Ministry of
Energy and
Resources

Saskatchewan Upstream Flaring and Incineration Specifications S-20

SASKATCHEWAN UPSTREAM FLARING AND INCINERATION SPECIFICATIONS S-20
PETROLEUM DEVELOPMENT BRANCH
CONSULTATION DRAFT JUNE 1, 2010

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SECTION 1.0 GENERAL DISCUSSIONS

1.1 General Discussions

This document provides comprehensive upstream oil and gas flaring and incineration performance, equipment spacing and set-back distance specifications.

The use of flare pits and earthen pits as storage receptacles in operation of wells and facilities are prohibited in Saskatchewan. Where approved, flare pits may be used during drilling of a well.

1.2 Applicable Facilities

The standards specified in this document apply to all upstream petroleum sites and facilities including but not limited to: primary oil and gas production facilities (batteries, compressors, gas processing plants, oil and gas wells), fieldgates, custom treating facilities, transfer stations, metering stations, pipeline facilities, pig traps, sand injection facilities, skimming operations, slop injection facilities, water injection facilities and waste processing facilities.

2.0 Air Emission Control

No person shall flare, incinerate and/or vent a volume of natural gas greater than 900 cubic metres per day from any oil well or facility to the atmosphere unless the activity meets the requirements of S-10.

When designing a new upstream facility, if it is expected that combined flaring and venting volumes at a planned facility will exceed 900 cubic metres per day, solution gas conservation should be evaluated. If economic evaluation reveals a potential for profit from solution gas conservation, ER strongly recommends proceeding with the gas conservation project.

The operator shall install a vapour recovery unit to prevent the emission of volatile gases from storage devices and associated equipment at a facility or well site that emits any volume of gas that contains hydrogen sulphide in a concentration greater than 10 parts per million or 0.01 moles/kilomole as measured at the edge of the lease or property boundary. The recovered gases shall be flared or collected for fuel.

Other methods to control sour gas emissions at a facility or well site may be approved by the ministry. Upon request by ER, the operator must be able to demonstrate the effectiveness of the emission control methods employed at these facilities or well sites.

No one shall operate an upstream oil and gas facility in a manner that results in the discharge of a quantity of air contaminants that is greater than the maximum concentration set forth in Table 1, unless the operator has a permit from the relevant provincial and/or federal authority explicitly allowing the operator to emit the above mentioned air contaminant(s), or has provided mitigative measures to minimize the harm to the health and safety of the public, properties and the environment to the satisfaction of ER.

Where persistent or significant odour complaints are received about an upstream petroleum industry facility or site, and obvious and measurable risk exists, or at the discretion of ER, the operator may be ordered and required to implement one or more of the following mitigative measure(s):

- conduct an air quality investigation or install air quality monitoring equipment
- attempt to eliminate the air contaminants at their source
- implement good housekeeping to minimize fugitive emissions
- develop and implement a public information and consultation program
- seal and leak proof storage vessels and equipment
- install a vapour recovery unit on storage or process equipment
- direct the recovered vapour to properly operating flares as per section 2.2.1
- recover associated gas (gas associated with crude oil production) that may be vented or flared
- any combination of these requirements as ordered by ER

Sour gas wells and facilities constructed after April 1, 2002 shall meet the minimum distance requirements specified in Table 2 unless otherwise approved by ER.

Flare System Standards can be found in the SER guideline S-20 Flaring and Incineration Performance Requirements.

Table 1. Ambient Air Quality Standards

POLLUTANT	ANNUAL CONCENTRATION FOR APPLICABLE TIME PERIOD				
	1 HOUR	8 HOURS	24 HOURS	30 DAYS	ANNUAL
SUSPENDED PARTICULATES			120 micrograms per cubic metre		*70 micrograms per cubic metre
SETTLEABLE PARTICULATES				2.0 milligrams per cubic metre	
SOIL INDEX			1.5 COH units		
POTASH				0.15 milligrams of K per square centimetre OR 0.15 milligrams of CL per square centimetre	
SULFUR DIOXIDE	450 (0.17) micrograms per cubic metre		150 (0.06) micrograms per cubic metre		**30 (0.01) micrograms per cubic metre
SULFATION				30 milligrams of sulphur trioxide per 100cm^2	
CARBON MONOXIDE	15 (13) milligrams per cubic metre	6 (5) milligrams per cubic metre			
OXIDANTS (OZONE)	160 (0.08) micrograms per cubic metre				
NITROGEN DIOXIDE	400 (0.2) micrograms per cubic metre				**100 (0.05) micrograms per cubic metre
HYDROGEN SULFIDE	15 (10.8) micrograms per cubic metre		5 (3.6) Micrograms per Cubic metre		

NOTE: Volume units, in parts per million or parts per billion for H_2S are in brackets.

