

Off-Target Well Requirements

Directive PNG007

November 2015

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Governing Legislation:

Act: *The Oil and Gas Conservation Act*

Regulation: *The Oil and Gas Conservation Regulations, 2012*

Order: 498/15

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Contents

1. Introduction 4

 1.1 Governing Legislation..... 4

 1.2 Definitions..... 4

2. Determining if a Proposed Well Completion is Off-Target 5

 2.1 Wells that are not Governed by Off-Target Regulations 5

 2.2 Types of Off-Target Wells 5

 2.3 Off-Target Well Penalties 6

 2.4 Encroaching Off-Target Wells 6

 2.5 Off-Target Wells that Are Not in Compliance with Drainage Unit Edge Regulations 6

3. Process for Licensing Off-Target Wells 6

 3.1 Diversely-Owned Drainage Unit Encroaching Off-Target Wells 7

 3.2 Development Off-Target Wells 7

 3.3 Exploratory, Surface Obstruction/Topographic, or Uneconomic Wells in the Drainage Unit Off-Target Wells 8

Appendix 1: How to Calculate Encroachment of Adjacent Target Areas 9

Appendix 2: Flow Chart Showing the Process to License an Off-Target Well..... 12

1. Introduction

This Directive sets out the requirements of the Saskatchewan Ministry of the Energy and Resources (ER) for off-target oil and gas well completions in Saskatchewan. It covers topics such as how to determine if a proposed well completion is considered off-target, when an off-target well completion may be considered to have an encroachment, when off-target penalties may apply, and the processes that may need to be followed before making an application.

Other requirements and guidelines that are pertinent to the topics in this Directive are:

- *Directive PNG009: Public Notice Requirements;*
- *Directive PNG011: Allowable Rates of Production: Gas Wells;*
- *Directive PNG012: Allowable Rates of Production: Oil Wells;* and
- *Guideline PNG021: Determining Drainage Units and Target Areas and Guideline PNG024: Reclassification and Recompletion.*

Questions concerning the requirements set out in this document should be directed to the ER Service Desk at 1-855-219-9373 or email at ER.servicedesk@gov.sk.ca.

1.1 Governing Legislation

The requirements outlined in this Directive are based on *The Oil and Gas Conservation Act* (OGCA) and *The Oil and Gas Conservation Regulations, 2012* (OGCR). In particular, sections 17 and 27 of the OGCA and sections 31 to 35 of the OGCR provide the authority to regulate off-target wells. Licensees should consult these documents in conjunction with this Directive. It is the responsibility of all operators, as specified in the legislation, to be aware of ER requirements and to ensure compliance with the requirements for off-target wells.

1.2 Definitions

Allowable rate of production (ARP): The amount of oil or gas a well is permitted to produce (see Directive PNG011 and Directive PNG012 for more information).

Commonly-owned land: The mineral ownership, lessee(s) and partners, well ownership and operator, farm-in agreements etc. of the mineral land, are identical to those for the drainage unit of the proposed off-target well completion.

Development well: A well completion that will be off-target as a result of geological or reservoir reasons, where the proposed completion is within 2.4 km (oil) or 4.8 km (gas) of any existing well completion (active/non-active/suspended) that is within the same stratigraphic unit.

Diversely-owned land: The mineral ownership, lessee(s) and partners, well ownership and operator, farm-in agreements etc. of the mineral land, are NOT identical to those of the drainage unit of the proposed off-target well completion.

Exploratory well: A well completion that will be off-target as a result of geological or reservoir reasons, where the proposed completion is at least 2.4 km (oil) or 4.8 km (gas) away from any existing oil or gas well completion (active/non-active/suspended) that is within the same stratigraphic unit.

Offset land: Is any mineral land that is immediately adjacent to the drainage unit land containing the well completion.

Offset mineral owner: Is any owner of a mineral land that is immediately adjacent to the drainage unit land containing the well completion.

Off-target penalty: Is a reduced allowable rate of production on a well. (See Directive PNG011 and Directive PNG012 for further details.)

Surface obstruction/topographic well: Wells that have issues which prevent the lease of a well from being constructed on-target, due to topographical features (e.g., extreme terrain making it hard to access drill site), environmental constraints (e.g., protected surface location), or surface obstruction reasons (e.g., proximity to an occupied dwelling).

Uneconomic well in drainage unit: Wells drilled off-target due to geological or reservoir reasons, where there is an existing well(s) within the drainage unit that penetrates through the pool of interest and has been determined to be uneconomic to produce based on reservoir evaluation.

