WELLSITE DESIGN SPACING RECOMMENDATIONS

INDUSTRY RECOMMENDED PRACTICE (IRP)

VOLUME 20 - 2008

SANCTIONED FEBRUARY 2008
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Disclaimer

This IRP is a set of best practices and guidelines compiled by knowledgeable and experienced industry and government personnel. It is intended to provide the owner, operator, and contractors with advice regarding the specific topic. It was developed under the auspices of the Drilling and Completions Committee (DACC).

The recommendations set out in this IRP are meant to allow flexibility and must be used in conjunction with competent technical judgment. It remains the responsibility of the user of the IRP to judge its suitability for a particular application.

If there is any inconsistency or conflict between any of the recommended practices contained in the IRP and the applicable legislative requirement, the legislative requirement shall prevail.

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PREFACE

PURPOSE
The purpose of Industry Recommended Practice (IRP 20) *Wellsite Design Spacing Recommendations* is to provide guidelines on wellsite size and spacing. Specifically, this IRP aims to provide a set of best practices that will ensure consistent and legal lease size information for typical Drilling, Completions, and Production Facilities in Alberta, British Columbia, Saskatchewan, Manitoba, the North West Territories, and Nunavut. Another objective of the IRP is to ensure that consistent provincial spacing requirements are followed when a lease is being designed.

AUDIENCE
The intended audience of this document includes

- oil and gas company companies,
- construction, geology, geophysics, drilling, completions, and production facilities personnel,
- industry training personnel,
- survey companies, and
- regulatory bodies.

SCOPE AND LIMITATIONS
This document contains the following information about wellsite size and spacing:

- Well spacing templates or overlays
- Flare pits and flare stacks
- Interprovincial spacing requirements
- Lease construction spacing requirements

The WellSite Spacing Committee tried to ensure consistency between provinces with regard to wellsite size, while still maintaining the legal spacing required by the governing regulatory bodies. However, there are still discrepancies between provinces in some areas. Therefore, it is necessary to verify spacing requirements.
**METHOD OF DEVELOPMENT**

Industry Recommended Practices are developed with the involvement of both the upstream petroleum industry and relevant regulators. Enform serves as the custodian of all IRPs. IRPs provide a unique resource outside of direct regulatory intervention.

This is the first edition of IRP 20. The content was developed by the Wellsite Spacing Committee, a subcommittee of the Drilling and Completions Committee (DACC). The committee consisted of representatives from industry and various government agencies. In March 2003, the committee released the draft “Wellsite Spacing Recommendations” to industry and government for feedback. At that point, the IRP 20 Development Committee began the process of developing the recommendations into an Industry Recommended Practice.

**FURTHER DEVELOPMENTS**

Since the release of the “Wellsite Spacing Recommendations” in March 2003, Alberta Sustainable Resource Development (ASRD) has incorporated the Lease Spacing Information Checklist and the Spacing Overlays within the newly structured Environmental Field Reports (EFR). The Oil and Gas Commission (OGC) - British Columbia will be including the information for new well applications in their Well Authority (WA) forms in British Columbia by the summer of 2005.

In addition, Enform has updated changes to its Lease Development and Reclamation course to incorporate the “Wellsite Spacing Recommendations” into the course. Enform also added an Environmental Field Report (EFR) Workshop in Spring 2005, which addresses Wellsite Spacing Recommendations.

As of winter 2005, there are no changes to the wording in the regulations regarding flare pits and stacks. However, ASRD is in the process of drafting a discussion paper on proposed changes for legislative planning purposes. The Act and regulations are due for a major overhaul. ASRD will be submitting issues such as those provided by the Wellsite Spacing Committee to the legislative planning personnel to prepare a discussion paper. This paper will be circulated to all internal (government) and external (industry) stakeholders for input within the next year or two. The Wellsite Spacing Committee identified a need for more consistent wording regarding Flare Pit and Flare Stack regulations between ASRD and the ERCB regulations.
Revision History

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SANCTION

The following organizations have sanctioned this document:

Alberta Employment, Immigration and Industry
British Columbia Oil and Gas Commission
British Columbia Workers Compensation Board (WorkSafeBC)
Canadian Association of Oilwell Drilling Contractors
Canadian Association of Petroleum Producers
Energy Resources Conservation Board
International Intervention and Coil Tubing Association (Canada)
Manitoba Science, Technology, Energy and Mines
National Energy Board
Petroleum Services Association of Canada
Saskatchewan Energy and Resources

ACKNOWLEDGEMENTS

This IRP was developed by a subcommittee of the Drilling and Completions Committee (DACC), the IRP 20 Development Committee. This subcommittee was made up of knowledgeable and experienced industry and government personnel. The individuals listed below are recognized for their significant contributions to this IRP. Many others, who may not be listed below, also contributed to specific sections of the IRP.

IRP 20 Development Committee

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The IRP 20 Development Committee would like to thank the Wellsite Spacing Committee, a subcommittee of the Construction and Reclamation Group (CRG), for its time and commitment in the development of the draft “Wellsite Spacing Recommendations.”

**Wellsite Spacing Committee**

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The committee also appreciates the important contribution of the following companies in the preparation of the document and templates:

- Challenger Geomatics Ltd.
- Caltech Surveys Ltd.
20.1 **Well Spacing Templates**

The size of the working area of a wellsite is most often determined by the size of the drilling rig intended to drill the well. However, other factors that will have an influence include the accessories needed for the drilling rig such as trailers for various critical crews, specialty equipment, type of drill sump, and often, the size of the service rig and its associated equipment. The associated service rig equipment often includes multiple trucks for fracturing operations, nitrogen trucks, and other equipment.

