

# Correspondence

Case No. 12 897

July 2002

## Ross, Stephen

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**From:** Phil Youngblood [phil@navajo-refining.com]  
**Sent:** Tuesday, July 16, 2002 5:43 PM  
**To:** sross@state.nm.us  
**Cc:** Deborah Seligman; Dave Pavlich; Don Whaley; Ron Loyd  
**Subject:** Proposed Change to Draft Exclusion



H2S Rule  
Flowchart11.ppt

Steven:

First, thanks for working with us in this.

We propose a revision(attached) to the draft exclusion you sent us.

What we are getting at is an explicit reference to the federal RMP program as part of the exclusion. As we have drafted it, oil and gas facilities upstream of refineries/NGP would NOT be able to avail themselves of the exemption because they don't have to prepare an RMP. Refineries and NGP plants DO have to prepare an RMP and therefore would be eligible for the exclusion under our proposal.

Please feel free to call me (505-746-5288) or Don Whaley of my staff(505-746-5398) to discuss this matter.

Thanks again,

Phil Youngblood  
Director of Environmental Affairs  
Navajo Refining Company

# Proposed Rule

## Exemptions

subsection J.

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### Exemptions:

It is proposed that the wording of this subsection be changed to:

“An exemption to the requirements of this Section may be granted by petitioning the director. 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. [*DELETE THIS: Submission of 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.

# Proposed Rule Exemptions – cont'd

[new paragraph]

In addition, each facility for which a Risk Management Plan (RMP) is required to be prepared and submitted to the U.S.EPA under the federal regulations at 40 CFR, Part 68, is exempt from the requirements of this Section upon submittal of a copy of the current RMP, and all subsequent updates, to the director.”

*DELETED TEXT - color key (green)*

ADDED TEXT - color key (blue)

7/5

**19.15.2. Hydrogen Sulfide Gas (Hydrogen Sulfide)**

**A. In General.** Hydrogen Sulfide Gas (known by its chemical abbreviation "H<sub>2</sub>S" or as "sulfurated hydrogen" or "hydrosulfuric acid") is a flammable, poisonous gas that occurs naturally as a component of crude petroleum and natural gas. The gas, and its combustion product, sulfur dioxide (SO<sub>2</sub>), present severe threats to human health and can be fatal in high concentrations. The gas has a distinct and characteristic odor of rotten eggs.

**B. Applicability.** This Section 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, 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. **[Roger: does this rule apply to surface waste facilities?]**

**C. Definitions** (specific to this Rule).

**1. API.** "API" means the American Petroleum Institute, 300 Corrigan Tower Building, Dallas, Texas, 75201.

**2. 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.

**3. 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. The escape rate is calculated using the maximum daily rate of the gaseous mixture produced or the best estimate thereof. For a natural gas well, the escape rate shall be calculated by using the current daily absolute openflow rate against atmospheric pressure. For an oil well, the escape rate shall be calculated by multiplying the producing gas/oil ratio by the maximum daily production rate or best estimate thereof. For an oil or natural gas well drilled in an undeveloped area (a wildcat well), the escape rate may be determined by using offset wells completed in the interval(s) 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 gaseous mixture through the facility or operation.

**4. PPM.** The abbreviation "ppm" means "parts per million."

**5. Potentially Hazardous Volume.** The phrase "potentially hazardous volume" as used in this Section means a volume of hydrogen sulfide gas whose volume, concentration and flow rate is such that, if released, any of the following conditions would exist: (a) a concentration of 100 ppm or greater at any residence, school, church, park, school bus stop, place of business or other area where any person could reasonably be expected to be present; (b) a concentration of 300 ppm or greater at any federal, state, county, municipal or public road or highway; or (c) a concentration of 100 ppm or greater at a distance of 3,000 feet from the site of release.