* Geometric Means

**Arithmetic Means

(1) Sampling will be in a manner and location specified by the Minister.

Table 2. Minimum Distance Requirements Separating Sour Gas Wells/Facilities from Residential and Other Developments

Level Of Sour Gas Facility	Sour Gas Well Release Rate m^3/s	Sour Gas Facility Potential Release Volume m^3	Minimum Separation Distance To Developments
1	<0.3	<300	▪ standard spacing requirements as per S-01 Appendix 1
2	0.3 - 2.0	300 - 2000	▪ for wells, a minimum separation distance of 100m from a permanent dwelling and 500m from an urban centre or public facility ▪ for facilities a minimum separation distance of 500m from a permanent dwelling and urban centre or public facility
3	2.0 - 6.0	2000 - 6000	▪ for wells, a minimum separation distance of 100m from a permanent dwelling and 500m from an urban centre or public facility ▪ for facilities, a minimum separation distance of 500m from a permanent dwelling and a minimum separation distance of 1500m from an urban centre or public facility
4	>6.0	>6000	▪ as specified by ER but not less than level 3

LEGEND

1. Sour gas is a natural gas that has H_2S concentration of 0.01 moles per kilomole or greater.
2. Sour gas well or facility is any well or facility which produces or processes sour gas including: oil and gas wells capable of producing sour gas; gas processing plants and any other upstream facilities.
3. Public facility means recreational areas such as campground, or a public building such as school, hospital or daycare.
4. Urban centre means city, town, village or other incorporated centres.
5. Separation distance means the minimum required distance between a sour gas well or facility and development such as permanent dwelling, public facility or urban centre.
6. The calculated flow rate of potential H_2S release from a sour gas well shall be established using maximum wellhead deliverability that can be attained at anytime through the tubing against zero wellhead pressure (wellhead absolute open flow rate) and shall be expressed in the unit m^3/s at standard conditions.
7. The calculated volume of potential H_2S release from a sour gas facility shall be established using the maximum operating pressure and shall be expressed in the unit m^3 at standard conditions. For the purpose of this calculation, assume that any automatic block valve closes instantaneously upon failure of the facility and the potential release volume shall be the sum of the volume of gases in all of the piping, equipment and storage devices within the facility downstream of the automatic block valve.

2.1 Flaring and Incineration Performance Requirements

These requirements apply to flares and incinerators used in all upstream oil and gas systems for burning sweet, sour, and acid gas. This includes portable equipment used for temporary operations such as well completion, servicing, and testing. Flare and incinerator systems including associated separation equipment, piping and controls.

Although some design or operating specifications are provided, S-20 **is not a substitute for comprehensive engineering design codes and guidelines.** It identifies minimum ER regulatory requirements but is not intended as a comprehensive design manual.

Operators must ensure that a professional engineer, certified technician, certified engineering technologist or registered engineering technologist is responsible for the design or review of flare and incinerator systems, including separation, related piping, and controls, and for the specification of safe operating procedures. Equipment and controls design information must be provided to ER upon request if ER determines that there is a concern with the equipment or controls.

Operators must ensure that operating procedures that define the operational limits of flare or incinerator systems are documented and implemented and that these procedures meet the design requirements. Operating limits and procedures must be provided to ER immediately upon request. Flare and incinerator systems must be operated within operational ranges and type of service specified by the designing or reviewing engineer, technician, or technologist. If this equipment is used for emergency shutdowns, this must be considered in the design.

If an operator is using a flare or incinerator in a field service that has not previously been field tested, the operator must be able to provide actual monitoring data to show that performance specifications can be met. Field testing of newly designed equipment is not allowed unless there are acceptable and redundant combustion systems to ensure that any sweet, sour, or acid gas can be properly combusted if the new equipment fails to perform as predicted or the ability exists for the facility to be shut in if problems arise.