This IRP stresses the importance of constructing a suitable-sized lease for the equipment required to drill, complete, work over, and produce the well. There is also a need to ensure proper access to mobilize the equipment. For example, the proper *vehicle turning radius* must be determined prior to the movement of equipment on the lease and on the access routes to the lease.

In addition to the working area, in many cases, additional space is required to meet the cut/fill requirements, and to maintain a slope that is suitable and stable for the type of soil used for the construction of the lease. For example, sandy soils will require a wider area for slope than soils with high clay content. Additional area may also be required for salvaged soil storage, snow storage, drainage ditches, storage for bush piles during high fire season, berms, and other considerations.

This IRP provides templates that reflect the appropriate working area size, considering such variations as rig sizes, service rigs, soils and terrain, and timing (e.g., snow cover). Because of the variance in drill rig and service rig set-ups, there may be many more variations that can be used. However, the IRP templates capture the majority of operations. See [20.6 Templates and Photographs](#) on page 6.

In addition, the IRP committee considered multiple well pads, which are often constructed for shallow or heavy oil operations. The lease requirements for corehole drilling usually associated with heavy oil programs were also considered. However, we concluded that these situations vary a great deal depending on the operator and the well layout conditions. As a result, they are not included in the IRP 20 templates. However, the same logic used in the development of this IRP can be applied to other, and all unique, lease configurations.
20.2  FLARE PITS AND STACKS

20.2.1  ALBERTA

In Alberta, the specifications required for a flare pit are as follows:

20.2.2  ASRD

The perimeter area around the flare pit has been cleared of all combustible debris within 30 metres (100 ft.). A clear bare mineral soil surface extending at least 8 metres (26 ft.) around the flare pit perimeter must be maintained. The flare pit is so constructed that burning debris cannot escape from the flare pit at any time. (Alberta Forest and Prairie Protection Act, Part II)

20.2.3  ERCB

The flare pit must be constructed to contain a minimum of 8 cubic metres (283 cu. ft.) of fluid. It must have side and back walls rising not less than 2 metres (7 ft.) above ground level. It must be constructed to resist the erosion of a high-pressure flow of gas or liquid. The flare pit must be located a minimum distance of 50 metres (164 ft.) from the well. (ERCB Oil and Gas Conservation Regulation 8.135(9))

20.2.4  BRITISH COLUMBIA

In British Columbia, the specifications required for flare pits and stacks are as follows:

20.2.5  OGC

The minimum recommended blackened area of 30 metres (100 ft.) in forested areas and 10 metres (33 ft.) in cultivated areas. A blackened area, free of vegetation and with a radius of at least 1.5 times the stack height, be maintained around the base of the flare stack or the end of a flare line to the following minimum distances: (i) 10 metres (33 ft.) in cultivated areas and (ii) 30 metres (100 ft.) in forested areas. (BC Oil and Gas Commission Regulation 62(n)

The complete Spacing Requirements for the Flare Pit or Stack are listed in Figure 10 and Figure 11 of this IRP.
20.3 INTERPROVINCIAL SPACING REQUIREMENTS

The size of a wellsite is heavily influenced by the various regulations that apply to the Oil and Gas Industry. To demonstrate the requirements of the various government agencies, a table was generated indicating the minimum spacing requirements as well as the associated regulation code that reflects the specific standard for each province (see Figure 12 on page 42). This table was revised in January 2005.

There is a discrepancy between government agencies in different provinces regarding the minimum spacing requirements for the same type of operation. The committee assumed that this discrepancy could be largely attributed to the conversion from imperial units to metric units: some provinces rounded up, while others rounded down. However, we were unable to standardize the distance or to resolve this issue. Therefore, this issue remains outstanding and should be reviewed and potentially resolved by CAPP.

The committee was also concerned about when, why, and how some of the specific rules were determined. After much discussion and limited success in discovering the history, we concluded that there must have been some support for the set distances. As a result, we did not change them. For example, there is a 25-metre (82-ft.) no-smoking rule as opposed to a 50-metre (164-ft.) flare rule. Discussions suggested that the flare has great potential for out-of-control burn and for radiant heat.

For further information, readers can refer to the ASRD ID 2002-01 Slope and Break Setback Guidelines.
20.4 **LEASE CONSTRUCTION SPACING CHECKLIST**

When wellsites are being built, another concern is that the constructed wellsite may be too large or too small for the intended operations. An oversized lease obviously does not have a substantial impact on the subsequent operations. However, it does mean additional and unnecessary construction expense, as well as the unnecessary disturbance of adjacent land. On the other hand, an undersized lease often results in illegal operations, which could lead to the entire operation being shut down by a Regulatory Agency. This situation also poses a potential safety issue for onsite personnel and a potential for equipment damage.

The Lease Construction Spacing Information Checklist (see Appendix A) is intended to provide the best possible wellsite construction specifications from a scout or survey stage. For optimal wellsite sizing and spacing, the following elements should be considered:

- LSD (Legal Subdivision) location
- Well type
- Well depth
- Future plans/Completions/Production
- Rig type
- Mud system
- Drilling waste disposal
- Flare requirements for drilling and production
- Tank spacing requirements
- Winter or summer drill
- Berm requirements
- Drainage ditches
- Brush storage
- Soil storage
- Construction method
- Wellsite working area and total area size

In addition, the templates provided in this document depict typical drilling or service rig and associated equipment footprint requirements for drilling and completions operations (see 20.6 Templates and Photographs on page 6).
20.5 CRITICAL CONCERNS

Various groups felt the following critical concerns should be included in IRP 20.

