H2S Rule Summary

This rule is about providing protection of the public from H2S in O&G operations

For all O&G operations and facilities the H2S concentration must be established

If the H2S concentration < 100 ppm no further action is required

If the H2S concentration ≥ 100 ppm

- Signs & markers are required
- Wind direction indicators are required
- Detection and monitoring equipment I required for drilling, completion, workover and well servicing operations (alarm set at 20 ppm or less)
- Wells and facilities within ¼ mile of a public area must be secured

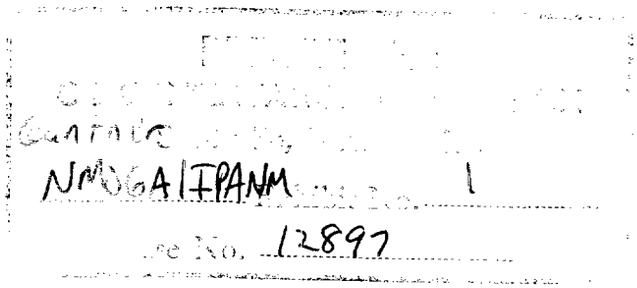
If a PHV could exist:

- An H2S contingency plan is required
- The plan must be activated for a PHV event
- The division must be notified any time the plan is activated
- The plan must be retained

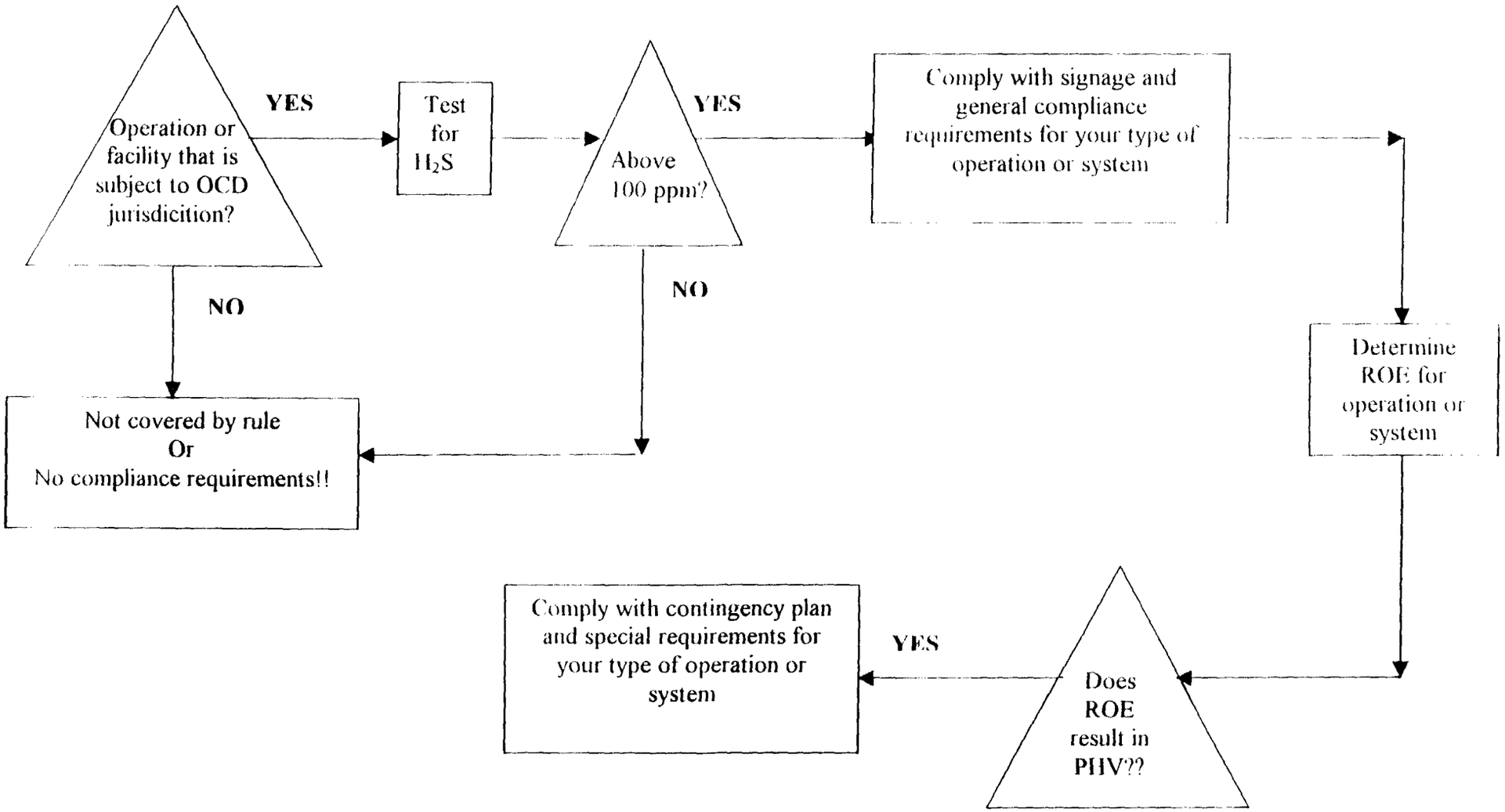
If the 100 ppm ROE involves a public area:

