

NOVA SCOTIA - ONSHORE

Administration

1. Agency regulating oil and gas exploration/production: Nova Scotia Department of Energy and Mines

2. Contact for regulatory updates:

Scott Weldon, Operations Geologist
Nova Scotia Department of Energy and Mines
12th Floor, 1690 Hollis St. | PO Box 2664 | Halifax, NS | B3J 3P7
E: Scott.weldon@novascotia.ca | T: 902 424-3234 | F: 902 424-5126

Or Alternate:

Kimberly Doane | Director, Petroleum Branch
Nova Scotia Department of Energy and Mines
12th Floor, 1690 Hollis St. | PO Box 2664 | Halifax, NS | B3J 3P7
E: Kim.doane@novascotia.ca | T: 902 424-7146 | F: 902 424-5126

3. Docketing procedure: All requests come to the Department of Energy and Mines, Petroleum Operations branch to first be addressed.

a. Emergency orders: Depends on type of Emergency orders (Health and Safety or Environment orders would come from those respective regulatory departments)

b. Notice: Depends on type of notice – typically under the Activity authority – notices can be given.

4. Agency regulating air emissions: Nova Scotia Department of Environment

5. Agency regulating water quality: Nova Scotia Department of Environment

License

1. License required: Must have either an Exploration or Production Agreement(s) to be able to do any petroleum exploration or development.

2. Under those Agreements there are activity authorizations. Those authorizations include: Authority to conduct Geophysical Program (seismic), Authority to drill a well, Authority to alter condition of a well, etc. In activity authorizations there is also an Industrial Approval which is an Environmental site specific approval required by our Department of Environment which is needed to get final Activity Authorization (seismic/drilling).

3. Conditions of license: Under Sec.48 of our Petroleum Resources Regulations, we have the ability to amend an Exploration or Production agreement at the mutual consent of the Minister and the agreement holder. This is typically requested at the end of license term situations. We also have the authority to add any terms and conditions to all activity authorizations and can suspend these authorizations at any time if there is just cause.

Bond/Surety

1. Purpose of surety: Ensure activity is engaged as indicated in work commitment so a performance bond and proof of \$10 million in insurance. This bond remains with the government to ensure activity is engaged in correctly to the regulators satisfaction and is not returned until wells are abandoned successfully.
2. Plugging and restoration: We currently indicate “best oilfield practice” and to meet this we require the standards set out in Directive 20, by the Alberta Energy Regulator of Alberta.
3. Compliance bond required: Yes
4. Types of surety accepted: Cash (preferred) – held in account with interest on behalf of that specific operator.
5. Conditions of bond:
 - a. Amount per well: \$90,000; (estimated well abandonment costs/per well in frontier NS)
 - b. Amount of blanket bond: 20% of value of proposed activity with ability to request more if not sufficient at the time of drilling authorizations to insure there is at least \$90,000 per unplugged well available.

Land Leasing Information

1. Leasing method: Lands are nominated by industry or the government and put out for competitive Call for Bids process. Government of Nova Scotia owns all the mineral and petroleum rights in the Province.
2. Notice method: Call for Bids process that has public publication in Provincial gazette or other publications as the Minister considers best advises the call, not less than 60 days prior to closure of that Call.
3. Minimum bidding \$ (per acre): Bidding is through a work commitment. Once a successful bid is made rentals are paid every year based on a minimum \$0.15 / hectare)

4. Qualification of the bidder: Technical and financial capability; two envelope process – first confirm technical and financial capability, then open bid \$ amount.
5. State statutes: NS Petroleum Resources Act
6. Maximum acres: No maximum; however, the government has the final say in the extent of any agreement.
7. Royalty rates: 10% all others 5% coal bed methane (based on wellhead value)
8. Agency in control of leasing: Nova Scotia Department of Energy and Mines

Setbacks

1. What rules/regulations/policies does your jurisdiction have in regard to well setbacks from private residences and/or other habitable structures for use by humans or animals? Sec. 21 (1) Petroleum Drilling Regulations indicates setback of 100 m from any surface improvement (ie: buildings, wells, etc.) but this may be exempt if operator has landowner permission.
2. Are there other sources of information on this matter that you could identify?

There are setback distances for geophysical (seismic) programs including consent of the owner of a Surface improvement/structure is required for any explosive exploration or test hole that is less than 180 meters from that structure. Consent of the owner of a water well is required for any non-explosive exploration that is closer than 100 meters from that water well (we provide Minimum Setback Distance table to operators).