20.5.1 POSITIONING OF FLARE STACKS AND PITS

The position of the Flare Stacks and Pits is largely determined by the drilling rig, service rig, and production facility. This positioning is not addressed in this IRP.

20.5.2 TURNING RADIUS ON ACCESS ROADS

The design of a road (including the turning radius of corners and access onto the lease) should be considered in the overall design of the access to a lease during the scout or survey phase. The committee concluded that spacing issues beyond the lease area do not apply to this IRP.

20.5.3 SEWAGE (TANKS/TRENCHES/PITS)

Spacing requirements for sewage lagoons and pits are addressed under section 65 of Figure 12: Interprovincial Spacing Requirements on page 35 of this IRP.

In Alberta, sewage treatment and other issues are being addressed by the Private Sewage Disposal Systems Temporary Work Camp Sewage Treatment Standards Subcommittee. The mandate of the subcommittee is to advise the Safety Codes Council, and Plumbing Technical Council on the development of guidelines for sewage treatment at relocatable industrial accommodations (work camps) that are considered temporary in nature. Further discussion of spacing should be addressed within this subcommittee.

In British Columbia, the WCB, OGC, and Regional Health Board refer to the BC Reg. 427/83 Industrial Camps Health Regulations and BC Reg. 411/85 Sewage Disposal Regulation.

20.5.4 WELLSITE LIGHTING

Adequate lighting should be considered when designing a lease; however, it is not within the mandate of the IRP 20 committee to address this concern.

20.5.5 ESCAPE LINES

Escape lines for drilling should be considered in the design of a lease. The well spacing templates allow room to ensure adequate lease area for the inclusion of the lines, and safe access around the lines. The guy lines should be adequately marked for visibility and safety.

The following guidelines for determining the required distance as it relates to the height (depending upon the rig’s size) can be used: single – 30 feet (9 m), double – 62 feet (19m), small triple - 100 feet (31 m), and large triple – 120 feet (37 m).
20.6 Templates and Photographs

The following templates include a side profile of the lease, as well as templates for drilling operations, service rig or coil tubing operations, and typical production requirements. These templates may be used for wellsite drafting purposes. To illustrate key issues regarding lease size determination, photographs are included to help explain the situations encountered.

The following template areas have been developed:

- Deep oil operation ([Figures:1A], [Figures:1B], [Figures:1C], [Figures:1D])
- Deep gas operation ([Figure:2A], [Figure:2B], [Figure:2C], [Figure:2D])
- Shallow gas operation ([Figure:3A], [Figure:3B], [Figure:3C], [Figure:3D])
- Prairie shallow gas low impact operation ([Figure:4A], [Figure:4B], [Figure:4C], [Figure:4D])
- Forested area shallow gas low impact operation ([Figure:5A], [Figure:5B], [Figure:5C], [Figure:5D])
- Shallow gas coil tubing operation ([Figure:6A], [Figure:6B], [Figure:6C], [Figure:6D])
- Underbalanced operation ([Figure:7A], [Figure:7B], [Figure:7C], [Figure:7D])
- Shallow oil operation ([Figure:8A], [Figure:8B], [Figure:8C], [Figure:8D])
- Blank template ([Figure:9A], [Figure:9B])

The shallow oil and gas operation formats generally refer to single drill rigs. The single drill rigs typically drill to a 1,000-metre (3,281-ft.) depth or less, but some are capable of drilling deeper. The deep oil and gas operation format refers to all other rigs besides single drill rigs, including triple and double rigs. For most double rigs, although the drilling rig layout may justify a smaller lease layout, the well servicing requirements dictate the same spacing as the deep operation formats.

For unique spacing requirements, use of the blank templates is recommended. That is, they may be used for drafting site-specific situations that are different from the referenced schematics (e.g., multiwell pads, corehole programs)
Figure 1A: Deep Oil Vertical Profile: Typical Vertical Profile

Figure 1B: Deep Oil Rig Layout Working Area: Typical Rig Layout
Figure 1C: Deep Oil Completion Operation: Typical Service Well

Figure 1D: Deep Oil Production Facility: Typical Production Facility
Photo 1: Deep Oil Drilling Operation

Photo 2: Deep Oil Completion Operation
Figure 2A: Deep Gas Vertical Profile: Typical Vertical Profile

Figure 2B: Deep Gas Rig Layout Working Area: Typical Rig Layout
Photo 3: Deep Gas Drilling Operation

Photo 4: Deep Gas Completion Operation
Figure 3A: Shallow Gas Vertical Profile: Typical Vertical Profile

Figure 3B: Shallow Gas Rig Layout Working Area: Typical Rig Layout
Figure 3C: Shallow Gas Completion Operation: Typical Service Well

Figure 3D: Shallow Gas Production Facility: Typical Production Facility
Photo 5: Shallow Gas Drilling Operation

Photo 6: Shallow Gas Completion Operation
Figure 4A: Prairie Shallow Gas Low Impact Vertical Profile: Typical Vertical Profile

NOTES:
1.) Sloped lands will vary lease perimeter.
2.) Space requirements vary with equipment type.
3.) During equipment set up and tear down additional working space may be required.

Figure 4B: Prairie Shallow Gas Low Impact Rig Layout Working Area: Typical Rig Layout

NOTE:
Shape may vary but acreage will remain the same.
Figure 4C: Prairie Shallow Gas Low Impact Completion Operation: Typical Service Well

Figure 4D: Prairie Shallow Gas Low Impact Production Facility: Typical Production Facility
Photo 7: Prairie Shallow Gas Low Impact Drilling Operation
Figure 5A: Forested Area Shallow Gas Low Impact Vertical Profile: Typical Vertical Profile

![Diagram of Forested Area Shallow Gas Low Impact Vertical Profile](image)

**NOTES:**
1. Sloped lands will vary lease perimeter.
2. Space requirements vary with equipment type.
3. During equipment set up and tear down additional working space may be required.