- A choke manifold, choke, accumulator, mud-gas separator, and flare line must be provided for all drilling, completion, workover and well servicing operations.
- For other operations, safety provisions to prevent an undetected release are required along with secondary well control

If the H2S concentration ≥ 300 ppm in the vapor space of tanks or vessels, all stairs and ladders leading to the top of the equipment must have the access restricted with chains and markings



Flow Chart
Proposed OCD Hydrogen Sulfide Rule



19.15.2.52 Hydrogen Sulfide Gas (Hydrogen Sulfide)

~~A. In General. Hydrogen sulfide gas is a flammable, poisonous gas that may occur naturally as a component of crude petroleum and natural gas. The gas has a distinct and characteristic odor of rotten eggs but due to olfactory fatigue may not be sensed by the human sense of smell.~~

~~B~~A. Applicability. This section is a public safety standard that applies to any person, operator or facility subject to the jurisdiction of the Division, including, but not limited to, any person, operator or facility engaged in drilling, stimulating, injecting into, completing, working over or producing any oil, natural gas or carbon dioxide well or any person, operator or facility engaged in gathering, transporting, storing, processing or refining of crude oil, natural gas or carbon dioxide. This section shall not act to exempt or otherwise excuse surface waste management facilities permitted by the division pursuant to 19 NMAC 15.I.711 from more stringent conditions on the handling of hydrogen sulfide required of such facilities by 19 NMAC 15.I.711 or more stringent conditions existing in permits issued thereunder, nor shall such facilities be exempt or otherwise excused from the requirements set forth in this section by virtue of permitting under 19 NMAC 15.I.711.

~~C~~B. Definitions (specific to this section).

1. ANSI. The acronym "ANSI" means the american national standards institute.
2. API. The acronym "API" means the american petroleum institute.
3. Area of Exposure. The phrase "area of exposure" means the area within a circle constructed with the point of escape at its center and the radius of exposure as its radius.
4. ASTM. The acronym "ASTM" means the american society for testing and materials.
5. Dispersion Technique. A "dispersion technique" is a mathematical representation of the physical and chemical transportation characteristics, dilution characteristics and transformation characteristics of hydrogen sulfide gas in the atmosphere.
6. ~~6.~~ Escape Rate. The "escape rate" is the maximum volume (Q) that is used to designate the possible rate of escape of a gaseous mixture containing hydrogen sulfide.
   a) For existing gas operations and facilities, t~~T~~he escape rate is calculated using the maximum daily rate of the gaseous mixture produced, handled, or the best estimate thereof. For an existing natural gas well, the escape rate shall be calculated by using the current daily absolute open flow rate against atmospheric pressure or the best estimate of that rate.
   b) For new gas operations and facilities, the escape rate will be calculated as the maximum anticipated flow rate through the system. For a new natural gas well, the escape rate shall be calculated using the maximum open-flow rate of off set wells, or the field average of current maximum open-flow rates.
   c) For an oil well, the escape rate shall be calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or the best estimate thereof. ~~For an oil or natural gas well drilled in a developed area, the escape rate may be determined by using data from offset wells completed in the interval in question, or using some other reasonable means to calculate the escape rate. For facilities or operations not mentioned, the escape rate shall be calculated using the actual flow of the gaseous mixture through the facility or operation~~.
7. GPA. The acronym "GPA" means the gas processors association.
8. LEPC. The acronym "LEPC" means the local emergency planning committee established pursuant to the emergency planning and community right-to-know act, 42 U.S. C. § 11001.
9. NACE. The acronym "NACE" refers to the national association of corrosion engineers.
10. PPM. The acronym "ppm" means "parts per million" by volume.

11. Potentially Hazardous Volume (hereinafter referred to as a ~~potentially hazardous volume~~ PHV) means the volume of hydrogen sulfide gas of such concentration that:

a. the 100-ppm radius of exposure includes any public area as defined herein;

b. the 500-ppm radius of exposure includes any public road as defined herein; or

c. the 100-ppm radius of exposure is ~~equal to or~~ in excess of 3,000 feet.