Spacing

1. Spacing requirements: None, The current plan is to space production wells 1 mile apart.
 - a. Density: In accordance with good oilfield practice and any submitted resource management plan
 - b. Lineal: In accordance with good oilfield practice and any submitted resource management plan
2. Exceptions: Considered on Case by Case bases if consistent with good oilfield practice
 - a. Basis: N/A
 - b. Approval: N/A

Pooling

1. Authority to establish voluntary: In accordance with good oilfield practice and any submitted resource management plan (approved prior to activity)
2. Authority to establish compulsory: In accordance with good oilfield practice and any submitted resource management plan (approved prior to activity)

Unitization

1. Compulsory unitization of all or part of a pool or common source of supply: In accordance with good oilfield practice and any submitted resource management plan (approved prior to activity)
2. Minimum percentage of voluntary agreement before approval of compulsory unitization:
 - a. Working interest: N/A
 - b. Royalty interest: N/A

Drilling Permit

1. Permits required for:
 - a. Drilling a producing or service well: Authority to drill a well (Dept of Energy and Mines) Industrial approval (Dept of Environment), or the Authority to alter the condition of a well (Dept of Energy and Mines)
 - b. Seismic drilling: Authority to explore geophysical (Dept of Energy and Mines)
 - c. Recompletion: Authority to alter the condition of a well (Dept of Energy and Mines)
2. Plugging and abandoning: Authority to abandon a well (Department of Energy and Mines) Permit fee: \$124.65 (these change from time to time – we would send out an Information Notice on change)
 - a. Drilling: \$124.65
 - b. Seismic drilling: \$124.65
 - c. Recompletion: \$124.65
 - d. Plugging and abandoning: \$124.65
 - a. Require filing report of work performed: Yes - Daily drilling or completions reports, end of well activity reports; submission of all data acquired and logging suites. Under Section 71 of the Petroleum Resources Regulations, various types of data are required to be submitted. Under

Sec. 72 (c) (d) of the Petroleum Resources Regulations, we have various confidentiality periods depending on the type of information. Related to logs 72 (c) In respect of information and data relating to the prognosis, drilling and completion of an exploratory well, for a period of two years following the completion or abandonment of the well and (d) in respect of information and data relating to a development or production well, for a period of one year following completion or abandonment of the well.

3. Sundry notices used: We refer to it as an Authority to alter the condition of a well

Vertical Deviation

1. Regulation requirement: None
 - a. When is a directional survey necessary: Beyond 5 degrees
 - b. Filing of survey required: Yes (incorporated with end of well report submission).
 - c. Format of filing: electronic & hard copy

Casing and Tubing

1. Minimum amount required:
 - a. Surface casing: Yes, require to 20 m below deepest known fresh water or 200m (most freshwater aquifers in the Province are less than 200 m). Identified casing strings in drilling program and approved by 3rd party drilling engineer at time of well authorizations.
 - b. Production casing: Yes, typically we have intermediate casing in most of our exploratory holes as well. Identified casing strings in drilling program and approved by 3rd party drilling engineer at time of well authorizations.
2. Minimum amount of cement required:
 - a. Surface casing: Yes, returns to surface
 - b. Production casing:
 - c. Setting time: After cementing of any casing or liner and before resuming any downhole operators, the operator shall ensure that the cement has reached a minimum compressive strength to support the casing and provide zonal isolation.
3. Tubing requirements: The operator shall ensure any production tubing used in a well is designed to withstand the maximum conditions, forces and stresses that

may be placed on it to maximize recovery (using draft set of regulations – as our policy position until put into effect)

- a. Oil wells: N/A
- b. Gas wells: note above

Hydraulic Fracturing – Moratorium (in place since Nov. 2014)

In the fall of 2014, the Province of Nova Scotia passed amendments to formally prohibit high-volume, hydraulic fracturing in shale formations, which will be further defined in regulation.

Bill No. 6 Amendments to Chapter 342 of the Petroleum Resources Act

1 Chapter 342 of the Revised Statutes, 1989, the Petroleum Resources Act, is amended by adding immediately after Section 11 the following Sections:

11A (1) In this Section and in clause 27(1)(ta), "high-volume hydraulic fracturing" means high-volume hydraulic fracturing as defined by the regulations.

(2) No person shall engage in high-volume hydraulic fracturing in shale formations unless exempted by the regulations for the purpose of testing or research.

11B (1) The Minister may review the prohibition under Section 11A.