API-RP-521: Guide for Pressure-Relieving and Depressuring Systems, Section 4: Selection of Disposal Systems, as well as applicable fire safety codes, electrical codes, CSA standards, and mechanical engineering standards, are all necessary references for the design of gas combustion systems.

Operators must comply with Saskatchewan safety regulations with respect to the design of pressure vessels and piping systems and the design of equipment and operating procedures.

ER recommends that operators use best engineering practices in the design and operation of flare systems, as well as appropriate engineering codes and standards.

2.2.1 Conversion Efficiency

Flares and incinerators, and other gas combustion systems, including those using sour gas as a fuel for production or process equipment, must be designed, maintained, and operated so that emissions do not:

- result in off-lease H_2S odours, or
- exceed the *Saskatchewan Ambient Air Quality Objectives.*

Operators must modify or replace existing flares or incinerators if operations result in off-lease odours, odour complaints, or visible emissions (e.g., black smoke).

2.2.2 Heating Value and Exit Velocity for Flares

If a flare is also subject to *The Clean Air Act* approval, the more stringent requirement on minimum heating value will apply.

- The combined net or lower heating value of gas, including make-up fuel gas, directed to a flare must not be less than 20 mega joules per cubic metre (MJ/m3), except as noted below:
    - If existing stacks have an established history of stable operation and compliance with the *Saskatchewan Ambient Air Quality Standards* (operators are expected to support claims that existing stacks have operated satisfactorily over time), operators are allowed to maintain the current heating value provided that it is not less than 12 MJ/m3.
    - If flare stacks have a history of flame failure, odour complaints, and/or exceedances of the *Saskatchewan Ambient Air Quality Standards*, operators must operate with a combined flare gas heating value of not less than 20 MJ/m3.
    - The combined net or lower heating value of acid gas plus make-up fuel gas directed to existing or new flares must not be less than 12 MJ/m3 under any circumstance.
    - Sour gas plant emergency systems must be configured to ensure that the flared gas heating value is not less than 12 MJ/m3 and the *Saskatchewan Ambient Air Quality Standards* are met. ER recommends that 20 MJ/m3 heating value be maintained for non-routine flaring but recognizes that short duration emergency flaring with a gas heating value of less than 20 MJ/m3 may occasionally occur.

- If fuel make-up is required, it must be specified for flare stacks by a qualified technical professional:
    - Equipment controls must be installed and operating procedures must be documented to ensure minimum fuel gas make-up during routine and non-routine operating conditions.
    - Facilities must be operated in compliance with specified minimum fuel gas make-up requirements.

- The flare tip diameter must be properly sized for the anticipated flaring rates. Equipment and controls design information must be provided to ER upon request if ER determines that there is a concern with the equipment or controls.
- Operating limits and procedures must be provided to ER immediately upon request.

2.2.3 Minimum Residence Time and Exit Temperature for Incinerators

If an incinerator is subject to *The Clean Air Act* approval, any requirements regarding minimum residence time or exit temperature contained in that approval will take precedence over these requirements.

- Incinerators must provide a minimum residence time of 0.5 seconds at maximum flow rate or greater as required for complete combustion of heavier gases.
    - Incinerators must be operated without exposed flame.
    - If the gas contains less than 10 mol/kmol (1%) H2S and the unsupplemented heating value of the gas is 20 MJ/m^3 or greater, no minimum residence time is required.

- Incinerators must operate with a minimum exit temperature of 600^{o}C.
    - For combustion of gases with less than 10 mol/kmol (1%) H2S and an unsupplemented heating value of 20 MJ/m3 or greater, no minimum exit temperature or temperature monitoring is required.
    - For combustion of gases with greater than 10 mol/kmol (1%) H2S, the facility must be designed to automatically shut down if the exit temperature of the incinerator drops below either 600^{o}C or the required temperature to meet *Saskatchewan Ambient Air Quality Objectives*, whichever is higher.
        - For combustion of gases with greater than 50 mol/kmol (5%) H2S, the incinerator must also be equipped with process temperature control and recording.
        - All violations, together with measures taken to prevent recurrence, must be immediately reported by the operator to the appropriate ER Field Office.