12. Public Area. A "public area" is any occupied building or structure that is not associated with the well, operation or system for which the radius of exposure is being calculated and that is used as a dwelling, office, place of business, church, school, school bus stop, hospital, or government building, or any portion of a park, city, town, village or ~~school bus stop or~~ other similar area where members of the public may reasonably be expected to be present.

13. Public Road. A "public road" is any federal, state, municipal or county road or highway ~~or postal route~~.

14. Radius of Exposure. The radius of exposure (hereinafter referred to as "radius of exposure" or "ROE") is that radius constructed with the point of escape as its starting point and its length calculated using the following Pasquill-Gifford derived equation, or by such other method as may be approved by the division:

a. For determining the 100-ppm radius of exposure: $X= [(1.589)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture, and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psia and 60°F).

~~or~~

b. For determining the 500-ppm radius of exposure: $X=[(0.4546)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$, where "X" is the radius of exposure in feet, the "hydrogen sulfide concentration" is the decimal equivalent of the mole or volume fraction of hydrogen sulfide in the gaseous mixture, and "Q" is the escape rate expressed in cubic feet per day (corrected for standard conditions of 14.73 psia and 60°F).

c. For a well being drilled, completed, recompleted, worked over or serviced in an area where insufficient data exists to calculate a radius of exposure but where hydrogen sulfide could reasonably be expected to be present in concentrations in excess of 100 ppm in the gaseous mixture, a 100-ppm radius of exposure equal to 3,000 feet shall be assumed.

~~D~~C. ~~Determination of Hydrogen Sulfide Risk~~Testing for Hydrogen Sulfide.

1. Determination of Hydrogen Sulfide Concentration.

a. Each person, operator or facility to which this section applies shall determine the hydrogen sulfide concentration within each of its ~~wells,~~ operations or systems. A representative sample or process knowledge may be used in lieu of individual testing of ~~wells,~~ operations or systems provided that the person, operator or facility can demonstrate that the concentration derived from the representative sample or process knowledge is reasonably representative of the hydrogen sulfide concentration within the ~~well,~~ operation or system.

b. The tests used to make the determination referred to in the previous subparagraph shall be conducted in accordance with applicable ASTM or GPA standards or by other methods approved by the division.

c. If a valid, representative sample from an ~~well,~~ operation or system was tested at any time prior to the effective date of this section, ~~within one (1) year of the effective date of this section,~~ new testing shall not be required~~: provided, however, new testing shall not be required for a producing well that was tested at any time prior to the effective date of this section~~.

2. Tested Concentrations Below 100 ppm. If the concentration of hydrogen sulfide in a given ~~well~~ operation or system is less than 100 ppm, no further actions shall be required pursuant to this section.

3. Tested Concentrations Above 100 ppm~~: Calculation of the Radius of Exposure.~~

~~c.~~ If the concentration of hydrogen sulfide in a given ~~well~~ operation or system is 100 ppm or greater, then the person, operator or facility must calculate the radius of exposure pursuant to ~~this section~~ Paragraph D and comply with the signage requirements outlined in paragraph F

~~c.~~ Retesting. If any change or alteration to an operation or system can materially increase the concentration of hydrogen sulfide, then the operator must retest that operation or system.

D. Determination of Radius of Exposure

1. For all operations subject to this section, the radius of exposure (ROE) shall be determined by following the definition given in B.14.

~~b~~2. If calculation of the radius of exposure reveals that a potentially hazardous volume is present, the person, operator or facility shall provide the results of the determination of the hydrogen sulfide concentration and the calculation of the radius of exposure to the division.

3. For an ~~well~~, operation or system existing on the effective date of this section, the determination, calculation and submission required herein shall be accomplished within ~~180~~360 days of the effective date of this section; for any ~~well~~ operation or system that commences operations after the effective date of this section, the determination, calculation and submission required herein shall be accomplished, preferably before operatons begin but no later than 60 days after initial production~~before operations begin~~.

4. Recalculation. The person, operator or facility shall ~~calculate or~~ recalculate the radius of exposure if an operational change or production alteration causes the hydrogen sulfide concentration in an ~~well~~ operation or system to increase to 100 ppm or greater or, if the hydrogen sulfide concentration in a well, operation or system was already 100 ppm or greater, causes a 25% or greater increase in the actual volume fraction of hydrogen sulfide. If calculation or recalculation of the radius of exposure reveals that a potentially hazardous volume is present, the person, operator or facility shall provide the results to the division ~~within thirty (30) days~~as soon as possible, but no later than sixty (60) days.