**6. Radius of Exposure.** The radius of exposure is an imaginary circle constructed from a point of escape as its starting point whose radius is calculated using the following Pasquill-Gifford derived equation, or by such other method(s) as may be approved by the Division:

a. For determining the 100 ppm radius of exposure where the hydrogen sulfide concentration in the gaseous mixture is less than 10 percent:  $X = [1.589(\text{hydrogen sulfide concentration})(Q)]^{(0.625)}$ , or

b. For determining the 300 ppm radius of exposure where the hydrogen sulfide concentration in the gaseous mixture is less than 10 percent:  $X = [(0.4546)(\text{hydrogen sulfide concentration})(Q)]^{(0.6258)}$  **(.4546 is for 500 ppm will be corrected for 300 ppm)**

Where: X= radius of exposure in feet; hydrogen sulfide concentration = decimal equivalent of the mole or volume fractions of hydrogen sulfide in the gaseous mixture; Q= maximum volume of gas determined to be available for escape in cubic feet per day (corrected for standard conditions of 14.73 psia and 60°F).

c. For determining the 100 ppm or the 300 ppm radius of exposure in gaseous mixtures containing hydrogen sulfide concentrations of 10 percent or greater, a dispersion technique that takes into account representative wind speed, direction, atmospheric stability, complex terrain, and other dispersion features shall be utilized. Such techniques may include, but shall not be limited to one of a

series of computer models outlined in the Environmental Protection Agency's "Guidelines on Air Quality Models (EPA-450/2-78-027R)."

d. Where multiple sources of hydrogen sulfide are present (e.g. wells, treatment equipment, flow lines, etc.), the radius of exposure may encompass a larger area than would otherwise be calculated using a radius of exposure computation for each component part.

e. For a well being drilled 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. Determination of the Hydrogen Sulfide Risk.**

**1. Determination of the Hydrogen Sulfide Concentration.** Each person, operator or facility to which this Section applies shall test the hydrogen sulfide concentration of the gaseous mixture in the well, operation, facility or system at least once using a method approved by the Division, and, using the test results, determine the hydrogen sulfide concentration. Records of the test shall be forwarded to the Division.

**2. Calculation of the Radius of Exposure.** If testing determines that the gaseous mixture contains hydrogen sulfide in a concentration of 100 ppm or greater, a calculation of the radius of exposure shall be made and the results submitted to the Division.

**3. Recalculation.** If operational or production alterations are made that result in a 5% or greater increase in the hydrogen sulfide concentration of the radius of exposure changes, a new radius of exposure shall be recalculated and the results submitted to the Division and similarly retained.

**4. Timing of Test, Determination and Calculation.** The testing, determination of the hydrogen sulfide concentration and the calculation of the radius of exposure shall be performed and results submitted to the Division within 180 days of the date of commencement of operations or within 180 days of the effective date of this rule.

**E. Public Contingency Plan.**

**1. In General.** A Public Contingency Plan is a written plan that provides an organized and effective plan of action to alert and protect persons at risk in the event of a release of a potentially hazardous volume of hydrogen sulfide.

**2. When Required.** A Public Contingency Plan must be prepared and maintained at any well, operation, facility or system where a potentially hazardous volume of hydrogen sulfide is present or may be present.

**3. Development.** A Public Contingency Plan shall be developed in conjunction with the Division, persons potentially at risk in the event of a release and emergency response authorities (including, but not limited to, police and fire departments near the well, operation or facility, the New Mexico State Police and/or the New Mexico Department of Public Safety, and the Local Emergency Planning Committee).

**4. Contents.** A Public Contingency Plan shall, at a minimum, contain the following elements:

**a. Actions to be Taken Upon Release.** A Public Contingency plan shall detail actions to be taken to alert and protect persons in the event of a release of a potentially hazardous volume of hydrogen sulfide. A Public Contingency Plan shall include instructions and procedures for alerting persons at risk and emergency response authorities in the event of a release of a potentially hazardous volume of hydrogen sulfide.

**b. Call List.** The plan shall include a call list that shall include the following as applicable:

1. local supervisory personnel;
- ii. county sheriff;
- iii. the Department of Public Safety and State Police;
- iv. city (municipal) police;
- v. ambulance services;

- vi. hospitals;
- vii. county and city fire departments;
- viii. doctors;
- ix. contractors for supplemental or emergency equipment;
- x. the appropriate Division district office; and
- xi. other public agencies as appropriate.

