



BRITISH  
COLUMBIA

*Energy Resource Activities Act*

DRILLING AND PRODUCTION  
REGULATION

**B.C. Reg. 282/2010**

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**Consolidated Regulations of British Columbia**

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# *Energy Resource Activities Act*

## **DRILLING AND PRODUCTION REGULATION**

**B.C. Reg. 282/2010**

### *Contents*

<b>PART 1 – DEFINITIONS AND APPLICATION</b>	
1 Definitions	1
1.1 Application	4
<b>PART 2 – WELL PERMITS AND EXEMPTIONS</b>	
2 Well classifications	5
3 Display of well permit	6
4 Exemptions for particular sites and installations from specified provisions	6
<b>PART 3 – WELL POSITION, SPACING AND TARGET AREAS</b>	
5 Position of wells	7
6 Spacing and target areas for oil wells	7
7 Spacing and target areas for gas wells	8
<b>PART 4 – WELL OPERATIONS</b>	
<b>Division 1 – Notification</b>	
8 Notification of well construction and drilling operations	10
<b>Division 2 – Blowout Prevention</b>	
9 Well control equipment	10
10 Testing of well control equipment	10
11 Drilling fluid system	11
12 Well control	11
13 Personnel	11
14 Records	12
<b>Division 3 – General Well Equipment</b>	
15 Protection from hazards	12
16 Tools, casing, equipment and materials	13
17 Wellhead requirements	13
18 Casing requirements	13
19 Surface and subsurface equipment	14
<b>Division 4 – Procedures</b>	
20 Management of substances	15
21 Fracturing operations	15
21.1 Induced seismicity	15
22 Hydraulic isolation	15
23 Multi-zone or commingled wells	16
24 Alterations of wells	16
25 Inactive or suspended wells	16
<b>PART 5 – ABANDONING, PLUGGING AND RESTORING WELLS</b>	
26 Plugging requirements for wells	17
27 [Repealed]	18

28	Surface restoration of wells and associated sites	18
<b>PART 6 – WELL AND OTHER DATA</b>		
29	Well samples and cores	18
30	Submission of core analysis data	19
31	Examination of cores	19
32	Daily drilling reports	20
33	Deviation and directional surveys	21
34	Tests, analyses, surveys and logs	21
35	Wellsite geology reports	23
36	Completion and workover reports	23
37	Fracturing fluids records	23
38	Production data	24
<b>PART 7 – SAFETY, SECURITY AND POLLUTION PREVENTION</b>		
<b>Division 1 – General</b>		
39	Safety and pollution prevention	24
40	Noise and light	26
40.1	Invasive plant compliance record	26
41	Venting and fugitive emissions	27
41.1	Leak detection and repair	28
<u>41.2</u>	<u>Alternative leak detection and repair</u>	<u>31</u>
42	Flaring limits	32
43	Flaring notification and reporting	32
44	Flaring performance requirements	33
45	Fire precautions	33
46	[Repealed]	34
47	Fire prevention	34
48	Position of tanks and production equipment	35
49	Emergency shutdown devices	35
50	Prevention of losses	35
51	Storage and disposal of wastes	36
52	Seals	37
<b>Division 2 – Natural Gas Emissions</b>		
52.01	Repealed.	38
<u>52.011</u>	<u>Definition</u>	<u>38</u>
52.02	Hydrocarbon gas conservation equipment	38
<u>52.021</u>	<u>Controls to eliminate venting of natural gas emissions</u>	<u>38</u>
52.03	<del>Tanks</del> Uncontrolled production tanks	38
52.04	Compressors	39
52.05	Pneumatic devices	41
52.06	Pneumatic <u>pumps</u>	<u>43</u>
<u>52.061</u>	<u>Methane emissions from pneumatic devices and pneumatic pumps</u>	<u>43</u>
52.07	Pneumatic compressor starters	43
52.08	Glycol dehydrators	44
52.09	Pipes and hatches	44
52.10	Sampling and pressure relief systems	44
52.11	[Repealed]	44
52.12	Measurement equipment	44

<b>Division 3 – Records and Reports</b>	
52.13    Records and reports	45
<b>PART 8 – PRODUCTION OPERATIONS</b>	
<b>Division 1 – Measurements</b>	
53    Measurements	45
<b>Division 2 – Oil</b>	
54    Daily oil allowable	46
55    Restriction of oil production	47
56    Test period allowable	48
56.1    Report required	48
57    Measurement of total oil production	48
58    Production test of oil wells	48
59    Calculation of oil production	49
60    Underproduction of oil	49
61    Overproduction of oil	49
62    Analysis of oil and hydrocarbon liquid production	50
<b>Division 3 – Gas</b>	
63    Gas well tests	50
64    Metering and measurement of gas	51
65    Restriction of gas production	51
66    Overproduction of gas	52
67    Analysis of natural gas and hydrocarbon liquid production	52
<b>Division 4 – Water</b>	
68    Measurement of water production	52
69    Water produced at oil wells	52
70    Water produced at gas wells	53
71    Water analysis	53
72    Operation of a water source well	53
<b>Division 5 – Pressure Measurement</b>	
73    Reservoir pressure measurements	54
<b>Division 6 – Injection and Disposal</b>	
74    Measurement of fluids injected	55
75    Reporting of injection and disposal	55
<b>Division 7 – Facilities</b>	
76    Notification	55
77    Signs for facilities	55
78    Production facilities	56
78.1    Integrity management program	57
79    Obligations on cancellation or cessation of operations	57
<b>Division 8 – Storage Reservoirs</b>	
80    Storage reservoirs	57
<b>PART 9 – RECORDS</b>	
81    Records generally	58
<b>SCHEDULE 1</b>	59
<b>SCHEDULE 2</b>	60

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## *Energy Resource Activities Act*

### **DRILLING AND PRODUCTION REGULATION**

**B.C. Reg. 282/2010**

#### **PART 1 – DEFINITIONS AND APPLICATION**

##### **Definitions**

**1** In this regulation:

“**abandon**”, in relation to a well, means permanently to plug the well in accordance with Part 5;

“**accepted safety training organization**” means either of the following:

- (a) the non-profit organization of Canadian petroleum industry trade associations known as Energy Safety Canada that provides certification, training and health and safety services to the oil and gas industry;
- (b) an organization equivalent to that referred to in paragraph (a) that provides certification, training and health and safety services to the oil and gas industry that are satisfactory to an official;

“**Act**” means the *Energy Resource Activities Act*;

“**annual gas allowable**” means, for any production period, the volume of natural gas determined by multiplying the daily gas allowable by either

- (a) the number of days from November 1 to October 31 inclusive, or
- (b) in the initial production year, the number of days from the date production began to October 31 inclusive;

“**ASME**” means the American Society of Mechanical Engineers;

“**ASME Standard B31.3**” means ASME Standard B31.3, Process Piping, as amended from time to time;

“**barrier**” means any fluid, plug or seal that prevents gas or oil or any other fluid from flowing unintentionally from a well or from a formation into another formation;

“**battery**” means a system or arrangement of tanks or other surface equipment receiving the effluents of one or more wells prior to delivery to market or other disposition, and may include equipment or devices for separating the effluents into petroleum, natural gas or water and for measurement;

“**completed**”, in relation to a well or zone, means a well or zone that is physically able to permit

- (a) the production of fluids from the well or zone,
- (b) the observation of the performance of a reservoir, or
- (c) the injection or disposal of fluids into a zone;

“**concurrent production**” means the controlled, simultaneous production from a pool of petroleum and natural gas at a gas-oil ratio that exceeds the solution gas-oil ratio;

## Part 1 – Definitions and Application

- “**core lab**” means the facility for the storage and examination of well samples and cores;
- “**CSA**” means the Canadian Standards Association;
- “**CSA Standard Z341**” means CSA Standard Z341, Storage of hydrocarbons in underground formations, as amended from time to time;
- “**CSA Standard Z662**” means CSA Standard Z662, Oil and gas pipeline systems, as amended from time to time;
- “**CSA Standard Z741**” means CSA Standard Z741, Geological storage of carbon dioxide, as amended from time to time;
- “**daily gas allowable**” or “**DGA**” means the volume of natural gas determined by multiplying the unadjusted daily gas allowable by any applicable adjustment factors in accordance with section 7 (7) or as otherwise specified in writing in a permit or a designation;
- “**daily oil allowable**” or “**DOA**” means the volume of petroleum determined in accordance with section 54;
- “**daily production limit**” means a volume equal to 125% of the daily oil allowable or daily gas allowable;
- “**deep groundwater**” has the same meaning as in section 51 of the Water Sustainability Regulation;
- “**emergency planning zone**” has the same meaning as in section 1 of the Emergency Management Regulation;
- “**facility permit**” means a permit that includes permission to construct or operate a facility;
- “**facility permit holder**” means a permit holder of a facility permit;
- “**flare stack**” means a vertical pipe in which natural gas or gas derived from petroleum is combusted at the tip;
- “**flaring**” means the disposal by combustion of natural gas or gas derived from petroleum;
- “**groundwater**” has the same meaning as in the *Water Sustainability Act*;
- “**incinerator**” means a device designed to dispose of natural gas or gas derived from petroleum by combusting the gas inside a chamber of the device;
- “**initial oil production**” means the first production after the release of the drilling rig and after the recovery of a volume of petroleum equal to the volume of the completion petroleum;
- “**integrity management program**”, in relation to a facility, means a documented program that specifies the practices used to ensure the safe, environmentally responsible and reliable operation of the facility;



DRILLING AND PRODUCTION REGULATION

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## Part 1 – Definitions and Application

- “**monthly oil allowable**” means, for any month, the volume of petroleum determined by multiplying the daily oil allowable by the number of days in the month;
- “**natural boundary**” has the same meaning as in section 1 of the *Land Act*;
- “**natural gas by-products**” means natural gas liquids, sulphur and substances other than marketable natural gas that are recovered from raw natural gas by processing or normal 2-phase field separation;
- “**observation well**” means a well or a portion of a well designated as an observation well under section 2 (7);
- “**overproduction of oil**” means, at the end of the test period, the amount by which petroleum production during the test period exceeds the test period allowable, and on any succeeding day means the amount by which the actual production from the beginning of the production period exceeds the production target;
- “**producing well**” means a completed well that has been placed on regular production;
- “**production period**” means a period beginning on the day following the test period to the following October 31 and thereafter means a 12 month period ending on October 31 each year;
- “**production tank**” means a tank used to receive and store produced or waste liquids at a facility, but does not include a tank used to receive and store liquids only during maintenance operations or process upsets;
- “**production target**” means, at the end of any day, the sum of the daily oil allowables for each day from the beginning of the production period plus any underproduction or less any overproduction carried forward from the test period or a preceding production period;
- “**proration battery**” means a battery that gathers from more than one well and where the petroleum volume, water volume and natural gas volume produced from the wells are measured at the battery outlet and are then allocated to each well based on test results;
- “**qualified professional**” means a person who is licensed or registered as either a professional engineer or a professional geoscientist under the *Professional Governance Act*;
- “**safety equipment**” means equipment that is required for the safe operation and shutdown of a producing well or facility;
- “**test period**” means, commencing with the day of initial oil production, the lesser of either 90 producing days or the time required to produce the test period allowable;
- “**turnaround**”, in relation to a facility, means a planned shutdown to allow for maintenance, cleaning, inspection, repairs or an overhaul;
- “**unadjusted daily gas allowable**” or “**UDGA**” means the greater of

## Part 1 – Definitions and Application

- (a) 60 000 m<sup>3</sup>, and
  - (b) the volume of gas determined from reservoir parameters and approved by an official,  
except in the case of concurrent producers, in which case paragraph (b) applies;
- “unadjusted daily oil allowable”** or **“UDO A”** means the volume of oil determined in accordance with section 54 (2);
- “underproduction of oil”** means, at the end of the test period, the amount by which petroleum production during the test period is less than the test period allowable and, at the end of any succeeding day, means the amount by which the actual production from the beginning of the production period is less than the production target;
- “usable groundwater”** means groundwater that is not deep groundwater;
- “water body”** means a natural water course or source of water supply, whether usually containing water or not, but does not include muskeg;
- “water production”** means the flowing of water from a water source well;
- “water supply well”** has the same meaning as in the Ground Water Protection Regulation, B.C. Reg. 299/2004;
- “well control”** means control of the movement of fluids into or from a well;
- “well operation”** means the operation of drilling, completing, recompleting, intervening, re-entering, carrying out a workover, suspending or abandoning a well;
- “well permit”** means a permit that includes permission to drill or operate a well;
- “wellhead”**
- (a) includes the flow control valves and all equipment installed on a well above the uppermost portion of the surface casing, and
  - (b) does not include associated flow lines;
- “workover”** means
- (a) any operation that changes the configuration or producing characteristics of a well or zone,
  - (b) the installation or removal of equipment from a wellbore, and
  - (c) stimulation operations.
  - (d) Repealed. [B.C. Reg. 146/2017, App. 1, s. 1 (b).]
- [am. B.C. Regs. 241/2012, s. 1; 204/2013, s. 3 (a); 147/2014, s. (a); 159/2015, s. 1; 146/2017, App. 1, s. 1; 103/2019, s. 1; 286/2018, s. 1; 48/2021, App. 2, s. 1; 202/2023, Sch. 2, s. 1; 78/2023, Sch. 2, s. 2.]

**Application**

- 1.1** Subject to section 22 of the Oil and Gas Processing Facility Regulation, this regulation does not apply in relation to the following:
- (a) a processing facility as defined in section 1 of the Oil and Gas Processing Facility Regulation;

**DRILLING AND PRODUCTION REGULATION**

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## Part 2 – Well Permits and Exemptions

- (b) an LNG facility as defined in section 1 of the Liquefied Natural Gas Facility Regulation;
- (c) a facility for manufacturing hydrogen, ammonia or methanol from petroleum, natural gas, water or another substance.

[en. B.C. Reg. 78/2023, Sch. 2, s. 3; am. B.C. Reg. 37/2024, s. 1.]

**PART 2 – WELL PERMITS AND EXEMPTIONS****Well classifications**

- 2**
- (1) A well is classified as a development well if, at the time the well permit is issued,
    - (a) it is to be located in a spacing area that is in or contiguous to an oil or gas pool designated under section 49.1 of the Act, and
    - (b) if an objective formation is not in a deeper geological formation than the designated oil or gas pool.
  - (2) A well is classified as an exploratory outpost well if, at the time the well permit is issued,
    - (a) it is to be located less than 7 km from an oil or gas pool designated under section 49.1 of the Act, and
    - (b) it is not a development well.
  - (3) A well is classified as an exploratory wildcat well if,
    - (a) at the time the well permit is issued, it is to be located not nearer than 7 km to an oil or gas pool designated under section 49.1 of the Act, or
    - (b) the well has been designated as a discovery well.
  - (4) If a well permit is amended to give permission to deepen a well, the new portion of the well is classified in accordance with subsections (1) to (3).
  - (5) An official may designate a well or a portion of a well as a discovery well if a new oil or gas pool has been designated as a result of data obtained from the well.
  - (6) An official may designate a well or a portion of a well as a special data well if the well permit holder submits to the regulator
    - (a) a report respecting monitoring of hydraulic fracturing operations in the well, or
    - (b) both of the following:
      - (i) at least 9 metres of full diameter core from the well or 20 rotary sidewall cores from the well;
      - (ii) at least 3 specialty petro-physical logs, run over an interval of not less than 200 metres, that correspond to the interval from which the cores referred to in subparagraph (i) are collected.
  - (7) An official may designate a well as an observation well if

## DRILLING AND PRODUCTION REGULATION

## Part 2 – Well Permits and Exemptions

- (a) the well is being used to monitor reservoir pressures or to obtain other formation information, and
- (b) the well is not used to produce from, or inject or dispose of fluids into, a formation being monitored.

[am. B.C. Regs. 241/2012, s. 2; 202/2023, Sch. 2, s. 2.]

**Display of well permit**

- 3** A well permit holder must keep a copy of the well permit at the well site during drilling operations.