E. Hydrogen Sulfide Contingency Plan.

1. In General. A hydrogen sulfide contingency plan is a written document that provides a plan of action that will be used to alert and protect persons at risk in the event of a ~~potentially~~ significant release of hydrogen sulfide gas that could produce a PHV. The hydrogen sulfide contingency plan should be developed with due consideration of API Standard RP-55 entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide" but, as a minimum must be developed in accordance with the following paragraphs.

2. When Required. A hydrogen sulfide contingency plan must be prepared whenever a potentially hazardous volume of hydrogen sulfide is present or , in the case of a well being drilled, deepened, or re-entered, may reasonably expected to be encountered.

~~3. Input of Emergency Response Authorities and the Division. The person, operator or facility shall develop a proposed hydrogen sulfide contingency plan and provide a copy to the division, the New Mexico department of public safety (*i.e.*, the New Mexico state police), and the local emergency planning committee. If the potential source of release is within a municipality, a copy shall be provided to the municipal police and fire department. If the potential source of the release is outside the boundaries of a municipality, a copy shall instead be provided to the county sheriff and the county fire department or departments. Input on the proposed plan shall be sought from each of the foregoing; if an emergency response authority provided with a copy of the proposed plan fails to provide input or fails to respond at all, that fact shall be stated in the final hydrogen sulfide contingency plan submitted to the division. The input provided by the emergency response authorities shall be considered when preparing the final plan for submission to the division but failure to include any specific suggestion shall not affect the validity of the plan or cause disapproval of the plan by the division.~~

3. Plan Contents ~~- Elements~~.

The contingency plans shall contain, but not be limited to, information on the following subjects, as appropriate for the operation or system to which it applies:

a. Emergency Procedures
   1. Responsibilities of personnel
   2. Immediate Action plan
   3. Telephone numbers and communication methods for public agencies, emergency response organizations, and public authorities as appropriate
   4. Locations of nearby residences, businesses, parks, schools, churches, roads, medical facilities, etc.
   5. Evacuation routes and road block locations
   6. Procedures for public notification (lists or reaction plans)

b. Characteristics of Hydrogen Sulfide and Sulfur Dioxide

c. Maps, and Drawings
   1. Plats or maps detailing the areas affected by the ROE, specifically delineating any affected public areas and public roads

d. Training and Drills
   1. Responsibilities and duties of essential personnel
   2. On-site or classroom drills
   3. Informing nearby residents on protective measures in emergency situations as appropriate
   4. Training and attendance documentation
   5. Briefing of public officials on issues such as evacuation or shelter-in-place plans

4. **Plan Activation**. The hydrogen sulfide contingency plan shall be activated in the event of a significan release of hydrogen sulfide gas that could produce a PHV.

~~a. Elements Required for Each Plan.~~

~~i. A detailed description of each action to be taken in the event of a release of hydrogen sulfide requiring activation shall be included in each hydrogen sulfide contingency plan, including provisions for alerting and accounting for personnel, controlling any release of hydrogen sulfide gas, eliminating possible ignition sources, alerting the public (directly or through appropriate government agencies), evacuating persons in the affected area, using the call list to alert company officials and emergency response authorities, making recommendations to public officials to block access to affected areas and conducting evacuations and coordinating emergency response with emergency response authorities. A plan that addresses the items described in paragraph 7.6 of the guidelines published by the API in its publication entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP-55, most recent edition, shall be adequate for this purpose.~~

~~ii. A call list including the following as applicable:~~

~~aa. local supervisory personnel;~~

~~bb. county sheriff;~~

~~cc. department of public safety and state police;~~

~~dd. city or municipal police;~~

~~ee. appropriate division district office; and~~

~~ff. other public agencies as appropriate;~~

~~iii. A plat or map detailing the area within the radius of exposure of a potentially hazardous volume; and~~

~~v. A list of the names and telephone numbers of all personnel to be contacted when a release is reported or suspected.~~

~~b. Where the 500-ppm radius of exposure encompasses any public road, the person, operator or facility shall include the following additional elements in the hydrogen sulfide contingency plan:~~

~~i. A plat or map detailing the area of exposure, including the locations of public roads; and~~

~~ii. A plan to divert traffic and safely get existing traffic off the road and out of danger.~~

~~c. Where the 100-ppm radius of exposure encompasses any public area, the following additional elements shall be included in the hydrogen sulfide contingency plan:~~

~~i. A call list including all the persons set forth in Sub-subparagraph B(1)(a)(iii), above, and the following:~~

~~aa. ambulance services;~~

~~bb. hospitals;~~

~~cc. county and city fire departments;~~

~~dd. doctors;~~

~~ee. contractors for supplemental or emergency equipment; and~~

~~ff. other public agencies as appropriate;~~

~~ii. A statement describing how emergency response actions will be coordinated with the division and the New Mexico state police, consistent with the New Mexico hazardous materials emergency response plan (HMER);~~