- Any enclosed combustion technology not meeting the above requirements (minimum exit temperature and minimum residence time) must submit third-party verified conversion efficiency test results to ER for approval, unless the facility is subject to an *The Clean Air Act* approval.

    - Test programs and submissions must be provided by a qualified technical professional and must include:
        - inlet gas parameters, including flow rates and composition;

- stack gas exit parameters, including temperature and composition;
- material and energy balance calculations;
- a mass-weighted conversion efficiency value representative of the exit conditions;
- discussion of the variation of measured and calculated results, depending on sampling location across the stack; and
- discussion of extending test results to other inlet conditions, including discussion of inlet limitations for H2S concentration and inlet gas flow rate.

- All testing must meet the Saskatchewan Stack Sampling Code.
- Temperature monitoring and reporting requirements would still apply.

- Equipment and controls design information must be provided to ER upon request if ER determines that there is a concern with the equipment or controls.
- Operating limits and procedures must be provided to ER immediately upon request.
- Operators using incinerators must be able to provide details about the conversion efficiency of the equipment. Any of the following are considered to be acceptable evidence of compliance with this requirement:
  - The design at the maximum specified capacity meets the residence time, temperature, and conversion efficiency requirements, as calculated using ERCB*incin.xls* spreadsheet, or
  - Conversion efficiency for incinerator is 99% or greater, based on one of the following:
    - the manufacturer's third-party-verified conversion efficiency test results, provided that the tests were conducted under conditions representative of the facility design, or
    - actual field measurements of conversion efficiency from the operating facilities following start-up.

  - If conversion efficiency is less than 99%, the incinerator will be considered to operate as a flare and must meet all requirements for flares, including stack height.

2.2.4 Smoke Emissions

Routine gas combustion must not result in continuous or repeat black smoke emissions. Black smoke from nonroutine or emergency flaring must not exceed an average of 40% opacity over six consecutive minutes or as defined in *The Clean Air Regulations*.

Any smoke emissions that may result in public concern must immediately be reported to the appropriate ER Field Office.

2.2.5 Ignition

- Acid gas and sour gas flares and incinerators must have reliable systems to ensure continuous ignition of any gas that may discharge to the device.
    - At all facilities (excluding gas plants) where the gas contains more than 10 mol/kmol H2S, a pilot **or** automatic ignition device must be installed on flares and incinerators for continuous (e.g., sour water or condensate tank flash-gas) and intermittent (e.g., emergency depressuring) sources.
    - At gas plants where gas contains more than 10 ppm H2S, pilots and automatic ignition must be installed on flares and incinerators.
    - If repeat failures have occurred or off-lease odours or other impacts have resulted from failure to ensure ignition of sour gas, regardless of H2S content, ER may require installation of:
        - both pilots and automatic ignition, and/or
        - flame failure detection and alarms.

- Manual flare and incinerator ignition subject to good fire safety practices will be accepted for nonroutine purposes where:
    - no continuous gas flow exists, and
    - no automatic relieving systems are connected to the stack.

2.2.6 Stack Design

Flares and incinerators must meet or exceed all of the applicable stack design requirements listed below.

- Flare and incinerator stacks must be designed so that the maximum radiant heat intensity at ground level will not exceed 4.73 kilowatts per square metre (kW/m2).
    - Ground-level radiant heat determinations for flares must be based on calculation procedures outlined in ER*flare.xls* spreadsheet, *API-RP-521* Section 4.4.2.3, or *GPSA Engineering Data Book* (12th edition), Section 5. Incinerators must be operated without exposed flame.
    - Exceptions to the requirement in 7.4(1) will be considered on request to ER, provided an equivalent level of safety can be ensured.
        - In such cases operators must restrict access to the area where the radiant heat intensity guideline could be exceeded and must ensure that this area is free of combustible materials and vegetation. Access restrictions must include appropriate warning signs and the area must be clearly marked.

        - Appropriate procedures (e.g., safe-work permit system) must be in place when it is necessary to work within the area where the radiant heat intensity guideline could be exceeded.

- Flares and incinerators located within a distance of 5 times the height of any neighbouring buildings must have a height of at least 2.5 times the height of the highest building.
    - The foregoing does not apply to devices for destruction of trace vent gases, such as those emitted from gas dehydrators.