**c. Coordination of Response.** A Public Contingency Plan shall stipulate how emergency response actions will be coordinated with the Division and the New Mexico State Police, a Division of the Department of Public Safety, as required pursuant to the New Mexico Emergency Management Act, NMSA 1978, Sections 74-48-1 through 74-4B-14 and the New Mexico Hazardous Material Emergency Response Plan (HMER Plan).

**d. Plat or Map.** The Plan shall include a plat or map detailing the area of exposure, including the locations of private dwellings or residences, public facilities such as schools, businesses, public roads or other similar areas when any person may be reasonably expected to be present within the radius of exposure.

**e. Names and Phone Numbers - Affected Persons.** The Plan shall include the names and telephone numbers of all persons living within the area of exposure.

**f. Names and Phone Numbers - Responsible Persons.** The Plan shall include a list of the names and telephone numbers of each responsible party for each of the publicly occupied areas within the radius of exposure, such as schools, churches, businesses and other public areas or facilities within the radius of exposure.

**g. Advance Briefing.** The Plan shall include provisions for advance briefing of persons within the radius of exposure. Such advance briefing shall include the hazards and characteristics of hydrogen sulfide, the necessity for an Public Contingency Plan, the possible sources of hydrogen sulfide with 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.

**h. Additional Support Information.** The Plan shall include additional support information, if applicable, such as the location of emergency evacuation routes, the location of safety and life support equipment, the location of hydrogen sulfide containing facilities, the location of nearby telephones and/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.

**i. Site-specific Factors.** The Division may impose additional requirements based site-specific conditions, population density or special circumstances.

**5. Submission.** A copy of a Public Contingency Plan shall be submitted to the Division.

**6. Failure to Submit Plan.** Failure to submit either a Drilling Contingency Plan or the Public Contingency Plan, or both when required, may result in denial of the Application to Drill.

**7. Annual Review.** A Public Contingency Plan(s) shall be reviewed on an annual basis and a copy of any necessary revisions shall be submitted to the Division.

**8. Retention and On-Site Inspection.** A Public Contingency Plan shall be maintained on file at all times and shall be available during a release of a potentially hazardous volume of hydrogen sulfide.

#### **F. Drilling Contingency Plan.**

**1. In General.** A drilling contingency plan is a written plan that describes emergency action to be taken to alert and protect persons at risk in the event of a release of a potentially hazardous volume of hydrogen sulfide, to provide for safety of any person at the site of the release, and to maintain control of the well.

**2. When Required.** Any drilling, completion or workover operation that is conducted in formations that contain, or that could reasonably be expected to contain a concentration of hydrogen sulfide in the gaseous mixture of 100 ppm or more must complete and file a drilling contingency plan (and a public contingency plan if a potentially hazardous volume of hydrogen sulfide is present). A

drilling contingency plan shall be submitted along with the Application for Permit to Drill (APD) (form C-101).

**3. Contents of the Drilling Contingency Plan.** A drilling contingency plan shall, at a minimum, contain the following elements:

**a. Actions to be Taken Upon Release.** A Drilling Contingency plan shall detail actions to be taken to alert and protect persons in the event of a release of a potentially hazardous volume of hydrogen sulfide.

**b. Call List.** The plan shall include a call list that shall include the following as applicable:

1. local supervisory personnel;
- ii. county sheriff;
- iii. the Department of Public Safety and State Police;
- iv. city (municipal) police;
- v. ambulance services;
- vi. hospitals;
- vii. county and city fire departments;
- viii. doctors;
- ix. contractors for supplemental or emergency equipment;
- x. the appropriate Division district office; and
- xi. other public agencies as appropriate.

**c. Coordination of Response.** The Plan shall stipulate how emergency response actions will be coordinated with the Division and the New Mexico State Police, a Division of the Department of Public Safety, as required pursuant to the New Mexico Emergency Management Act, NMSA 1978, Sections 74-48-1 through 74-4B-14 and the New Mexico Hazardous Material Emergency Response Plan (HMER Plan).