~~iii. A plat or map detailing the area of exposure, including the locations of public areas and public roads;~~

~~iv. The names and telephone numbers of all persons living within the area of exposure and contact persons for areas of public concentration such as churches, schools, hospitals, offices and places of business;~~

~~v. Provision for advance briefing of affected persons within the radius of exposure. Such advance briefing shall include the hazards and characteristics of hydrogen sulfide, the necessity for a hydrogen sulfide contingency plan, the possible sources of hydrogen sulfide within the radius of exposure, instructions for reporting a gas leak, the manner in which persons will be notified in the event of an emergency and steps to be taken in an emergency;~~

~~vi. In lieu of the provision for advance briefing of persons within the radius of exposure described in the previous subsubparagraph, a reaction-type plan may be prepared and submitted that provides for mass notification of a release of hydrogen sulfide and for evacuation of affected areas; and~~

~~vii. Additional support information, if applicable, such as the location of emergency evacuation routes, the location of safety and life-support equipment, the location of facilities containing hydrogen sulfide, the location of nearby telephones or other means of communication and special instructions for conditions at a particular installation such as local terrain and the effect of various weather conditions.~~

~~d. Additional Requirements. The division may impose additional requirements or modify requirements based on site-specific conditions, population density or special circumstances.~~

5. Submission. ~~The hydrogen sulfide contingency plan shall be submitted to the division and a copy shall be submitted to the local emergency planning committee, if one exists.~~ A hydrogen sulfide contingency plan for a ~~well~~ system or operation existing on the effective date of this section shall be submitted to the Division within ~~180~~360 days from the effective date of this section. A hydrogen sulfide contingency plan for a new ~~well~~ system or operation shall be submitted, preferable before operations begin, but no later than 60 days of commencing ~~before~~ operations ~~commence~~. ~~A hydrogen sulfide contingency plan shall be submitted within 180 days if a public area or public road is established that creates a potentially hazardous volume where none previously existed. The hydrogen sulfide~~

~~contingency plan~~ rFor a drilling, completion, workover or well servicing operation, the hydrogen sulfide contingency plan must be on-file with the division prior to commencing work. The plan may be submitted separately or along with the application for permit to drill (APD) or must be on-file from a previous submittal.

6. Failure to Submit Plan. Failure to submit a hydrogen sulfide contingency plan when required may result in denial of an application for permit to drill that well, cancellation of an allowable or other appropriate enforcement action.

7. ~~Annual Review. Amendment~~Updating Provisions. The ~~person, operator or facility shall review the hydrogen sulfide contingency plan on an annual basis, or more frequently if activation of a plan reveals a deficiency or, if changes to processes, concentrations of hydrogen sulfide or other circumstances occur, or if a new public area and/or a new public road is established that creates a potentially hazardous volume. The person, operator or facility shall submit any amendments to the division and to the local emergency planning committee. Reasonable efforts shall be taken to update on an annual basis the lists of names and telephone numbers in the hydrogen sulfide contingency plan~~Contingency Plan shall be periodically reviewed and updated any time its provisions or coverage materially change.

8. Retention and Inspection. The hydrogen sulfide contingency plan shall be reasonably accessible in the event of a release and maintained on file at all times and shall be available for inspection by the division.

F. Signage at ~~Wells~~, Facilities or Operations. ~~For every well, operation or system to which this section applies that contains a concentration of hydrogen sulfide of 100 ppm or greater, the person, operator or facility must provide signage as set forth herein.~~

1. Where required. For every operation, or system to which this section applies that is determined to contain a hydrogen sulfide concentration of 100 ppm or greater, signs or markers meeting the requirements outlined below must be installed and maintained.

2. Signs and Markers Specifications. The sign or marker shall contain sufficient information and be readily readable by the public to warn that a potential danger exists and shall contain the words "Poison Gas". Signs or markers that have been installed prior to the effective date of this section and that are in compliance with other applicable regulations (Department of Transportation, OSHA, etc.) shall satisfy the requirements of this section. Other signs and markers that have been installed prior to the effective date of this section shall be acceptable provided that they indicate the presence of a potential hazard. For drilling, workover, completion, and recompletion operations, additional warning measures (e.g., red flags, signs, etc) shall be prominently posted whenever an imminent danger situation exists.

3. Location. Signs and/or markers shall be prominently posted at appropriate locations (e.g., entrance points) for facilites and operations subject to this section.