**Exemptions for particular sites and installations from specified provisions**

- 4** (1) An official may grant to a permit holder an exemption in writing from the application of any or all of the following:
- (a) section 5 (2) (a);
  - (b) section 6 (4);
  - (c) section 7 (3);
  - (c.1) section 15 (3);
  - (d) section 16 (1) (b), (2) and (3);
  - (e) section 18;
  - (f) section 25 (5);
  - (g) section 26 (1) (a) and (d);
  - (h) section 29;
  - (i) section 31;
  - (j) section 33 (1), (2) and (4);
  - (k) section 34 (1), (2.1), (6.1) and (7);
  - (l) section 39;
  - (m) section 41 (4), [\(4.02\)](#) and (6);
  - (m.1) section 41.1;
  - (n) section 45 (3) (b);
  - (n.1) section 47 (c);
  - (n.2) section 48;
  - (o) section 51 (3) and (6);
  - [\(o.1\) section 52.03 \(1\);](#)
  - [\(o.2\) section 52.04 \(3\);](#)
  - [\(o.3\) section 52.05 \(4.1\);](#)
  - [\(o.4\) section 52.06 \(4\);](#)
  - [\(o.5\) section 52.08 \(5\);](#)
  - (p) section 54 (2) and (6);
  - (q) section 55;

(r) section 58 (1);

(s) section 59 (2);

(t) section 60 (2);

(u) section 62 (1);

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**DRILLING AND PRODUCTION REGULATION**

## Part 3 – Well Position, Spacing and Target Areas

- (v) section 63 (1);
- (w) section 65 (4) and (5);
- (x) section 67 (1);
- (y) section 71 (1);
- (z) section 73 (1) and (2);
- (z.01) section 78 (2), (3), (4) and (6);
- (z.1) section 79 (1) (b).

- (2) In granting an exemption under subsection (1), an official may impose any conditions on the exemption the official considers necessary.

[am. B.C. Regs. 94/2011; 241/2012, s. 3; 159/2015, s. 2; 146/2017, App. 1, s. 2; 103/2019, s. 2; 286/2018, s. 2; 78/2023, Sch. 2, s. 4.]

**PART 3 – WELL POSITION, SPACING AND TARGET AREAS****Position of wells**

- 5** (1) If a well or facility is
- (a) closer than 100 m to the natural boundary of a water body, or
  - (b) 100 m or more from the natural boundary of a water body, but situated so that, given the topography or other relevant factors, it is likely that an uncontrolled flow of oil, gas, brine or another fluid may reach the water body,
- the permit holder must ensure surface-control features are in place, or surface-control measures have been taken, to contain escaping fluids.
- (2) A permit holder must not drill a well within
- (a) 40 m of the right of way or easement of any road allowance or public utility,
  - (b) 100 m of a permanent building, installation or works,
  - (c) 100 m of a place of public concourse, or
  - (d) 100 m of a reservation for national defence.

**Spacing and target areas for oil wells**

- 6** (1) In each pool, the target area for an oil well in a normal spacing area at any depth is the area inside, but not nearer than 100 m to the sides of, the spacing area.
- (2) If the boundary of a location does not coincide with the side of a normal oil well spacing area, the oil well target area must have sides not nearer than 100 m to the boundary.
- (3) A permit holder may complete one oil well in each normal spacing area on a location that contains more than one normal spacing area if each well is located not nearer than 100 m to the boundary of the location.

**DRILLING AND PRODUCTION REGULATION**

## Part 3 – Well Position, Spacing and Target Areas

- (3.1) Subsections (2) and (3) do not apply to the completed portion of a well producing from an unconventional zone listed in Schedule 2.
- (4) For the purposes of section 54, the off-target penalty factor for an oil well completed outside the oil well target area is:

$$F_{\text{OTP}} = 12 \times \frac{d_1 d_2}{A}$$

where

$F_{\text{OTP}}$  = off-target penalty factor;

$d_1$  = the distance north or south, whichever is closer, from the closest point of the well bore within the productive zone to the side of the spacing area;

$d_2$  = the distance east or west, whichever is closer, from the closest point of the well bore within the productive zone to the side of the spacing area;

$A$  = the area of the spacing area.

- (5) Subsection (4) does not apply to any of the following:
- (a) the discovery well of an oil pool;
  - (b) a well drilled and completed before May 2, 1958;
  - (b.1) the completed portion of a well producing from an unconventional zone listed in Schedule 2;
  - (c) an off-target oil well located not nearer than 100 m to the boundary of the location.
- (6) A well permit holder may not produce from a well in an unconventional zone listed in Schedule 2 if a completed portion of the wellbore is located closer than the distance listed in Schedule 2 for that zone to land with respect to which the well permit holder
- (a) is not the owner of the petroleum and natural gas rights or the holder of the location, or
  - (b) does not have an agreement with the owner or holder respecting the production.

[am. B.C. Regs. 146/2017, App. 1, s. 3; 103/2019, s. 3.]

**Spacing and target areas for gas wells**

- 7 (1) In each pool, the target area for a gas well in a normal spacing area at any depth is the area inside, but not nearer than 250 m to the sides of, the spacing area.
- (2) A permit holder may complete one gas well in each normal spacing area on a location that contains more than one normal spacing area if each well is located not nearer than 250 m to the boundary of the location.

**DRILLING AND PRODUCTION REGULATION**

## Part 3 – Well Position, Spacing and Target Areas

- (3) For the purposes of section 65, the off-target penalty factor for a gas well completed outside the gas well target area is:

$$F_{\text{OTP}} = 8 \times \frac{d_1 d_2}{A}$$

where

$F_{\text{OTP}}$  = off-target penalty factor;

$d_1$  = the distance north or south, whichever is closer, from the closest point of the well bore within the productive zone to the side of the spacing area;

$d_2$  = the distance east or west, whichever is closer, from the closest point of the well bore within the productive zone to the side of the spacing area;

$A$  = the area of the spacing area.

- (4) Subsection (3) does not apply to any of the following:
- the discovery well of a gas pool;
  - a well drilled and completed before May 2, 1958;
  - an off-target gas well located not nearer than 250 m to the boundary of the location.
- (5) Subsections (1) to (3) do not apply to the completed portion of a well producing from an unconventional zone listed in Schedule 2.
- (6) A well permit holder may not produce from a well in an unconventional zone listed in Schedule 2 if a completed portion of the wellbore is located closer than the distance listed in Schedule 2 for that zone to land with respect to which the well permit holder
- is not the owner of the petroleum and natural gas rights or the holder of the location, or
  - does not have an agreement with the owner or holder respecting the production.
- (7) For the purposes of the definition of “daily gas allowable” in section 1, daily gas allowable is:

$$\text{DGA} = \text{UDGA} \times F_{\text{OTP}}$$

where

DGA = daily gas allowable;

UDGA = unadjusted daily gas allowable;

$F_{\text{OTP}}$  = off-target penalty factor.

[am. B.C. Regs. 241/2012, s. 4; 159/2015, s. 3.]



**PART 4 – WELL OPERATIONS****Division 1 – Notification****Notification of well construction and drilling operations**

- 8** (1) A well permit holder must notify the regulator, in electronic form, of the following actions taken by the permit holder:
- (a) beginning the construction of a well;
  - (b) beginning the drilling of a well;
  - (c) releasing a rig, if drilling is completed or temporarily suspended;
  - (d) resuming drilling operations after a temporary suspension.
- (2) The notice under subsection (1) (a) must be sent at least 2 days before construction is to begin, and a notice under subsection (1) (b), (c) or (d) must be sent within 24 hours of the action being taken.

[am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Division 2 – Blowout Prevention****Well control equipment**

- 9** (1) A well permit holder must ensure that, during all well operations, reliably operating well control equipment is installed to control kicks, prevent blow-outs and safely carry out all well operations.
- (2) If a well barrier fails, the well permit holder must ensure that no other activities, other than those intended to restore or replace the barrier, take place in the well.

**Testing of well control equipment**

- 10** (0.1) This section does not apply with respect to a well drilled to access usable groundwater.
- (1) A well permit holder must ensure that
- (a) pressure-control equipment associated with well operations is pressure-tested on installation and as often as necessary during well operations to ensure the continued safe operation of the equipment, and
  - (b) the rig crew conducting the well operation has an adequate understanding of, and is able to operate, the blowout prevention equipment.
- (2) At the request of an official, a well permit holder's contractor or rig crew, when it is safe to do so, must test the operation and effectiveness of the blowout prevention equipment installed on the permit holder's well in accordance with the Well Control Procedure placard issued by the Canadian Association of Oilwell Drilling Contractors or well control procedures approved by an accepted safety training organization.

**DRILLING AND PRODUCTION REGULATION**

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## Part 4 – Well Operations

- (3) A well permit holder must maintain, for 60 days from the date of rig release, a record of the results of tests required under subsection (1) (a).

[am. B.C. Regs. 146/2017, App. 1, s. 4; 103/2019, s. 4.]

**Drilling fluid system**

- 11** A well permit holder must ensure that
- (a) the drilling fluid system and associated monitoring equipment is designed, installed, operated and maintained to allow for proper well evaluation, to ensure safe drilling operations and, except when drilling underbalanced, to provide an effective barrier against formation pressure, and
  - (b) the indicators and alarms associated with the monitoring equipment are located at appropriate locations on the drilling rig to alert onsite personnel of well conditions that could lead to a loss of well control.

**Well control**

- 12** (1) A well permit holder must take all reasonable measures to minimize the risk of loss of well control.
- (2) If well control is lost or compromised, the well permit holder must ensure that all actions necessary to rectify the situation are taken without delay.

**Personnel**

- 13** (1) A well permit holder must ensure that
- (a) there is a sufficient number of trained and competent individuals carrying out well operations for those operations to be carried out safely and without causing pollution, and
  - (b) any operational procedure that is a hazard to safety or the environment is corrected and all affected persons are informed of the alteration.
- (2) A driller of a well being drilled or tested during drilling operations, other than a well that is drilled to access usable groundwater, must
- (a) be trained in blowout prevention,
  - (b) have a valid first line supervisor's blowout certificate or a valid second-line supervisor's well control certificate issued by an accepted safety training organization, and
  - (c) provide evidence of the driller's qualifications to an official on the official's request.
- (3) A rig manager and the permit holder's representative at the well site where a well, other than a well that is used to access usable groundwater, is being drilled or tested during drilling operations must
- (a) be trained in blowout prevention,
  - (b) have a valid second-line supervisor's certificate issued by an accepted safety training organization, and

## Part 4 – Well Operations

- (c) provide evidence of their qualifications to an official on the official's request.
- (4) The following people must possess, during servicing operations on a well other than a well that is drilled to access usable groundwater, a valid well service blowout prevention certificate issued by an accepted safety training organization and provide evidence of their qualifications to an official on the official's request:
  - (a) the driller on tour;
  - (b) the rig manager;
  - (c) the well permit holder's representative.

[am. B.C. Regs. 146/2017, App. 1, s. 5; 103/2019, s. 5; 37/2024, s. 2.]

**Records**

- 14**
- (1) For each well operation, a well permit holder must maintain a record of the well control equipment and an assessment of the adequacy of the well control equipment for 6 months following the completion of the well operation.
  - (2) A well permit holder must maintain records of the policies and procedures used to ensure the safe conduct of well operations.

**Division 3 – General Well Equipment****Protection from hazards**

- 15**
- (1) Until the well is abandoned, a well permit holder must ensure that a permanently legible and conspicuous sign is displayed and maintained at each well, and that sign must show all of the following:
    - (a) the name of the well permit holder;
    - (b) current emergency notification information, including a telephone number;
    - (c) the location of the surface site of the well;
    - (d) if the well may produce flammable gas, a flammable gas symbol from Schedule 1;
    - (e) if the well may produce gas containing 100 ppm or greater of hydrogen sulphide, a poisonous gas symbol from Schedule 1;
    - (f) after March 1, 2011, if the well may produce gas containing 10 ppm or greater of hydrogen sulphide, a poisonous gas symbol from Schedule 1.
  - (2) A well permit holder must not post warning symbols where no hazard exists.
  - (3) A well permit holder must ensure both of the following:
    - (a) that the well site is maintained in a condition so as to minimize hazards, including but not limited to hazards associated with pits, holes, storage of materials and equipment;
    - (b) that the well site is free of garbage, debris and derelict equipment.

[am. B.C. Regs. 241/2012, s. 5; 146/2017, App. 1, s. 6; 103/2019, s. 6; 202/2023, Sch. 2, s. 3.]

**DRILLING AND PRODUCTION REGULATION**

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## Part 4 – Well Operations

**Tools, casing, equipment and materials**

- 16** (1) A well permit holder must ensure
- (a) that all tools and equipment used in well operations, production, injection or disposal are installed and operated in accordance with the manufacturer's specifications or sound engineering practices,
  - (b) that all production from or injection into a well is through tubing, except during a well operation, the production of fluids containing less than 5 mole percent of hydrogen sulphide or the injection of fresh water, and
  - (c) that any packer set in a well is set as near as is practical above the completed interval.
- (2) Except during a well operation, before injecting a fluid other than fresh water or gas containing less than 5 mole percent of hydrogen sulphide into an injection or disposal well, a well permit holder must
- (a) set a production packer in the well as near as is practical above the injection interval, and
  - (b) ensure that the space between tubing and the outer steel casing is filled with a corrosion and frost inhibiting fluid.
- (3) If a production packer is set in accordance with subsection (2), a well permit holder must
- (a) conduct an annual segregation test of any of the holder's wells with a production packer, and, if the test fails, complete repairs without unreasonable delay, and
  - (b) submit a report of the annual segregation test and any repairs completed under paragraph (a) to the regulator within 30 days of completing the test.
- [am. B.C. Regs. 159/2015, s. 4; 146/2017, App. 1, s. 7; 103/2019, s. 7; 202/2023, Sch. 2, s. 2.]

**Wellhead requirements**

- 17** A well permit holder must ensure that the wellhead is designed and maintained to operate safely under the conditions anticipated during the life of the well and that the wellhead is not subjected to excessive force.
- [am. B.C. Regs. 146/2017, App. 1, s. 8; 103/2019, s. 8.]

**Casing requirements**

- 18** (1) A well permit holder must ensure that casing is designed so that it will not fail if subjected to the maximum loads and service conditions that can reasonably be anticipated during the expected service life of the well.
- (2) A well permit holder must use non-toxic drilling fluids during the drilling of a well until, in the opinion of a qualified professional, all usable groundwater has been isolated from the drilling fluid.
- (3) A well permit holder must ensure that surface casing for a well conforms to the following requirements:

## DRILLING AND PRODUCTION REGULATION

## Part 4 – Well Operations

- (a) surface casing must be set in a competent formation at a depth sufficient to provide a competent anchor for blowout prevention equipment and to ensure control of anticipated well pressures;
  - (b) the annulus must be filled with cement to the surface.
- (4) A well permit holder, with respect to a well drilled after this regulation came into force, must ensure that the next casing string is cemented full length if surface casing for the well is not set below usable groundwater.
- (5) A well permit holder must ensure that surface casing cement is not drilled out until sufficient compressive strength has been reached to allow the safe conduct of drilling operations.
- (6) A well permit holder must ensure that
- (a) all reasonable measures are taken to cement all intermediate and production casing to the surface or a minimum of 200 m above the shoe of the previous casing string, and
  - (b) the cement is not drilled out until sufficient compressive strength has been reached to allow the safe conduct of drilling operations.
- (7) If there is any reason to doubt the effectiveness of casing cementation, a well permit holder must evaluate the cement integrity and ensure that remedial measures are taken if necessary.
- (8) On detection of a casing leak or failure, a well permit holder must
- (a) notify the regulator about the leak or failure without delay, and
  - (b) repair the leak without unreasonable delay.
- (9) A well permit holder must ensure that a well is configured such that
- (a) ~~the~~ subject to subsection (10) surface the casing annulus can freely vent,
  - (b) excessive pressure cannot occur at the surface casing shoe, and
  - (c) the surface casing is equipped with an open valve.

[am. B.C. Regs. 146/2017, App. 1, s. 9; 202/2023, Sch. 2, s. 2.]

(10) Subsection (9) (a) does not apply to a well if all of the following requirements are met:

- (a) the surface casing is cemented to the surface;
- (b) the surface casing is set below the base of useable groundwater;
- (c) the buildup pressure of the surface casing vent does not exceed  $\frac{1}{2}$  of the formation leak off pressure at the base of the surface casing;
- (d) the well permit holder has control of emission through one of the following:
  - (i) installation of a burst plate on the surface casing vent with a maximum pressure that does not exceed  $\frac{1}{2}$  of the formation leak off pressure at the base of the surface casing;

(ii) flaring emissions of natural gas from the surface casing vent in accordance with sections 42 to 44;

(iii) routing emission of natural gas from the surface casing vent to hydrocarbon conservation equipment.

**Surface and subsurface equipment**

- 19**
- (1) The well permit holder of a completed oil or gas well must ensure that the surface and subsurface equipment of the well is arranged to permit the ready measurement of the tubing pressure, production casing pressure and surface casing pressure.
  - (2) The well permit holder of a completed well must ensure that the surface equipment at the well site includes
    - (a) the valve connections necessary to sample the oil, gas or water produced, and
    - (b) in the case of a gas well, facilities for determining the wellhead fluid temperature.

unofficial early consolidation

**DRILLING AND PRODUCTION REGULATION**

## Part 4 – Well Operations

- (2.1) The well permit holder of a cased well must ensure that the well is equipped with a wellhead, or a capping assembly, that permits access to the wellbore for pressure measurement.
- (3) The well permit holder of a well must keep a detailed record of all subsurface equipment in the well at all times prior to abandonment.