**d. Plat or Map.** The Plan shall include a plat or map detailing the area of exposure, including the locations of private dwellings or residences, public facilities such as schools, businesses, public roads or other similar areas when any person may be reasonably expected to be present within the radius of exposure.

**e. Names and Phone Numbers - Affected Persons.** The Plan shall include the names and telephone numbers of all persons living within the radius of exposure.

**f. Names and Phone Numbers - Responsible Persons.** The Plan shall include a list of the names and telephone numbers of a responsible party for each of the publicly occupied areas within the radius of exposure, such as schools, churches, businesses or other public areas or facilities within the radius of exposure.

**g. Advance Briefing.** The Plan shall include provisions for advance briefing of persons within the radius of exposure. Such advance briefing shall include the hazards and characteristics of hydrogen sulfide, the necessity for an Public Contingency Plan, the possible sources of hydrogen sulfide with 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.

**h. Additional Support Information.** The Plan shall include additional support information, if applicable, such as the location of emergency evacuation routes, the location of safety and life support equipment, the location of hydrogen sulfide containing facilities, the location of nearby telephones and/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.

**i. Site-specific Factors.** The Division may impose additional requirements based site-specific conditions, population density or special circumstances. The details may vary according to the site-specific conditions or the population potentially at risk. The Division may impose additional safety and engineering control requirements to provide for public safety.

**4. Combined Drilling Contingency Plan and Public Contingency Plan.** A combined Drilling Contingency Plan and Public Contingency Plan may be submitted where multiple APD's are filed for a lease, communitization agreement, unit or field.

**5. Submission.** A copy of a Drilling Contingency Plan shall be submitted to the Division.

**6. Failure to Submit Plan.** Failure to submit either a Drilling Contingency Plan shall result in denial of the Application to Drill.

**7. Annual Review.** A Drilling Contingency Plan(s) shall be reviewed on an annual basis and a copy of any necessary revisions shall be submitted to the Division.

**8. Retention and On-Site Inspection.** A Drilling Contingency Plan shall be maintained on file at all times and shall be available during a release of a potentially hazardous volume of hydrogen sulfide.

**G. Protection from Hydrogen Sulfide During Drilling, Workover and Servicing Operations.**

**1. Adherence to API Standards.** At a minimum, all drilling, completion, workover and well servicing operations shall be conducted in accordance with the publications of the American Petroleum Institute (API) entitled "Recommended Practice for Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide," RP-68, and "Recommended Practices for Safe Drilling of Wells Containing Hydrogen Sulfide," RP-49, most recent edition.

**2. Additional Standards.** At a minimum, and in addition to the foregoing API standards, each drilling, completion, workover and well servicing operation shall also be conducted in accordance with the following:

**a. Before Commencing Operations.** A Drilling Contingency Plan and, if applicable, a Public Contingency Plan, shall be completed before commencement of operations. In addition, hydrogen sulfide training shall be completed and all related safety equipment and warning systems shall be operational.

**b. Egress Routes.** Egress routes shall be maintained at all times during operations, as follows:

i. Two roads, one at each end of the location or as dictated by prevailing winds and terrain shall be established as emergency egress routes. If a second road is not practical, a clearly marked footpath to a safe area shall be provided.

ii. Egress routes shall be kept passable at all times.

**c. Detection and Monitoring.** Hydrogen sulfide detection and monitoring equipment shall be provided, as follows:

i. Each drilling and completion site shall have a hydrogen sulfide detection and monitoring system that automatically activates visible and audible alarms when the ambient air concentration of hydrogen sulfide reaches 10 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 periodically tested [according to manufacturer's recommendations]. 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 wellbore as practical. Additional sensing points may be necessary for large and/or long-term operations.