~~Drilling, Completion, Workover, and Well Servicing Operations. A danger or caution sign shall be displayed at each drilling, completion, workover and well servicing operation along each point of access to the site. The signs shall read "DANGER - POISON GAS, HYDROGEN SULFIDE PRESENT" or, as appropriate, "CAUTION - POISON GAS - HYDROGEN SULFIDE MAY BE PRESENT" or use equivalent language approved by the division, and shall state in smaller lettering: "Do Not Approach If Red Flag is Flying" or use equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration, or in another color approved by the division. The signs shall be legible and large enough to be read by all persons entering the well site and shall be placed a minimum of 200~~

~~feet but no more than 500 feet from the well site and at a location that allows vehicles to turn around at a safe distance prior to reaching the site.~~

~~2. Crude Oil Pump Stations, Producing Wells, Tank Batteries and Associated Production Facilities, Refineries, Gas Plants and Compressor Stations. A danger sign or signs shall be posted within 50 feet of each crude oil pump station, producing well, tank battery and associated production facility, refinery, gas plant and compressor station to alert the public of the potential hydrogen sulfide danger. If fenced, a danger sign at the gates shall suffice. The signs shall read "DANGER - POISON GAS - HYDROGEN SULFIDE PRESENT." or, as appropriate, "CAUTION - POISON GAS - HYDROGEN SULFIDE MAY BE PRESENT" or use equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration, or in another color approved by the division. The signs shall be legible and large enough to be read by all persons entering the site. A sign shall be placed at each point where a flow line or gathering line crosses a public road; each sign shall be legible and shall contain the name of the owner or operator and an emergency telephone number.~~

~~3. Tanks or Vessels. A danger sign or signs shall be posted on or within 50 feet of any storage tank to alert persons of the potential hydrogen sulfide danger. For any storage tank for which fencing is required, a danger sign posted at the locked gates shall suffice. The signs shall read "DANGER - POISON GAS - HYDROGEN SULFIDE PRESENT." or, as appropriate "CAUTION - POISON GAS - HYDROGEN SULFIDE MAY BE PRESENT." or equivalent language approved by the division. Each sign shall be painted in colors that satisfy Table 1 of ANSI standard Z53.1-1967 or regulations of the federal occupational safety and health administration or another color approved by the division. The sign(s) shall be legible and large enough to be read by all persons entering the site.~~

G. Compliance Requirements

1. Protection from Hydrogen Sulfide During Drilling, Completion, Workover, and Well Servicing Operations.

a. API Standards. All drilling, completion, workover and well servicing operations where it is reasonably expected that a potentially hazardous volume of hydrogen sulfide will be encountered shall be conducted with due consideration to the guidelines published by the API entitled "Recommended Practice for Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide," RP-68, and "Recommended Practices for Drilling and Well Servicing Operations Involving ~~of~~ Wells Containing Hydrogen Sulfide," RP-49, most recent edition.

~~2. Minimum Standards. At a minimum, each drilling, completion, workover and well servicing operation where a potentially hazardous volume of hydrogen sulfide may reasonably be expected to be encountered shall be conducted in accordance with the following:~~

~~a. Before Commencing Operations. Hydrogen sulfide training shall be completed and warning systems shall be operational before commencement of operations. Detection and monitoring equipment is not required for drilling from the surface to within 500 feet of the zone anticipated to contain hydrogen sulfide.~~

~~b. Egress Routes. The person, operator or facility shall maintain passable egress routes at all times during operations.~~

b. Detection and Monitoring Equipment. The person, operator or facility shall provide hydrogen sulfide detection and monitoring equipment as follows:

i. Each drilling and completion site shall have an accurate hydrogen sulfide detection and monitoring system that is capable of automatically activatesing visible and audible alarms when the ambient air concentration of hydrogen sulfide ~~reaches~~is equal to or less than 20 ppm. There shall be a sensing point located at the shale shaker, rig floor and bell nipple for a drilling site and the cellar, rig floor and circulating tanks or shale shaker for a completion site.

~~ii. The detection system shall be calibrated and tested and the results recorded monthly. Each test of the hydrogen sulfide monitoring system shall be recorded on the driller's log or its equivalent.~~

(iii). For workover and well servicing operations, one operational sensing point shall be located as close to the well bore as practical. Additional sensing points may be necessary for large or long-term operations.

(viii). Hydrogen sulfide detection and monitoring equipment must be provided and must be made operational during drilling when drilling is within 500 feet of a zone anticipated to contain hydrogen sulfide and continuously thereafter through all subsequent drilling.

c. Wind Indicators.

i. Equipment to indicate wind direction shall be present and visible at all times. At least two devices to indicate wind direction shall be installed at separate elevations and visible from all principal working areas at all times.

ii. When a sustained concentration of hydrogen sulfide is detected in excess of 20 ppm at any detection point, red flags shall be displayed.

d. Special Requirements. Where drilling, workover, completion, and recompletion operations occur in areas where the 100 ppm ROE includes a public area, the following additional measures are required:

i. The operator shall install a choke manifold, mud-gas separator, and flare line and provide a suitable method for lighting the flare.

ii. A remote controlled choke and accumulator shall be installed and operational.