- Flare stacks for acid or sour gas containing more than 10 mol/kmol H2S must have a minimum height of 12 m above ground level.
- Flares and incinerators must have sufficient height to provide adequate plume dispersion to comply with the *Saskatchewan Ambient Air Quality Objectives* for SO2.
    - Proper stack heights must be used in order to minimize fuel consumption. If the use of supplemental fuel gas is proposed, all other options must be investigated first. Fuel gas usage and amounts must be justified.

- Interconnecting lines to the flare or incinerator must be secured to prevent whipping or flailing.

2.2.7 Liquid Separation

Entrained liquids in a flare or incinerator stream may reduce combustion efficiency and contribute to increased emissions of total reduced sulphur compounds, hydrocarbons, and products of incomplete combustion. Proper gas-liquid separation facilities adequate to protect the pipeline system or gas combustion system must be used.

The terms knockout, knockout drum, scrubber, and separator are used interchangeably. These requirements apply to all of these devices.

- Design information on flare and incinerator system liquid separation equipment must be submitted upon request to ER.
- Liquid separation equipment must be provided in both temporary (including well test) and permanent flare and incinerator systems to prevent the carryover of liquid hydrocarbons, water, or other liquids.
- Flare and incinerator separators must be designed in accordance with good engineering practice to remove droplets of 300 to 600 micron diameter and larger (see *API-RP-521*).
    - Designs must be based on the lowest density hydrocarbon liquids that could be released to the flare or incinerator system.
- The flare and incinerator separators or knockout drums must be designed to have sufficient holding capacity for liquid that may accumulate as a result of

upstream operations, such as hydrocarbon carryover, liquid slugs, and line condensation.

- Flare and incinerator separators in facilities constructed after the effective date of this Guide must be equipped with high-level alarms that can be responded to by the operator prior to liquid carryover, in addition to liquid level indication.
- All flare and incinerator separators constructed prior to this Guide must be provided with visual level indicators, plus high-level facility shutdowns or high-level alarms that can be responded to by the operator prior to liquid carryover, as well as operating procedures to ensure that the liquid retention in the vessel will not exceed the maximum design liquid level during all operating conditions. If impacts such as liquid carryover or unacceptable smoke emissions have occurred as a result of failure to control liquid level, both high-level facility shutdowns and high-level alarms must be provided.
- High-level alarms and facility shutdowns must be installed on all flare and incinerator separators where liquid streams are directed to the separator for storage or where free liquids are contained in continuously combusted streams.
- Flare and incinerator separator high-level alarms must be connected to facility alarm panels and/or semi-attended facility alarm call-out systems if the facilities are so equipped.
- Well test vessels receiving production from oil wells must be equipped with a high-level shutdown, unless attended 24-hours a day and procedures for monitoring liquid levels are in place.
- Flare and incinerator separators or knockout drums used for liquid storage must be designed and be in accordance with S-01.

2.2.8 Exceptions to Separator Requirements

ER does not require independent flare or incinerator separators in situations where the only vessels connected to the flare or incinerator are production separators equipped with an HLSD (or equivalent devices) or with a system that prevents liquids from entering the flare or incinerator.

The following limitations apply to this exception:

- The HLSD must be configured to shut down and block in, but not depressure, the battery. The HLSD trip level must be set so that adequate vapour-liquid separation is not impaired at maximum liquid level and vapour flow rates.
- If liquid carryover involving spills occurs around the flare or incinerator or if black smoke is formed, operators must install adequately sized flare or incinerator separators.

2.2.9 Backflash Control

Inadequately purged flare or incinerator systems may have sufficient oxygen present to support combustion. Backflash may occur when the linear velocity of the combustible mixture of gas and air in the system is lower than the flame velocity.

- Operators must take precaution to prevent backflash using appropriate engineering and operating practices, such as
    - installation of flame arresters between the point of combustion and the flare or incinerator separator, or
    - provision of sufficient flare header sweep gas velocities (i.e., purge or blanket gas) to prevent oxygen intrusion into the flare or incinerator system.
- Check valves are not an acceptable form of backflash control.
- Safe work procedures must be in place to ensure complete purging of oxygen from flare or incinerator systems prior to ignition.
- Operators must provide information on backflash controls to ER upon request if ER determines that there is a concern with the equipment or controls.