Figure 5B: Forested Area Shallow Gas Low Impact Rig Layout Working Area: Typical Rig Layout

![Diagram of Forested Area Shallow Gas Low Impact Rig Layout](image)

**NOTE:**
Shape may vary but coreage will remain the same.
Figure 5C: Forested Area Shallow Gas Low Impact Completion Operation: Typical Service Well

Figure 5D: Forested Area Shallow Gas Low Impact Production Facility: Typical Production Facility
Figure 6A: Shallow Gas Coil Tubing Vertical Profile: Typical Vertical Profile

Figure 6B: Shallow Gas Coil Tubing Rig Layout Working Area: Typical Rig Layout
Figure 6C: Shallow Gas Coil Tubing Completion Operation: Typical Service Well

Figure 6D: Shallow Gas Coil Tubing Production Facility: Typical Production Facility
Photo 8: Shallow Gas Coil Tubing Drilling Operation

Photo 9: Deep Gas Coil Tubing Completion Operation
Photo 10: Deep Gas Coil Tubing Completion Operations

Photo 11: Shallow Gas Coil Tubing Completion Operation
Photo 12: Shallow Gas Coil Tubing Completion Operation
Figure 7A: Underbalanced Vertical Profile: Typical Vertical Profile

Figure 7B: Underbalanced Rig Layout Working Area: Typical Rig Layout
Figure 7C: Underbalanced Completion Operations: Typical Service Well

Figure 7D: Underbalanced Production Facility: Typical Production Facility
Photo 13: Underbalanced Completion
Figure 8A: Shallow Oil Vertical Profile: Typical Vertical Profile

NOTES:
1. Drawings do not account for soil storage.
2. Sloped lands will vary lease perimeter.
3. Space requirements vary with equipment type.
4. During equipment set up and tear down additional working space may be required.

Figure 8B: Shallow Oil Rig Layout Working Area: Typical Rig Layout

NOTE:
Shape may vary but acreage will remain the same.

EXTRA AREA REQUIRED FOR WELLS IN BRITISH COLUMBIA

SUMP & SPOIL FILE AREA (IF REQUIRED)
NOTE: SIZE VARIES BY DEPTH
Figure 8C: Shallow Oil Completion Operation: Typical Service Well

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Photo 15: Corehole Single Drilling Rig
Photo 16: Adding Wells to Existing Pads

Photo 17: Many Wells on a Pad Requiring Downhole Avoidance
Photo 18: Screwjacks Instead of Pumpjacks

Photo 19: Vertical Oil Well with Slant Water Wells with Production Facilities
Photo 20: Vertical Oil Well with Slant Oil and Water Wells

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Photo 22: Stockpiling to Drill Through the Summer at a Remote Site

Photo 23: Sag D
Photo 24: Rig Moves

Photo 25: Rig Moves
Figure 10: Sketch Plan: Typical Alberta Flare Pit

**Typical Alberta Flare Pit**

**Scale: 1:500**

**Forest Protection Regulations**
- a) The area around the flare pit has been cleared of all combustible debris within 30 metres.
- b) A clear bare mineral soil surface extending at least 8 metres around the flare pit is maintained.
- c) The flare pit is so constructed that burning debris cannot escape from the flare pit at any time.

**EUB Regulations**
- If a flare pit is used, the following requirements apply:
  - a) Be constructed to contain a minimum of 8km³ of fluid
  - b) Have side and back walls rising not less than 2m above ground level
  - c) Be constructed to resist the erosion of a high pressure flow of gas or liquid
  - d) Be located a minimum distance of 50m from the well

[Diagram of a typical Alberta flare pit with various labeled areas such as area cleared of trees & shrubs, mineral soil, and a cross-section view showing depth and dimensions.]
Figure 11: Sketch Plan: Typical British Columbia Flare Pit

SHOWING
TYPICAL BRITISH COLUMBIA FLARE PIT
SCALE: 1:500

SPECIFICATIONS
THE EARTHEEN PIT REFERRED TO IN SUBSECTION (1) (a) MUST
b) BE EXCAVATED TO A DEPTH OF NO LESS
THAN 2 METRES,
C) HAVE SIDE AND BACK WALLS RISING NO
LESS THAN 2 METRES ABOVE GROUND LEVEL.
D) BE CONSTRUCTED TO RESIST THE EROSION
OF A HIGH PRESSURE FLOW OF GAS OR LIQUID.
E) OUTLET LINE MUST TERMINATE IN AN EARTHEEN
PIT, OR FLARE PIT, 50 METRES FROM WELL.

PLAN VIEW

CROSS-SECTION VIEW
NOT TO SCALE
**Figure 12: Interprovincial Spacing Requirements**

DISCLAIMER: The intent of this figure is to guide the construction lease professional relative to distances and relevant regulatory. Consultation with regulatory authority is encouraged.

Note: In order for the hyperlinks to be work, the following table is meant to be viewed with a web enabled PC. Figure 12.1 is made available for offline users to search for referenced. Hyperlink references were valid at the time of creation.

