include the following:
  – well tubing or casing (gas must be dry)
  – portable well tester (Port-a-Check)
  – treater or other vessel with fluid/gas
  – gas sales meter (upstream of a scrubber)
There are two specific H-9 formats: Drilling and Production

- H2S concentration is **100 ppm** or greater in system/operation
- Producing/injection in designated H2S field
- Drilling into known H2S field near a public area
- Drilling into a wildcat field (H2S)

*Note: A field is designated as sour when an operator files a Production H-9 indicating 100 ppm or greater H2S concentration.*
SWR 36 – Radius of Exposure (ROE)

- SWR 36 identifies two ROEs that identify potential danger and may require additional compliance.
- **100 ppm** ROE – distance from release to where H2S concentration in air will dilute to **100 ppm**.
- Identifies public areas within the ROE
- ROE is not a fixed point of location or reference
• 500 ppm ROE – distance from release to where H2S concentration in air will dilute to 500 ppm

• Identifies public roads within the ROE
  – public roads are tax supported or any road used for public access/use
Warning & Marker Provision

All signs shall state “Caution” and “Poison Gas” with yellow and black contrast.
• Signs must be of sufficient size
• Signs must be posted:
  – at well or facility within city limits or close proximity to public
  – at public road crossings
  – along a line when located within public area
  – along a road at frequent intervals to avoid accidental excavation
EXAMPLES

CAUTION
H₂S
POISONOUS GAS
MAY BE PRESENT

DANGER
POISON

DANGER
H₂S
MAY BE PRESENT
• Facilities shall be fenced and locked when located within \( \frac{1}{4} \text{ mile} \) of a public area
• Specific fencing requirements will be satisfied on case-by-case by the appropriate district office.
• Manufactured to satisfy NACE MR-01-75 and API RP-14E requirements

• Materials not susceptible to H2S stress cracking may be used
  – fiberglass, plastics
  – when used for applicable industry standard, specifications or recommended practices
  – The utilization of brass connections and other equipment consisting of brass or bronze alloys are not recommended by the RRC
• All existing facilities shall be in compliance providing there has been no H2S stress related failure

• The RRC shall be notified of a failure resulting from H2S stress cracking
  – notified in writing
  – compliance of system will be determined
• Operators subject to this provision include:
  – 100 ppm ROE is in excess of 50 ft., includes any public area
  – 500 ppm ROE is greater than 50 ft., includes any public road
  – 100 ppm ROE is 3,000 ft. or greater

• Operators subject to this provision shall:
  – install and maintain devices and safety procedures to prevent the undetected release of H2S gas
SWR 36 – Contingency Plan

• Plan of action for alerting, responding and protecting the public following release of potentially hazardous volume of H2S gas

• Required for any operations where:
  – 100 ppm ROE is in excess of 50 ft., includes any public area
  – 500 ppm ROE is greater than 50 ft., includes any public road
  – 100 ppm ROE is 3,000 ft. or greater
• Instructions/procedures for alerting public/safety personnel of emergency
• Procedures for requesting assistance to remove public
• Call list
  – supervisory personnel, sheriff, DPS, ambulance, fire department, doctors, RRC District Office, etc.
• Plat detailing area of exposure
• Names & telephone numbers of responsible parties
• Provisions for advance briefing of the public
• RRC District Office phone number

*Refer to SWR 36 “Contingency Plan Provisions” for a complete list of requirements.
• Injection of fluids containing H2S is not allowed unless:
  – approved by Commission after public hearing
  – approved by District Office
• Contingency plan and control and safety equipment required
• Injection of sour produced water is not H2S injection
• Operations with a **100 ppm** concentration or greater of H2S **SHALL** train employees working in potentially affected areas in H2S safety

• Operators **SHALL** require service companies in H2S affected areas to utilize only personnel trained in H2S safety
• Training **SHALL** include:
  – hazards and characteristics of H2S safety precautions
  – operations of safety and life support equipment

