Practice Direction
Petroleum and Gas Reporting

Well and bore, survey, petroleum and hydraulic fracturing activities reports
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- Data – Cement
- Data – Core
- Data – Drilling bits
- Data – Drilling fluids
- Data – Geophysics (non-seismic)
- Data – Hydraulic fracturing
- Data – Lithology
- Data – Mud log
- Data – Perforation
- Data – Petroleum production
- Data – Petroleum reserves and resources
- Data – Petroleum reserve and resource maturity
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- Data – Production for ATP or PL relinquishment
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- Data – Production testing
- Data – Prospects and leads
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- Data – Reservoirs
- Data – Samples and analysis
- Data – Seismic acquisition
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- Data – Seismic 2D lines and 3D coverage
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Purpose

This Practice Direction forms part of the practice manual maintained by the chief executive under section 202 of the Mineral and Energy Resources (Common Provisions) Act 2014. It contains directions to petroleum resource authority holders on the structure, content and format requirements of their reporting obligations under the Petroleum Act 1923 (Qld), Petroleum and Gas (Production and Safety) Act 2004 and Petroleum and Gas (General Provisions) Regulation 2017.

Application

This Practice Direction provides further detail and specifications for the content and format of information to be lodged in the following reports.

<table>
<thead>
<tr>
<th>Report Type</th>
<th>Resource Authorities</th>
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<tbody>
<tr>
<td></td>
<td>ATP</td>
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<tr>
<td>Relinquishment</td>
<td>X</td>
</tr>
<tr>
<td>Surrender</td>
<td>X</td>
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<tr>
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<td>X</td>
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<tr>
<td>End of Authority</td>
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<tr>
<td>Pipeline Licence Surrender</td>
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<tr>
<td>Petroleum Production</td>
<td>X</td>
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<tr>
<td>Production Testing</td>
<td>X</td>
</tr>
<tr>
<td>Petroleum Reserves</td>
<td>X</td>
</tr>
<tr>
<td>Seismic Survey</td>
<td>X</td>
</tr>
<tr>
<td>Scientific or Technical Survey</td>
<td>X</td>
</tr>
<tr>
<td>Well or Bore Completion</td>
<td>X</td>
</tr>
<tr>
<td>Well or Bore Abandonment</td>
<td>X</td>
</tr>
<tr>
<td>Hydraulic Fracturing Activities</td>
<td>X</td>
</tr>
</tbody>
</table>

This Practice Direction details the required report structure, format and content as follows:

- **Common requirements**: This section outlines the requirements which apply to all reports.
- **Section 1**: Describes report types and provides information on how to complete each part of the report.
- **Section 2**: Outlines the details and formats required for each section of the report.
- **Section 3**: Provides a reference checklist to ensure you have included all the required information in the required formats.

There is also a list of abbreviations and acronyms at the end of the document for your reference.

Lodging your report

All details about lodging statutory reports and notices are available on the Business Queensland website at [www.business.qld.gov.au](http://www.business.qld.gov.au). Reports must be lodged through the GSQ Lodgement Portal. Representatives from the Department of Natural Resources, Mines and Energy are also available to assist via email at GSQOpenData@dnrme.qld.gov.au.

Common requirements

This section describes the common requirements which apply to all report types referred to in this Practice Direction.
Report content and structure

The format for the Petroleum Production, Production Testing, and the Petroleum Resources and Reserves reports consists of the prescribed data files and any appendices or other associated data, which can be lodged as separate files.

All other reports must include the following elements:

- the main report including:
  - title page
    - report name
    - project, well or, activity name where applicable
    - resource authority (tenure) type and number
    - name of the resource authority holder
    - name and affiliation of the report author
    - name and affiliation of the report submitter
    - the report period, or activity start and end dates, in day-month-year format
    - the report date in day-month-year format
  - table of contents
  - report sections
  - references

- associated maps, images and cross-sections (in jpg, tif, or png formats)
- appendices (where applicable submitted as separate associated documents)
- data files (as separate original data files and/or data submission templates as per the Data Files section).

Note: Data files and appendices are only required where there is applicable data for the activity. For example, no perforation data file is required in a well completion report for a well that was not perforated.

Ancillary reports

Contractor reports that must be supplied are detailed in ‘Ancillary reports’ (Appendices). Any other ancillary reports, including contractor reports, completed as part of the activity, should be attached as appendices. Ancillary reports include operational reports such as daily drilling reports or other specific events within the overall activity (e.g. well tests). They also include analytical and interpretation reports. For these, the methodologies and assumptions used in conducting the analyses or interpretations should be adequately described for comparison with results from similar activities. Where reports are required, the results must also be provided in a digital native format as supplied by the party (i.e. contractor) that conducted the work. Any outstanding results must be submitted once they become available. See ‘Ancillary reports’ (Appendices) and ‘Data – Ancillary reports’ in this Practice Direction for further information on this requirement.

Consistency

In order to ensure confidence in the information provided, the detail contained within each report section must be consistent throughout the report. Any inconsistencies in the detail of information provided in the main body of the report and any appendices or data files must be explained. This includes where corrections have been made and incorporated into the final report. All reports and appendices are to be written and submitted in English.

Data formats and standards
Detailed information must be provided in a digital form to allow efficient capture and validation of data submitted on report lodgement.

**Digital standards**

Acceptable digital standards for well logs are Log ASCII Standard (LAS) or Digital Log Information Standard (DLIS). Seismic data must be submitted as per the Society of Exploration Geophysicists (SEG) standards, being SEG-SPS for spatial and positioning data, and SEG-Y or SEG-D formats for processed and acquisition data, respectively.