[am. B.C. Reg. 103/2019, s. 9.]

**Division 4 – Procedures****Management of substances**

- 20** Before a well permit holder drills, completes, plugs or begins production from a well, the well permit holder must ensure that adequate provision is made for the management of any oil, gas, formation water, drilling fluid, completion fluid, chemical substances, and waste.

**Fracturing operations**

- 21** A well permit holder must not conduct a fracturing operation at a depth less than 600 m below ground level unless the operations are permitted by the well permit.

**Induced seismicity**

- 21.1** (1) During fracturing, injection or disposal operations on a well, the well permit holder must immediately report to the regulator any seismic event within a 3 km radius of the drilling pad that is recorded by the well permit holder or reported to the well permit holder by any source available, if
  - (a) the seismic event has a magnitude of 4.0 or greater, or
  - (b) a ground motion is felt on the surface by any individual within the 3 km radius.
- (2) If a well is identified by the well permit holder or the regulator as being responsible for a seismic event that has a magnitude of 4.0 or greater, the well permit holder must suspend fracturing, injection and disposal operations on the well immediately.
- (3) Fracturing, injection and disposal operations suspended under subsection (2) may continue once the well permit holder has implemented operational changes satisfactory to the regulator to reduce or eliminate the initiation of additional induced seismic events.

[en. B.C. Reg. 159/2015, s. 5; am. B.C. Regs. 165/2015; 146/2017, App. 1, s. 10; 202/2023, Sch. 2, s. 2.]

**Hydraulic isolation**

- 22** A well permit holder must establish and maintain hydraulic isolation between all porous zones in a well, except during production from or disposal into zones in which

## Part 4 – Well Operations

commingled production or disposal is permitted or authorized as described in section 23.

[am. B.C. Reg. 103/2019, s. 10.]

**Multi-zone or commingled wells**

- 23** (1) A well permit holder must not commingle production or disposal from a well unless commingling is permitted under the well permit or authorized under section 75 of the Act.
- (2) A well permit holder respecting a multi-zone well who has permission or authorization for commingled production must, within 30 days of beginning production from a commingled well, submit to the regulator a notification of the commingled well production.
- (3) A well permit holder respecting a multi-zone well, who does not have permission for commingled production for more than one pool or zone, must
- (a) once every calendar year and immediately after a change of subsurface equipment or the completion of any operation that may have disturbed or exerted an abnormal differential pressure on equipment, conduct segregation tests,
  - (b) if the tests referred to in paragraph (a) fail, complete repairs without unrea- sonable delay, and
  - (c) maintain records of the tests and repairs referred to in paragraphs (a) and (b).

[am. B.C. Regs. 103/2019, s. 11; 202/2023, Sch. 2, s. 2.]

**Alterations of wells**

- 24** A well permit holder must submit a notice of operations to the regulator at least one business day before beginning work to do any of the following:
- (a) complete or recomplete a well;
  - (b) perform a workover on a well;
  - (c) perform remedial work on a well;
  - (d) install, remove or repair wellbore equipment, including plugs, packers, tubing, casing, artificial lift or subsurface safety valves;
  - (e) plug a portion of a well;
  - (f) perform maintenance operations on a wellbore.

[am. B.C. Regs. 146/2017, App. 1, s. 11; 202/2023, Sch. 2, s. 2.]

**Inactive or suspended wells**

- 25** (1) In this section:
- “active” means
- (a) production, injection or disposal of fluids,
  - (b) drilling or completion operations, and



**DRILLING AND PRODUCTION REGULATION**

## Part 5 – Abandoning, Plugging and Restoring Wells

- (c) with respect to a well designated under section 2 (7), monitoring reservoir pressure or obtaining other formation information;

**“inactive”**, in relation to a well, means a well that has not been abandoned but

- (a) has not been active for 12 consecutive months, or  
(b) if the well is classified as a special sour well, has not been active for 6 consecutive months.

- (2) The well permit holder of an inactive well must submit a report to the regulator within 30 days of the suspension of a well.
- (3) The well permit holder of a suspended well must establish a program of inspections sufficient to ensure the ongoing integrity of the well.
- (4) The well permit holder of a suspended well must maintain records of the inspections referred to in subsection (3).
- (5) The well permit holder of an inactive well, within 60 days of the well becoming inactive, must do both of the following:
- (a) suspend the well in a manner that ensures the ongoing integrity of the well;  
(b) ensure positive isolation between the well and the flowline by disconnecting the well from the flowline or by other means.

[am. B.C. Regs. 241/2012, s. 6; 146/2017, App. 1, s. 12; 103/2019, s. 12; 202/2023, Sch. 2, s. 2.]

**PART 5 – ABANDONING, PLUGGING AND RESTORING WELLS****Plugging requirements for wells**

- 26** (0.1) The following persons must comply with the requirements set out in subsection (1):
- (1):
- (a) for the purposes of section 40 (e) of the Act, a permit holder, former permit holder, authorization holder or former authorization holder with respect to a well permit under which a well has been drilled;
- (b) for the purposes of plugging a well, a well permit holder.
- (1) The requirements for the purposes of subsection (0.1) are as follows:
- (a) for cased wells, a notice of operations and a plugging program must be submitted to the regulator at least 7 days before commencement of operations;
- (b) the permit holder must plug the well in a manner that ensures
- (i) adequate hydraulic isolation is established between porous zones,  
(ii) fluids will not leak from the well,  
(iii) excessive pressure will not build up within any portion of the well, and  
(iv) the long-term integrity of the wellbore is maintained;

**DRILLING AND PRODUCTION REGULATION**Part 6 – Well and Other Data

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(c) an abandonment report, in chronological format, detailing all significant operations, treatments, tests and resulting well behaviour, and including a downhole schematic diagram, must be submitted to the regulator within 30 days of the completion of abandonment operations;

(d) Repealed. [B.C. Reg. 48/2021, App. 2, s. 2.]

(2) For wells drilled to access usable groundwater, an official may exempt, on conditions the official considers advisable, the permit holder from a requirement under subsection (1).

[am. B.C. Regs. 241/2012, s. 7; 159/2015, s. 6; 146/2017, App. 1, s. 13; 103/2019, s. 13; 48/2021, App. 2, s. 2; 202/2023, Sch. 2, s. 2.]

27 Repealed. [B.C. Reg. 103/2019, s. 14.]

**Surface restoration of wells and associated sites**

28 Immediately after ceasing drilling or workover operations, or as soon after cessation as weather and ground conditions permit, a well permit holder must restore the ground surface of those areas of the well site and associated remote sumps and camp sites that will not be required for future operations to a state that eliminates hazards, enables control of weeds and runoff and prevents erosion.

**PART 6 – WELL AND OTHER DATA****Well samples and cores**

- 29 (1) A well permit holder must
- (a) unless paragraph (a.1) applies, take a series of drill cuttings samples at depth intervals of 5 m beginning at a point determined by the permit holder to be 50 m measured depth above the shallowest potential reservoir zone expected in the well and continuing to the total depth of the well,
  - (a.1) for horizontal wells drilled from a common drilling pad location and to be completed in a zone listed in Schedule 2, take drilling cutting samples as follows:
    - (i) for a minimum of one horizontal well on the pad location, at 5 m intervals beginning at a point determined by the permit holder to be 50 m measured depth above the shallowest potential reservoir zone expected in the well and continuing to the point at which the drilling of the horizontal portion of the well is begun;
    - (ii) for a minimum of one well on the pad location in each dominant direction of the horizontal portion of the well for each zone listed in Schedule 2, at 10 m intervals beginning at the point at which the drilling of the horizontal portion of the well is begun and continuing to the total depth of the well,
  - (b) collect, wash, dry, sort and preserve 2 complete sets of drill cuttings samples in vials, arranged in trays of adequate construction,
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**DRILLING AND PRODUCTION REGULATION**

## Part 6 – Well and Other Data

- (c) clearly and accurately label the vials and trays with the name and location of the well and the sample depths represented and, if the well is a multi-leg well, identify the leg from which the cuttings originated, and
  - (d) deliver 2 sets of the drill cuttings samples, carriage prepaid, to the regulator not later than 14 days after the date of rig release.
- (2) A well permit holder must
- (a) as soon as practicable after collecting a core sample, remove the core sample from the core barrel and store it in book fashion in one or more core boxes,
  - (b) accurately label on the end of the box body, but not the box lid, the well permit number, the well name, the surface location of the well, the core number and interval and the length of the core recovered, and identify the top and bottom of the core on the core box,
  - (c) protect boxes containing the cores from theft, misplacement or exposure to the weather, and
  - (d) forward the core to the regulator, carriage prepaid, not later than 14 days after the date of rig release.
- (3) A well permit holder must ensure that core boxes are of adequate construction, the sides of the boxes project above the level of the contained cores, lids are securely fixed to ensure safe transit and the boxes have an inside length of 80 cm.
- (4) When submitting a core that has been slabbed, a well permit holder must ensure that the 1/3 slab is either placed in the core box with the corresponding 2/3 slab, or, with the approval of an official, preserved as a viewing slab and submitted in cardboard boxes of adequate construction.

[am. B.C. Regs. 241/2012, s. 8; 146/2017, App. 1, s. 14; 202/2023, Sch. 2, s. 2.]

**Submission of core analysis data**

- 30**
- (1) If a well permit holder has submitted core from a well under section 2 (6) and the well has been designated as a special data well, the well permit holder must complete core analysis of the core without unreasonable delay.
  - (2) Within 30 days after completion of a core analysis, a well permit holder must submit to the regulator a report of the result of the core analysis, including digital core analysis data and photographs, if any.

[am. B.C. Regs. 241/2012, s. 9; 202/2023, Sch. 2, s. 2.]

**Examination of cores**

- 31**
- (1) A person must ensure that core declared by an official as being representative of a type section is not broken or chipped.
  - (2) A person must ensure that breakage of core during examination at the core lab is minimized and that core is not destroyed, broken or sampled without approval of an official.

## Part 6 – Well and Other Data

- (3) With the approval of an official and subject to subsection (4), a person, on payment of the fees set out in section 19 of the Fee, Levy and Security Regulation, may examine and remove a well core from the core lab for the purpose of laboratory investigations and analysis that cannot be performed at the core lab.
- (4) A person who removes a well core from the core lab must
  - (a) return the core within 90 days,
  - (b) take every reasonable precaution to prevent damage to or mixing of the core in core boxes,
  - (c) submit a report, including photographs, if any, of any laboratory analysis conducted on the core to the regulator within 30 days of completing the analysis,
  - (d) submit any thin sections cut from core to the regulator in adequate boxes labelled with the unique well identifier, well permit number and well name,
  - (e) label individual thin sections with the well permit number and depth,
  - (f) test cores in a manner acceptable to an official, and
  - (g) return the core immediately on the request of an official.
- (5) Repealed. [B.C. Reg. 8/2014, s. 1 (b).]  
[am. B.C. Regs. 241/2012, s. 10; 8/2014, s. 1; 146/2017, App. 1, s. 15; 202/2023, Sch. 2, s. 2.]

**Daily drilling reports**

- 32**
- (1) A well permit holder of well being drilled or otherwise worked on must
    - (a) ensure that a daily drilling report (tour sheet) is kept at the well site,
    - (b) if a kick occurs during drilling operations, notify the regulator immediately and submit a written kick report to the regulator within one day of the incident,
    - (c) submit a copy of the daily drilling report (tour sheet) to the regulator within 30 days of rig release,
    - (d) submit a summary report of drilling operations to the regulator within 4 days of the following:
      - (i) the rig is released;
      - (ii) drilling operations have ceased with the intention of resuming drilling at a later date, and
    - (e) maintain all data recorded by the electronic drilling recorder for at least 30 days from the date of rig release.
  - (2) A daily drilling report (tour sheet) under subsection (1) (a) must set out complete data on all operations performed during the day, including but not limited to the following:
    - (a) the depth at the beginning and end of each tour;

**DRILLING AND PRODUCTION REGULATION**

## Part 6 – Well and Other Data

- (b) all casing data, including size, type, grade, weight, whether new or used and the depth at which the casing is set;
- (c) particulars of cementing;
- (d) a report of any tests made, including blowout prevention system function tests;
- (e) full details of all formation tests, unless the details are submitted on a confidential report form provided by the regulator;
- (f) details of any loss of drilling fluid into the formation;
- (g) the allocation of time to each operation;
- (h) the name of the drilling contractor or service company and rig number;
- (i) the spud and rig release dates;
- (j) details of any casing bowl welding;
- (k) the results of all deviation surveys.

[am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Deviation and directional surveys**

- 33** (1) A well permit holder must ensure that deviation surveys are made during drilling at intervals not exceeding 150 m in depth, unless there are significant wellbore stability problems, in which case a survey may be omitted.
- (2) A well permit holder must ensure that a directional survey of a well to total depth is made if
- (a) the surface position of the well is nearer to the boundary of its target area than 2% of the measured depth of the well,
  - (b) the surface position of the well is outside its target area, or
  - (c) the well is directionally drilled.
- (3) A well permit holder must submit to the regulator within 14 days of rig release the results of the directional survey under subsection (2).
- (4) A permit holder must not drill a well, other than a relief well, so that it intersects with an existing well.

[am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Tests, analyses, surveys and logs**

- 34** (1) Subject to subsections (2) and (2.1), before a well is completed, suspended or abandoned, a well permit holder must ensure that
- (a) a gamma ray log is taken from ground level of the well to total depth,
  - (b) a neutron log is taken from 25 m below ground level to the base of the surface casing, and
  - (c) a resistivity and porosity log is taken from the base of the surface casing to
    - (i) the total depth of the well of a vertical pilot hole, if one exists, or

## Part 6 – Well and Other Data

- (ii) the lowest point in the vertical portion of one horizontal well beyond which the logging tool cannot be lowered by gravity.
- (2) Subsection (1) (b) applies only to wells the drilling of which begins after the date this regulation came into force.
- (2.1) If more than one well has been drilled or has been permitted to be drilled from a common drilling pad location in an unconventional zone listed in Schedule 2, the logs referred to in subsection (1) must be taken in at least one of the wells and, in the case of the other well or wells,
  - (a) subsection (1) does not apply, and
  - (b) a gamma ray log must be taken from the base of the surface casing of each well to the total depth of each well.
- (3) Within 30 days after the date on which a log was run, the well permit holder must submit a copy of the log to the regulator.
- (4) A well permit holder must submit to the regulator
  - (a) a pressure chart, and
  - (b) a report containing complete details on fluid recoveries for each drill stem test or wire line test taken on a wellwithin 30 days of the date on which the test was made.
- (5) A well permit holder must submit the following to the regulator within 30 days of analysis completion:
  - (a) if tests from a well allow good sampling, a report of all analyses made of any oil, gas, hydrocarbon liquid or formation water recovered from each formation;
  - (b) if performed, a report of all isotopic analyses of mud gas, headspace gas, produced gas, surface casing flow gas, or any other gas associated with a well.
- (6) On obtaining the data and results of a bottom hole sample analysis or other pressure-volume-temperature analysis, the well permit holder must submit the data and results to the regulator within 30 days of analysis completion.
- (6.1) A well permit holder of an exploratory outpost well or an exploratory wildcat well must
  - (a) capture a minimum of 15 mud gas isotope data samples per 1 000 m interval between the base of the surface casing and either
    - (i) the total depth in a vertical well, or
    - (ii) the point where deviation exceeds 80° from the vertical in a horizontal well, and
  - (b) submit an analysis of the isotope data samples captured under paragraph (a) to the regulator within 30 days of analysis completion.

**DRILLING AND PRODUCTION REGULATION**

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## Part 6 – Well and Other Data

(7) Repealed. [B.C. Reg. 48/2021, App. 2, s. 2.]

[am. B.C. Regs. 241/2012, s. 11; 159/2015, s. 7; 174/2018, s. 1; 48/2021, App. 2, s. 2; 202/2023, Sch. 2, s. 2.]

**Wellsite geology reports**

**35** (1) Within 14 days after the date of rig release of the drilling rig, a well permit holder must submit to the regulator the final as-drilled survey plan, showing the surface location and bottom hole location of the well and including the following for each:

- (a) northing and easting coordinates, determined using the North American Datum of 1983, also known as NAD 83;
- (b) north and east offsets to the nearest corner of the spacing unit in which each is located, and identifying the reference corner.

(2) Within 60 days after the date of rig release of the drilling rig, a well permit holder must submit to the regulator a wellsite geology report

- (a) for a well or portion of a well classified exploratory outpost or exploratory wildcat, or
- (b) regardless of the well classification, if a wellsite geological report has been compiled.

[am. B.C. Regs. 103/2019, s. 15; 202/2023, Sch. 2, s. 2.]