<table>
<thead>
<tr>
<th>Required distance from wellhead to</th>
<th>Alberta (ERCB/ SRD/ EI/ Crown)</th>
<th>British Columbia (BC OGC AND W CB)</th>
<th>Saskatchewan (SIR- SK Industry &amp; Resources)</th>
<th>National Energy Board (NEB)</th>
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</thead>
<tbody>
<tr>
<td>1. Lighted aerodrome</td>
<td>5 km OGCR 2.090</td>
<td>* DPR 5(2) repealed</td>
<td>*</td>
<td>5 km COGDR 85(3)</td>
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<td>2. Unlighted aerodrome</td>
<td>1.6 km OGCR 2.090</td>
<td>* DPR 5(2) repealed</td>
<td>5 km</td>
<td>COGDR 85(3)</td>
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<tr>
<td>3. Roads (surveyed or road allowances)</td>
<td>40 m OGCR 2.110</td>
<td>Planning 6.2.2</td>
<td>40 m OGCR 19(1) 100 m COGDR 85(1)</td>
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<td>4. Surface improvement</td>
<td>100 m OGCR 2.110</td>
<td>80 m/100 m</td>
<td>75 m OGCR 19(1)</td>
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<tr>
<td>5. Coal mine (active)</td>
<td>3 km OGCR 6.140 - 6.190</td>
<td>3 km DPR 6</td>
<td>All mines are restricted. A special application is required.</td>
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<td>6. Coal mine (abandoned)</td>
<td>400 m OGCR 6.140 - 6.190</td>
<td>* DPR 6</td>
<td>All mines need special approval by chief COGDR 85(4)a.b.</td>
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<td>7. Flare to production/rig tank</td>
<td>50 m OGCR 8.080(5) &amp; Schedule 11</td>
<td>50 m WorkSafeBC OHS 23.7(2)</td>
<td>50 m OGCR 60(1)e</td>
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<td>25 m</td>
<td>50 m COGDR 85(3)</td>
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<td>8. Flare</td>
<td>50 m</td>
<td>OGC 8.135(9)</td>
<td>50 m DPR 62(c)</td>
<td>OGC 72(4)</td>
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<td></td>
<td>WorkSafeBC OHS 23.7(2)</td>
<td>40 m/H₂S</td>
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<td>9. Flare tank - Surface casing waiver</td>
<td>35 Direction 8</td>
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<td>DPR 62(a)</td>
<td>COGDR 112(3)a</td>
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<td>Isolation of Ignition sources required</td>
<td>WorksafeBC OHS 23.44(1)</td>
<td>112(4)i</td>
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<td>10. Flare tank</td>
<td>50 m/25 m</td>
<td>ID 91-3</td>
<td>50 m DPR 62(f)</td>
<td>OGC 72(4)</td>
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<td></td>
<td>25 m/25 m OGC 04-18</td>
<td>40 m/H₂S</td>
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<td>23 m/25 m OGC 53(3)</td>
<td>40m/40m</td>
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<td>11. Boiler</td>
<td>25 m</td>
<td>OGC 8.090(4)</td>
<td>25 m DPR 62(f)</td>
<td>OGC 8(4)</td>
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<td>12. Wellsite trailer</td>
<td>25 m</td>
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<td>25 m OGC 04-18</td>
<td>OGC 8(4)</td>
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<td>23 m/25 m OGC 53(3)</td>
<td>COGDR 85(1)</td>
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<td>13. Permanent building</td>
<td>100 m</td>
<td>OGC 2.110(1)</td>
<td>80 m DPR 5(1)b</td>
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<td>23 m/25 m OGC 53(3)</td>
<td>25 m COGDR 85(1)</td>
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<td>14. Public facility</td>
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<td>15. Military installation</td>
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<td>OGC 53(2)</td>
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<td>100 m OGC 19(2)</td>
<td>OGC 53(2)</td>
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<td>16. Powerline - Right of way</td>
<td>100 m</td>
<td>OGC 2.110(1)</td>
<td>80 m DPR 5(1)</td>
<td>100 m OGC 53(2)</td>
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<td>17. Railway - Right of way</td>
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<td>80 m DPR 5(1)</td>
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<td>18. Pipeline - Right of way</td>
<td>100 m</td>
<td>OGC 2.110(1)</td>
<td>80 m DPR 5(1)</td>
<td>100 m OGC 53(2)</td>
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<tr>
<td>19. School/Church</td>
<td>100 m</td>
<td>OGC 2.110(1)</td>
<td>80 m DPR 7(1)c</td>
<td>100 m OGC 53(2)</td>
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<td>20. Water well</td>
<td>No distance</td>
<td>OGC 8.120(2)</td>
<td>No distance</td>
<td>OGC 85(1)</td>
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<td>21. Water bodies (normal high water mark)</td>
<td>100 m OGC 2.120(2)</td>
<td>100 m DPR 5(3)</td>
<td>100 m OGC 19(2)</td>
<td>COGDR 85(1)</td>
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<td>22. Crude oil storage tanks</td>
<td>50 m</td>
<td>OGC 8.090(3)</td>
<td>50 m DPR 62(h)</td>
<td>OGC 51(2)</td>
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<td></td>
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<td>45 m/50 m OGC 51(2)</td>
<td>50 m Installation 8(3)(2)</td>
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<td>Required distance from wellhead to</td>
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<td>23. High vapor pressure hydrocarbon storage</td>
<td>50 m <strong>OGCR 8.110(2)b</strong></td>
<td>50 m <strong>DPR 62(a)</strong> Risk assessed &amp; safe zone determined</td>
<td>25 m <strong>OGCR 59(1)</strong></td>
<td>50 m <strong>Installation 8(2)</strong></td>
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<td>24. Diesel engines without air shut-off</td>