**Written reports**

The written report must use the specified headings for each section and be submitted in a machine-readable file type (*.TXT, *.DOCX, or *.PDF in ISO19005-1 compliant (PDF/A) format).

**Spatial data**

Spatial files must be provided in a shape (*.SHP) file format. Data may comprise linear, point, or polygonal features with datum, projection and zone specified (GDA2020 preferred). Files must include metadata that describes their context and clearly identifies all component features.

Where files are composite sets, all associated files must be submitted (e.g. shape files must be submitted as a *.ZIP including a *.SHP, *.SHX, *.PRJ, and *.DBF file set as a minimum).

Further information on the requirements for spatial data submitted to the department is contained in the Geological Spatial Data Submission Standard (2020), available on the GSQ Open Data Portal. For definition of terminology and technical concepts refer to the GSQ vocabularies available in VocPrez at https://vocabs.gsq.digital/vocabulary/. Details on the use of persistent identifiers, the handling of spatial locations, data modelling, and system architecture is available on the GSQ GitHub repository at https://github.com/geological-survey-of-queensland.

**Tabular data**

Submission templates have been developed for the lodgement of key summary data in a standardised format. It follows the PPDM 3.9 data model developed by the Professional Petroleum Data Management Association and has been adapted for the purpose of this Practice Direction, where required. The templates are available in Microsoft Excel formats (*.XLS, *.XLSX, *.XLSM). All data must be appropriately mapped to the standard data fields using the definitions provided, for lodgement. Submitted files must be provided with identical field (column) names to the templates and all mandatory fields populated. Non-mandatory fields and template information rows may be omitted. Data may be submitted in Microsoft Excel formats (*.XLS, *.XLSX) or in standard comma-delimited ascii formats (*.TXT, *.ASCII, *.CSV). For specific information on lodgement and to download submission templates, please follow the links provided in the ‘Lodging your report’ section of this Practice Direction.

Stratigraphic units must be listed as per the Australian Stratigraphic Units Database (ASUD).

Further details on the submission requirements, applicable standards, and file formats for data files lodged with a report are contained within the relevant sections of this Practice Direction.
Depth and seismic reference datums

The depth reference datum that depths are referenced to in a well or bore (i.e. Ground Level (GL), Rotary Table (RT), or Kelly Bushing (KB)) and seismic reference datum that time or depth is referenced to in a seismic survey, must be reported. The reference datum must be consistent throughout the report: within all text, tables, figures, and attached data files. Elevation values must be relative to the Australian Height Datum (AHD). All depth measurements must state the measurement type (i.e. Measured Depth (MD) or True Vertical Depth (TVD)). Unless specified, all information pertaining to a well or bore, must be referenced to measured depth with respect to the depth reference datum.

Units of measure

For the following measurements, ‘standard reporting units’ are mandatory, unless specified otherwise in this Practice Direction, as follows:

- depth and depth intervals (thickness) must be stated in metres (m)
- volume of water in megalitres (ML)
- volume of gas in million cubic metres (Mm³)
- volume of LPG in kilotonnes (kt)
- volume of crude oil and condensate in million barrels (MMbbl)
- energy of gas in petajoules (PJ)
- energy of oil in million barrels of oil equivalent (MMBOE)
- projected spatial coordinates must be stated as eastings and northings in metres, referenced to a specified datum, projection and zone
- geographic spatial coordinates must be stated as latitude and longitude in decimal degrees, referenced to a specified datum with no less than six decimal place accuracy.

All other numeric values must be reported in their original unit of measure with units stated. Engineering components (e.g. drill bits, casing, etc.) which are manufactured to a standard such as the American Petroleum Institute (API), must be reported in units as stated by the manufacturer. Quantities must be reported in significant figures as per the original measurement, unless specified otherwise in this Practice Direction.

Date must be specified in DD-MMM-YYYY format with standard calendar days recorded in 24-hour time with each day spanning from 00:00:00 to 23:59:59 hours.

Additional requirements under the Code of Practice

The Code of Practice for the construction and abandonment of coal seam gas and petroleum wells, and associated bores in Queensland was developed to ensure that all petroleum wells, coal seam gas (CSG) wells, and CSG water bores are constructed and abandoned to a minimum acceptable standard resulting in long term well integrity, containment of hydrocarbons and the protection of groundwater resources. They also further describe types of records which must be kept and submitted including service company reports. A well or bore completion or abandonment report must contain enough detail to communicate that the requirements under this code of practice have been met and the records have been submitted or retained, as needed, to support this.

Additional environmental reporting requirements

The duty to notify of environmental harm (ESR/2016/2271) and The duty to notify for contaminated land (ESR/2015/2155) were developed to ensure environmental incidents on Environmental Authorities are managed and reported to a minimum acceptable standard. These are administered under the Environmental Protection Act 1994, which lists obligations and offences to prevent...
environmental harm, nuisances and contamination. They further describe the types of records which must be kept and submitted in the case of an environmental incident, and the method of submission.

## 1 Petroleum and Gas report types

The following outlines in tabular form the requirements that must be included in the following reports.