**Completion and workover reports**

**36** (1) For each separate completion or workover operation on a well, a well permit holder must submit to the regulator, within 30 days of the end of each completion or workover operation, a report, in chronological format, detailing all significant operations, treatments and resulting well behaviour, and including a downhole schematic diagram.

(2) A report under subsection (1) is not required for maintenance operations, including injection of corrosion inhibitors, scale removal or pressure testing operations.

[am. B.C. Regs. 241/2012, s. 12; 146/2017, App. 1, s. 16; 202/2023, Sch. 2, s. 2.]

**Fracturing fluids records**

**37** (1) A well permit holder must maintain detailed records of the composition of all fracturing fluids that are used in a well for which the well permit holder is responsible, including, but not limited to

- (a) the well authorization number,
- (b) the fracture date,
- (c) an identification of the fluid ingredients and a description of the purpose of each,
- (d) an identification of the ingredient concentration in the additive and in the hydraulic fracturing fluid,

## Part 7 – Safety, Security and Pollution Prevention

- (e) the chemical abstract service number of each ingredient,
  - (f) an identification of the total volume of water injected with the ingredients, and
  - (g) the trade name and supplier of each ingredient.
- (2) A well permit holder must submit to the regulator the records referred to in subsection (1) within 30 days after the completion of the well.

[en. B.C. Reg. 249/2011; am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Production data**

- 38**
- (1) A permit holder must keep, for not less than 72 months, complete, correct and accurate records of quantities of petroleum, natural gas, hydrocarbon liquids or natural gas liquids that are produced, sold, purchased, acquired, stored, transported, refined, processed or marketed by the permit holder.
  - (2) A permit holder must keep, for not less than 72 months, records of supporting information, methodologies and data associated with the records referred to in subsection (1).
  - (3) The permit holder's accounting methods, practices and record keeping as well as the measurement methods and practices associated with records referred to in subsection (1) must be sufficient to ensure that records of quantities are correct, accurate and complete.
  - (4) The records referred to in subsection (1) must be adequate for production accounting purposes and the assessment of royalties under the Petroleum and Natural Gas Royalty and Freehold Production Tax Regulation.

[am. B.C. Reg. 174/2018, s. 2.]

**PART 7 – SAFETY, SECURITY AND POLLUTION PREVENTION****Division 1 – General****Safety and pollution prevention**

- 39**
- (1) In this section, “**populated area**” means an occupied dwelling, school, picnic ground or other place of public concourse.
  - (2) A permit holder of a completed well or facility must establish and maintain a system to detect and control leaks as quickly as practicable.
  - (3) A permit holder of a completed well or facility must install and maintain fencing or take other access control measures to prevent unauthorized access to the well or facility if
    - (a) the boundary of the well or facility is located within 800 m of a populated area, or
    - (b) a populated area is within the emergency planning zone for the well or facility.



**DRILLING AND PRODUCTION REGULATION**

## Part 7 – Safety, Security and Pollution Prevention

- (4) If an uncontrolled flow of oil or gas from a completed well, other than a well suspended in accordance with section 25, could produce a hydrogen sulphide concentration greater than 100 ppm in atmosphere within 50 metres of the well, the permit holder of the well must install and maintain
- (a) an automated system to isolate the well in the event of an uncontrolled flow of oil or gas, and
  - (b) if the well is located within 1 600 m of a populated area, a hydrogen sulphide detection and alarm system that is continuously monitored and is capable of activating the automated system referred to in paragraph (a).
- (5) If an uncontrolled flow of oil or gas from a facility could produce a hydrogen sulphide concentration greater than 100 ppm in atmosphere at the facility boundary, the permit holder of the facility must install and maintain
- (a) an automated system to isolate the facility in the event of an uncontrolled flow of oil or gas, and
  - (b) if the facility is located within 1 600 m of a populated area, a hydrogen sulphide detection and alarm system which is continuously monitored and is capable of activating the automated system referred to in paragraph (a).
- (6) The permit holder of a completed well must do all of the following if the hydrogen sulphide content of the gas exceeds 5 mole percent or a populated area or a numbered highway is within the emergency planning zone for the well:
- (a) for a completed well not produced by artificial lift,
    - (i) equip the well with 2 master valves,
    - (ii) install a production packer set as closely above the producing formation as is practicable and fill the annular space between the tubing and production casing with a suitable corrosion inhibiting liquid,
    - (iii) install wellhead equipment for which the working pressure rating is not less than the bottom hole pressure of the producing formation, but with a minimum rating of 14 000 kPa,
    - (iv) if a hot oil circulating string is used inside the production casing of a well, install a check valve in the injection line and automatic shutoff valve on the return line,
    - (v) if a well is equipped with a production packer as required under subparagraph (ii), conduct annual segregation tests and, if the test fails, complete repairs without unreasonable delay, and
    - (vi) submit within 30 days of completion a record of the tests and repairs referred to in subparagraph (v);
  - (b) for a flowing well that is located within 800 m of a populated area or within 8 km of a city, town or village and that has the potential to produce more than 30 000 m<sup>3</sup> of gas per day, install at least 30 m below the surface a downhole safety valve in the tubing that closes automatically in the event

## Part 7 – Safety, Security and Pollution Prevention

of an uncontrolled flow of oil or gas or a failure in the system which operates the valve;

- (c) for an acid gas injection or disposal well, install a downhole safety valve in the tubing that
  - (i) is at least 30 m below the surface, and
  - (ii) closes automatically in the event of an uncontrolled flow of oil or gas or a failure in the system that operates the valve.
- (7) If a well is equipped with an artificial lift after October 4, 2010, and the hydrogen sulphide content of the gas exceeds 100 ppm, the permit holder must,
  - (a) if a pumpjack is the method of artificial lift,
    - (i) install on the stuffing box a device that will
      - (A) shut down the pumping unit in the event of a stuffing box failure, and
      - (B) seal off the well in the event of a polish rod failure, and
    - (ii) install an automatic vibration shutdown system that will safely shut down the pumpjack, or
  - (b) if paragraph (a) does not apply, maintain a system that will shut down the artificial lift if a leak is detected.
- (8) Repealed. [B.C. Reg. 103/2019, s. 16 (d).]
- (9) Repealed. [B.C. Reg. 204/2013, s. 3 (b).]
- (10) Repealed. [B.C. Reg. 282/2010, s. 39 (11).]
- (11) Spent.
 

[am. B.C. Regs. 241/2012, s. 13; 204/2013, s. 3 (b); 159/2015, s. 8; 146/2017, App. 1, s. 17; 174/2018, s. 3; 103/2019, s. 16.]

**Noise and light**

- 40** A permit holder must ensure that operations at a well or facility for which the permit holder is responsible do not cause excessive noise or excessive emanation of light.
- [am. B.C. Reg. 146/2017, App. 1, s. 18.]

**Invasive plant compliance record**

- 40.1** A person who carries out energy resource activities within an operating area must prepare and maintain an invasive plant compliance record that describes the activities carried out for the purpose of complying with the obligations described in section 15 of the Environmental Protection and Management Regulation, including all of the following:
- (a) the assessment and monitoring activities carried out for the purpose of determining whether invasive plants
    - (i) are present or established, or may become established, or
    - (ii) have spread to adjacent areas;

**DRILLING AND PRODUCTION REGULATION**

## Part 7 – Safety, Security and Pollution Prevention

- (b) the location, type and distribution of each species of invasive plants found through assessment and monitoring activities;
- (c) the activities carried out for the purpose of preventing the following:
  - (i) the transportation of seed, plant parts or propagules of invasive plants;
  - (ii) the establishment of invasive plants, including the removal of invasive plants;
- (d) the revegetation activities carried out, including the plant species used for revegetation;
- (e) the activities carried out for the purpose of ensuring that revegetated plants are successfully established;
- (f) with respect to the activities described in this section,
  - (i) the dates on which the activities were carried out, and
  - (ii) the processes and equipment used in carrying out the activities;
- (g) the qualifications of the persons
  - (i) carrying out assessment and monitoring activities, and
  - (ii) supervising the activities described in this section.

[en. B.C. Reg. 145/2023, App. 2, s. 1; am. B.C. Reg. 202/2023, Sch. 2, s. 4.]

**Venting and fugitive emissions**

- 41** (1) A permit holder must not vent gas unless the gas heating value, volume or flow rate is insufficient to support stable combustion and
- (a) the venting is conducted in a manner that does not constitute a safety hazard,
  - (b) the venting does not cause off-site odours,
  - (c) the quantity of vented gas is minimized, and
  - (d) the duration of venting is minimized.
- (1.1) A well permit holder who vents natural gas during a well liquids unloading event must maintain a record of the event including all of the following:
- (a) the dates on which the event was carried out;
  - (b) the location of the venting;
  - (c) the measures taken to reduce emissions of natural gas;
  - (d) the volume, in m<sup>3</sup>, of natural gas vented.
- (2) A well permit holder must check each well for evidence of a surface casing vent flow, and submit the results of the check to the regulator,
- (a) immediately after initial completion or any recompletion of the well,
  - (b) within one year of rig release,
  - (c) as routine maintenance throughout the life of the well,
  - (d) before suspension of the well,
  - (e) before abandoning the well, and

(f) before applying for a transfer of the well permit.

(2.1) Subsection (2) does not apply to a well permit holder if the requirements in section 18(10) are met.

- (3) On discovery of a surface casing vent flow that presents an immediate safety or environmental hazard, a well permit holder must
- (a) immediately take steps to eliminate the hazard,
  - (b) immediately notify the regulator of the surface casing vent flow, and

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## DRILLING AND PRODUCTION REGULATION

Part 7 – Safety, Security and Pollution Prevention

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- (c) submit to the regulator without delay a report respecting the surface casing vent flow and the steps taken under paragraph (a).
- (4) On discovery of a surface casing vent flow other than one referred to in subsection (3), a well permit holder must
  - (a) test the flow rate and buildup pressure of the surface casing vent flow, and
  - (b) submit a surface casing vent flow report to the regulator within 30 days of the discovery of the surface casing vent flow.
- (4.01) A well permit holder must ensure that the emissions of natural gas from a surface casing vent flow do not exceed 100 m<sup>3</sup> per day.
- (4.02) Beginning on January 1, 2026, despite subsection (4.01) and subject to subsection (4.03), if all of the following apply, a well permit holder must ensure emissions of natural gas from a surface casing vent flow do not exceed 3 m<sup>3</sup> per day:
  - (a) the surface casing is cemented to the surface;
  - (b) the surface casing is set below the base of usable groundwater;
  - (c) the buildup pressure of the surface casing vent does not exceed ½ of the formation leak off pressure at the base of the surface casing.
- (4.03) Subsection (4.02) does not apply
  - (a) until 90 days after discovery of the vent flow,
  - (b) during testing of a vent flow or during a well operation, or
  - (c) until after initial completion of a well unless a well becomes inactive in accordance with section 25 prior to initial completion of the well.
- (4.04) A well permit holder must notify the regulator, in electronic form, at least 7 days before taking action to control the emission of natural gas from a surface casing vent flow referred to in subsection (4.02).
- (4.05) A notice under subsection (4.04) must
  - (a) demonstrate how the criteria in subsection (4.02) are met, and
  - (b) identify the actions taken to control the emission of natural gas from a surface casing vent flow.
- (4.1) On discovery of an occurrence of gas migration, a permit holder must
  - (a) immediately notify the regulator of the gas migration,
  - (b) evaluate the cause and source of the gas migration and complete a risk assessment of the gas migration, and
  - (c) submit to the regulator without delay a report respecting the evaluation and risk assessment completed under paragraph (b).
- (5) Repealed. [B.C. Reg. 286/2018, s. 3.]

- (6) A permit holder of a well drilled or facility constructed after the date this regulation came into force may use gas containing hydrogen sulphide for pneumatic instrumentation or to provide motive force to pumps only if the gas contains no more than 20 parts per million of hydrogen sulphide.

[am. B.C. Regs. 241/2012, s. 14; 242/2012; 159/2015, s. 9; 146/2017, App. 1, s. 19; 103/2019, s. 17; 286/2018, s. 3; 202/2023, Sch. 2, s. 2; 78/2023, Sch. 2, s. 5.]

#### **Leak detection and repair**

**41.1** (1) In this section:

**“comprehensive survey”** means a survey to detect leaks using one or both of the following methods:

- (a) an organic vapour analyzer that is
  - (i) capable of detecting natural gas concentrations of 500 parts per million, and
  - (ii) operated in accordance with United States Environmental Protection Agency Method 21 – Determination of Volatile Organic Compound Leaks;
- (b) a gas imaging camera that is
  - (i) capable under laboratory conditions of detecting, at a distance of 3 metres, pure methane emitted at a rate of 1 gram per hour, and
  - (ii) operated by individuals who are competent in the operation of the camera;

**DRILLING AND PRODUCTION REGULATION**

Part 7 – Safety, Security and Pollution Prevention

“**screening survey**” means a survey to detect leaks using one or both of the following methods:

- (a) a soap solution bubble test;
- (b) the senses of hearing, sight and smell;

“**water source well**” has the same meaning as in section 1 of the *Petroleum and Natural Gas Act*.

(2) Subject to subsections (7) ~~to~~ and (9), a facility permit holder must, each calendar year, carry out at least the following surveys of the facility, including, without limitation, any pneumatic devices at the facility:

(a) the number of comprehensive surveys determined in accordance with subsection (3), if the facility is one of the following:

- (i) a gas processing plant;
- (ii) a compressor station;
- (iii) a battery, other than a satellite battery;
- (iv) a processing battery;
- (v) a natural gas liquid fractionation facility;
- (vi) a compressor dehydrator facility;

(b) one comprehensive survey, if the facility is one of the following and is pressurized 91 days or more in the calendar year:

- (i) an injection or disposal facility that processes or uses natural gas;
- (ii) a tank terminal that processes or uses natural gas;
- (iii) a pump station that processes or uses natural gas;
- (iv) a satellite battery;
- (v) a gas dehydrator facility;

~~(vi) (e) one screening survey, if the facility is a gas sales meter facility and is pressurized 91 days or more in the calendar year;~~

(c) Repealed

(3) The number of comprehensive surveys of a facility referred to in subsection (2) (a) required in a calendar year is the number set out in column 2 of the following table opposite the number of days the facility is pressurized in the calendar year set out in column 1:

Column 1 Days pressurized per calendar year	Column 2 <del>Surveys</del> <u>Number of surveys required</u> per calendar year
0 – 30	0
31 – <del>121</del> <u>90</u>	1
<del>122 –</del> <del>243</del> <u>91 –</u> <u>181</u>	2
<del>244 –</del>	3

<del>365</del> <u>182</u> – 272	
<u>273 or more</u>	<u>4</u>

4) The facility permit holder of a facility referred to in subsection (2) must

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## DRILLING AND PRODUCTION REGULATION

## Part 7 – Safety, Security and Pollution Prevention

- (a) maintain a record of the number of days that the facility was pressurized in each calendar year, and
  - (b) submit the record to the ~~commission~~regulator by March 31 of the calendar year after the calendar year to which the record relates.
- (5) Subject to subsections (7) ~~to~~and (9), the well permit holder of a well, other than a water source well, a water injection well or a water disposal well, that is pressurized 91 days or more in a calendar year must carry out at least the following surveys of the well in the calendar year:
- (a) one comprehensive survey, if the well
    - (i) has a production tank, or
    - (ii) is producing from an unconventional zone listed in Schedule 2;
  - (b) in any other case, one screening survey.
- (5.1) This subsection and subsection (5) are repealed on December 31, 2029.
- (5.2) Beginning on January 1, 2030, a well permit holder of an active well, other than a water source well, a water injection well or a water disposal well, that is pressurized 91 days or more in a calendar year must carry out at least one comprehensive survey of a well per calendar year.
- (5.3) A well permit holder of an inactive well, other than a water source well, a water injection well or a water disposal well, must carry out at least one screening survey of the well per calendar year.
- (6) Subject to subsections (7) ~~to~~and (9), a survey required under this section must be carried out no sooner than the following interval after the previous required survey:
- (a) in the case of a facility described in subsection (2) (a), 60 days;
  - (b) in the case of a facility described in subsection (2) (b) ~~or (c)~~ or a well described in subsection (5) (a) or (b), 9 months.
- (7) A permit holder who carries out a comprehensive survey of a facility under subsection (2) (a) or (b) or a well under subsection (5) (a) must at the same time carry out a comprehensive survey of each other facility and well of the permit holder that is located at the same site.
- ~~(8) — A(7.1) Beginning on January 1, 2030, a permit holder who carries out a screeningcomprehensive survey of a facility referred to inwell under subsection (2) (e5.2) must at the same time carry out a screeningcomprehensive survey of each other facility, and each well, of the permit holder that is located at the same site.~~
- (8) repealed
- (9) A requirement for a permit holder to carry out a screening survey of a facility ~~or well~~awell under this section is met if the permit holder carries out a comprehensive survey of the facility ~~or well~~.
- (10) If a leak is detected at a facility or well during a comprehensive survey ~~required under this section~~, the permit holder of the facility or well ~~must measure the~~

leak unless

~~(a) it is unsafe to measure the leak,~~

~~(b) the leak is inaccessible, or~~

~~(c) the leak flow rate is outside the range of the measurement device.~~

~~(11) If a leak referred to in subsection (10) cannot be measured, the permit holder must quantify the leak rate using an engineering estimate or by applying an emission factor.~~