<td>25 m <strong>OGCR 8.100(1)</strong></td>
<td>25 m <strong>DPR 60(2)</strong> WorksafeBC OHS 23.8 (1)(b)</td>
<td>23 m/25 m <strong>OGCR 58(1.1)b</strong></td>
<td>25 m <strong>COGIR 8(8)</strong></td>
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<tr>
<td>25. Internal combustion motor exhaust</td>
<td>6 m <strong>OGCR 8.090(9)</strong></td>
<td>25 m <strong>DPR 60(2)</strong> BC Electrical code &amp; Drilling &amp; production regs define distance</td>
<td>23 m/25 m <strong>OGCR 53(5)</strong></td>
<td>6 m <strong>COGIR 8(8)b</strong></td>
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<td>26. Fuel storage tanks</td>
<td>25 m <strong>OGCR 8.120</strong></td>
<td>25 m <strong>DPR 60(5)</strong></td>
<td>25 m <strong>COGDR 136(c)</strong></td>
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<td>27. Smoking</td>
<td>25 m <strong>OGCR 8.120</strong></td>
<td>25 m <strong>DPR 59</strong> WorkSafeBC OHS 23.7 (1)</td>
<td>25 m <strong>COGDR 158(1)a</strong></td>
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<td>28. Pressure vessel, treater, dehy, flame type equipment</td>
<td>25 m <strong>OGCR 8.090(4)</strong></td>
<td>25 m <strong>DPR 62(e)</strong> WorkSafeBC OHS 23.67 (1)</td>
<td>23 m/25 m <strong>OGCR 53(2)</strong></td>
<td>25 m <strong>COGIR 8(4)</strong></td>
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<td>29. Internal combustion engine</td>
<td>25 m <strong>OGCR 8.090(9)</strong></td>
<td>25 m <strong>DPR 60(1)</strong> WorkSafeBC OHS 23.8(1)(b)</td>
<td>6 m</td>
<td>6 m <strong>COGIR 8(8)(b)</strong></td>
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<td>Required distance from wellhead to</td>
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<td>Regulation</td>
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<td>30.  Class III (ws) accumulator system</td>
<td>25 m</td>
<td>OGCR 8.145(6)</td>
<td>25 m</td>
<td>DPR 26(6)(a)</td>
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<td>31.  Class I &amp; II (ws) controls (remote)</td>
<td>7 m</td>
<td>OGCR 8.145(5)</td>
<td>5 m</td>
<td>DPR 26(5)(b)</td>
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<td>32.  Drilling remote accumulator and controls</td>
<td>15 m</td>
<td>Directive 36 Sec 6.1</td>
<td>15 m</td>
<td>DPR 22(1)</td>
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<td>33.  Divert lines on oil sands evaluation wells</td>
<td>15 m</td>
<td>Directive 36 Sec 21</td>
<td>No distances</td>
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<td>34.  Well to drill choke manifold</td>
<td>20 m</td>
<td>DPR 21(2)(a)</td>
<td>No distances</td>
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<td>35.  Setback HVP pipelines and public institutions</td>
<td>200 m</td>
<td>GB 99.4</td>
<td>CSA Z662</td>
<td>CSA Z662</td>
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<td>36.  Electrical devices (refer to Canadian Electrical Code)</td>
<td>25 m</td>
<td>Directive 36</td>
<td>25 m</td>
<td>DPR 62(e)</td>
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<td>37.  Rubbish incinerator from well</td>
<td>50 m</td>
<td>OGCR 8.090(2)</td>
<td>50 m</td>
<td>DPR 62(a)</td>
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<td>38.  Municipal setback requirements</td>
<td>100 m</td>
<td>OGCR 2.110(1)</td>
<td>Min. 500 m Sec. 11 6.1.1</td>
<td>100 m</td>
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<tr>
<td>39.  Level 2 sour well pipeline or facility to permanent dwelling, unrestricted country development</td>
<td>100 m</td>
<td>Directive 56 Sec 7.10.12</td>
<td>100 m</td>
<td>O&amp;G Handbook Sec 11</td>
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<tr>
<td>40.  Level 2 - Public facility or urban centre</td>
<td>500 m</td>
<td>Directive 56 Sec 7.10.12</td>
<td>Min. 500 m O&amp;G Handbook Sec 11</td>
<td>100 m</td>
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<td>41.  Level 3 sour well to permanent dwelling</td>
<td>100 m</td>
<td>Directive 56 Sec 7.10.12</td>
<td>100 m</td>
<td>O&amp;G Handbook Sec 11</td>
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<td>42.  Level 3 - Unrestricted country development</td>
<td>500 m</td>
<td>Directive 56 Sec 7.10.12</td>
<td>500 m</td>
<td>O&amp;G Handbook Sec 11</td>
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<td>43. Level 3 - Public facility or urban centre</td>
<td>1,500 m</td>
<td>Directive 56 Sec 7.10.12</td>
<td>1,500 m</td>
<td>O&amp;G Handbook Sec 11</td>
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<td>44. Level 4 sour well, pipeline or facility to permanent dwelling</td>
<td>100 m</td>
<td>Directive 56 Sec 7.10.12</td>
<td>Not less than Level 3</td>
<td>O&amp;G Handbook Sec 11</td>
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<td>45. Minimum setback will be approved by EUB, but not less than level 3</td>
<td>Directive 56 Sec 7.10.12</td>
<td>O&amp;G Handbook Sec 11</td>
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<td>N/A</td>
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<td>46. Abandoned well to permanent structure</td>
<td>5 m</td>
<td>Advisory land use document</td>
<td>Nothing similar in BC</td>
<td>In a discussion with Mr. Bruce Simard from PRRD, he mentioned that something similar may be considered, but the implementation time is unknown.</td>
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<td>47. Abandoned well to underground utilities</td>
<td>3 m</td>
<td>Advisory land use document</td>
<td>Nothing similar in BC</td>
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<td><strong>Miscellaneous Spacing</strong></td>