### 1.1 Relinquishment, surrender, and end of tenure reports

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<thead>
<tr>
<th>Legislative Reference</th>
<th>Regulation (references)</th>
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<tbody>
<tr>
<td><strong>Petroleum and Gas (Production and Safety) Act 2004 (Qld)</strong> s.543-553</td>
<td>s.21(2)(a-b), s.22(2)(a-b), s.25(2)(a)</td>
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<tr>
<td><strong>Petroleum Act 1923 (Qld)</strong> Part 6E</td>
<td>s.21(2)(a-c), s.22(2)a-b, s.22(2)(e), s.23(b-d), s.25(2)(a-b)</td>
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<tr>
<td><strong>Petroleum and Gas (General Provisions) Regulation 2017 (Qld)</strong> s.21, s.22, s.23, s.25</td>
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<table>
<thead>
<tr>
<th>Lodgement</th>
<th>Within six months of the relinquishment, surrender, or end of tenure taking effect</th>
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<tbody>
<tr>
<td>Confidentiality Period</td>
<td>None</td>
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**Report Structure**

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<th>Regulation (references)</th>
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<tbody>
<tr>
<td><strong>Introduction</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Tenure information</strong></td>
<td>s.21(2)(a-b), s.22(2)(a-b), s.25(2)(a)</td>
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<tr>
<td><strong>Location map</strong></td>
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<table>
<thead>
<tr>
<th><strong>Report sections</strong></th>
<th></th>
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<td><strong>Activities summary</strong></td>
<td>s.21(2)c, s.22(2)(e), s.25(2)(a)</td>
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<tr>
<td><strong>Geological model (Petroleum Lease relinquishment)</strong></td>
<td>s.22(2)d, s.25(2)(a)</td>
</tr>
<tr>
<td><strong>Reason for relinquishment or surrender</strong></td>
<td>s.21(2)f, s.22(2)(g), s.23(e), s.25(2)(a-b)</td>
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<tr>
<td><strong>Hazard information</strong></td>
<td>s.21(2)(d), s.22(2)(f), s.23(a), s.25(2)(a-b)</td>
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<th><strong>Data files</strong></th>
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<td><strong>Data – Prospects and leads</strong></td>
<td>s.21(2)c, s.22(2)(e), s.23(d), s.25(2)(a-b)</td>
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<tr>
<td><strong>Data – Production for ATP or PL relinquishment</strong></td>
<td>s.21(2)c, s.22(2)(c), s.25(2)(a)</td>
</tr>
<tr>
<td><strong>Data – Production for ATP (1923) surrender</strong></td>
<td>s.21(2)(e), s.25(2)(a)</td>
</tr>
<tr>
<td><strong>Data – Remote sensing</strong></td>
<td>s.21(2)c, s.21(2)(f), s.22(2)(d-e), s.22(2)(g), s.23(e), s.25(2)(a-b)</td>
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<tr>
<td><strong>Data – Reservoirs</strong></td>
<td>s.21(2)(a-c), s.21(2)(h), s.22(2)(a-b), s.22(2)(e), s.22(2)(h), s.23(b), s.25(2)(a-b)</td>
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<tr>
<td><strong>Data – Spatial information</strong></td>
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1.2 End of authority report

<table>
<thead>
<tr>
<th>Legislative Reference</th>
<th>Petroleum and Gas (Production and Safety) Act 2004 (Qld) s.543-553 Petroleum and Gas (General Provisions) Regulation 2017 (Qld) s.26</th>
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<tbody>
<tr>
<td>Lodgement</td>
<td>Within six months of the end of authority taking effect</td>
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<tr>
<td>Confidentiality Period</td>
<td>None</td>
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<td>Introduction</td>
<td>s.26(b-c)</td>
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1.3 Pipeline licence surrender report

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<td>s.24(b)</td>
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1.4 Petroleum production report

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<tr>
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<th>Petroleum and Gas (Production and Safety) Act 2004 (Qld) s.547-550 Petroleum and Gas (General Provisions) Regulation 2017 (Qld) s.42, s.52</th>
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<td>Lodgement</td>
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<tr>
<td>Data - Stratigraphy</td>
<td>s.42(3)(h)</td>
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<tr>
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1.5 Production testing report

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<td>s.44(4)(a-d), s.44(4)(f-h), s.44(4)(j)</td>
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<td>s.44(4)(m)</td>
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<td>Data - Reservoirs</td>
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### 1.6 Petroleum resources and reserves report

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### 1.7 Seismic survey report

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1.8 Scientific or technical survey report

| Legislative Reference | Petroleum and Gas (Production and Safety) Act 2004 (Qld) s.547-550
|                       | Petroleum and Gas (General Provisions) Regulation 2017 (Qld) s.39, s.52 |
| Lodgement             | Within 12 months of the day on which the activity was completed. |
| Confidentiality Period| 3 years after the day on which the activity was completed. |

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<td>s.39(3)(a), s.39(3)(i)</td>
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<td>Acquisition and processing summary</td>
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<td>Data - Spatial information</td>
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<tr>
<td>Data - Remote sensing</td>
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<td>Data - Samples and analysis</td>
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1.9 Well or bore completion report

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<td>s.36(3)(m)</td>
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<td>Daily drilling report</td>
<td>s.35</td>
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<td>s.36(7)</td>
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<td>• Data - Cement</td>
<td>s.36(3)(o)</td>
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<td>• Data - Drilling bits</td>
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<td>• Data - Drilling fluids</td>
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<td>s.36(3)(n)</td>
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<td>• Data - Tubular</td>
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<td>• Data - Well completion</td>
<td>s.36(3)(m)</td>
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<td>• Data - Well or bore summary</td>
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<td>• Data - Well tests</td>
<td>s.36(3)(p)</td>
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<td>• Data - Core</td>
<td>s.36(3)(t), s.36(6)(a)</td>
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<td>• Data - Lithology</td>
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<td>• Data - Reservoirs</td>
<td>s.36(3)(p), s.36(3)(t-u)</td>
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<td>• Data - Well logs and directional surveys</td>
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1.10 Well or bore abandonment report