(11) repealed

(12) A facility permit holder must

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**DRILLING AND PRODUCTION REGULATION**

## Part 7 – Safety, Security and Pollution Prevention

- (a) repair a leak detected at a facility during a survey required under this section as follows:
    - (i) if the repair does not require equipment to be shut down, within 30 days of detection;
    - (ii) if the repair requires equipment to be shut down, as soon as practicable, but no later than the next turnaround for the facility, and
  - (b) if the leak is repaired more than 30 days after detection, maintain, for at least 2 years from the date of the repair, a record of the reasons for the repair timeline.
- (13) A well permit holder must repair a leak detected at a well or a facility associated with a well during a survey required under this section within 30 days of detection.
- (14) A permit holder must
- (a) prepare a leak detection and repair report for each survey carried out during a calendar year of a well or facility of the permit holder, and
  - (b) submit the report to the ~~commission~~regulator by March 31 of the calendar year after the calendar year to which the report relates.
- (15) A leak detection and repair report must include the following information:
- (a) the site identification number provided to the permit holder by the ~~commission~~regulator;
  - (b) if more than one survey of the well or facility per year is required under this section, the survey sequence number;
  - (c) the number of days the facility or well was pressurized during the calendar year;
  - (d) the date the survey was carried out;
  - (e) the name of the company that carried out the survey;
  - (f) whether the survey was a comprehensive survey or a screening survey;
  - (g) if the survey was a comprehensive survey, the make and model of the detection instrument used;
  - (h) the name, job title and business contact information, including email address and telephone number, of the individual primarily responsible for submitting the report;
  - (i) for each leak detected, the following:
    - (i) ~~a unique leak identifier~~repealed
    - (ii) the type of equipment component at which the leak was detected;
    - (iii) whether the leak was identified in a previous survey and not repaired;
    - (iv) whether the leak contained hydrogen sulphide;
    - (v) quantification of the leak rate in m<sup>3</sup>/hour;
    - (vi) the method used to quantify the leak rate;

## DRILLING AND PRODUCTION REGULATION

## Part 7 – Safety, Security and Pollution Prevention

- (vii) ~~if the leak rate was measured, the make and model of the device used to measure the leak;~~repealed
  - (viii) ~~if the leak rate was quantified using an engineering estimate or by applying an emission factor, the reason that the leak was not measured;~~repealed
  - (ix) if the leak was repaired, the date and method of repair.
- (16) A permit holder must maintain, for at least 7 years from the date a leak detection and repair report is submitted, records respecting the information included in the report, including, without limitation, the following:
- (a) for each individual who participated in carrying out the survey, a record of the individual's training relating to carrying out surveys under this section;
  - (b) a record of the repair of each leak;
  - (c) for each leak that was not repaired within 30 days of detection, a record of the reason for the repair timeline.

[en. B.C. Reg. 286/2018, s. 4; am. B.C. Reg. 78/2023, Sch. 2, s. 6.]

- (17) Beginning on January 1, 2028, a facility permit holder must install a fixed leak monitoring device for the purpose of detecting leaks from hatches and pressure relief devices on a controlled production tank.
- (18) A facility permit holder must keep records in respect of a fixed leak monitoring device on a controlled production tank including the following:
- (a) a description of the device including thresholds for leak indications;
  - (b) the date and time of leak detection;
  - (c) a description of the measures taken to investigate the leak;
  - (d) a description of when and what actions were taken to address leak indications.
- (19) A facility permit holder must repair a leak detected at a controlled production tank in accordance with subsection (12)
- (20) If within 60 days of repairing a leak at a controlled production tank the facility permit holder detects a reoccurrence of the leak, the facility permit holder must report the reoccurrence of the leak to the regulator within 14 days of detection.

#### Alternative leak detection and repair

- 41.2 (1) A permit holder may apply to the regulator for approval to develop and implement an alternative leak detection and repair program.
- (2) A proposed alternative leak detection and repair program must include the

following:

- (a) a list of the wells and facilities included in the alternative leak detection and repair program;
- (b) a description of the proposed leak detection technology including a description of how leaks will be detected, quantified and repaired;
- (c) a description of practices to be used to ensure reliable operation of the leak detection technology; an estimate of the reduction in natural gas emissions to be achieved by the alternative leak detection and repair program compared to leak detection and repair measure referred to in section 41.1.

(3) If an alternative leak detection and repair program is approved under this section, wells and facilities included in the alternative leak detection and repair program are not required to comply with section 41.1.

#### **Flaring limits**

- 42**
- (1) A permit holder must ensure that the duration of flaring and the quantity of gas that is flared is minimized.
  - (2) Subject to subsections (3) and (5), a permit holder must not flare gas unless flaring is required for emergency purposes or for drilling operations.
  - (3) A well permit holder may flare gas at a well if
    - (a) flaring is required for a workover or maintenance and the cumulative quantity of gas flared does not exceed 50 000 m<sup>3</sup> in one year, or
    - (b) permission to flare is included in the well permit.
  - (4) Repealed. [B.C. Reg. 159/2015, s. 10 (b).]
  - (5) A facility permit holder may flare gas at a facility if
    - (a) flaring is required for maintenance purposes, or
    - (b) permission to flare is included in the facility permit.

[am. B.C. Regs. 241/2012, s. 15; 159/2015, s. 10.]

#### **Flaring notification and reporting**

- 43**
- (1) A permit holder must notify the regulator at least 24 hours before a planned flaring event if the quantity of gas to be flared exceeds 10 000 m<sup>3</sup>.
  - (2) If an unplanned flaring event occurs and the quantity of flared gas exceeds 10 000 m<sup>3</sup>, the permit holder must notify the regulator within 24 hours of the flaring event.
  - (3) A permit holder must maintain a log of all flaring that occurs at each facility.

## DRILLING AND PRODUCTION REGULATION

## Part 7 – Safety, Security and Pollution Prevention

- (4) When gas is flared at a well, the permit holder with respect to the well must report the quantity of gas flared to the regulator no later than 20 days after the end of the month in which the flaring occurred.

[am. B.C. Regs. 174/2018, s. 4; 202/2023, Sch. 2, s. 2.]

**Flaring performance requirements**

- 44** (1) A permit holder of a well or facility must ensure all of the following:
- (a) that flare stacks are adequately anchored;
  - (b) that unsupervised flare stacks where flaring may occur are equipped with an adequate auto-ignition system;
  - (b.1) if the hydrogen sulphide content of the gas to be flared does not exceed one mole percent, that unsupervised flare stacks where continuous flaring will occur are
    - (i) equipped with a continuous monitoring device that monitors whether a flame is present, or
    - (ii) inspected at least every 7 days to determine whether a flame is present;
  - (c) if the hydrogen sulphide content of the gas to be flared exceeds one mole percent, that
    - (i) unsupervised flare stacks where continuous flaring will occur are equipped with a flame-out detection device with operation shut down capability that provides an immediate alarm to the permit holder, and
    - (ii) the minimum height of flare stacks is 12 m;
  - (c.1) that a flare pit is constructed only if the construction is specifically authorized in the well or facility permit;
  - (d) flare and incinerator systems installed after the date this regulation came into force are designed by and operated within the limits specified by a professional engineer licensed or registered under the *Professional Governance Act*;
  - [\(d.1\) flare and incinerator systems installed after January 1, 2025 are designed for a 98% carbon conversion efficiency.](#)
  - (e) flaring does not result in the emission of black smoke.
- (2) A permit holder must maintain records of inspections under subsection (1) (b.1) (ii).

[am. B.C. Regs. 159/2015, s. 11; 103/2019, s. 18; 202/2023, Sch. 2, s. 5; 78/2023, Sch. 2, s. 7.]

**Fire precautions**

- 45** (1) A well permit holder must ensure that, if engines are located at a wellsite, suitable safeguards are in place and tested to prevent a fire or explosion in the event of a release of flammable liquids or ignitable vapours.
- (2) Except where gasoline or liquid fuel is held in fuel tanks actually connected to operating equipment, a well permit holder must not store gasoline or liquid fuel

**DRILLING AND PRODUCTION REGULATION**Part 7 – Safety, Security and Pollution Prevention

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within 25 m of a well, and must ensure that drainage of gasoline or liquid fuel from the places where it is stored is in a direction away from a well location.

- (3) If a pressure relieving device is installed on a pressure vessel at a facility, the permit holder must ensure
- (a) that the device is connected by suitable piping to a tank if production is in the liquid phase,
  - (b) that the device is connected to a flare system, if a flare system exists at the facility, or
  - (c) that a system of controls is installed to ensure safe operation and minimize venting.
- (4) A person carrying out an energy resource activity must not smoke within 25 m of any well or facility.

[am. B.C. Regs. 103/2019, s. 19; 202/2023, Sch. 2, s. 6.]

**46** Repealed. [B.C. Reg. 103/2019, s. 20.]

**Fire prevention**

- 47** A permit holder must ensure all of the following:
- (a) fires and fired equipment are located a safe distance from flammable liquids or potential sources of ignitable vapours so that there is no undue risk of fire or explosion;
  - (b) all fires for any purpose are safeguarded by sufficient mechanical or other means so that no hazard to surrounding property is created;
  - (c) flares and incinerators are located at least
    - (i) a safe distance from any energy resource road or other resource road,
    - (ii) 80 m from any other public road,
    - (iii) 100 m from any permanent building, installation or works that is not associated with an energy resource activity, and
    - (iv) 100 m from any place of public concourse;
  - (d) all facility piping is arranged and provided with control valves to permit ready shut off of oil or gas in the event of fire at any facility installation;
  - (e) a separator is not enclosed within the fire wall, dike or ditch surrounding a storage tank installation, unless the installation is equipped with safety equipment designed to prevent fire, explosions or exposure of personnel to hydrogen sulphide or other toxic or poisonous gases;
  - (f) all vessels and equipment from which ignitable vapours may issue are safely vented to the atmosphere;
  - (g) explosives of every kind and description are stored only in properly constructed magazines, situated not less than 150 m from any place where any drilling, production or processing operation is being undertaken;
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**DRILLING AND PRODUCTION REGULATION**

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## Part 7 – Safety, Security and Pollution Prevention

- (h) a sufficient area beneath and around the flare stack is free of combustible materials and vegetation.

[am. B.C. Regs. 241/2012, s. 16; 159/2015, s. 12; 202/2023, Sch. 2, ss. 6 and 7.]

**Position of tanks and production equipment**

- 48** A permit holder must ensure that any petroleum storage tanks and production equipment for a well or facility for which the permit holder is responsible are located at least

- (a) a safe distance from any energy resource road or other resource road,
- (b) 80 m from any other public road,
- (c) 100 m from any permanent building, installation or works that is not associated with an energy resource activity, and
- (d) 100 m from any place of public concourse.

[en. B.C. Reg. 159/2015, s. 13; am. B.C. Reg. 202/2023, Sch. 2, ss. 6 and 7.]

**Emergency shutdown devices**

- 49** (1) A permit holder must not bypass or disable safety equipment at a well that is producing, injecting or disposing of fluids, or at a facility, unless
- (a) the purpose of the bypass or disablement is to carry out maintenance or commissioning of the well or facility,
  - (b) the well or facility is continuously monitored,
  - (c) the permit holder has established and documented work procedures sufficient to ensure that the operation can be conducted safely, and
  - (d) the operation is conducted in accordance with the procedures referred to in paragraph (c).
- (2) Subject to subsection (1), a permit holder must lock or car seal any valve or device that can bypass or disable safety equipment at a well that is producing, injecting or disposing of fluids, or at a facility.

[am. B.C. Regs. 241/2012, s. 17; 159/2015, s. 14; 146/2017, App. 1, s. 20; 103/2019, s. 21.]

**Prevention of losses**

- 50** (1) A permit holder must take every reasonable precaution to prevent loss or waste of oil, gas or water in drilling, producing and processing operations, and, in storing, piping or distributing, oil or gas must not be used wastefully or allowed to leak or escape from natural reservoirs, wells, tanks, containers or pipes.
- (2) A facility permit holder must ensure that each storage tank or group of tanks at the permit holder's facility has secondary containment in accordance with the current edition of National Fire Protection Association Code 30: Flammable and Combustible Liquids Code, and that any dike or fire wall is maintained in good condition and the area encompassed by it is kept free from grass, weeds or other combustible material.



## Part 7 – Safety, Security and Pollution Prevention

- (3) A well permit holder must take every reasonable precaution to protect wells, whether connected to flow lines or not, against damage or interference from unauthorized persons or activities.

**Storage and disposal of wastes**

- 51**
- (1) A well permit holder must ensure that formation water, oil, drilling fluid, completion fluid, waste, chemical substances or refuse from a well, tank or other facility do not do any of the following:
    - (a) create a hazard to public health or safety;
    - (b) run into or contaminate any water supply well, usable aquifer or water body or remain in a place from which it might contaminate any water supply well, usable aquifer or water body;
    - (c) run over, pollute or damage any land or public road;
    - (d) pass into or, on ice, over any water body that is frequented by fish or wildlife or that flows into any such water body.
  - (2) A well permit holder who deposits into an earthen pit drilling fluids that may be harmful to domestic livestock or big game must maintain the pit so as to prevent, in a manner satisfactory to an official, domestic livestock or big game from ingesting the fluids.
  - (3) A well permit holder who uses an earthen pit to store liquid waste from a well drilling operation must ensure that the pit is
    - (a) not located within 100 m of the natural boundary of a water body,
    - (b) not located within 200 m of a water supply well,
    - (c) constructed of clay or other suitable impermeable material with the bottom of the pit above ground water level,
    - (d) located or ditched so that it will not collect natural run-off water,
    - (e) filled to not more than one metre below the point of overflow at any given time, and
    - (f) completely emptied and any excavation filled without unreasonable delay.
  - (4) Within 90 days of completing a drilling waste disposal, a well permit holder must submit to the regulator a report of the drilling waste disposal.
  - (5) A well permit holder who uses an earthen pit to store water-based fluids that have a concentration of total dissolved solids greater than 4 000 ppm must
    - (a) obtain a facility permit that authorizes the earthen pit, and
    - (b) ensure that the earthen pit is designed by and installed under the supervision of a professional engineer licensed or registered under the *Professional Governance Act*.
  - (6) A well permit holder who uses an above ground structure with a liner as the primary means of containment to store water-based fluids with a concentration of total dissolved solids greater than 4 000 ppm must ensure that

**DRILLING AND PRODUCTION REGULATION**

## Part 7 – Safety, Security and Pollution Prevention

- (a) the fluids have been generated from or are being stored for the purpose of hydraulic fracturing operations,
- (b) the structure is not located within 100 m of the natural boundary of a water body unless the structure is on a permitted well location,
- (c) the capacity of each structure is not greater than 6 600 m<sup>3</sup>,
- (d) before the structure is used, a qualified professional verifies that contained fluids will not migrate beyond the lease boundary in the event of a complete containment failure,
- (e) the regulator is satisfied that the retaining walls of the structure are capable of withstanding the hydraulic pressure of the contents at full capacity,
- (f) the installation of the liner system is completed to the satisfaction of the regulator,
- (g) the ground surface has been prepared to the satisfaction of the regulator,
- (h) the structure is filled to not more than 50 cm below the point of overflow at any given time,
- (i) the structure is equipped with measures to prevent waterfowl from coming in contact with the fluids,
- (j) when the structure contains fluid, it is inspected daily for leaks and a record of inspection is maintained until the site is decommissioned,
- (k) any sign of leakage is reported to the regulator within 24 hours of discovery, and
- (l) the structure is decommissioned and removed from the site within one year from the date of first use unless there exists an engineered, lined or otherwise impermeable secondary containment system designed and maintained to be capable of holding a minimum of 110% of the fluid in the structure.

[am. B.C. Regs. 159/2015, s. 15; 146/2017, App. 1, s. 21; 103/2019, s. 22; 202/2023, Sch. 2, ss. 2 and 5.]

**Seals**

- 52**
- (1) An official may seal or cause to be sealed any or all valves or meters installed at a well or on any pipeline, tank or other receptacle used for the storage or transportation of oil or other fluid produced or withdrawn from the well, and may remove or authorize the removal of such seals.
  - (2) An official must notify the permit holder, orally or in writing, of the affixing of a seal under subsection (1) and of the reasons for taking that action.
  - (3) If notice under subsection (2) is given orally, an official, within 48 hours, must provide in writing the notice referred to in subsection (2).
  - (4) A permit holder must not remove or tamper with any seal affixed under subsection (1).

