

Guideline

REGULATORY REQUIREMENTS FOR FINAL WELL REPORTS ONSHORE TO OFFSHORE WELLS

1. Introduction

The requirement to prepare and submit a Final Well Report is specified by subsection 201(1) of the Newfoundland Offshore Petroleum Drilling Regulations, 28 January, 1993 (SOR/93-23), amended 21 February, 1995 (SOR/95-101) and subsection 151(1) of the Petroleum Drilling Regulations, (RSN 1150/96).

The purpose of this document is to provide details regarding the content and preparation of Final Well Reports for "onshore-to-offshore" exploratory wells.

Throughout this document, the applicable sections (§) of the "offshore" drilling regulations are provided in parenthesis for ease of reference. Similar requirements are specified in the "onshore" Petroleum Drilling Regulations, (RSN 1150/96).

Three (3) print copies and three (3) digital copies of the Final Well Report must be submitted within ninety (90) days of the rig release date to the:

Newfoundland and Labrador Department of Natural Resources
Energy Branch
Petroleum Development Section
P.O. Box 8700
4th Floor, Natural Resources Building
50 Elizabeth Avenue
St. John's, NF
A1B 4J6

2. General Format

Final well reports should be prepared on letter-sized paper, suitably bound. In addition to print, the final well report is required in pdf format with tabular data submitted in ASCII or Excel format. All logs are required to be submitted in print as well as the digital data, which is required in DLIS, LAS and Image file format. Measurements should be given using the S.I. system unless otherwise approved. Dates and times should be given as year/month/day/hour. Each of the subjects listed in this document should be addressed in the report. **If information pertaining to a particular heading does not exist, will not become available, or, is not applicable to the well, a statement to this effect should be made.**

2.1 Title Page

Full name of the well, name of the operator's representative responsible for the report and the date that the report was prepared.

2.2 Introduction

A summary of approximately 200 words giving the nature and purpose of the well, name of the operator and drilling contractor, name and type of drilling rig, a summary of operations at the well site, the Formations penetrated, the results of any formation flow testing and the current status of the well i.e., suspended, completed or abandoned.

2.3 Map

A single page map showing the location of the well.

2.4 General Information

Include well name, Exploration Licence/Permit, the location of the well (including UTM co-ordinates for Zone 21) and a description of the surveying system used to determine the final well position.

2.5 Difficulties and Delays

Provide a summary of any problems encountered and the steps taken to overcome the problems. An estimate of the total time delay for each problem encountered should be provided.

3. Drilling Operations

The following data should be provided:

- 3.1 **Elevation** - elevation above mean sea level of natural ground level, casing flange and kelly bushing (or rotary table or rig floor where applicable).
- 3.2 **Total Depth** - specify drilled depth, logged depth and, if applicable, plugged-back depth.
- 3.3 **Spud Date** - date and hour spudded.
- 3.4 **Date Drilling Completed** - date and hour total depth of the well was reached.
- 3.5 **Rig Release Date** - date and hour the drilling rig last conducted operations on the well.
- 3.6 **Well Status** - suspended, abandoned or completed.
- 3.7 **Hole Sizes and Depths** - bit diameters and total depth drilled for each section of hole.
- 3.8 **Bit Records** - as per IADC/CAODC codes and format.

- 3.9 Casing and Cementing Record** - for each casing string, indicate size, weight, grade, number of joints, type of thread/connection, depth of shoe and make and type of casing hangers and seals. With respect to cementing details, indicate location of centralizers and scratchers, sacks of cement, type and amount of cement additives, the intervals cemented or top of cement behind each casing string and the basis for the estimated top of cement, i.e., calculations or cement bond log.
- 3.10 Sidetracked Hole** - describe any sidetracked hole, the reason for sidetracking, the method used and the effectiveness of the operation.
- 3.11 Drilling Fluid** - type of drilling fluid and summary of the properties maintained for each phase of the hole.
- 3.12 Fluid Disposal** - Details of any fluid disposal downhole, including volumes, rates, pressures, dates, nature of the fluid.
- 3.13 Fishing Operations** - details of any fishing operations, a description of any fish left in the hole and a statement regarding the probable cause of the problem.
- 3.14 Well Kicks** - details of any kicks encountered including volumes, pressures and a summary of associated well control operations.
- 3.15 Formation Leak-Off Tests** - details of each leak-off test including depth, mud density, applied surface pressure, mud weight equivalent and last casing depth. Copies of the leak-off test reports and graphs should be included.
- 3.16 Time Distribution** - a table of the hourly activity as recorded on the IADC/CAODC Daily Drilling Reports from the hour the well was spudded to the time the rig was released, showing the total hours for each type of operation.
- 3.17 Deviation Plot** - a plan view showing the location of the well bore with respect to the well head. The bottom hole co-ordinates, referenced to surface location, should also be provided.
- 3.18 Abandonment/Suspension Plugs** - type and depth of plugs including, for cement plugs, the type and amount of cement and additives. The nature of fluids remaining between plugs should also be provided.
- 3.19 Well Schematic** - showing casing, tubing, plugs and any other equipment installed in or on the well.
- 3.20 Fluid Samples** - a listing of any fluid samples collected including depths, type, number and volume, tests conducted and final disposition.
- 3.21 Composite Well Record** - a chart summarizing all relevant drilling and geological data on a suitable depth scale, including the following information:
- > time-depth plot denoting all major operational activities;
 - > major lithological units;
 - > rates of penetration;
 - > gas detection curves;
 - > hydrocarbon shows;
 - > cores;
 - > bit record;
 - > casing points;
 - > test intervals; and
 - > plugs.