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<td><strong>Lodgement</strong></td>
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<td><strong>Confidentiality Period</strong></td>
<td>3 years (exploration or appraisal well or bore) or 5 years (development well or bore) after the day on which the rig was released.</td>
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<td>• Well schematic</td>
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<td>Data - Ancillary reports</td>
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<td>Data - Well or bore summary</td>
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<td>Operational summary</td>
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## 1.11 Hydraulic fracturing activities completion report

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<td><strong>Data – Perforation</strong></td>
<td>s.45(3)(h)</td>
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<td><strong>Data – Samples and analysis</strong></td>
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<td><strong>Data – Well tests</strong></td>
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2 Report Structure

2.1 Introduction

2.1.1 Tenure Information

Tenure and general information for the resource authority and the relinquished or surrendered area must be provided and include the following information:

- a general description of the topographical features of the previous tenure area and the relinquished area or surrendered area, including, for example, access to the areas
- the day the licence or tenure was granted, and the term of the licence
- the day the relinquishment, surrender or end of tenure or authority takes effect
- the period of the work program or development plan for the tenure
- for relinquishment and surrender reports, the blocks or sub-blocks comprising the relinquished or surrendered area.

2.1.2 Survey details

Surveys comprise acquisition, processing, and interpretation of new survey data or re-processing and interpretation of existing survey data. They may include, but are not limited to:

- seismic surveys
- airborne or ground geophysics
- remote sensing
- geological mapping
- soil, rock, fluid, or atmospheric sampling and analyses
- water bore observation or monitoring programs.

Information that describes the details of the survey completed must be provided and include the following information:

- the name of the survey
- the type of survey carried out
- the completion day for the survey
- petroleum resource authority name and number
- a description of the location of the area surveyed
- the objectives of the survey.

The objectives must clearly outline the reason(s) for conducting the survey, how it improves the understanding of the geological model and its relevance to petroleum prospectivity. This should include a brief description of the region, supported with a location map that shows the area(s) in the resource authority where the survey was undertaken, with reference to any topographic or other points of reference provided.
2.1.3 Location map

A location map must show the relevant resource authority and the activity, study area, or relinquished or surrendered area at a scale that provides useful context. Features specific to the activity or area must be provided and may include sample locations, survey line locations, physical transects, and survey areas. Every map must have title, coordinates, scale, legend (legible), datum, projection, and zone stipulated. The map must be to standard base-10 scale e.g. 1:10,000, 1:250,000. 1:1,000,000. Location map images must be at a sufficient image resolution so that all features and text are legible at the scale of the image.

The location map may include any features relevant to the spatial context of the well or activity including, but not limited to:

- the nearest petroleum wells or bores
- nearby seismic survey lines (2D) or survey areas (3D only) or other survey limits
- resource authority boundaries
- any permanent features (e.g. processing plants, dam sites, ponds, etc)
- topographic features in the area including:
  - population centres
  - roads and railways
  - access tracks
  - pipelines
  - watercourses.

Maps of relinquished and surrendered areas must clearly show the blocks or sub-blocks which comprise the area.

Spatial data files locating the activity, activities, or study area that is the subject of the report must be provided where the data has not been offered through other must statutory reporting or available in the public domain. See the associated data files for further information.

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<tr>
<td>Associated data files:</td>
<td>Data - Spatial information; Data – Ancillary reports</td>
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2.2 Report sections

2.2.1 Tenure reports – Activities summary

For a resource authority, at the end of tenure, or upon the relinquishment or surrender of part of a resource authority, a summary of the results of authorised activities carried out since the resource authority took effect must be provided. In addition, any subsequent conclusions drawn by the holder based on the results including any prospects or leads identified must be detailed. Authorised activities include, but are not limited to:

- drilling
- seismic surveys
- geophysical surveys (airborne and ground)
- remote sensing
- geological mapping
- soil, rock, fluid or atmospheric testing.

A table of activities and the corresponding year that these have taken place should be provided, followed by a brief summary of each, while additional detail can be referred to in the respective Activity Report.

For a pipeline licence surrender the activities a summary must be provided and include:

- a description of the location of the pipeline in the surrendered area, and access to the pipeline
- a summary of the methods used to decommission the pipeline
- the details of all maintenance carried out on the pipeline during the term of the licence.

Associated sections: Tenure reports – Hazard information, Appendices – Ancillary reports
Associated data files: Data – Ancillary reports, Data – Remote Sensing, Data – Geophysics (non-seismic), Data – Spatial information

2.2.2 Tenure reports – Geological Model

For a Petroleum Lease, at the end of tenure, or upon the relinquishment of part of the lease, a geological model must be provided. This summary should be concise and reference any relevant tables, figures, appendices, and data files to provide further detail. The summary must include the following information:

- a description of any natural underground reservoirs in the, including:
  - a description of the petroleum system the reservoir(s) are part of and related seals, source rocks, and mechanisms for hydrocarbon entrapment
  - a list of discovery wells and the relevance of their results to the petroleum systems
- a description of any structural information, submitted with associated maps (see Seismic survey – Interpretation)
- a description of any leads and prospects (See Data – Prospects and leads)

Associated sections: Appendices – Ancillary reports, Appendices – Cross-sections
Associated data files: Data – Reservoirs, Data – Prospects and leads, Data – Ancillary reports
2.2.3 Tenure reports – Reason for relinquishment or surrender

Where a resource authority or part of a resource authority has been relinquished or surrendered, a summary which details the reasons for this, must be provided. Technical and non-technical considerations may be used to rationalise the decision, with supporting information such as:

- Surface constraints or risks which inhibit or reduce the likelihood of a successful future development of petroleum resources
- Geoscience, geophysical, and/or petrophysical subsurface information which demonstrate the lack of economic potential for petroleum resources
- Commercial information, including market conditions, investor attractiveness, and infrastructure constraints which inhibit or reduce the likelihood of successful commercialisation of petroleum resources.