- (5) Despite subsection (4), a permit holder may remove a seal affixed under subsection (1)
- (a) in case of emergency, in which case the person must notify the regulator of the removal without delay, or
  - (b) if the permit holder has not received notice as required under subsections (2) and (3).

[am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

## Division 2 – Natural Gas Emissions

**52.01** Repealed. [B.C. Reg. 78/2023, Sch. 2, s. 8.]

**52.011** In this Division, “modification”, in relation to an existing facility, means the addition of major process equipment to the facility

### Hydrocarbon gas conservation equipment

- 52.02** (1) A facility permit holder of a facility that uses hydrocarbon gas conservation equipment must ensure that
- (a) the equipment is operated at least 95% of the time that the facility is in operation,
  - (b) the equipment recovers at least 95% of the natural gas routed through the equipment, and
  - (c) the natural gas recovered by the equipment is used for a purpose other than to dispose of that gas as waste.
- (2) A facility permit holder of a facility that uses hydrocarbon gas conservation equipment must maintain a record of the following for each piece of hydrocarbon gas conservation equipment:
- (a) the periods of time when the equipment is in operation;
  - (b) the periods of time when the equipment is not in operation;
  - (c) the following information for each calendar month:
    - (i) the volume of natural gas routed through the equipment;
    - (ii) the volume of natural gas recovered by the equipment.

[en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Reg. 78/2023, Sch. 2, s. 9.]

### Tanks

#### Controls to eliminate venting of natural gas emissions

~~52.03~~ **52.021** (1) A facility permit holder ~~of~~ may vent natural gas at a facility if an assessment demonstrates that elimination of venting is not practicable due to one or more of the following:

- (a) the impairment of the safe operation of the facility;
- (b) the impairment of the reliable operation of the facility;
- (c) the economic feasibility is unattainable based on a net present value

calculation that considers capital and operating costs, provincial price of carbon emission and total emission reduction achieved.

- (2) Despite subsection (1), a facility permit holder may vent natural gas for one or more of the following:
- (a) emergency purposes;
  - (b) carrying out operations at a facility that operates 60 days or less per calendar year;
  - (c) maintenance operations;
  - (d) process upsets.
- (3) The assessment referred to in subsection (1) must be signed and sealed by a professional engineer licensed or registered under the *Professional Governance Act*.
- (4) The facility permit holder must keep a detailed record to demonstrate how each criteria in subsection (1) was assessed.
- (5) The facility permit holder must keep records referred to in subsection (4) until the facility is removed.

#### Uncontrolled production tanks

- 52.03 (1) Subject to subsection (2) or (3), a facility permit holder must not vent natural gas from an uncontrolled production tank at a facility unless it is permitted under section 52.021.
- (2) Subsection (1) does not apply to a facility that began operations ~~on or after~~ before January 1, 2022 ~~must ensure that if~~
- (a) the emissions of natural gas from all uncontrolled production tanks at the facility are less than ~~1 250~~ 9 000 m<sup>3</sup> per month ~~in total~~, and
  - (b) ~~(2) Beginning on January 1, 2023,~~ the facility permit holder ~~of~~ has not made a modification to the facility on or after January 1, 2028.
- (3) Subsection (1) does not apply to a facility that began operations ~~before on or after~~ January 1, 2022 ~~must ensure that if~~
- (a) the emissions of natural gas from all uncontrolled production tanks at the facility are less ~~9 000~~ than 1 250 m<sup>3</sup> per month ~~in total~~,
  - (b) the facility permit application was made before January 1, 2025, and
  - (c) ~~(3) A~~ the facility permit holder ~~of~~ has not made a modification to the facility ~~that includes an~~ on or after January 1, 2028.
- (4) This subsection and subsections (2) and (3) are repealed on January 1, 2035.
- (5) The facility permit holder must maintain
- (a) a record of the volume, in m<sup>3</sup>, of natural gas emitted from the uncontrolled production tank ~~must~~ in each calendar month, and
  - (b) all records of equipment and methods used to quantify the volume of natural gas reported.

## DRILLING AND PRODUCTION REGULATION

## Part 7 – Safety, Security and Pollution Prevention

~~(a) maintain a record of the volume, in m<sup>3</sup>, of natural gas emitted from the production tank during each calendar month in each calendar year, and~~

~~(6) (b) The facility permit holder must~~ submit the ~~record~~ records referred to in subsection (5) (a) to the ~~commission~~ regulator by March 31 of ~~the calendar~~ each year ~~after the calendar year to which the record relates.~~

~~(7) (4) A facility permit holder of a facility that includes an uncontrolled production tank must maintain, for at least 7 years from the date a record is~~ records submitted under subsection (3), ~~all records of equipment and methods used to quantify the volume of natural gas reported.~~

~~[en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Reg. 78/2023, Sch. 2, s. 10.]~~ for a period of 7 years after submission.

## Compressors

52.04 (1) In this section:

“average vent gas rate”, in relation to a fleet of reciprocating compressors, means the rate calculated in accordance with the following formula:

$$\frac{\sum_{i=1}^n v_i}{\sum_{i=1}^n (t_i * c_i)}$$

where

n = the number of reciprocating compressors in the fleet;

v = the vent gas volume, in m<sup>3</sup>, for the calendar year for each reciprocating compressor;

t = the number of hours per calendar year that each reciprocating compressor is pressurized;

c = the number of pressurized throws for each reciprocating compressor;

“fleet of reciprocating compressors”, in relation to a facility permit holder, means all of the following reciprocating compressors used at facilities of the facility permit holder, whether or not under the same permit:

(a) reciprocating compressors that

(i) are rated at 75 kW or more,

(ii) are pressurized for 450 hours or more per year, and

(iii) were installed before January 1, 2021;

(b) reciprocating compressors that

(i) have fewer than 4 throws,

(ii) are rated at 75 kW or more,

(iii) are pressurized for 450 hours or more per year, and

(iv) were installed on or after January 1, 2021.

- (2) ~~A~~[Subject to section \(2.1\), a](#) facility permit holder of a facility that uses a reciprocating compressor described in paragraph (a) or (b) in the definition of “fleet of reciprocating compressors” in subsection (1) or a centrifugal compressor described in

unofficial early consolidation

## DRILLING AND PRODUCTION REGULATION

## Part 7 – Safety, Security and Pollution Prevention

subsection (8) must, at least once each calendar year, measure the volume of natural gas emitted from each compressor seal during a 15-minute period that is representative of the normal operating conditions of the compressor.

~~(3) A facility permit holder of a facility that uses a~~ (2.1) Subsection (2) does not apply to reciprocating ~~compressor described in subsection (4) must ensure~~ compressors or centrifugal compressors if emissions of natural gas from the compressor seals

- (a) are routed to hydrocarbon gas conservation equipment, or
- (b) subject to sections 42 to 44, are flared.

(3) A facility permit holder of a facility that uses a reciprocating compressor described in subsection (4) or (4.1) must not vent natural gas from the compressor seals of the reciprocating compressor unless it is permitted under section 52.021.

- (4) Subsection (3) applies in relation to a reciprocating compressor that
- (a) has 4 or more throws,
  - (b) is rated at 75 kW or more,
  - (c) is pressurized for 450 hours or more per year, and
  - (d) was installed on or after January 1, 2021.

(4.1) Subsection (3) applies to a reciprocating compressor at a facility if the facility permit holder

- (a) applied for a facility permit on or after January 1, 2025, or
- (b) made a modification to the facility after January 1, 2028.

(5) A facility permit holder who uses a fleet of reciprocating compressors must ensure that

- (a) the venting of seal gas from each throw does not exceed 53 m<sup>3</sup> per hour, and
- (b) the average vent gas rate for the fleet for each calendar year does not exceed ~~0.83~~0.3 m<sup>3</sup> per hour per throw.

(6) A facility permit holder who uses a fleet of reciprocating compressors must

- (a) maintain a record of the average vent gas rate for the fleet for each calendar year, and
- (b) submit the record to the ~~commission~~regulator by March 31 of the calendar year after the calendar year to which the record relates.

(7) A facility permit holder who uses a fleet of reciprocating compressors must maintain, for at least 7 years from the date a record is submitted under subsection (6) (b), records of the following information for each reciprocating compressor within the fleet:

- (a) the facility identification number provided to the permit holder by the commission;

- (b) a unique compressor identifier;
- (c) the compressor power rating, in kW;
- (d) the date the compressor was installed;
- (e) the number of throws;
- (f) the number of hours the compressor was pressurized;
- (g) the date each compressor seal was tested;
- (h) the equipment used for each compressor seal test;
- (i) equipment calibration records for the equipment used;

unofficial early consolidation



**DRILLING AND PRODUCTION REGULATION**

## Part 7 – Safety, Security and Pollution Prevention

- (j) the date each compressor seal was installed;
  - (k) the results of each compressor seal test by volume, in m<sup>3</sup>, of natural gas emissions.
- (8) A facility permit holder of a facility that uses a centrifugal compressor that is rated at 75 kw or more and is pressurized for 450 hours or more per year must ensure that the vent gas rate for the compressor is lower than the following:
- (a) if the compressor was installed before January 1, 2021, 10.20 m<sup>3</sup> per hour per compressor body;
  - (b) if the compressor was installed on or after January 1, 2021, 3.40 m<sup>3</sup> per hour per compressor body.

(8.1) A facility permit holder of a facility to which this subsection applies must not vent natural gas from the seals of a centrifugal compressor unless it is permitted under section 52.021.

(8.2) Subsection (8.1) applies to a facility if the facility permit holder

(a) applied for a facility permit on or after January 1, 2025, or (b) made a modification to the facility after January 1, 2028.

- (9) A facility permit holder of a facility that uses a centrifugal compressor described in subsection (8) must
- (a) prepare a compressor seal test report for the compressor each calendar year, and
  - (b) submit the report to the regulator by March 31 of the calendar year after the calendar year to which the report relates.
- (10) A compressor seal test report under subsection (9) must include the following information:
- (a) the facility identification number provided to the permit holder by the commission;
  - (b) a unique compressor identifier;
  - (c) the number of compressor bodies;
  - (d) whether each seal type is wet or dry;
  - (e) the results of each compressor seal test by volume, in m<sup>3</sup>, of natural gas emissions.

**DRILLING AND PRODUCTION REGULATION**

Part 7 – Safety, Security and Pollution Prevention

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- (11) A facility permit holder of a facility that uses a centrifugal compressor described in subsection (8) must maintain, for at least 7 years from the date a compressor seal test report is submitted under subsection (9) (b), records respecting the information included in the report, including, without limitation, the following:
- (a) the date each compressor seal was tested;
  - (b) the equipment used for each compressor seal test;
  - (c) equipment calibration records for the equipment used;
  - (d) the date each compressor seal was installed.

[en. B.C. Reg. 78/2023, Sch. 2, s. 11.]

(12) This subsection and subsections (1) to (11) are repealed on December 31, 2034.

(13) Beginning on January 1, 2035, a facility permit holder must not vent natural gas from the compressor seals of a reciprocating compressor or the compressor seals of a centrifugal compressor unless it is permitted under section 52.021.

**Pneumatic devices**

- 52.05** (1) In this section:

**DRILLING AND PRODUCTION REGULATION**

Part 7 – Safety, Security and Pollution Prevention

“**large compressor station**” means a compressor station at which the total power of all compressors is 3 MW or greater;

“**pneumatic device**” does not include a pneumatic pump ~~or~~, a pneumatic compressor starter or an emergency shutdown device.

- (2) A facility permit holder of a facility that began operations on or after January 1, 2021 must not use at the facility a pneumatic device that emits natural gas.
- (3) A facility permit holder of a gas processing plant, or a large compressor station, that began operations before January 1, 2021 must not use at the facility a pneumatic device that emits natural gas.

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## DRILLING AND PRODUCTION REGULATION

## Part 7 – Safety, Security and Pollution Prevention

- (4) A facility permit holder of a facility that began operations before January 1, 2021, other than a gas processing plant or a large compressor station, must not use at the facility a pneumatic device that ~~emits~~vents natural gas unless ~~(a)~~ the emissions of natural gas from the device do not exceed 0.17 m<sup>3</sup> per hour, ~~or~~ ;
- ~~(b) all of the following requirements are met:~~
- ~~(i) the~~(4.1) Beginning on January 1, 2028, a facility permit holder ~~has a signed statement, from a professional engineer licensed or registered under the Professional Governance Act, that~~
- ~~(A) the device cannot be operated so as to meet the requirement referred to in paragraph subsection (a4) without compromising the safe operation of the who makes a modification to a facility, and~~
- ~~(B) it is must not practical to replace use at the device with facility a pneumatic device that can be operated so as to meet those requirements; vents natural gas unless it is permitted under section 52.021.~~
- ~~(ii) the emissions of natural gas from the device are minimized to the extent consistent with efficient operation of the device and safe operation of the facility, and~~
- ~~(iii) the device is marked with a weatherproof and readily visible tag~~
- (4.2) Subsection (4.1) does not apply to well facilities.
- (4.3) This subsection and subsections (4) to (4.2) are repealed on December 31, 2034.
- (4.4) Beginning on January 1, 2035, a facility permit holder of a facility must not use at the facility a pneumatic device that vents natural gas unless it is permitted under section 52.021.
- (5) A facility permit holder of a facility that uses a pneumatic device that emits natural gas must maintain a record of the following:
- a description of the device;
  - the purposes and operational settings of the device;
  - whether the device is being used ~~under subsection (4) (b);~~
  - the volume of natural gas emitted from the device in each calendar month.
- (6) Repealed. [B.C. Reg. 78/2023, Sch. 2, s. 12 (d).]
- ~~(7) A facility permit holder who uses, in accordance with the requirements set out in subsection (4) (b), a pneumatic device that emits natural gas must maintain a record of the signed statement referred to in subsection (4) (b) (i) for at least 7 years from the date of the statement.~~

## DRILLING AND PRODUCTION REGULATION

## Part 7 – Safety, Security and Pollution Prevention

(7) Repealed

~~(8) An official may grant to a permit holder an exemption in writing from the application of one or more of subsections (2), (3) or (4) if the official is satisfied that, in the circumstances,~~Repealed

~~(a) compliance with the provision or provisions is not reasonably practicable,  
or~~

~~(b) the exemption is in the public interest.~~

~~(9) In granting an exemption under subsection (8), an official may impose any conditions on the exemption that the official considers necessary.~~Repealed

(10) This section does not apply in relation to a pneumatic device that uses propane.

[en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Regs. 202/2023, Sch. 2, s. 5; 78/2023, Sch. 2, s. 12.]

**Pneumatic pumps**

**52.06** (1) A facility permit holder of a facility must not use at the facility a pneumatic pump that emits natural gas unless the pump

(a) was installed before January 1, 2021, or

(b) is operated 750 hours or less per year.

**DRILLING AND PRODUCTION REGULATION**

## Part 7 – Safety, Security and Pollution Prevention

- (2) A facility permit holder of a facility that uses a pneumatic pump that emits natural gas must maintain a record that contains
- (a) a description of the pump and the type of fluid pumped, and
  - (b) the following information for each calendar month:
    - (i) the number of hours the pump is operated;
    - (ii) the volume of natural gas emitted from the pump.
- (3) This section does not apply in relation to a pneumatic pump that uses propane.  
[en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Reg. 78/2023, Sch. 2, s. 13.]
- (4) A facility permit holder must not use a pneumatic pump that vents natural gas at a facility unless it is permitted under section 52.021.
- (5) Subsection (4) applies to a facility if the facility permit holder
- (a) applied for a facility permit on or after January 1, 2025, or
  - (b) made a modification to the facility, other than a well facility, after January 1, 2028.
- (6) This subsection and subsections (1), (2), (4) and (5) are repealed on December 31, 2034.
- (7) Beginning on January 1, 2035, a facility permit holder of a facility that includes a pneumatic pump must not vent natural gas unless it is permitted under section 52.021.

Methane emissions from pneumatic devices and pneumatic pumps52.061

- (1) In this section, “pneumatic devices and pneumatic pumps fleet”, in relation to a permit holder means all of the pneumatic devices and pneumatic pumps used at facilities of the permit holder whether or not under the same permit.
- (2) Beginning on January 1, 2030, a permit holder that uses a pneumatic device or pneumatic pump at a facility must ensure that the emissions of methane from the permit holder’s pneumatic devices and pneumatic pumps fleet do not exceed the annual methane emissions threshold calculated in accordance with subsection (3).
- (3) Subject to subsection (4), the annual methane emissions threshold is calculated in accordance with the following formula, rounded to the nearest whole number:

$$\text{Annual volume of methane emissions (tonnes/year)} = 0.4 (a+b+c+d+e+f)$$

where:

a = number of oil wells;

b = number of gas wells;

c = number of disposal wells;

d = number of batteries;

e = number of satellite batteries;  
f = number of processing batteries.