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<td>48. Flare to surface improvement</td>
<td>100 m</td>
<td>OGCR 8.080(3)</td>
<td>80 m</td>
<td>DPR 62(c)</td>
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<td>49. Flare to process equipment</td>
<td>25 m</td>
<td>OGCR 8.080(5)</td>
<td>25 m</td>
<td>DPR 62(c)</td>
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<td>50. Flare to oil storage tanks</td>
<td>50 m</td>
<td>OGCR 8.080(5)</td>
<td>50 m</td>
<td>DPR 62(c)</td>
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<td>51. Flame type equipment to oil storage tanks</td>
<td>25 m</td>
<td>OGCR 8.090(4)</td>
<td>25 m</td>
<td>DPR 62(e)</td>
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<td>52. Tank dike to surface improvement</td>
<td>60 m</td>
<td>OGCR 8.030(4)</td>
<td>60 m</td>
<td>DPR 64</td>
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<td>53. Glycol dehydrator to permanent residence</td>
<td>750 m</td>
<td>IL 2001-7</td>
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<td><strong>Workplace Health &amp; Safety (Alberta)</strong></td>
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<td>54. Motor vehicles to well bore</td>
<td>25 m</td>
<td>218(1)(c)</td>
<td>25 m</td>
<td>DPR 62</td>
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<td>55. Fuel storage, except diesel and the fuel in the tanks of operating equipment</td>
<td>20 m</td>
<td>199</td>
<td>25 m</td>
<td>DPR 60(5)</td>
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<td>Public Highways Development Act</td>
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<td>56. Primary highway, all three-digit highways</td>
<td>100 m**</td>
<td>AB Transport</td>
<td>80 m</td>
<td>DPR 5(1)</td>
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<td>Forest and Prairie Protection Act</td>
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<td>57. Flare pit/Tank fire guard width</td>
<td>8 m</td>
<td>Sec. 14</td>
<td>No distances</td>
<td>DPR 62(n)</td>
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<td>58. Flare pit/Tank debris-free clearing</td>
<td>30 m</td>
<td>Sec. 14</td>
<td>No distances</td>
<td>DPR 62(n)</td>
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<td>59. Sour gas (permanent) flare stack debris-free clearing</td>
<td>2.5 times height</td>
<td>Sec. 15</td>
<td>No distances</td>
<td>DPR 62(n)</td>
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<td>60. Wellsite edge to water body/ watercourse (high water mark)</td>
<td>100 m</td>
<td>Public Lands Handbook</td>
<td>100 m</td>
<td>DPR 5(3)</td>
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<td>61. Boring (geo-technical) to water body/watercourse (high water mark)</td>
<td>45 m</td>
<td>PLD Directive 2002</td>
<td>100 m</td>
<td>DPR 5(3)</td>
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<td>Fish and Wildlife</td>
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<td>62. Wellsite edge to river breaks</td>
<td>100 m</td>
<td>Public Lands Handbook</td>
<td>100 m</td>
<td>DPR 5(3)*</td>
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<td>Required distance from wellhead to</td>
<td>Alberta (ERCB/ SRD/ EII/ Crown)</td>
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<td>Distance</td>
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<td>Alberta Electrical &amp; Communication</td>
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<td>63. Spacing - Horizontal clearance between overhead powerline and oil or gas well bore</td>
<td>40 m</td>
<td>II(4)(5)15</td>
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<td>Alberta Sewage Systems Standard of Practice 1999</td>
<td>Note: At time of publication this document was not available on-line</td>
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<td>64. Sump pit (lagoon) to water well</td>
<td>90 m</td>
<td>11.2.2</td>
<td>These distances are regulated by the Ministry of Health in BC.</td>
<td>No distances</td>
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<td>65. Sump pit (lagoon) to building/trailer</td>
<td>10 m</td>
<td>MA/AENVS</td>
<td>The Sewerage Regulations are found at the following web page</td>
<td>No distances</td>
</tr>
<tr>
<td>66. Sump pit (lagoon) to creek</td>
<td>90 m</td>
<td>11.2.2</td>
<td></td>
<td>No distances</td>
</tr>
<tr>
<td>67. Septic tank/Treatment plant to building/trailer</td>
<td>1 m</td>
<td>5.2.1</td>
<td>Health Act -- SEWERAGE SYSTEM REGULATION</td>
<td>No distances</td>
</tr>
<tr>
<td>68. Septic tank/Treatment plant to water well</td>
<td>9 m</td>
<td>5.2.1</td>
<td>The Standard Practice manual for Sewerage Installations is found at BCOSSA Resources</td>
<td>No distances</td>
</tr>
<tr>
<td>69. Discharge point to watercourse</td>
<td>90 m</td>
<td>3.2.2</td>
<td></td>
<td>No distances</td>
</tr>
<tr>
<td>70. Discharge point to other surface water</td>
<td>45 m</td>
<td>10.2.1</td>
<td>BCOSSA Resources</td>
<td>No distances</td>
</tr>
<tr>
<td>71. Discharge point to water well</td>
<td>45 m</td>
<td>10.2.1</td>
<td>Only authorized Technicians can do these installations</td>
<td>No distances</td>
</tr>
<tr>
<td>72. Discharge point to building</td>
<td>45 m</td>
<td>10.2.1</td>
<td></td>
<td>No distances</td>
</tr>
</tbody>
</table>
*Additional setback restrictions may be dictated by other regulatory authorities
*H2S release rates may increase setback spacing requirements
*Refer to specific regulations for exceptions.
**Authorization required within 100 m
1In Drilling and Production Regulation, it is not specified if this distance is referring to sweet or sour gas.
2Variance if it is your own road

