

Well Survey Requirements

Directive PNG003

January 2025

Revision 2.0

Governing Legislation:

Act: *The Oil and Gas Conservation Act*

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

Order: 23/25

Record of Change

Revision	Date	Description
0.0		Initial draft
1.0	November 2015	Live version, updated wording, added directive number.
2.0	January 2025	Revised definitions, clarification of terminology referenced in well survey plans and alignment to requirements of other directives to promote clarity and consistency.

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1. Introduction

This Directive outlines the elements that are required in all survey plans for wells licensed by the Ministry of Energy and Resources (ER).

A survey plan must be submitted by a licensee as part of a well licence application. An as-drilled survey is also required to be submitted after completion of drilling operations for all wells that are not vertical wells.

1.1 Governing Legislation

This Directive should be used in conjunction with *The Oil and Gas Conservation Act* (OGCA) and *The Oil and Gas Conservation Regulations, 2012* (OGCR).

The requirements outlined in this Directive are authorized under and supported by:

- *The Oil and Gas Conservation Act* (OGCA)
- *The Oil and Gas Conservation Regulations, 2012* (OGCR)
- Associated Directives and Guidelines:
 - *Directive PNG004: Surface lease Construction Requirements* (Directive PNG004)
 - *Directive PNG006: Horizontal Oil and Gas Well Requirements* (Directive PNG006)
 - *Directive PNG013: Well Data Submission Requirements* (Directive PNG013).

It is the responsibility of all operators, as specified in the legislation, to be aware of ER requirements and to ensure compliance with all requirements prior to submitting a well survey

1.2 Definitions

Bottom hole (depth): means the termination point of a wellbore.

Boundary co-ordinates: are measurements using a reference point of nearest boundaries of the Section.

Directionally-drilled well: is a well that is not vertical but does not meet the minimum criteria to be horizontal.

Dwelling: means a building occupied by a person on a temporary **or** permanent basis.

Horizontal well: means a well that has a productive interval of at least 100 metres (m) or that is at least 80 degrees from the vertical or is deemed by the minister to be horizontal.

Inter-well set-back: as defined in Directive PNG006.

Intermediate Casing Point (ICP): means the point where the intermediate casing lands.

Kickoff point: means where an additional wellbore begins on a multi-bore horizontal well.

Landing point (LP): refers to the point where the well path has reached at least 80-degrees from the vertical position within the target pool and is only applicable to a monobore horizontal well.

Lease boundary set-back: as defined as Directive PNG006.

Monobore: means a horizontal well with a single string of production casing, with uniform diameter, cemented from total depth to surface.

Productive interval: as defined in Directive PNG006.

Rectangular co-ordinates: are measurements using a reference point of the well origin.

Target area: means the specified area within a drainage unit allocated to one well completion for the purpose of producing oil or gas from a non-horizontal oil well or a gas well.

Vertical Well: means a well drilled from surface to bottom hole without intentional deviation from vertical.

Water body: means a body of water or an area where water flows or is present, whether the flow or the presence of water is continuous, seasonal or intermittent, or occurs only during a flood.

Wellbore: means a path of drilled meterage from the well origin to a terminating point or, for wellbores drilled from existing wellbores, the kickoff point to a terminating point.

2. Mandatory Components of a Survey Plan

For a survey plan to be accepted by ER, it must contain all the components listed in subsections 2.1 and 2.2 and must comply with all the requirements set out for them.