- (4) The number of wells or batteries referred to in subsection (3) are wells or batteries reported as active in the 2021 calendar year.
- (5) The permit holder must maintain records in respect of the information used to make the calculation under subsection (3) until January 1, 2035.
- (6) The permit holder must submit to the regulator a report stating the total volume in tonnes of emissions of methane from the pneumatic devices and pneumatic pumps fleet by March 31 of each year.
- (7) This section is repealed on December 31, 2034.

**Pneumatic compressor starters**

- 52.07** (1) A facility permit holder of a facility that uses a pneumatic compressor starter must ensure that the emissions of natural gas from the compressor starter are
- (a) routed to hydrocarbon gas conservation equipment, if the facility includes hydrocarbon gas conservation equipment to which the emissions can be routed, or
  - (b) flared in accordance with sections 42 to 44, if the facility includes a flaring system to which the compressor starter can be connected.
- (2) A facility permit holder of a facility that uses a pneumatic compressor starter that cannot be routed or flared as set out in subsection (1) must maintain a record that contains
- (a) a description of the compressor starter, and
  - (b) the following information for each calendar month:
    - (i) the volume of natural gas used in start attempts;
    - (ii) the number of hours the compressor starter is operated;
    - (iii) the volume of natural gas emitted from the compressor.
- [en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Reg. 78/2023, Sch. 2, s. 14.]

## DRILLING AND PRODUCTION REGULATION

## Part 7 – Safety, Security and Pollution Prevention

## Glycol dehydrators

~~52.08 (1) Subject to subsection (2), a facility permit holder of a facility that uses a glycol dehydrator that was installed on or after January 1, 2022 must ensure that the emissions of natural gas from the dehydrator are less than 25 tonnes per year.~~0.1) In this section:

“Dehydrator Engineering and Operations Sheet” means a form that demonstrates the optimized glycol circulation rate for the dehydrator with recorded normal operating conditions, control technology and equipment;

“glycol dehydrators fleet”, in relation to a facility permit holder, means all glycol dehydrators used at facilities of the permit holder, whether or not under the same permit, but does not include glycol dehydrators at a facility referred to in subsection (7).

(1) Repealed.

~~(2) Beginning on January 1, 2023, a facility permit holder of a facility that uses a glycol dehydrator that was installed before January 1, 2022 must ensure that the emissions of natural gas from the dehydrator are less than 50 tonnes per year.~~Repealed.

(3) A facility permit holder of a facility that uses a glycol dehydrator must

(a) maintain a record of the volume of natural gas emitted from the dehydrator in each calendar year, ~~and~~

(b) submit the record referred to in paragraph (a) to the regulator by March 31 of the calendar year after the calendar year to which the record relates, and

[en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Regs. 202/2023, Sch. 2, s. 2; 78/2023, Sch. 2, s. 15.]

(c) complete a Dehydrator Engineering and Operations Sheet for each glycol dehydrator at a facility.

(4) A Dehydrator Engineering and Operations Sheet referred to in subsection (3) must be

(a) available at the location of the glycol dehydrator,

(b) revised once per calendar year or upon a change in the operation status of the glycol dehydrator, and

(c) in the form and manner specified by the regulator.

(5) Subject to subsection (6), beginning on January 1, 2025, a facility permit holder of a facility that uses a glycol dehydrator must not vent natural gas from the glycol dehydrator unless it is permitted under section 52.021.

(6) A facility permit holder of a facility must ensure that the average emissions of natural gas from a glycol dehydrators fleet does not exceed 25 tonnes per dehydrator per year.

(7) Subsection (5) applies to a facility where a facility permit holder

(a) applied for a facility permit on or after January 1, 2025, or



- (b) made a modification to the facility on or after January 1, 2028.
- (8) This subsection, the definition of “glycol dehydrators fleet” in subsection (0.1) and subsections (5) to (7) are repealed on December 31.
- (9) Beginning on January 1, 2035, a facility permit holder of a facility that uses a glycol dehydrator must not vent natural gas from the glycol dehydrator unless it is permitted under section 52.021.

#### **Pipes and hatches**

- 52.09** A facility permit holder of a facility must ensure that pipes and hatches at the facility are closed whenever an operation does not require them to be open.

[en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Reg. 78/2023, Sch. 2, s. 16.]

#### **Sampling and pressure relief systems**

- 52.10** A facility permit holder of a facility must ensure that sampling and pressure relief systems at the facility are installed and operated so that emissions of natural gas are minimized.

[en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Reg. 78/2023, Sch. 2, s. 16.]

- 52.11** Repealed. [B.C. Reg. 78/2023, Sch. 2, s. 17.]

#### **Measurement equipment**

- 52.12** A permit holder of a facility or well must ensure that the equipment and methods used to measure emissions at the facility or well are sufficient to measure
- (a) the actual volumes and rates of emissions referred to in this Division, other than in section 52.04 (7) (k) and (10) (e), and
  - (b) the volume of emissions referred to in section 52.04 (7) (k) and (10) (e) to within 10% of the actual volume.

[en. B.C. Reg. 286/2018, s. 5 (b); am. B.C. Reg. 78/2023, Sch. 2, s. 18.]

**DRILLING AND PRODUCTION REGULATION**

## Part 8 – Production Operations

**Division 3 – Records and Reports****Records and reports**

**52.13** The following records and reports under this Part are prescribed for the purposes of section 38 (1) (a) of the Act:

- [\(a\) a record or report required to be submitted or maintained under section 41;](#)
- ~~(a)~~ [\(a.1\)](#) a record or report required to be submitted or maintained under section 41.1;
- (b) a record required to be maintained under section 44 (2);
- (c) a record or report required to be submitted or maintained under Division 2 of Part 7.

[en. B.C. Reg. 78/2023, Sch. 2, s. 19.]

**PART 8 – PRODUCTION OPERATIONS****Division 1 – Measurements****Measurements**

**53** A permit holder must ensure all of the following:

- (a) that the measurement equipment for each well, facility or gathering system for which the permit holder is responsible are sufficient to determine the actual production of each product from
  - (i) each zone in a well,
  - (ii) each product stream used for reporting purposes at a facility, and
  - (iii) any fluid injection or pressure measurement required by this Part;
- (b) that the equipment and methods associated with the measurement of fluids are adequate for
  - (i) the management of wells, pipelines, facilities and reservoirs,
  - (ii) the quantification of waste discharges,
  - (iii) production accounting purposes, and
  - (iv) the assessment of royalties under the Petroleum and Natural Gas Royalty and Freehold Production Tax Regulation;
- (c) if quantities of energy resources or carbon dioxide are not metered due to the failure of a meter, chart recorder or quantity device, that an engineering estimate of all un-metered production from the well or facility is included in the quantity computation for the reporting period for the meter, chart recorder or other quantity device;
- (d) if a quantity error is apparent or discovered, that the quantity error and the source of the quantity error are rectified immediately and a report of the corrected quantity for the period during which the quantity was incorrect is submitted by the next reporting cycle;
- (e) if energy resources, carbon dioxide or water are produced from or injected into a well or facility, that

## DRILLING AND PRODUCTION REGULATION

## Part 8 – Production Operations

- (i) the meter is maintained in good operating condition, and
- (ii) the meter is suitably safeguarded from weather and from interference by unauthorized persons;
- (f) if energy resources, carbon dioxide or water are produced from or injected into a well or facility and there is a bypass around a meter, that valves are installed that, when closed, will effectively stop all flow through the bypass;
- (g) if energy resources, carbon dioxide or water are produced from or injected into a well or facility and a bypass around a meter is opened or if, for any other reason, the full production stream does not reach the meter, that a suitable entry is made on the meter chart or on the recordkeeping notations in the electronic flow measurement (EFM) system.

[am. B.C. Regs. 159/2015, s. 16; 146/2017, App. 1, s. 22; 202/2023, Sch. 2, s. 8.]

### Division 2 – Oil

#### Daily oil allowable

- 54** (1) In this section, “**well depth**” means the true vertical depth, in metres, of the lowest producing perforation or open hole section in a zone.
- (1.1) This section does not apply to production from wells in unconventional zones listed in Schedule 2.
- (2) The UDOA for an oil well, expressed in m<sup>3</sup>/day and rounded to one decimal place, is
- (a) 10.0, if the well depth is less than 1 000 metres,
  - (b) the well depth of the well divided by 100, if the well depth is equal to or greater than 1 000 metres,
  - (c) as specified in the well permit, or
  - (d) as specified by an official.
- (3) For oil wells that are part of a special project under section 75 of the Act and have been assigned a project UDOA, the project UDOA may be applied to the entire project area as though it were a single well.
- (4) The gas-oil ratio adjustment factor for the purposes of subsection (6) is the factor calculated in accordance with the following formula, rounded to the second decimal place:

$$F_{\text{GOR}} = \frac{177.3}{\text{GOR} + 0.0257 \times S}$$

where

- $F_{\text{GOR}}$  = the gas-oil ratio adjustment factor;
- $\text{GOR}$  = net calculated gas-oil ratio (m<sup>3</sup>/m<sup>3</sup>);
- $S$  = average separator pressure (kPa).

**DRILLING AND PRODUCTION REGULATION**

## Part 8 – Production Operations

- (5) A calculation under subsection (4) must be made in accordance with the following:
- (a) the data used to make the calculation must be obtained from the last calendar month during which the oil well produced;
  - (b) for a gas reinjection project, the net calculated gas-oil ratio must be calculated using the net produced gas;
  - (c) the average separator pressure is
    - (i) for a single well, the average separator pressure for the month,
    - (ii) if stage separation is used, the average separator pressure of the lowest pressure stage for the month,
    - (iii) if a project UDOA has been designated for a group of wells, the average separator pressure for the month for the group of wells, weighted by the volume of oil produced, and
    - (iv) 400 kPa if no separator pressure is reported.
- (6) The DOA of an oil well or a group of oil wells that have been designated a project UDOA under section 75 of the Act is:

$$\text{DOA} = \text{UDO A} \times F_{\text{GOR}} \times F_{\text{OTP}}$$

where

DOA = the daily oil allowable in m<sup>3</sup>/day;

UDO A = the unadjusted daily oil allowable in m<sup>3</sup>/day;

F<sub>GOR</sub> = the gas-oil ratio adjustment factor calculated in accordance with subsection (3);

F<sub>OTP</sub> = the off-target penalty factor determined under section 6 (4).

[am. B.C. Regs. 241/2012, s. 18; 146/2017, App. 1, s. 23.]

**Restriction of oil production**

- 55** (1) Subject to section 49.1 (1) (c) of the Act and subsection (2) of this section, the permit holder of

- (a) an oil well, or
- (b) a group of oil wells that have been designated a project UDOA under section 75 of the Act

must ensure that oil production from the well or group of wells in any one day does not exceed the daily production limit.

- (2) Subsection (1) does not apply to wells completed in unconventional zones listed in Schedule 2.

[am. B.C. Reg. 146/2017, App. 1, s. 24.]

## DRILLING AND PRODUCTION REGULATION

## Part 8 – Production Operations

**Test period allowable**

- 56** (1) During the test period for an oil well, the test period allowable is

$$\text{TPA} = 90 \times \text{UDO} + 500$$

where

TPA = the volume of oil that may be produced during the test period (m<sup>3</sup>);

UDO = the unadjusted daily oil allowable in m<sup>3</sup>/day.

- (2) Subsection (1) does not apply to a well subject to
- a designation under section 75 of the Act, or
  - a well completed in an unconventional zone listed in Schedule 2.

[am. B.C. Reg. 146/2017, App. 1, s. 25.]

**Report required**

- 56.1** A permit holder must submit to the regulator, within 60 days of initial oil production, a detailed report of

- any oil well flow test for which temporary flow testing equipment is used to measure pressures and rates of each fluid, and
- any cleanup flow that results in oil coming to the surface.

[en. B.C. Reg. 146/2017, App. 1, s. 26; am. B.C. Regs. 103/2019, s. 23; 202/2023, Sch. 2, s. 2.]

**Measurement of total oil production**

- 57** (1) If, during calibration of a meter, a permit holder finds that a consistent meter factor is unattainable, the permit holder must take corrective action without delay.
- (2) A permit holder must maintain a record of the calibration of the oil meter installation.

**Production test of oil wells**

- 58** (1) A permit holder must conduct at least 2 production quantity tests per month on each oil well whose production quantity is delivered to a proration battery.
- (2) A production quantity test referred to in subsection (1) must
- measure the quantities of petroleum, water and natural gas produced,
  - be at least 22 hours in duration,
  - be adequately spaced throughout the month, and
  - allow sufficient purge time before the test to ensure that liquids from a previous quantity test are replaced by the fluids from the new well to be tested.
- (3) A permit holder must keep records of production quantity tests conducted, and the records must include the following, as applicable:
- quantity test date;
  - duration of the quantity test in hours;

**DRILLING AND PRODUCTION REGULATION**

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## Part 8 – Production Operations

- (c) opening and closing meter readings;
  - (d) meter factor;
  - (e) percent of basic sediment and water;
  - (f) quantities of petroleum, water and natural gas produced during the quantity test;
  - (g) average separator pressure over the time duration of the quantity test;
  - (h) net gas oil ratio;
  - (i) petroleum density.
- (4) To calculate the monthly estimated oil well quantity production that is to be reported for each oil well producing to a proration battery, a permit holder must use the test-to-test method of calculation.

**Calculation of oil production**

- 59** (1) A well permit holder must determine the overproduction or underproduction of each of the permit holder's wells at the end of every month.
- (2) A permit holder must ensure that
- (a) the production target at the end of the month and the overproduction or underproduction at the beginning of the month for each producing oil well or group of oil wells for which the permit holder is responsible is calculated each month, and
  - (b) a production allowable report is submitted to the regulator in time to be received on or before the 16th day of the month.
- (3) Subsections (1) and (2) do not apply to production from unconventional zones listed in Schedule 2.

[am. B.C. Regs. 146/2017, App. 1, s. 27; 202/2023, Sch. 2, s. 2.]

**Underproduction of oil**

- 60** (1) A permit holder may make up underproduction at any time within a production period at a rate not exceeding the daily production limit.
- (2) A permit holder may not carry forward underproduction to the following production period.
- (3) Subsections (1) and (2) do not apply to production from wells in unconventional zones listed in Schedule 2.

[am. B.C. Reg. 146/2017, App. 1, s. 28.]

**Overproduction of oil**

- 61** (1) If overproduction at the beginning of any month exceeds the monthly oil allowable, adjusted for any penalties, for that month, the permit holder must shut in the oil well on or before the 16th day of the month, and must keep it shut in until the overproduction is completely retired.

## Part 8 – Production Operations

- (2) If overproduction at the end of a production period is greater than 25% of the monthly oil allowable for October, adjusted for any penalties, the permit holder must carry the overproduction forward and must shut in the well on or before November 16 and must keep it shut in until the overproduction is completely retired.
- (3) If a permit holder shuts in a well in accordance with this section, the regulator must be notified in writing of the date on which the well is shut in, and the number of days calculated for the shut in period based on the daily oil allowable.
- (4) Subsections (1) to (3) do not apply to production from wells in unconventional zones listed in Schedule 2.

[am. B.C. Regs. 146/2017, App. 1, s. 29; 202/2023, Sch. 2, s. 2.]

**Analysis of oil and hydrocarbon liquid production**

- 62**
- (1) Subject to subsection (3), a well permit holder must take representative oil and hydrocarbon liquid samples from each producing formation from a well within 30 days of the initial production date.
  - (2) A well permit holder must submit to the regulator a report of the component analyses and physical properties of the oil and hydrocarbon liquids within 60 days of
    - (a) the sampling referred to in subsection (1), and
    - (b) any other oil sampling and analysis performed on the well.
  - (3) This section applies to hydrocarbon liquids only if the hydrocarbon liquids are produced from
    - (a) a zone listed in Schedule 2 and have a specific gravity greater than 0.8063, or
    - (b) a zone not listed in Schedule 2 and have a specific gravity greater than 0.7796.

[en. B.C. Reg. 103/2019, s. 24; am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Division 3 – Gas****Gas well tests**

- 63**
- (1) Subject to subsection (3), before 6 months have elapsed after a permit holder has first placed a gas well on production, the permit holder must flow test the well and determine the absolute open flow potential if
    - (a) the well is producing from a pool with suspected water drive, or
    - (b) the well is classified as an exploratory outpost well or exploratory wildcat well.
  - (2) A permit holder must submit to the regulator, within 60 days of the date on which the operation concluded, a detailed report of

**DRILLING AND PRODUCTION REGULATION**

## Part 8 – Production Operations

- (a) any gas well flow test for which temporary flow testing equipment is used to measure pressures and rates of each fluid,
  - (b) any cleanup flow that results in burnable gas to the surface, and
  - (c) any underbalanced drilling that results in burnable gas to the surface.
- (3) Subsection (1) does not apply with respect to a well completed in an unconventional zone listed in Schedule 2.