2.2.10 Flare and Incinerator Spacing Requirements

Operators must follow good engineering and safety practices in the layout of facilities. Notwithstanding liquid separation requirements, unexpected liquid carryover to flares and incinerators can happen. Adequate spacing of these devices from areas frequented by workers and from sources of combustible gas is prudent. Operators must consult fire protection codes and guidelines as part of facility design.

- Flares and incinerators must be located, as measured from the base of the stack, at least
    - 50 m away from wells, not including water disposal wells or water injection wells where there is no risk of flammable vapours,
    - 50 m away from storage tanks containing flammable liquids or flammable vapours, and
    - 25 m away from any oil and gas processing equipment.
- Flares and incinerators must be located, designed, and operated so that no hazard to public property is created. They must be at least:
    - 100 m away from surface improvements (with the exception of surveyed roadways or road allowances, which must be 40 m from flares and incinerators), and
    - 100 m away from an occupied residence.
    - Flare and incinerator spacing must comply with the requirements defined in the current *The Prairie and Forest Fire Act.*
    - Operators must maintain areas surrounding flares and incinerators to minimize fire hazards.
- ER recommends that operators also comply with *The Prairie and Forest Fire Act* in un-forested areas where there is a fire hazard associated with flare and incinerator operations.
- In certain circumstances, ER may consider variances in flare and incinerator spacing requirements.
    - ER discourages variance requests for new facilities.
    - Existing well site equipment spacing waivers in effect prior to the effective date of this Guide are maintained.

- Operators requesting a spacing variance must first consult relevant codes and engineering practices and provide related information in support of the variance request.

2.2.11 Compliance with Fire Bans

Information on fire bans can be obtained from Saskatchewan Environment's Web site at http://www.environment.gov.sk.ca/

GLOSSARY

“acid gas” Gas that is separated in the treating of solution or nonassociated gas that contains hydrogen sulphide (H2S), total reduced sulphur compounds, and/or carbon dioxide (CO2).

"and" means comply with all of the listed items.

“associated gas” Gas that is produced from an oil reservoir. This may apply to gas produced from a gas cap or in conjunction with oil.

"**flame type equipment**" means open flame equipment, other heating device or electrical device that has open ignition and/or it could potentially cause a fire or explosion. For the purpose of equipment spacing, flame type equipment includes, but is not limited to, steam boilers, free water knock-outs, dehydrators, generators, heaters, treaters, diesel engines without automatic air shut offs and heated water tanks on a skid.

“fugitive emissions” Unintentional releases of gas resulting from production, processing, transmission, storage, and delivery.

"**internal combustion engine exhaust**" means exhaust from gasoline engines, diesel engines with air shut-offs, natural gas engines, propane engines and their respective exhaust gases and free liquids. It does not include diesel engines with no air shut-offs. There are no spacing requirements applicable to internal combustion engines. The exhausts from these engines must be placed away from an oil and gas wellhead, a minimum distance of 6 metres. The exhausts from these engines must be pointed away from the wellhead, either by orientating the exhaust vertically up or pointing it in the opposite direction from the wellhead. Connecting engine exhaust to a wellhead is strictly prohibited.

"natural gas booster compressors" means a compressor that is portable with trailer or skid mounts and does not have a permanent concrete footing and does not exceed 250 horsepower. The natural gas booster compressors must be installed a minimum of 23 metres from a wellhead. These compressors must comply with the requirements of the Ministry of Energy and Resources Guideline for Natural Gas Booster Compressors.

“non-associated gas” Gas produced from a gas pool (i.e., not associated with oil or bitumen reservoirs or with production).

“non-routine flaring, venting, incinerating” Intermittent and infrequent events such as planned maintenance, process upsets, and emergencies that result in flaring, venting, or incinerating.

"oil and gas site" means any sites or facilities associated with oil and gas exploration, recovery, production, processing, transmission, transportation, treatment and/or disposal. It includes waste processing facilities but it does not include refineries or upgraders.

"opacity" means the degree expressed as a percentage to which an air contaminant obstructs the passage of light and obscures the view of an object in the background.