**d. Wind Indicators and Signs.**

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. Danger or caution sign(s) shall be displayed along all accesses to the site. The sign(s) shall read "DANGER - POISON GAS - HYDROGEN SULFIDE" and in smaller

lettering: "Do Not Approach If Red Flag is Flying" or equivalent language approved by the Division. Each sign shall be painted with high visibility red, black and white, or yellow paint with black lettering. The sign(s) 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 300 feet from the well site and at a location which allows vehicles to turn around at a safe distance prior to reaching the site.

iii. When hydrogen sulfide is detected in excess of 10 ppm at any detection point, red flag(s) shall be displayed.

**e. If Hydrogen Sulfide Encountered During Operations.** If hydrogen sulfide was not anticipated at the time the APD was approved but is encountered during drilling in excess of 100 ppm in the gaseous mixture, the operator shall immediately ensure control of the well, suspend drilling operations (unless detrimental to well control), and obtain materials and safety equipment to bring the operations into compliance with the following paragraphs of this Rule. 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 after discovery.

### **3. Operating Practices In Hydrogen Sulfide Concentrations of 100 ppm or Greater.**

Operating practices in areas known to contain a concentration of hydrogen sulfide gas of 100 ppm or greater in the gaseous mixture shall be subject to the following requirements:

**a. 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 for aerated mud, 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.

**b. Flare System.** A flare system shall be designed and installed to safely gather and burn hydrogen sulfide-bearing gas. Flare outlets shall be located as far from the well bore as feasible (but not less than 150 feet from the well). 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.

#### **c. Protection from Sulfur Dioxide.**

i. Detection Equipment. At any well site where sulfur dioxide may be released as a result of flaring of hydrogen sulfide, the operator shall place sulfur dioxide portable detection equipment and check the sulfur dioxide level in the flare impact area.

ii. Activation of Public Contingency Plan. If the flare impact area reaches a sustained ambient threshold level of 2 ppm or greater of SO<sub>2</sub> in air and includes any residence, school or church, park, or place of business, or area where any person could reasonably be expected to be present, the Public Contingency Plan shall be activated. **[ROADS?]**

#### **d. Remote Controlled Choke.**

i. When Required. A remote controlled choke shall be installed during drilling and, where feasible, during completion and well servicing operations conducted within a municipality or within 1/4 mile of the outer boundaries thereof, or when conducted within 1/4 mile of a residence, school, church, park, playground, school bus stop, place of business, or any other area where any person could reasonably be expected to be present. **[ROADS?]**

ii. Remote Controlled Valve. A remote controlled valve may be used in lieu of use of a remote controlled choke, but only for completion operations.

iii. Remote Controlled Choke, Requirements. A remote controlled choke or remote controlled valve shall have, at a minimum, a pressure and hydrogen sulfide-rated well control choke and kill system including manifold and blowout preventer (hereinafter referred to as "BOP") pursuant to specifications API-16C and API-RP 53. The BOP stack shall have a least one spool for the kill and choke lines, two pipe rams, one blind ram, one annual **[should this be "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 or other Division Rules, if more stringent.

**e. Mud Program.** The mud programs shall adhere to the following minimum requirements:

i. pH. A pH of 10 or above in a fresh water-base mud system shall be maintained to control corrosion, to insure that hydrogen sulfide gas returns to surface, and to minimize sulfide stress cracking and embrittlement, unless the Division finds that formation conditions or mud types justify a lesser pH level.

ii. Degassing. Drilling mud containing hydrogen sulfide gas shall be degassed in accordance with current industry standards and practices. Gases shall be piped into the flare system.

iii. Additives. Sufficient quantities of mud additives shall be maintained on location to scavenge and/or neutralize hydrogen sulfide where formation pressures are unknown.

iv. Well Testing. Well testing shall be performed with a minimum number of personnel in the immediate vicinity to safely and adequately operate the test equipment. Except with prior approval by the Division, the drill-stem testing shall be conducted only during daylight hours and formation fluids shall not be permitted to flow to the surface (closed chamber only). An operator shall notify the Division 24 hours in advance of a drill-stem test if a Public Contingency Plan is required pursuant to this Rule.