[am. B.C. Regs. 241/2012, s. 19; 146/2017, App. 1, s. 31; 202/2023, Sch. 2, s. 2.]

**Metering and measurement of gas**

- 64** (1) A measurement of a volume of gas required by the Act or this regulation must be computed as the number of cubic metres it would occupy at standard conditions of 101.325 kPa and 15°C.
- (2) A well permit holder must make provision to allow for proving taps to be used in conjunction with wet meter testing of gas wells.

**Restriction of gas production**

- 65** (1) In this section, “**retrograde condensate**” means any hydrocarbon fluid which exhibits an increased liquid volume fraction at pressures below the dew point, yet will also begin to significantly revapourize on some further reduction of pressure.
- (2) A permit holder may not produce from any of the following types of gas wells unless a DGA for the well has been established by the permit holder’s permit or by a designation made under section 75 of the Act:
- (a) a producing well under a special project for concurrent production designated under section 75 of the Act;
  - (b) a producing well from a retrograde condensate reservoir;
  - (c) a producing well from a pool with suspected water drive;
  - (d) a gas well to which an off-target penalty factor applies as set out in section 7 (3) of this regulation.
- (3) For gas wells that are part of a special project designated under section 75 of the Act and that have been assigned a project DGA, the DGA may be applied to the entire project area as though it were a single well.
- (4) Subject to section 49.1 (1) (c) of the Act, if a DGA has been established for a well by permit or a designation under section 75 of the Act, the well permit holder must ensure that natural gas production from the well
- (a) does not in any one day exceed the daily production limit, and
  - (b) does not exceed the daily gas allowable multiplied by the number of days in the production period, or multiplied by the number of days from the date of initial production to the end of the production period.
- (5) A permit holder must not produce from a gas well that is in a gas cap.

[am. B.C. Reg. 159/2015, s. 17.]



## Part 8 – Production Operations

**Overproduction of gas**

- 66** (1) A permit holder must determine the accumulated overproduction for the period November 1 to October 31 for each gas well or group of wells and, during the subsequent 3 months, the permit holder must ensure that the production rate is adjusted so that all accumulated overproduction is retired by January 31.
- (2) A permit holder must submit to the regulator a report of any accumulated overproduction for the period November 1 to October 31, and the submission must be made in time for it to be received on or before December 16 for each gas well or special project under section 75 of the Act.

[am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Analysis of natural gas and hydrocarbon liquid production**

- 67** (1) Subject to subsection (3), a well permit holder must take representative natural gas and hydrocarbon liquid samples from each producing formation from a well within 30 days of the initial production date.
- (2) A well permit holder must submit to the regulator a report of the component analyses and physical properties of the natural gas and hydrocarbon liquids within 60 days of
- (a) the sampling referred to in subsection (1), and
  - (b) any other natural gas sampling and analysis performed on the well.
- (3) This section applies to hydrocarbon liquids only if produced from
- (a) a zone listed in Schedule 2 and have a specific gravity of 0.8063 or less, or
  - (b) a zone not listed in Schedule 2 and have a specific gravity of 0.7796 or less.

[en. B.C. Reg. 103/2019, s. 25; am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Division 4 – Water****Measurement of water production**

- 68** (1) A measurement of a quantity of water required by the Act or this regulation must be computed as the number of cubic metres it would occupy at standard conditions of 15°C.
- (2) A permit holder must meter the quantity and rate of water produced from the permit holder's water source well.

**Water produced at oil wells**

- 69** (1) If the water production from a permit holder's oil well is 100 m<sup>3</sup>/1 000 m<sup>3</sup> or more of the total liquid production and no test treater facilities are available, the permit holder must ensure that the water content of the oil is determined by
- (a) continuous proportional sampling of the produced liquids and accurate analysis of the sample, or
  - (b) a product analyzer.

**DRILLING AND PRODUCTION REGULATION**

## Part 8 – Production Operations

- (2) If the water production from a permit holder's oil well is less than 100 m<sup>3</sup>/1 000 m<sup>3</sup> of the total liquid production and no test treater facilities are available, the permit holder must ensure that the water content of the oil is determined by centrifuging 2 samples taken at reasonable intervals during each test and averaging the results or by methods described in subsection (1).
- (3) If the total water production at a permit holder's oil well or battery exceeds 50 m<sup>3</sup> per month and the water content exceeds 5 m<sup>3</sup>/1 000 m<sup>3</sup> of the total liquid production, the permit holder must ensure that the water is separated from the oil and accurately gauged or metered at the well, the battery or a central treating facility.
- (4) If the total water production from a permit holder's multi-well battery is less than 50 m<sup>3</sup> per month, the permit holder must ensure that water production is determined by totalling the calculated water production for each well based on its individual test rate.
- (5) If the total water production from a permit holder's oil well not grouped with others in a battery is less than 50 m<sup>3</sup> per month, the permit holder must ensure that the water production is determined by centrifuging 3-spot or proportional samples taken at well spaced intervals during the month and averaging the results or by the method described in subsection (1).
- (6) A permit holder must quantify sediment and water production in accordance with chapter 10.4, "Determination of Water and/or Sediment in Crude Oil by the Centrifuge Method", in the American Petroleum Institute's Manual of Petroleum Measurement Standards, as amended from time to time.

**Water produced at gas wells**

- 70** A permit holder must ensure that water production that is separated at a gas well or central facility is metered to determine production or disposition quantities.

**Water analysis**

- 71** (1) If a zone in a well has produced sufficient water to allow sampling, the well permit holder of the well must collect a water sample from the zone and have it analyzed for mineral and ion content.
- (2) Within 60 days of the sampling referred to in subsection (1), the well permit holder must submit to the regulator a report of the analysis.
- (3) Within 60 days of performing any other well water analysis, the well permit holder must submit to the regulator a report of the analysis.

[am. B.C. Regs. 146/2017, App. 1, s. 33; 202/2023, Sch. 2, s. 2.]

**Operation of a water source well**

- 72** (1) Repealed. [B.C. Reg. 146/2017, App. 1, s. 34.]

## Part 8 – Production Operations

- (2) A well permit holder must report the quantity of water production from a water source well to the regulator no later than 20 days after the end of the month in which the production occurred.

[am. B.C. Regs. 146/2017, App. 1, s. 34; 174/2018, s. 5; 202/2023, Sch. 2, s. 2.]

**Division 5 – Pressure Measurement****Reservoir pressure measurements**

- 73 (1) Subject to subsection (5), a well permit holder must ensure that the static bottom hole pressure of each completed zone of each of the permit holder's oil, gas, disposal or injection wells, and for any water source well accessing deep ground- water, is measured before initial oil, gas or water production, disposal or injection.
- (2) Subject to subsection (6), a well permit holder must ensure that the static bottom hole pressure of each of the permit holder's producing pools, observation wells and water source wells accessing deep groundwater is measured once every calendar year.
- (3) A well permit holder must report the following measurements to the regulator within 60 days of the date the measurements were taken:
- (a) all static bottom hole pressures and temperatures and the duration of the resulting shut-in period;
  - (b) all other pressures measured using downhole recorders.
- (4) A well permit holder must ensure that, when static bottom hole pressures and temperatures are measured, the surveyed wells remain shut-in until the reservoir pressure has been attained in the well bore or until sufficient data are available to permit the calculation of the reservoir pressure and, in the latter case, details of the reservoir pressure calculations are included in the report required under subsection (3).
- (5) Subsection (1) does not apply with respect to a well completed in an unconventional zone listed in Schedule 2 if the regulator has released, under section 17 of the Energy Resource Activities General Regulation, well reports and well data that include a static bottom hole pressure measurement from the same unconven- tional zone within a 4 km radius measured from the wellhead of the well.
- (6) Subsection (2) does not apply with respect to a well completed in an unconven- tional zone listed in Schedule 2.

[am. B.C. Regs. 241/2012, s. 20; 146/2017, App. 1, s. 35; 103/2019, s. 26; 202/2023, Sch. 2, ss. 2 and 9.]

**DRILLING AND PRODUCTION REGULATION**

## Part 8 – Production Operations

**Division 6 – Injection and Disposal****Measurement of fluids injected**

- 74** A well permit holder must ensure that the quantity and rate of water, gas, air or any other fluid injected through a well to an underground formation is metered and that the injection pressure at the wellhead is measured.

[am. B.C. Reg. 159/2015, s. 19.]

**Reporting of injection and disposal**

- 75** (1) If a well permit holder injects or disposes of water, gas, air or any other fluid into an underground formation, the well permit holder must submit to the regulator a monthly injection or disposal statement indicating all of the following:
- (a) the quantity of fluid injected or disposed of;
  - (b) the maximum wellhead injection or disposal pressure;
  - (c) the total monthly operating hours.
- (2) A well permit holder must submit the statement required under subsection (1) no later than 20 days after the end of the month in which the activity occurred.
- (3) In addition to the statement required under subsection (1), a well permit holder of an acid gas disposal well must submit to the regulator a composition analysis of all disposed fluids, identifying the well location and disposal formation.
- (4) A well permit holder must submit the analysis required under subsection (3) no later than 6 months after the last analysis was submitted.

[en. B.C. Reg. 103/2019, s. 27; am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Division 7 – Facilities****Notification**

- 76** A facility permit holder must notify the regulator
- (a) at least 2 days before beginning construction of a facility or beginning permitted modifications to a facility,
  - (b) at least 2 days before conducting a pressure test on process piping at a facility,
  - (c) at least one day before beginning production operations at a facility, and
  - (d) at least one day before putting new or modified equipment in service at a facility.

[am. B.C. Reg. 202/2023, Sch. 2, s. 2.]

**Signs for facilities**

- 77** (1) A facility permit holder must ensure that a permanently legible and conspicuous sign is displayed and maintained at each facility, and the sign must show all of the following:
- (a) the name of the permit holder;

## Part 8 – Production Operations

- (b) current emergency notification information, including a telephone number;
  - (c) the legal description of the site;
  - (d) if the facility handles flammable gas, a flammable gas symbol from Schedule 1;
  - (e) if the facility handles gas containing 100 ppm or greater of hydrogen sulphide, a poisonous gas symbol from Schedule 1;
  - (f) after March 1, 2011, if the facility handles gas containing 10 ppm or greater of hydrogen sulphide, a poisonous gas symbol from Schedule 1.
- (2) A permit holder must not post warning symbols where no hazard exists.

[am. B.C. Regs. 241/2012, s. 21; 146/2017, App. 1, s. 36.]

**Production facilities**

- 78**
- (1) A facility permit holder must maintain up-to-date and detailed flow diagrams, metering schematics and gathering schematics for all wells, groups of wells, facilities and gathering systems.
  - (1.1) A facility permit holder must ensure that all tools and equipment used in facility operations are installed and operated in accordance with the manufacturer's specifications or sound engineering practices.
  - (2) Repealed. [B.C. Reg. 48/2021, App. 2, s. 3 (a).]
  - (3) A facility permit holder must design and construct every portion of the piping system of the facility in accordance with either
    - (a) ASME Standard B31.3, or
    - (b) CSA Standard Z662.
  - (3.1) A facility permit holder referred to in subsection (3) must operate and maintain in accordance with the standard referred to in subsection (3) (b) any portions of the piping facility designed and constructed in accordance with that standard.
  - (4) A facility permit holder must submit to the regulator all record drawings including piping and instrumentation diagrams, metering schematics and plot plans, signed and sealed by a professional engineer licensed or registered under the *Professional Governance Act*, within 3 months of beginning production or completing permitted modifications, as applicable.
  - (5) The permit holder for a facility to which subsection (3) applies must indicate on the record drawings referred to in subsection (4) and on the piping of the facility the points at which the design and construction of the facility changes from one standard to the other, as applicable.
  - (6) A facility permit holder must ensure both of the following:
    - (a) the facility is maintained in a condition that minimizes hazards, including hazards associated with pits, holes, equipment and storage of materials;

**DRILLING AND PRODUCTION REGULATION**

## Part 8 – Production Operations

- (b) the facility site is clean and free of garbage, debris and derelict equipment.

[am. B.C. Regs. 241/2012, s. 22; 159/2015, s. 21; 146/2017, App. 1, s. 37; 103/2019, s. 29; 48/2021, App. 2, s. 3; 202/2023, Sch. 2, ss. 2 and 5.]

**Integrity management program**

- 78.1** A facility permit holder must prepare and maintain an integrity management program and carry out operations in accordance with the integrity management program throughout the life cycle of the facility.

[en. B.C. Reg. 146/2017, App. 2, s. 1.]

**Obligations on cancellation or cessation of operations**

- 79** (0.1) In this section, “**inactive facility**” means a facility at which no petroleum, natural gas, water or substance referred to in paragraph (d) or (e) of the definition of “pipeline” in the Act is gathered, processed, measured or disposed of.

- (1) The removal of the facility from the facility site is prescribed with respect to a facility permit for the purposes of section 40 (e) of the Act.
- (2) The facility permit holder of an inactive facility must
  - (a) within 12 consecutive months of the facility becoming an inactive facility, suspend the facility in a manner that ensures its ongoing safety and integrity, and
  - (b) within 60 days of the suspension of the facility, notify the regulator of the suspension.
- (3) A facility permit holder who has suspended operations at the facility must notify the regulator at least 5 days before reactivating the facility.

[am. B.C. Regs. 241/2012, s. 23; 146/2017, App. 2, s. 2; 48/2021, App. 2, s. 4; 266/2022, Sch. 2; 202/2023, Sch. 2, s. 2.]

**Division 8 – Storage Reservoirs****Storage reservoirs**

- 80** (1) A well permit holder of a well that is part of a special project for storage reservoirs designated under section 75 of the Act must construct and operate the well in accordance with CSA Standard Z341.
- (2) A facility permit holder of a facility that is part of a special project for storage reservoirs designated under section 75 of the Act must construct and operate the facility in accordance with CSA Standard Z341.
- (3) A well permit holder of a well that is part of a special project for carbon dioxide storage designated under section 75 of the Act must construct and operate the well in accordance with CSA Standard Z741.

[am. B.C. Reg. 159/2015, s. 22.]

## PART 9 – RECORDS

### Records generally

- 81** The records, reports and plans required under this regulation are prescribed for the purposes of section 38 of the Act.

[en. B.C. Reg. 145/2023, App. 2, s. 2.]

unofficial early consolidation

**SCHEDULE 1**

[en. B.C. Reg. 48/2021, App. 2, s. 5.]

[Sections 15 and 77]

# WARNING SIGNS

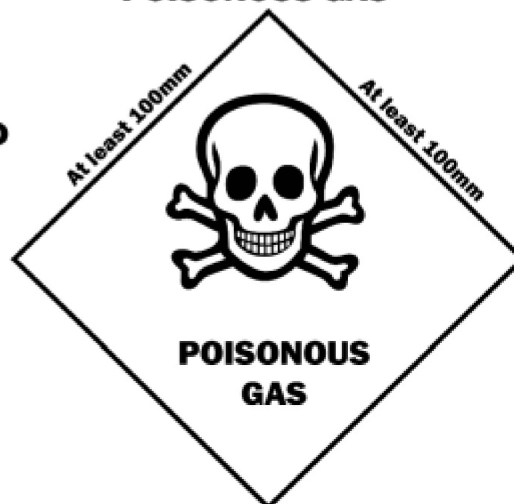
**FLAMMABLE**



**WHITE SYMBOL AND  
LETTERING ON RED  
BACKGROUND**

**BLACK LETTERING AND  
SYMBOL OUTLINE ON  
WHITE BACKGROUND**

**POISONOUS GAS**





## DRILLING AND PRODUCTION REGULATION

## Schedule 2

**SCHEDULE 2**

[en. B.C. Reg. 146/2017, App. 1, s. 38.]

[Sections 6, 7, 29 and 34]

**Unconventional Zones**

Item	Field	Zone Name	Distance (m)	
			Gas	Oil
1	Horn River	Muskwa-Otter Park	100	
2	Horn River	Evie	100	
3	Helmet	Muskwa-Otter Park	100	
4	Helmet	Evie	100	
5	Liard Basin	Besa River	100	
6	Northern Montney	Montney	150	100
7	Northern Montney	Doig Phosphate-Montney	150	100
8	Heritage	Montney	150	100
9	Deep Basin	Cadomin	150	
10	Deep Basin	Nikanassin	150	

<b>Legend:</b>	
<u>Insertion</u>	
<del>Deletion</del>	
<del>Moved from</del>	
<u>Moved to</u>	
Style change	
Format change	
<del>Moved deletion</del>	
Inserted cell	
Deleted cell	
Moved cell	
Split/Merged cell	
Padding cell	

unofficial early consolidation