“operator” means licensee of the facility. Where license does not exist, the operator is the company(s) or person(s) who owns the facility or has control on the selection and design of the storage devices installed at the facility.

"or" means comply with one of the items.

"**primary production facility**" means all upstream facilities and any other oil and gas sites, including but not limited to gas wells, oil wells, water source wells, disposal wells, Enhanced Oil Recovery projects (steam, water, fire, CO_2, solvent floods) and waste processing facilities.

"**primary liner**" means the upper most liner that covers all of the area within the dyke and it is keyed into the dyke walls or incorporated into the dyke wall.

"**produced products**" means upstream oil and gas products (unrefined), byproducts, wastes and materials contaminated with produced products. They include, but are not limited to, crude oil, condensate, drilling fluids, drilling waste, frac fluids, frac sands, liquid petroleum gas, oily byproduct, produced water, produced sand and any other material contaminated with produced products.

"**process equipment**" means any non-flame type equipment used in the upstream petroleum recovery or treatment process such as amine tank, pop tank, scrubber, sweetener and separator. Process equipment generally does not have a permanent footing.

“routine flaring, venting, incinerating” Applies to continuous flaring, venting, and incinerating.

“separator” means an apparatus for separating liquid and gas at the surface as they are produced from a well.

"**sour gas**" (for purpose of section 2.2) means natural gas containing hydrogen sulphide (H_2S) concentrations equal to or greater than 0.01 moles per kilomole (10 PPM, 0.001%).

"**storage**" means holding of material produced, generated and used by the upstream petroleum industry for a period of time until the products, byproducts or wastes are transported, treated or disposed.

"**storage area**" means a segregated area of an operating facility that is used to store materials produced, generated and used by the upstream petroleum industry in containers and/or tanks and includes all land and associated structures.

"**storage facility**" means a facility dedicated to the storage of materials produced, generated and used by the upstream petroleum industry in containers and/or tanks and includes all land and associated structures.

“shallow gas operation” means any operation in Saskatchewan Area Three conducted specifically for the production of natural gas and producing from no lower than the Medicine Hat formation.

“sulphur emissions” For the purposes of this Guide, this includes all air emissions of sulphur-containing compounds, including SO_2, H_2S, and total reduced sulphur compounds (e.g., mercaptans). Sulphur emissions from flare stacks are expected to be primarily in the form of SO_2, with minor amounts of other compounds.

"**tank**" means a device designed to contain materials produced, generated and used by the upstream petroleum industry which is constructed of impervious materials that provides structural support.

“treater” means an apparatus for separating oil, gas and water at the surface as they are produced from a well.

"**upstream facility**" means all wells and facilities including oil and gas production sites, pipelines, flowlines and associated equipment, satellites, batteries, metering stations, compressor stations, pump stations, truck unloading stations, and gas plants.

“venting” The intentional controlled release of un-combusted gas.

Regulatory Contact List

Ministry of Energy and Resources

Head Office
200, 2101 Scarth Street, Regina, S4P 2H9

Petroleum Development Branch

Todd Han, Director	(306) 787-2221
Brad Wagner, Manager of Environment and Liability	(306) 787-2348
Technical Inquiries on the Storage Standards	(306) 798-3083
Fax	(306) 787-2478

Petroleum Development Branch Field Offices

Flaring and Incineration Emission Inquires, Notification or Complaints

Estevan
P.O. Box 5000, 1219 - 5th Street, Estevan, S4A OZ1

General Inquiry	(306) 637-4541
Regional Area Manager, Dean Pylypuk	(306) 637-4542
Fax	(306) 637-4547

Kindersley
P.O. Box 850, 113 2nd Avenue E. Kindersley, SOL 1SO

General Inquiry	(306) 463-5400
Regional Area Manager, Kirk Hogarth	(306) 463-5402
Fax	(306) 463-5404

Lloydminster
4815 - 50th Street, Lloydminster, S9V OM8

General Inquiry	(306) 825-6434
Regional Area Manager, Gary Ericson	(306) 825-6436
Fax	(306) 825-6433

Swift Current
P. O. Box 5000, 350 Cheadle St. W., Swift Current, S9H 4G3

General Inquiry	(306) 778-8252
Regional Area Manager, Ron Dolter	(306) 778-8253
Fax	(306) 778-8256