2. Determining if a Proposed Well Completion is Off-Target

A well is considered to be off-target if the following situations apply:

- a non-horizontal oil well completion is located outside the prescribed target area; or
- any gas well completion is located outside the prescribed target area.

For assistance in determining the drainage unit and target area for a proposed well completion, see Guideline PNG021.

2.1 Wells that are not Governed by Off-Target Regulations

Horizontal oil wells are regulated by set-back and are therefore not eligible to be off-target.

Some *Pool Orders* provide set-back requirements for vertical and directional wells; these well completions are also not eligible to be off-target.

To request reduction of a set-back requirement, an application is required, in accordance with the *Spacing Modification Application Guideline*.

2.2 Types of Off-Target Wells

There are four different types of off-target wells:

- Development
- Exploratory
- Surface Obstruction/Topographic
- Uneconomic well(s) in the drainage unit

These four types of off-target wells are explained in 'Definitions', and the different processes that must be followed during a well licence application for each of these off-target well types are outlined in section 3 of this Directive.

2.3 Off-Target Well Penalties

An off-target well may be subject to an off-target well penalty.

Whether an off-target well is subject to an off-target penalty is discussed in section 3 of this Directive.

2.4 Encroaching Off-Target Wells

In addition to the designation 'off-target', a proposed well completion will also be considered to be 'encroaching' on offset drainage units.

An encroachment occurs when a proposed well completion is off-target and the completion is located closer to an adjacent drainage unit's target area than an on-target location would allow.

For assistance in determining the drainage unit and target area for a proposed well completion, see Guideline PNG021.

Appendix 1 contains examples of how to determine the encroachment of a proposed off-target well completion.

2.5 Off-Target Wells that Are Not in Compliance with Drainage Unit Edge Regulations

According to subsection 35(3) of the OGCA, a well completion must be at least 50 m from a drainage unit edge unless the well is within a designated target area.

If the well completion is less than 50 m from the drainage unit edge and is not within a target area – that is, it is off-target – written consent from the encroached upon offset mineral owners and operators must be obtained in order to proceed with licensing or applying to complete the proposed off-target well.

If the encroached upon offset lease is commonly-owned, a company may provide their own consent for an off-target well completion to be located within 50 m of the drainage unit edge.

If the encroached upon offset lease is diversely-owned, written consent from mineral owners/operators and other impacted parties must be obtained. Public notice will not be accepted in place of written consent.

3. Process for Licensing Off-Target Wells

The processes that must be followed before licensing an off-target well may vary based on the type of off-target well being proposed. The following subsections provide examples of the processes that must be followed for off-target wells, and for the four identified types of off-

target wells: development; exploratory; surface obstruction/topographic; and uneconomic well in the drainage unit.

Appendix 2 contains a flow chart illustrating the decisions required when applying to license an off-target well.

3.1 Diversely-Owned Drainage Unit Encroaching Off-Target Wells

Where the proposed well is found to encroach upon a diversely owned drainage unit, consents or public notice is required. See Directive PNG009 for more details about the requirements for consent letters and the public notice process.

3.2 Development Off-Target Wells

The first step before submitting a well licence application for an off-target development well is to assess if the well is off-target to diversely-owned parties. If an off-target well is determined to be encroaching on diversely-owned land, follow the steps below.

If applying for waiver of off-target penalty when offsetting diversely owned drainage units:

- The company must send the location of the proposed well and waiver of off-target penalty to public notice
- If there is no objection to the application the company may proceed with the licence application and disclose accordingly
- If an objection to the location of the well is received, the objecting party must submit technical reasoning (e.g., geological or reservoir implications of the location of the proposed well) to the applicant for the objection to be considered valid. A company may receive an objection in relation to the location or waiver of penalty and work to resolve it prior to making any submissions to ER.
- If there are unresolved objections to the location of the well, the company may still apply for an off-target well licence. Part of the application must include copies of the public notification, the objection information and all details of attempts to resolve the conflict.

Note:

If there are unresolved objections to the location of the well and a company has plans to proceed to apply for a well licence, the company should have supporting documentation on record (e.g., survey plan, contour maps, isopach maps, geological discussion) that should be included as part of the public notice attachment.

If an encroached-upon party lodges an objection to the waiver of the off-target well penalty, the proposed well will be subject to an off-target penalty. No technical support is needed to object to the waiver of off-target penalty.

If the proposed off-target development well is offsetting commonly-owned land, no additional work is required and an off-target penalty would not apply.