**Additional Notes:**
BC OHS 4.1 - General Conditions and OHS 23.5 (1-3) would allow enforcement of other legislation relating to spacing requirements if it is viewed that the health and safety of workers at the jobsite is being, or could be, negatively impacted by the layout of the well site
## Figure 12.1: WebLink Locations

The following table lists the website addresses that are referenced in the Spacing Requirements Table.

<table>
<thead>
<tr>
<th>Alberta</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OGCR - ALBERTA REGULATION 151/71</td>
<td><a href="http://www.ercb.ca/docs/requirements/actsregs/ogc_reg_151_71_ogcr.pdf">http://www.ercb.ca/docs/requirements/actsregs/ogc_reg_151_71_ogcr.pdf</a></td>
</tr>
<tr>
<td>Oil and Gas Conservation Act</td>
<td></td>
</tr>
<tr>
<td>OIL AND GAS CONSERVATION REGULATIONS</td>
<td></td>
</tr>
<tr>
<td>ID 91-03</td>
<td><a href="http://www.eub.ca/docs/ils/ids/pdf/id91-03.pdf">http://www.eub.ca/docs/ils/ids/pdf/id91-03.pdf</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BC</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DRILLING AND PRODUCTION REGULATION</td>
<td></td>
</tr>
<tr>
<td>WorkSafe BC OHS Regulation</td>
<td><a href="http://www2.worksafebc.com/Publications/OHSRegulation/Home.asp">http://www2.worksafebc.com/Publications/OHSRegulation/Home.asp</a></td>
</tr>
<tr>
<td>Information Letter #OGC 04-18</td>
<td><a href="https://www.ogc.gov.bc.ca/documents/informationletters/OGC%202004-18%20Setback%20Distance%20for%20Wellsite%20Trailers.pdf">https://www.ogc.gov.bc.ca/documents/informationletters/OGC%202004-18%20Setback%20Distance%20for%20Wellsite%20Trailers.pdf</a></td>
</tr>
<tr>
<td>BCOSSA Resources</td>
<td><a href="http://www.bcossa.com/documents.html">http://www.bcossa.com/documents.html</a></td>
</tr>
<tr>
<td>------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>National Energy Board</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX A: LEASE CONSTRUCTION SPACING INFORMATION CHECKLIST

1 LOCATION: 
   ___ / LSD ___ SEC ___ TWP ___ RGE ___ W M

2 WELL TYPE 
   □ GAS  □ OIL  □ SWEET  □ SOUR

3 WELL DEPTH: ___ m

4 FUTURE PLANS/ TYPE OF COMPLETIONS/ PRODUCTION: 
   SKETCH #: ___

   RIG TYPE: 
   □ Single  □ Double  □ Triple  □ Coiled Tubing  □ Underbalanced Rig

5 ESCAPE LINES: 
   □ Single 30’  □ Double 62’  □ Small Triple 100’  □ Large Triple 120’

6 MUD SYSTEM: 
   □ GEL CHEM  □ HYDROCARBON BASED  □ OTHER _______________________________

7 DRILLING WASTE DISPOSAL: 
   □ OFFSITE SUMP  □ ONSITE SUMP  □ OTHER _______________________________

   EXPLAIN: __________________________________________________________________

   SUMP AREA REQUIRED SUMP/SPOIL PILE ___ m X ___ m = ___

8 FLARE REQUIREMENTS FOR DRILLING AND PRODUCTION: 

   □ 50m  □ 35m  □ 25m  □ FLARE PIT
   □ FLARE TANK  □ FLARE STACK

   POSITION OF FLARE PIT/TANK (I.E. SW CORNER) _______________________________

9 FLARE TANK SPACING REQUIREMENT: 
   □ 50m  □ 25m (Heavy Oil)

10 WINTER DRILL: 

   □ YES  □ NO  
   If summer, 30m tree-free clearing required around flare
   Maintain 8 m bare mineral soil around the flare pit.

11 BERM REQUIREMENTS: 
   □ YES  □ NO  
   Width Required: ___ m

12 DRAINAGE DITCH: 
   □ YES  □ NO  
   Width Required: ___ m

13 IS BRUSH STORAGE REQUIRED: 
   □ YES  □ NO

   EXPLAIN (I.E. FIRE HAZARD) __________________________________________________________________

14 SOIL STORAGE: 
   STRIPPING REQUIRED: 
   □ YES  □ NO  
   Width Required: ___ m

   □ TOPSOIL  □ SUBSOIL

15 CONSTRUCTION METHOD: 
   □ MINIMAL DISTURBANCE  □ PAD  □ CUT/FILL

   SLOPE SPACING REQUIREMENTS: (CUT SIDE) 
   □ 1:1  □ 2:1  □ 3:1  □ 4:1  Width Required: ___ m

   SLOPE SPACING REQUIREMENTS: (FILL SIDE) 
   □ 1:1  □ 2:1  □ 3:1  □ 4:1  Width Required: ___ m

   EXPLAIN (I.E. SOIL TYPE) __________________________________________________________________

16 WELL SITE SIZE: Total Area ___ m X ___ m = ___

   Working Area ___ m X ___ m = ___

17 ADDITIONAL NOTES: ___________________________________________________________________

________________________________________________________________________

March 2007