2.1 Basic Survey Plan Components

A survey plan must consist of the following components:

- Be prepared from a survey made by a Saskatchewan Land Surveyor, within the meaning of *The Land Surveyors and Professional Surveyors Act*;
- Be dated, certified, and signed by the surveyor, with the signature duly witnessed;
- Have a survey revision date (new or revised) that is less than 12 months prior to the date of submission;
- Be in a scale acceptable to the minister;
- Display all applicable set-back radii from well origin at corresponding distances as required by Directive PNG004;
- Show the location of the well origin in relation to the following items situated within 200 metres of the surface lease;
 - The boundaries of the section;
 - Water bodies;
 - Mines, whether worked or abandoned;
 - Existing wells and abandoned wells;

- Roadways, road allowances, railways, pipelines, power lines, and any other right of way;
- Aircraft runways or taxiways; and
- Structures of every kind;
- Show all proposed wells;
- Show all licensed wells labeled with CWI, UWI or well licence;
 - If well is abandoned, label as abandoned.
- Show the elevation of the well site and the locations of:
 - The well origin;
 - The surface lease boundaries;
 - The access road; and
 - The target area (if applicable);
- Have all measurements and distances tied to:
 - A surveyed monument or evidence of a surveyed monument in a surveyed area; or
 - A surveyed base line, or
 - Some prominent topographical feature acceptable to the minister in an unsurveyed area;
- State in the legend the true East/West and North/South co-ordinates of the well site relative to the initial reference point used in the survey (section corner monument, surveyed base line, etc.);
- State in the legend the decimal degrees latitude and longitude of all points plotted on the survey, in North American Datum 1983 (NAD83).

2.2 Additional Survey Plan Requirements

In addition to the above basic components, a survey plan must also include the following:

- One page overview displaying the well path in its entirety of all wellbore(s).
- Complete drawings of all quarter sections where the surface well origin and entire directionally-drilled or horizontal wellbores are located;
- For horizontal oil wells, display from the subject well the minimum inter-well set-back and the lease boundary set-back. The definitions of “inter-well set-back” and “lease boundary set-back” are in Directive PNG006. For further details on set-back requirements, refer to section 2 of Directive PNG006. This requirement does not apply to horizontal gas wells as they do not have minimum set-back requirements. Therefore, only the productive interval needs to be displayed.
- All applicable linear measurements, midsection bends, corner angles and the bearing of at least one adjacent boundary for the quarter sections referred to in the component above;
- Cartesian co-ordinates, referenced from the nearest section corner to the well origin location. These co-ordinates may not necessarily be tied to a survey monument;
- Boundary co-ordinates, referenced from the nearest boundaries of the section to the:
 - Well origin location;
 - Bottom-hole location of all wellbores associated with the subject well;
 - ICP/LP of horizontal wells;
 - Kickoff point of all subsequent wellbores of horizontal wells;
 - Target completion point of directionally-drilled wells.

Note:

- Wells located within partial sections are always referenced from the east side of the section.
- For wells where the surface well origin and bottom hole are not contained within the same quarter section, the surface and bottom hole co-ordinates must be referenced to their respective quarter section boundaries.
- Wells with an origin or bottom hole located within a road allowance must reference the boundaries of the adjacent legal subdivision (LSD) for land description. Wells on a road allowance running north-south must reference the LSD immediately to the east. Wells in an east-west road allowance must reference the LSD immediately to the north.
- Wells located on an LSD boundary must reference the lower LSD as the bottom hole or origin location.
- Rectangular coordinates, referenced from the well origin to the:
 - Bottom hole location of all wellbores associated with the subject well;
 - ICP/LP of all horizontal wells;
 - Kickoff point of all subsequent wellbores;
 - Target completion interval of all directionally-drilled wells.
- If applicable, a reference to the convergence angle in the legend. This is necessary in order to obtain local geodetic bearings referenced to the meridian through well origin.
- Residence sketch, showing all public facilities and dwellings within 1.5 km of the well origin and all other applicable set-back radii in relation to dwellings as required by Directive PNG004.

3. “As Drilled” Survey Plan Requirements

Once a well is drilled, an “as drilled” survey plan for all directionally-drilled and horizontal wells must be prepared in relation to a single well licence. These “as drilled” surveys must be drawn to emphasize the subject well licence and include:

- All the requirements listed above for survey plans;
- The completed interval for directionally-drilled wells;
- First and last perforation points for a monobore horizontal well; and
- The well CWI and wellbore(s) CWI.