The summary must be accompanied by any maps, images, and data which support this interpretation. Any data, which has not already been provided in this report or through activity reporting, must be included as data files. Please see the associated data files for further information.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Ancillary reports, Appendices – Cross-sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Prospects and leads, Data – Ancillary reports</td>
</tr>
</tbody>
</table>

2.2.4 Tenure reports – Hazard information

A summary of any significant hazards remaining in the resource authority at the end of tenure or in the relinquished or surrendered part of the resource authority, where relevant, must be provided. Hazards include, but are not limited to; uncontrolled gas migration, unrecovered downhole equipment, hazardous chemical and radioactive agents. The summary must include the following information:

- the nature of the hazard
- the way in which the hazard was created
- the location of the hazard and
- measures taken to prevent or reduce the risk of the hazard and mitigate its effects.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Tenure reports – Activities summary, Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Spatial information, Data – Ancillary reports</td>
</tr>
</tbody>
</table>

2.2.5 Scientific or technical survey – Acquisition and processing summary

A summary of the acquisition of a scientific or technical survey must be provided. This summary should be concise and reference any relevant tables, figures, appendices, and data files to provide further detail of the activities.

The summary must include the following information, where applicable:

- a listing of line names used and/or survey stations
- field localities or bore locations where observations were made and/or samples were taken
- methods used to analyse any samples taken
- line distance in kilometres and/or number of survey stations
• an operational synopsis describing the activities carried out with their corresponding dates
• recording operations, including a description of each method used to acquire raw data, process, or reprocess data such as:
  o the equipment used for positioning, surveying, navigation or other purposes
  o the techniques and equipment used for recording and testing the data
  o processing tests or trials undertaken
  o processing sequence or steps and key parameters or assumptions used.

Metadata that provides details of the survey along with the raw data produced during the acquisition and data produced during processing, must be provided. Metadata must include details on the media used for data capture and storage, where applicable. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Ancillary reports, Appendices – Cross-sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Surface geology; Data – Geophysics; Data – Remote sensing; Data – Samples and analysis, Data – Ancillary reports</td>
</tr>
</tbody>
</table>

2.2.6 Scientific or technical survey – Interpretation summary

A summary on the results and interpretations of a scientific or technical survey must be provided. This summary should be concise and reference any relevant tables, figures, appendices, and data files to provide further detail of the activities.

The summary must include the following information:

• a statement on the key findings and relevance to understanding the geological model and regional petroleum prospectivity
• an evaluation of the processed or reprocessed data
• how the initial objectives were achieved, and if not why.

Any interpretations made must reference the relevant data submitted elsewhere within the report. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Surface geology; Data – Ancillary reports</td>
</tr>
</tbody>
</table>

2.2.7 Seismic survey – Acquisition summary

A summary of the acquisition of a seismic survey must be provided. This summary should be concise and reference any relevant tables, figures, appendices, and data files to provide further detail of the activities.

The summary must include the following information:

• An operational synopsis describing the activities carried out with their corresponding dates
• recording operations, including a description of each method used to acquire raw data, such as:
  o the equipment used for positioning, surveying, navigation or other purposes
  o the techniques and equipment used for recording and testing the data.
Metadata that provides details of the survey along with the raw data produced during the acquisition, must also be provided, see associated data files. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices - Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Seismic Acquisition, Data – Seismic data (raw), - Seismic 2D lines and 3D coverage, Data – Seismic shell processing support</td>
</tr>
</tbody>
</table>

### 2.2.8 Seismic survey – Processing summary

A summary of the processing or reprocessing of a seismic survey must be provided. This summary should be concise and reference any relevant tables, figures, appendices, and data files to provide further detail of the activities.

The summary must include the following information, where applicable:

- the reasons or objective of the seismic survey processing
- processing tests or trials undertaken
- processing sequence or steps and key parameters or assumptions used
- static corrections applied
- a listing of the processed products such as:
  - raw and final stacks
  - raw and final migrated stacks (pre-stack or post-stack)
  - filtered and final migrated stack
  - final processed (grid) bin coordinates (3D surveys)
  - seismic attributes (e.g. AVO, acoustic impedance, coherence)
  - velocity information.

Metadata that provides details of the survey along with the data produced during processing, must be provided, see associated data files. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Seismic Acquisition, Data – Seismic Processing, Data - Seismic 2D lines and 3D coverage, Data – Seismic shell processing support, Data – Seismic data (processed)</td>
</tr>
</tbody>
</table>
2.2.9 Seismic survey – Interpretation summary

A summary on the results and interpretations of a seismic survey must be provided. This summary should be concise and reference any relevant tables, figures, appendices, and data files to provide further detail of the activities.

The summary must include the following information:

- a statement on the key findings and relevance to understanding the geological model and regional petroleum prospectivity
- an evaluation of the processed or reprocessed data
- how the initial objectives were achieved, and if not why.