~~e. Flare System. For drilling and completion operations, the person, operator or facility shall install a flare system to safely gather and burn hydrogen sulfide-bearing gas. Flare outlets shall be located at least 150 feet from the well bore. Flare lines shall be as straight as practical. The flare system shall be equipped with a suitable and safe means of ignition. Where noncombustible gas is to be flared, the system shall be provided supplemental fuel to maintain ignition.~~

~~f. Use of Well Control Equipment.~~

~~i. Drilling. A remote controlled choke and accumulator shall be installed and operational at all times beginning when drilling is within 500 feet of the formation believed to contain hydrogen sulfide and continuously thereafter during drilling. The remote controlled choke must include, at a minimum, a pressure and hydrogen sulfide-rated well control choke and kill system including manifold and blowout preventer that meets or exceeds the specifications API-16C and API-RP 53 or other specifications approved by the division. The blowout preventer stack shall have at least one spool for the kill and choke lines, two pipe rams, one blind ram, one annular device and a rotating head. Mud-gas separators shall also be used. These systems shall be tested and maintained pursuant to the specifications referenced, according to the requirements of this part, or otherwise as approved by the division.~~

~~ii. Completion, Workover and Well Servicing. If feasible, the equipment described in the previous subsubparagraph shall be installed and operational at all times during completion, workover and well servicing of a well. If not feasible, a suitable alternative to a remote choke such as a remote-controlled valve or blow out preventer with remote accumulator may be used, so long as the alternative equipment will be protective of public safety.~~

~~g. Mud Program. A mud program, including de-gassing and flaring, capable of handling hydrogen sulfide conditions and well control shall be used.~~

~~h. Well Testing. Except with prior approval by the division, drill-stem testing of a zone that contains hydrogen sulfide shall be closed chamber only, in that formation fluids shall not be permitted to flow to the surface.~~

~~3. If Hydrogen Sulfide Encountered During Operations.~~

~~a. If hydrogen sulfide was not anticipated at the time the division issued a permit to drill but is encountered during drilling in a concentration of 100 ppm or greater in the gaseous mixture, the operator shall immediately ensure control of the well, suspend drilling operations unless detrimental to well control, take whatever measures are necessary under the circumstances to assure public safety, calculate the radius of exposure and, if a potentially hazardous volume is present, prepare a hydrogen~~

~~sulfide contingency plan and obtain materials and equipment to bring operations into compliance with this section. The operator shall notify the division of the event and the mitigating steps that have or are being taken as soon as possible, but no later than 24 hours following discovery.~~

~~b. If Hydrogen Sulfide Is Encountered During Use of Air, Gas, Mist or Other Non-Mud Circulating Media. If hydrogen sulfide gas in excess of 100 ppm is encountered while drilling with air, gas, mist or other non-mud circulating mediums, the well shall be killed with a water- or oil-based mud, and mud shall be used thereafter as the circulating medium for continued drilling. An alternate drilling method may be used if specifically approved by the division.~~

2. Protection from Hydrogen Sulfide at Crude Oil Pump Stations, Producing Wells, Tank Batteries and Associated Production Facilities, Refineries, Gas Plants and Compressor Stations.

a. API Standards. Operations at crude oil pump stations and producing wells, tank batteries and associated production facilities, refineries, gas plants and compressor stations containing a potentially hazardous volume of hydrogen sulfide shall be conducted with due consideration to the guidelines published by the API in its publication entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP-55, latest edition.

~~2. Minimum Standards. At a minimum, operations at crude oil pump stations and producing wells, tank batteries and associated production facilities, refineries, gas plants and compressor stations containing a potentially hazardous volume of hydrogen sulfide shall also be conducted in accordance with the following subparagraphs and subsubparagraphs.~~

b. Security Provisions~~Fencing. Fencing and gates shall be required when crude oil pump stations and producing wells, tank batteries and associated production facilities are located in a public area or within a 1/4 mile of a building or structure used as a dwelling, office, place of business, church, school, hospital or government building or within 1/4 mile of a park, playground or school bus stop. The fence shall consist of a 5-foot chain link topped by two stands of barbed wire or other design approved by the division. Gates shall be locked when unattended~~Well sites or other unattended fixed surface facilities shall be protected from public access when the location is within ¼ mile of a public area. This provision shall be provided by fencing and locking, as appropriate. A surface pipeline shall not be considered as a fixed surface facility for this section.