**4. Activation of Drilling Contingency Plan.** The Drilling Contingency Plan shall be activated immediately when hydrogen sulfide is detected in excess of 10 ppm at any detection point.

**H. Protection from Hydrogen Sulfide at Producing Wells, Tank Batteries and Associated Production Facilities.**

**1. Adherence to American Petroleum Institute (API) Standards.** Operations at producing wells, tank batteries and associated production facilities shall be conducted in accordance with American Petroleum Institute (API) publication entitled "Recommended Practices for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide," RP-55, latest edition. **[Is adherence to these standards required even if the hydrogen sulfide concentration is less than 100 ppm?]**

**2. Additional Standards.** At a minimum, and in addition to the foregoing API standards, production from wells, operation of tank batteries and associated production equipment shall also be conducted in accordance with the following:

**a. Gaseous Mixtures Containing 100 ppm or more.** Producing wells containing 100 ppm or more of hydrogen sulfide in the gaseous mixture, tank batteries and associated production facilities at such sites, shall be subject to the following:

**i. Public Contingency Plan.** A determination must be made of the radius of exposure pursuant to this Rule and, if required based on the calculated radius of exposure, a Public Contingency Plan will also be required. **[but it's already required BECAUSE it exceeds 100 ppm - is this paragraph necessary?]**

**ii. Signage.** A danger sign or signs shall be posted within 50 feet of each facility to alert the public of the potential hydrogen sulfide danger. If fenced, a danger sign at the gate(s) shall suffice. Danger signs shall be posted at each flowline and gathering line that contains hydrogen sulfide gas as specified in Subparagraph. A sign shall be placed at each point where such a line crosses a public road or lease road. Each sign shall be legible and shall contain the name of the owner or operator and an emergency telephone number.

**iii. Fencing.** Fencing and gate(s) shall be required when producing wells, associated tank batteries and associated production facilities are located within a municipality, within 1/4 mile of the outside boundary of a municipality or within 1/4 mile of an residence, school, church, park, playground, school bus stop, place of business, or where any person could reasonably be expected to be present. **[ROADS?]** The Division shall approve the method and type of fencing. Gate(s) shall be locked when unattended by the operator.

**iv. Wind Direction Indicators.** Wind direction indicator(s) shall be required. In the event the producing well and associated tank battery is located at the same site, one such indicator shall suffice.

**v. Secondary Well Control.** All wells shall possess a secondary means of immediate well control through the use of appropriate Christmas tree and/or downhole completion equipment. **[Is this in addition to what is already required --- or is this specific to hydrogen sulfide operations?]** Such equipment shall allow downhole accessibility (reentry) under pressure for permanent well control operations. If a potentially hazardous volume exists, well head configuration shall be in accordance with API specifications and at least two entry points provided in the casing/tubing annulus.

**vi. Automatic Safety Valve or Shutdown.** If a potentially hazardous volume exists, an automatic safety valve or shutdown shall be installed at the wellhead or other appropriate shut-in control shall be installed. The automatic safety valve shall be set to activate upon a release of a potentially hazardous volume of hydrogen sulfide.

**b. Tank Batteries With Hydrogen Sulfide Concentrations of 300 ppm or Greater.** Any tank battery serving a well whose gaseous mixture contains a concentration of 300 ppm of hydrogen sulfide or greater shall be subject to the following additional requirements:

i. Each stair or ladder leading to the top of any storage tank shall be chained and/or marked to restrict entry. For any tank battery that requires fencing pursuant to this Section, a danger sign posted at the gate(s) shall suffice.

ii. A danger sign 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. Each sign shall read: "DANGER: POISON GAS HYDROGEN SULFIDE."

iii. At least one permanent wind direction indicator shall be installed so that wind direction can be easily determined at or approaching the storage tank(s).

iv. Each tank battery shall be enclosed with a Division-approved fence to restrict access when located within a municipality or within 1/4 mile of the outer boundaries of a municipality, or within 1/4 mile of a residence, school, church, park, playground, school bus stop, place of business, or an area where any person could reasonably be expected to be present. Gates shall be locked when unattended.