3.3 Exploratory, Surface Obstruction/Topographic, or Uneconomic Wells in the Drainage Unit Off-Target Wells

For these types of off-target wells, first assess if the well is off-target to diversely-owned parties. Options to proceed if offsetting diversely owned drainage units include:

- the company may choose to accept that an off-target penalty be applied to the well completion
- the company may send the waiver of the off-target penalty to public notice
- the company may obtain consents from all encroached upon parties to waiver of the off-target penalty

If an encroached-upon party lodges an objection to the waiver of the off-target well penalty, the proposed well will be subject to an off-target penalty. No technical support is needed to object to the waiver of off-target penalty.

If the proposed off-target well is offsetting commonly-owned land, no additional work is required and an off-target penalty would not apply.

Surface obstruction and topographic off-target wells should be clearly justified by including details on the proposed well survey. A company should have on record supporting documentation that provides justification as to why directional drilling was not an option.

Appendix 1: How to Calculate Encroachment of Adjacent Target Areas

The following are examples of some drainage units and target areas and how to calculate encroachment of adjacent target areas.

Legend for the following off-target well encroachment illustrations

- Illustration Legend:
- Drainage Unit (DU) (will be defined for each example)
 - Legal Subdivision (LSD)*
 - Target Area (TA)
 - Proposed Well
 - $\#m$ Distance from proposed well to DU edge or TA edge
 - $\#m$ Distance from on-target to adjacent DU on-target location
 - $\#m$ Distance from proposed well to adjacent on-target location
 - OK Off-target well IS NOT encroaching, $\#m > \#m$
 - OT Off-target well IS encroaching, $\#m < \#m$

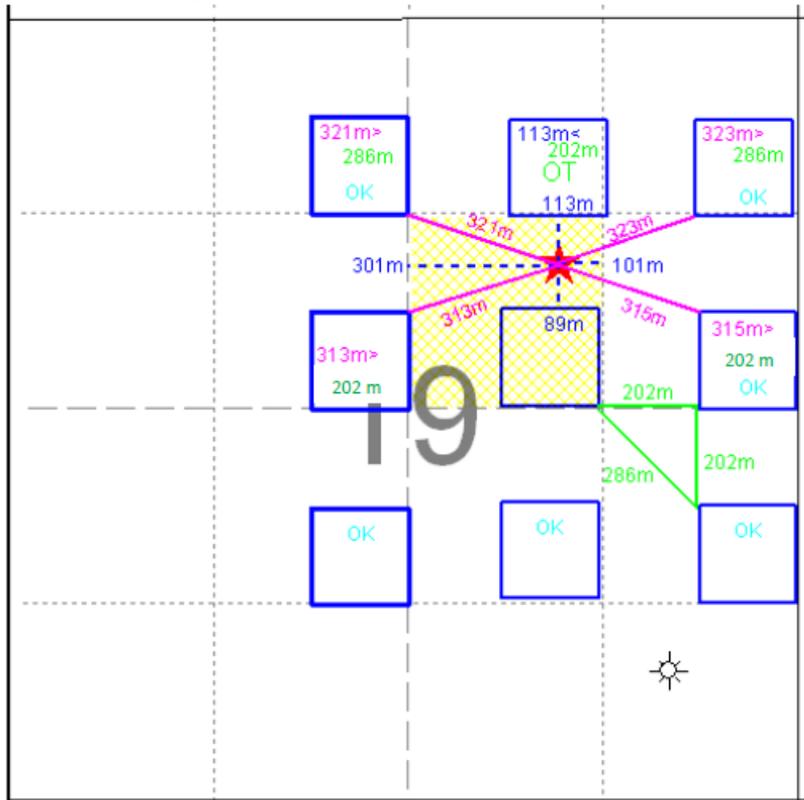
*LSD - assume 402m X 402m for illustrations

Diagonal distances are calculated using: $c = \sqrt{a^2 + b^2}$



Example 1: DU = 1 LSD, TA = a rectangle situated in the southeast corner of the DU, having the north and west sides located 200 m from the south and east sides of the DU.