c. Wind Direction Indicators. ~~Wind direction indicators shall be required.~~ Equipment to indicate wind direction shall be present and visible at all times. At least two devices to indicate wind direction shall be installed at separate elevations and visible from all principal working areas at all times

d. Special Requirements. For operations or systems occur in areas where the 100 ppm ROE includes a public area, the following additional measures are required:

i. Operators shall install safety devices and maintain them in an operable condition or shall establish safety procedures designed to prevent the undetected continuing escape of hydrogen sulfide.

ii. Any well shall possess a secondary means of immediate well control through the use of appropriate christmas tree or downhole completion equipment. Such equipment shall allow the downhole accessibility (reentry) under pressure for permanent well control.

~~e. Secondary Well Control. Any well shall possess a secondary means of immediate well control through the use of appropriate christmas tree or downhole completion equipment. Such equipment shall allow downhole accessibility (reentry) under pressure for permanent well control operations.~~

~~d. Automatic Safety Valve or Shutdown. Any well shall possess an automatic safety valve or shutdown at the facility or wellhead or other appropriate shut-in control. The automatic safety valve shall be set to activate upon a release of a volume of hydrogen sulfide that may create a concentration of hydrogen sulfide of 100 ppm in any public area, 500 ppm at any public road or 100 ppm 3,000 feet from the site of release.~~

e. Tanks or vessels. Each stair or ladder leading to the top of any tank or vessel containing 300 ppm or more of hydrogen sulfide in the gaseous mixture shall be chained or marked to restrict entry. ~~Any tank or tank battery that requires fencing pursuant to this section may substitute a danger sign posted at the gates for chaining and signs.~~

f. Compliance Schedule. Each existing crude oil pump station and producing well, tank battery and associated production facility, refinery, gas plant and compressor station not currently meeting the requirements and minimum standards set forth herein shall be brought into compliance within one year of the effective date of this section. Each crude oil pump station and producing well, tank battery and associated production facility constructed following the effective date of this section shall be designed, constructed and operated to meet the requirements set forth herein.

3. Personnel Protection and Training. All persons responsible for the implementation of any hydrogen sulfide contingency plan shall be provided training in hydrogen sulfide hazards, detection, personal protection and contingency procedures.

~~J. Standards for Equipment That May Be Exposed to Hydrogen Sulfide. Persons, operators and facilities shall choose equipment with consideration for both the hydrogen sulfide working environment and anticipated stresses. NACE Standard MR0175 (latest edition) or some other standard approved by the division shall be used for selection of metallic equipment or, if applicable, adequate protection by chemical inhibition or other methods that control or limits the corrosive effects of hydrogen sulfide shall be used.~~

~~K. Exemptions. Any person, operator or facility may petition the director for an exemption to any requirements of this section. Any such petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the public safety will be protected. A safety plan required by other governmental agencies may accompany the petition for exemption. The director, after considering all relevant factors, may approve an exemption if the circumstances warrant an exemption.~~

~~L. Release. Upon a release of hydrogen sulfide the following actions must be taken:~~

~~1. Activation of the Hydrogen Sulfide Contingency Plan. The hydrogen sulfide contingency plan shall be activated in the event of a release that may create a concentration of hydrogen sulfide of 100 ppm in any public area, 500 ppm at any public road or 100 ppm 3,000 feet from the site of release.~~

4. Notification of the Division. The person, operator or facility shall notify the division upon a release of hydrogen sulfide requiring activation of the hydrogen sulfide contingency plan, ~~preferably within one hour of discovery of the release, but~~ as soon as possible, recognizing that a ~~in cases where~~ prompt response should supercede notification. The person, operator or facility shall submit a full report of the incident to the division on Form C-141 no later than fifteen (15) days following the release.

~~M. Electronic Submission. Any submission to the division required by this section shall be made electronically in a generally accepted format that is compatible with the division's systems.~~

H. Reciprocity. Any facility or operation, that is subject to another jurisdiction with respect to hydrogen sulfide regulations (e.g., Bureau of Land Management Onshore Order 6) and is in compliance with those regulations, shall be deemed in compliance with this section.

~~N. Corrective Actions. The division may require corrective actions if necessary to maintain control of a well or any other facility or to safeguard public safety.~~

I. Exemptions. Any person, operator or facility may petition the director, or the directors designee, for an exemption to any requirements of this section. Any such petition shall provide specific information as to the circumstances that warrant approval of the exemption requested and how the public safety will be protected. A safety plan required by other governmental agencies may accompany the petition for exemption. The director, or the directors designee, after considering all relevant factors, may approve an exemption if the circumstances warrant an exemption.