**3. Modification or Repair.** The Division may require modification or repair of a producing well, associated tank battery or associated production facilities if the sustained ambient concentration of hydrogen sulfide is 1 ppm or greater at any residence, school, church, park, playground, school bus stop, place of business, or area where any person could reasonably be expected to present. **[ROADS?]**

**4. Compliance Schedule.** Each existing producing well and associated tank battery not currently meeting the requirements and minimum standards set forth herein shall be brought into compliance within one (1) year of the effective date of this Rule. Each producing well and tank battery constructed following the effective date of this Rule shall be designed, constructed and operated to meet the requirements set forth herein.

**I. Personnel Protection and Training.** Any person working at a facility for which a Public Contingency Plan or a Drilling Contingency Plan is required to be submitted pursuant to this Section shall be trained in hydrogen sulfide hazards, detection and contingency procedures **[shouldn't we also require training in "the requirements of the Public Contingency Plan and the Drilling contingency Plan"??]**, and shall be provided with adequate protective equipment. Records of such training shall be retained and shall be made available to the Division upon request.

**J. Standards for Equipment That May Be Exposed to Hydrogen Sulfide.**

**1. Metallurgical Equipment.** All metallurgical equipment that may be exposed to hydrogen sulfide **[any particular concentration - or ANY exposure at any level?]** shall be suitable for hydrogen sulfide service. The metallurgical properties of the materials used shall conform to the current

National Association of Corrosion Engineers (NACE) Standard MR 0175-90, Material Requirement, Sulfide Stress Cracking Resistant Metallic Material for Oil Field Equipment.

**2. Other Equipment.** Elastomers, packing, and similar inner parts exposed [**same question as the previous paragraph --- "exposed" to what concentration?**] to hydrogen sulfide shall be resistant at the maximum anticipated temperature of exposure. The manufacturer's verification of design for use in an environment containing hydrogen sulfide shall be sufficient verification of suitable service in accordance with this Section. If applicable, adequate protection by chemical inhibition or other such method that controls or limits the corrosive effects of hydrogen sulfide shall be used.

**K. Hydrogen Sulfide Injection Prohibited.** Injection of fluids containing hydrogen sulfide [**at any concentration?**] is prohibited where the injection fluids are a gaseous mixture, or would be a gaseous mixture in the event of a release to the atmosphere, and where the 100 ppm radius of exposure includes any residence, school, church, park, school bus stop, place of business, an area where any person could reasonably be expected to be present, within a municipality, or within a 1/4 mile of the outer boundary of a municipality.

**L. Exemptions.** An exemption to the requirements of this Section may be granted by petitioning the Director. Any such petition shall provide specific information as to the circumstances that warrant approval of the variance requested and the proposed alternative methods by which the related requirements of this Section are to be satisfied. The Director, after considering all relevant factors, may approve an exemption if it is determined that the proposed alternative meets or exceeds the requirements of this Section and otherwise protects the health, safety and welfare of potentially affected persons.

**M. Release.** Upon a release of hydrogen sulfide the following actions must be taken:

**1. Activation of the Public Contingency Plan or the Drilling Contingency Plan, or Both.** The Public Contingency Plan or the Drilling Contingency Plan, or both, shall be activated immediately upon release of a potentially hazardous volume of hydrogen sulfide or if any person is subjected to an atmosphere exposure exceeding 30 ppm of hydrogen sulfide or 10 ppm of sulfur dioxide.

**2. Notification of the Division.** Upon release of a potentially hazardous volume of hydrogen sulfide, or, alternatively, upon exposure of any person to an atmosphere exposure exceeding 30 ppm of hydrogen sulfide or 2 ppm of sulfur dioxide, the Division shall be notified as soon as practicable, but no later than within one hour of the discovery of the release. A full report of the incident shall be submitted to the OCD on a C-141 form no later than fifteen (15) days following the incident.

**N. Minimum Standards.** The Division may require more stringent standards on a case-by-case basis than those set forth in this Section, or require corrective actions if necessary, to maintain control of a well or any other facility.