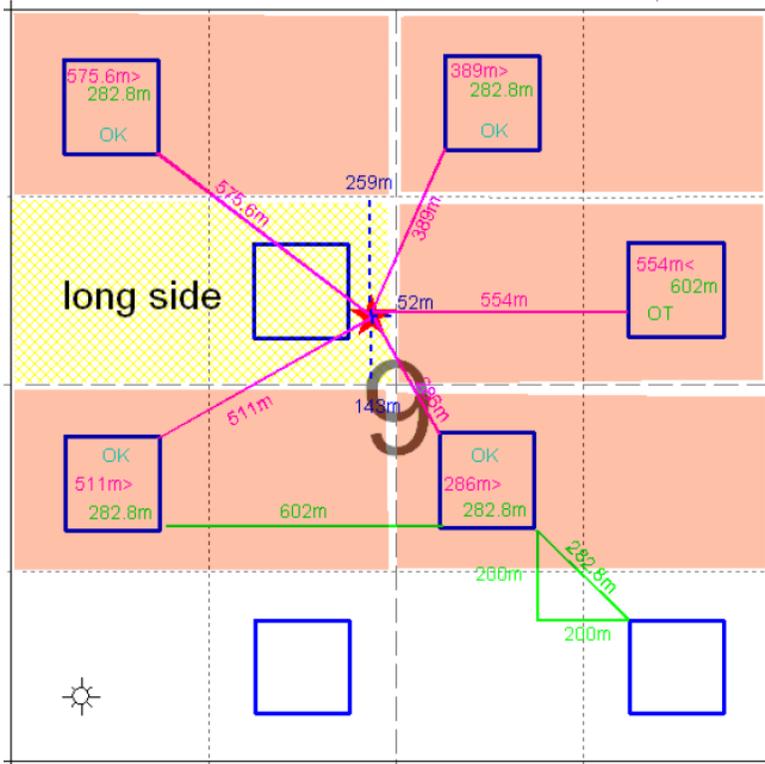
Proposed off-target well is located 515 m S of N and 503 m W of E.



Example 2: DU = 2 LSDs, TA = the sides of the target area are located 100 m from and parallel to the corresponding sides of the odd-numbered LSD.

For 2 LSD Spacing, when the proposed well completion is on the short side of the target area in the drainage unit, adjacent drainage units in all directions of the proposed drainage unit can be encroached upon.

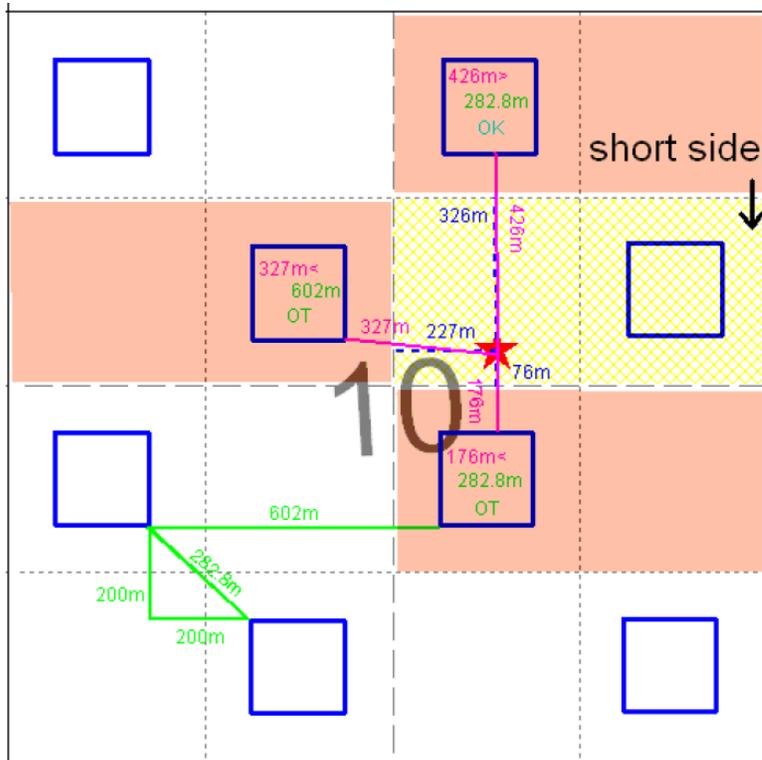
Proposed off-target well is located 661 m S of N and 856 m W of E.



Example 3: DU = 2 LSDs, TA = the sides of the target area are located 100 m from and parallel to the corresponding sides of the odd numbered LSD.

For 2 LSD Spacing, when the proposed well completion is on the long side of the target area in the drainage unit, the adjacent drainage units excepting the diagonal off-set drainage units, may be encroached upon.

Proposed off-target well is located 726 m S of N and 577 m W of E.



Appendix 2: Flow Chart Showing the Process to License an Off-Target Well