Any interpretations made must reference the relevant data submitted elsewhere within the report. All interpretive information depicted should also be provided as data. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

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<tr>
<th>Associated sections:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Ancillary reports</td>
</tr>
</tbody>
</table>

2.2.10 Well or bore completion and abandonment – Operational summary

A summary of the drilling, well construction, and evaluation/testing operations must be provided. This summary should be concise and reference any relevant tables, figures, appendices and data files to provide further detail of the activity. The operational summary must provide context to the data provided elsewhere in the report and should supply relevant data not otherwise captured. The operational summary must include the following information:

- well or bore name
- spud and rig release dates
- total depth
- target formation and basin
- for exploration wells, the rationale for drilling the well or bore
- details of any significant impacts to planned operations such as hazards encountered, in the drilling, construction or evaluation and testing of the well, (e.g. significant fluid loss, instability, overpressure or pressure depletion, highly fractured zones, well control events), or lost equipment/foreign objects, that may present risk to future extraction of mineral and energy resources
- details of methods attempted to remedy impacts to planned operations referred to above and an assessment of their failure or success.

If a well or bore is abandoned, on or before the rig release day of the drilling activity, the completion report must also contain the plug and abandonment information. In this case, a separate well or bore abandonment report is not required.

Details of a well or bore abandonment must include the following information:

- details of the casing and equipment installed in the well or bore, with diagrams showing the major dimension and features of the casing and equipment (see Well Schematic)
- details of the surface abandonment equipment and configuration such as cap and cut details
- a full description of any unrecovered tools or equipment lost downhole that are retained in the well or bore, including the size, type, and any hazardous material.
- the location of any prescribed or unrecovered equipment, surveyed where available
• the method of the cementing operations carried out in or on the well or bore, including the location and type of plugs, the depth intervals covered, the volume and type of cement used, any losses of cement due to voids or permeable strata and the methods used to overcome losses of cement
• a description of any other abandonment procedures used for the well or bore including the results of tests to ensure integrity of each cemented interval
• any other details of the activities undertaken in drilling, completing, and plugging and abandoning of the well or bore, including an assessment of their possible impacts that would assist a person in making an assessment of potential risks to future safe and efficient extraction of mineral and energy resources.

Schedule 2AA of the Petroleum & Gas (Safety) Regulation 2018 (Qld) lists the requirements for plugging and abandoning a petroleum well or bore. Additional information is also provided in the Code of Practice for the construction and abandonment of coal seam gas and petroleum wells, and associated bores in Queensland, where requirements include:

• isolation of aquifers and porous formations
• removal of casing of prescribed well or bore except where it is not feasible
• cement plug requirements
• requirement for a packer
• fluid left in bore
• requirements if steel casing or drill string has been left in coal seams
• for lateral wells, the requirement for a slotted liner.

The cement report must be attached as an Appendix (see Ancillary reports), and any relevant cement bond log(s) and block tests performed as part of abandonment.

Metadata that provides details of the well or bore completion and/or abandonment must also be provided. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Well or bore completion - well or bore schematic, Appendices – Daily drilling reports, Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Drilling bits, Data - Drilling fluid, Data - Tubular, Data - Cement, Data – Directional survey, Data – Well logs, Data – Well or Bore Summary, Data – Abandonment, Data – Perforation, Data – Well completion</td>
</tr>
</tbody>
</table>
2.2.11 Well or bore completion and abandonment – Well schematic

A well or bore schematic is a graphical representation of the main components used in constructing a well or bore installed at time of rig release. The schematic must be appropriately scaled to display relevant details.

The well or bore schematic must include the following components:

- the size and type of casing (weight/grade/coupling) and base or shoe depths, including fibreglass sections
- location of all casing perforation intervals including the depth of the top and base of each
- depth of the top and base of each cemented interval in the well or bore
- location and identification of any downhole equipment, including completions, packers, cement plugs and abandoned equipment.

If a well or bore has intersected another well or bore, the intersection must be adequately identified and reflected in the well schematic. For wells with more than one wellbore, the schematic must reflect the components of each wellbore and their relationships. Well or bore components must be systematically identified to facilitate clarity of the schematic and to prevent duplication of reporting requirements.

The well or bore schematic submitted in the report must accurately reflect the completion of the well or bore at the time of rig release. For a plugged and abandoned well, it will represent the final well configuration. It must ensure sufficient information is present in order to verify that mandatory requirements as per the Code of Practice for the construction and abandonment of coal seam gas and petroleum wells, and associated bores in Queensland.

Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Daily drilling reports, Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Drilling bits, Data – Tubular, Data – Cement, Data – Directional Survey, Data – Perforation, Data – Well completion, Data - Abandonment</td>
</tr>
</tbody>
</table>
Example:

Well Name 1
GL: 123.45 m AHD | RT: 128.00 m AHD

Ground level

Surface Hole
12 ¾"
10.00 to 250.00 m MD
250.00 m TVD

Surface Casing
9 ¾"
to 248.5 m MD
248.5 m TVD
Grade: J55
Weight: 32.3 lbs/ft
Coupling: BTC R3

Intermediate Hole
8 5/8"
250.00 to 1100.00 m MD
950.00 m TVD

Intermediate Casing
7"
to 1098.2 m MD
949.1 m TVD
Grade: J55
Weight: 20.0 lbs/ft
Coupling: BTC R3

Milled Window
1031.00 to 1036.50 m MD

Conductor Hole
17"
4.55 to 10.00 m MD

Casing
16"
4.55 to 10.00 m MD
Grade: API SL Gr 350
Weled pipe with flared end

Kick Off Point
300 m MD

Cement Plug
950 to 1030 m MD

Whipstock
1040 m MD

Abandoned Tool
1150.0 to 1159.1 m MD

Illusion Formation
1200.45 m MD
3000.30 m TVD

Proxy Sandstone
357.91 m MD
400.00 m TVD

Well Name 1 ST1
Perforations
1250.00 to 1400.00 m MD

Production Hole (Well Name 1)
6 ¼" 1100.00 to 1165.82 m MD

Production Hole (Well Name 1 ST1)
6 ¼" 1038.00 to 1420.51 m MD

Production Liner
4 5/8"
1017.80 to 1600.00 m MD
930.00 to 1110.60 m TVD
Grade: K55
Weight: 11.6 lbs/ft

Total Depth
1420.50 m MD | 1120.00 m TVD

*All measurements must be relative to the specified depth reference datum
2.2.12 Hydraulic fracturing activities – Operational summary

A summary of the operations that occurred during hydraulic fracturing activities of a well or bore must be provided. Hydraulic fracturing includes any activity in a well or bore that is designed to stimulate a formation by inducing fractures using fluid pressure and includes testing, such as diagnostic fracture injection tests (DFITS). This summary should be concise and reference any relevant tables, figures, appendices and data files to provide further detail of the activity.