• Additional training for on-site supervisory personnel:
  – effects of H2S on metal components
  – corrective action and shutdown procedures
  – full knowledge of contingency plan
• The operator is responsible for notifying RRC District Office:
  – accidental release of H2S gas that may present a hazard
  – activation of contingency plan
  – incident/accident involving H2S gas

• A written report shall be furnished to the RRC District Office within **10 days** of these conditions.
• Infield drilling and workovers
• Drilling into known H2S zone
• Wildcat drilling
• Drilling or workover operations where:
  – 100 ppm ROE is in excess of 50 ft., includes any public area
  – 500 ppm ROE is greater than 50 ft., includes any public road
• Requirements for drilling or workovers on leases with Production Form H-9 filed:
  – protective breathing equipment (SCBA)
  – maintained at two or more locations
  – wind indicators and H2S signs on site
  – automatic H2S sensors/alarms
  – personnel trained in H2S and safety equipment
• Minimum compliance depth for drilling: **1,000 feet** above known H2S zone

• Compliance for workovers is when a rig moves in to rig up
Visible wind indicators
H2S signs posted at entrance
Automatic, audible H2S sensors/alarms
Personnel trained in H2S and safety equipment
Compliance depth for drilling: **1,000 feet** above known H2S zone
• “Wildcat” designation may require operator to comply if District Office determines conditions warrant compliance.
• Call District Office for specific requirements.
• Requirements vary by District Office.
• “Full compliance” requires:
  – infield drilling and workover requirements
  – sufficient breathing equipment
  – minimum 3 audible H2S sensors
  – method of igniting gas in event of emergency
  – choke manifold, mud-gas separator, flare line and method for lighting the flare
• “Full compliance” requires:
  – secondary remote control of blowout prevention and choke equipment located a safe distance from well
  – Drill Stem Test of H2S zone
    • during daylight hours
    • RRC DO notified before test
  – BOP and well control systems pressure tested
    • at or near compliance depth
    • RRC DO notified 4 hours prior
• When **100 ppm ROE** includes public area or **500 ROE** includes a road:
  – call RRC District Office
  – file Form H-9 for Drilling with the RRC DO 30 days prior
  – file Contingency Plan with RRC DO
• Full compliance/same requirements as Wildcat drilling
• Certified operator has or will comply with the provisions

• H-9’s are not transferable, each operator must test each lease/gas well or system and file H-9
  – file in triplicate with the District Office
  – file **30 days prior** to commencement of drilling;
  – file within **30 days after P-4** certificate of transfer;

• New/amended H-9 filed if change in public exposure

• Signed by a person trained, experienced and qualified to make the certification
• Shall report on the initial completion report for oil well and gas well gas the H2S concentration when completed either in a designated H2S field or the H2S is 100 ppm or greater

• Shall file a Drilling Form H-9 or provide a copy of a certified copy of a Production Form H-9 when submitting a drilling application that requires one to be filed
<table>
<thead>
<tr>
<th>District and Contact Name</th>
<th>Phone Number</th>
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<tbody>
<tr>
<td>San Antonio (01/02), Wesley Dresch*</td>
<td>(210) 227-1313</td>
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<td>Houston (03), Pete Fisher</td>
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<td>Corpus Christi (04), Rick Silguero</td>
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<td>Kilgore (05/06), Ronny Russell</td>
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<td>Wichita Falls (09), Blake Ramon</td>
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<td>Pampa (10), Alan Leach</td>
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*State Coordinator for Districts 1, 2, 3, 4, 5, & 6

**State Coordinator for Districts 7B, 7C, 8/8A, 9 & 10
More information on Statewide Rule 36 is available on the Railroad Commission of Texas website.

http://www.rrc.state.tx.us/oil-gas/research-and-statistics/field-data/h2s/

http://www.rrc.state.tx.us/media/2943/outlinerule36.pdf