NOTE: This record may be provided as an appendix.

4. Geology

The following data should be provided:

- 4.1 **Drill Cuttings** - frequency of sampling, any intervals for which samples were not obtained, distribution of samples and location of stored suites of cuttings.
- 4.2 **Cores** - for conventional cores, provide, in tabular form, core number, interval and recovery. For sidewall cores, indicate depths sampled and portions recovered. If tested to destruction, indicate results - use of an appendix or separate report is also acceptable. The location of storage for any remaining core should also be provided.
- 4.3 **Lithology** - lithological description of all cuttings and cores, including any visual shows of hydrocarbons, as seen under either conventional or fluorescent light.
- 4.4 **Stratigraphic Column** - table of formations or biostratigraphic units showing name, age, lithology, palaeontology, depth, sub-sea elevation and thickness of each stratigraphic unit penetrated.
- 4.5 **Biostratigraphic Data** - chart summarizing the biostratigraphic data (palynology, micropalaeontology) with reference to the lithostratigraphic picks in the well.

5.0 Well Evaluation

The following data should be provided:

- 5.1 **Downhole Logs** - list of logs run including date, run number, type, interval and service company. Copies of consolidated logs, if not already provided, should be included as an appendix. Logs are required to be submitted in DLIS, LAS and Image file format.
- 5.2 **Other Logs** - list of other logs, such as computed dipmeter, deviation and drift records and records from gas detection and mud logs. Copies of these logs may also be included as an appendix. Logs are required to be submitted in DLIS, LAS and Image file format.
- 5.3 **Synthetic Seismograms** - processed to match the operator's recent seismic data in the vicinity of the well and displayed on an equivalent time scale - may also be provided as an appendix.
- 5.4 **Vertical Seismic Profiles** - final report of any vertical seismic profile surveys, which includes the information required for velocity surveys and a display of the profile on a time scale corresponding to the time scale of the operator's seismic data near the well. This report may be provided as an appendix.
- 5.5 **Velocity Surveys** - final report of any velocity surveys (check-shot surveys) which includes summary tables of true vertical seismic time relative to the datum of the seismic data, interval velocity, average velocity, root mean square velocity and reflection coefficient sequence. This report may be provided as an appendix and is required only if vertical seismic profiles are not available for the well.
- 5.6 **Formation Stimulation** - date(s), intervals, method, contractor, types and quantities of stimulants and the results of any formation stimulation. This report may be provided as an appendix.

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5.7 Formation Flow Tests - date(s), test number, intervals, the method of obtaining pressures and a summary of the results of any formation flow tests. Details of the tests and data should be provided in a separate report or appendix.

6. Other

Three (3) print copies and three (3) digital copies of the following data and reports, if not previously supplied should be included as appendices, where applicable (§ 201(2)):

- 6.1 Mud Loggers Report** (§ 98, 99, 102, 155 & 164)
- 6.2 Directional & Deviation Survey Report(s)** (§ 103)
- 6.3 Final Legal Survey Plan** (§ 74 & 147)
- 6.4 Core Photos**
- 6.5 Core Analysis Report**
- 6.6 Fluid Analysis Report(s)** (§ 199)
- 6.7 Oil, Gas & Water Analysis Report(s)** (§ 199)
- 6.8 Geochemical Report** (§ 201(2)(e))
- 6.9 Biostratigraphy Report** (§ 201(2)(e))
- 6.10 Petrological Report** (§ 201(2)(e))
- 6.11 Palynological Report** (§ 201(2)(e))
- 6.12 Paleontological Report** (§ 201(2)(e))