The operational summary for hydraulic fracturing activities must include the following information:

- the name and address of the lease holder, operator of the well(s) or bore(s), and the company that performed hydraulic fracturing activities
- the names of each well or bore and wellbore, where applicable, treated or used for observation
- the start and end dates of hydraulic fracturing activities for each well
- details of the equipment and techniques used to perform and monitor the hydraulic fracturing activities
- details of tubular installations (casing, liner, tubing) and any perforations
- details of any significant impacts to planned operations such as hazards encountered, attempted remedies and their outcome.

Metadata that provides details of the hydraulic fracturing activity and the raw data acquired must be provided. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Hydraulic fracturing; Data – Ancillary reports; Data – Well tests; Data – Tubular; Data – Perforation; Data – Samples and analysis</td>
</tr>
</tbody>
</table>

2.2.13 Hydraulic fracturing activities – Interpretation summary

A summary on the results and interpretations from the hydraulic fracturing activities must be provided. This summary should be concise and reference any relevant tables, figures, appendices, and data files to provide further detail of the activities.

The summary must include the following information:

- details of any known natural or induced geological connection between the geological interval over which hydraulic fracturing activities were carried out and any aquifers
- a statement on the key findings and outcomes
- how the initial objectives were achieved, and if not why.

Any interpretations made must reference the relevant data submitted elsewhere within the report. All interpretive information depicted should also be provided as data. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Ancillary reports, Data – Hydraulic fracturing</td>
</tr>
</tbody>
</table>
2.2.14 Regional geology

Where the reported activity significantly alters or adds to the understanding of regional geology, a summary that describes the regional geological setting must be provided. Significant alteration or addition of regional geological understanding includes any conclusions derived from activities in areas with limited prior exploration activities, and novel techniques that provide new insight in previously explored areas. Reports for routine activities that do not alter the understanding of regional geology, such as the drilling of a development well do not require a regional geology section.

Where required, the summary must include the following information:

- a description of the information obtained or interpreted from the reported activity and its relevance to the change in understanding of regional geology
- the extent and relationship of sedimentary basins
- local structural elements or features
- a figure illustrating the stratigraphic column
- the history of the sedimentary accumulation and timing of key tectonic events.

The summary should include details on the following, where the activity has altered their interpretation:

- a description of the petroleum systems, including source, reservoir and seal units and mechanisms for entrapment
- identification of the petroleum plays being targeted and a description of the conceptual model
- local geological variations that affect hydrocarbon prospectivity at a prospect or field scale.

Where a contractor/consultant has been engaged to complete or provide input to the summary, the original report(s) and associated data must also be provided. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Cross-section, Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Ancillary reports</td>
</tr>
</tbody>
</table>

2.2.15 Hydrocarbon potential

For exploration and appraisal wells, an assessment of the hydrocarbon potential of the well or bore must be provided that describes the significance of its results with respect to the prospect, play, field, and/or basin.

The summary must include the following information:

- the reasons for drilling
- results and interpretation
- a discussion of the success or failure to find commercial hydrocarbons.

Any interpretations made must reference the relevant data submitted elsewhere within the report. Interpretive information depicted should also be provided as data. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

<table>
<thead>
<tr>
<th>Associated sections:</th>
<th>Appendices – Mud log; Appendices – Composite log; Appendices – Well logs; Appendices – Ancillary reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Associated data files:</td>
<td>Data – Stratigraphy, Data – Reservoirs, Data – Samples and analysis, Data – Mud log, Data – Well logs, Data – Lithology, Data - Core</td>
</tr>
</tbody>
</table>
2.3 Appendices

Information that is best provided separately should be provided as an appendix and referenced from the applicable report section. Appendix information that is too numerous or large to be provided within the report can be provided as a separate associated file.

2.3.1 Ancillary reports

Ancillary reports include operational, analytical, and interpretation reports completed as part of a reportable activity. A listing of common types of ancillary reports and requirements are included below.

For Seismic survey reports:
Ancillary reports must include the following components:

- All contractor reports relating to survey activities performed by a contractor that detail the raw, processed, or reprocessed data derived from the survey.
  - acquisition
  - processing
  - reprocessing

For Well or bore completion and abandonment reports:
Ancillary reports must include the following components:

- a daily drilling report for each day on which drilling of a petroleum well is carried out (See Appendices – Daily Drilling Report).
- casing report/casing tally
- cementing reports
- drilling fluids (mud engineer's report), where applicable
- cement laboratory test results, where applicable.
- samples and analysis (laboratory reports), where applicable.

For Hydraulic fracturing activities completion reports:
Ancillary reports must include the following components:

- all raw time-based measurement data acquired (see Data – Hydraulic Fracturing)
- any hydraulic fracturing activities report supplied by the contractor
- well logging and testing programs, where applicable.
- samples and analysis (laboratory reports), where applicable.