(2) Where the Minister reviews the prohibition, the Minister shall consider the net benefit to Nova Scotians, taking into account

(a) social issues; (b) economic issues; (c) health issues; (d) environmental issues; (e) scientific and technical issues; (f) regulatory effectiveness and efficiency; and (g) any other matter or thing that the Minister considers necessary or advisable.

Permitting: Under review - defining requirement for Research and Testing lease

- a. Before drilling: Authority to Drill a well
 - b. Before fracing: currently moratorium on HVHF
 - c. How long before: N/A
2. Reporting requirements:
 - a. Where reported: currently moratorium on HVHF
 - b. When reported: ideally, before and after activity
 3. Source water requirements: Department of Environment
 4. Mechanical integrity:

- a. Cementing log required: Yes
 - b. Pressure testing: Yes (all wells regardless of technology used)
 - c. Pressure monitoring: Yes (all wells regardless of technology used)
 - d. Blowout preventer required: Yes (all wells regardless of technology used)
5. Disposal of flowback fluids:
- a. Retaining pits: No (used to be common practice – engineered pits with liners, however water disposal is an issue so now by policy decision, we no longer allow this practice in NS)
 - b. Tanks: Yes
 - c. Approved discharge to surface water: No
 - d. Underground injection: Yes
6. Chemical disclosure requirement:
- a. Mandatory: Yes
 - b. Where disclosed: To regulating Departments (Energy and Mines and Environment) – Policy intention would be to make it available to the public (Mechanism?)
 - c. When disclosed (pre-fracing, post-fracing, both): Post Fracing
 - d. Time limit to disclose: N/A
 - e. Information required to be disclosed: Chemical composition of what’s being utilized
 - f. Trade secret protection: No
 - g. Required disclosure to health/emergency personnel: Yes

Underground Injection

1. Agencies that control the underground injection of fluid by well class:
Department of Energy and Mines & Department of Environment – we currently have no injection wells

Completion

2. Completion report required: Yes

- a. Time limit: Daily operation reports submitted to Department of Energy and Mines and an “end of well” operations report, and all related data required to be submitted after the completion or abandonment operations of the well.
 - b. Where submitted: Electronically Emailed to Administrator of Drilling Regulations
3. Well logs required to be filed: Yes
- a. Time limit: At the completion of the drilling operations
 - b. Where submitted: To Department of Energy and Mines
Attn: Administrator of Drilling Regulations (Scott Weldon)
 - c. Confidential time period: Under Sec. 72 (c) (d) of the Petroleum Resources Regulations, we have various confidentiality periods depending on the type of information. Related to logs 72 (c) In respect of information and data relating to the prognosis, drilling and completion of an exploratory well, for a period of two years following the completion or abandonment of the well and (d) in respect of information and data relating to a development or production well, for a period of one year following completion or abandonment of the well.
 - d. Available for public use: Yes, after confidentiality period ends
 - e. Log catalog available: Well list – includes types of logs submitted, we retain paper and electronic copies of logs.
4. Multiple completion regulation:
- a. Approval obtained: Yes
5. Commingling in well bore:
- a. Approval obtained: Yes

Oil Production

We currently do not have oil production

1. Definition of an oil well: No
2. Potential tests required: N/A
 - a. Time interval: N/A
 - b. Witness required: N/A

3. Maximum gas-oil ratio: No
 - a. Provision for limiting gas-oil ratio: N/A
 - b. Exception to limiting gas-oil ratio: N/A
4. Bottom-hole pressure test reports required: N/A
 - a. Periodical bottom-hole pressure surveys: N/A
5. Commingling oil in common facilities: N/A
6. Measurement involving meters: N/A
7. Production reports: N/A
 - a. By lease:
 - b. By well:
 - c. Time limit:

Gas Production

1. Definition of a gas well: No
2. Pressure base _____ psia @ _____ degrees F.
3. Initial potential tests: Yes, would be required
 - a. Time interval:
 - b. Witness required:
4. Bottom-hole pressure test reports required: Yes
 - a. Periodical bottom-hole pressure surveys:
5. Commingling of gas in common facilities: N/A
6. Measurement involving meters: The operator would be required to ensure that the rate of flow and the volume of fluids, are measured and recorded in accordance with the flow management system, flow calculation procedures and flow allocation procedures (using draft set of regulations – as our policy position until put into effect)
7. Production reports:
 - a. By lease:

- b. By well: Expected by well
- c. Time limits: Daily, Monthly and Annual reporting (using draft set of regulations – as our policy position until put into effect)