For Production testing reports:
Ancillary reports must include the following components:

- all raw time-based measurement data acquired
- well logging and testing programs, where applicable
- samples and analysis (laboratory reports), where applicable.
For **Petroleum production reports:**
Ancillary reports must include the following components, where applicable:

- well logging and testing programs
- samples and analysis (laboratory reports).

For **Scientific or technical survey reports:**
Ancillary reports must include the following components, where applicable:

- acquisition
- interpretation
- samples and analysis (laboratory reports).

For well tests, a report must include the details of the tests with raw data (time-based measurements) in the associated data files. It must also contain test parameters including the rate of pumping, and relevant results such as the initial shut-in pressure, final shut-in pressure, breakdown pressure, and fracture closure pressure. A chart showing rate of pumping and pressure vs time should be provided. Pressure, should be provided as wellhead pressure and bottom-hole pressure and must be reported in the original units of measure along with the rate of pumping.

For production logging tests, a report must include the details of the tests with raw data in the associated data files. Also, it should include an interpretation of the results, and in particular the volume and/or percentage contribution of the total wellhead volume of gas and/or fluids produced from the well as per each measured reservoir.

For samples and analyses, the reports must include the methods for analysis, key assumptions made, and details of the laboratory, QA/QC methodology, analytical testing equipment and procedures, sample details and preparation, and results of the tests, provided in digital tabular form in the associated data files.

Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

| Associated data files | Data - Ancillary reports |
2.3.2 Cross-sections

Any cross-sections that illustrate the subsurface geological environment, should be provided in the appendices. All cross-sections must meet the following general requirements:

- a sufficient image resolution so that all features and text are legible at the scale of the image
- a horizontal scale must be labelled as equidistant or scaled, proportional to the relative distance between the wells or bores included in the section. Labelling increments are proportional to the max distance between wells or bores
- a vertical scale that is identified as relative to sea level or true vertical depth
- if the section has been flattened on a stratigraphic horizon, this must be either represented in the title of the section or labelled appropriately in the legend or otherwise
- a legend describing any colours, patterns, or symbols used on the cross-section.

Where applicable information is available, the following should be included in a cross section:

- the name of each well or bore included in the cross section and a depth track to total depth of the well or bore
- a map, showing the section line with respect to the subsurface environment, which may include horizons, faults, and/or other structural elements
- stratigraphic intervals, including the intercepts of stratigraphic tops for each well, with labels and/or unique pattern/colours used that are clearly described in the legend
- scale bar and units for any other information provided on well or bore tracks such as well logs, analytical, or testing results, where applicable.

2.3.3 Daily drilling report

For all wells and bores, a daily drilling report must be completed for each day of activity from commencement of drilling (spud date) to the date of rig release. These reports must be retained, available for inspection, and lodged as part of the well or bore completion report.

The daily drilling report must contain details of the activities carried out on the day to which the report relates. Other than general well information, information supplied in a daily drilling report should not be repeated in subsequent daily drilling reports. Daily drilling reports must include the following information relevant to the daily reporting period:

- the identifying name and number of the well or bore
- the wellbore identifier, where applicable
- the name of the operator of the well or bore and resource authority holder
- the type and number of the relevant petroleum resource authority
- the name of the drilling rig used
- a summary of the drilling operations carried out
- the measured depth of the well or bore at the beginning and end of the day
- the size and type of drilling bits
- the type of drilling fluid and additives used
- the diameter, weight, grade, coupling type, top depth, and base or shoe depth for any casing installed
- the depth of the top and base for each cemented interval
- where performed, the results of any directional surveys undertaken during the reporting period
- where performed, a description of any drill stem tests or other well tests carried out
- the depth of the top and base of notable hydrocarbon shows, with type and a brief description for each interval
- the type of any perforations in the casing, and the depth of the top and base of the perforated intervals
- the times and depths of any hydraulic fracturing activities or other stimulation carried out
- the times and depths of any squeeze cementing or cement plugging carried out
- the depths and description of any cores or cuttings taken.
Metadata that provides details of the activity and raw data acquired must also be provided. Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

| Associated data files | Data – Ancillary reports |

### 2.3.4 Composite log

Where a composite log has been generated a graphic plot must be submitted as part of the report. The corresponding digital data must also be provided as detailed in the associated data files section. A composite log is a graphical summary of the geological and geophysical or petrophysical interpretation of a well or bore, depth-corrected to a common reference datum.

Where a composite log has been produced, the associated information must be provided. The following should be included where available:

- well header information
  - the identifying name and number of the well or bore
  - the wellbore identifier, where applicable
  - dates of ‘spud’, total depth, and rig release
  - depth reference datum
  - total depth
  - location in latitude and longitude
- hole size and casing details
- measured depth and true vertical depth tracks
- calliper log and selected geophysical and/or petrophysical logs (e.g. gamma ray, porosity)
- lithology log
- identification of stratigraphic units
- intervals where coring was undertaken
- identification of where hydrocarbon shows occurred
- identification of where well tests occurred and results.

Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

| Associated data files | Data – Well logs and directional surveys, Data – Mud log, Data – Stratigraphy, Data – Reservoirs, Data – Samples and analysis, Data – Lithology, Data – Core, Data – Well or bore summary, Data – Tubular, Data – Well tests |
Example:

FOR Instance 1 - Example composite well log
Scale: 1:5000

SURFACE LOCATION
Latitude: 23.26' 37.9689' S
Longitude: 144.90' 33.6734' E
Datum: GDA94, MGA 255
Easting: 500000 m
Northing: 15000000 m

HOLE SIZE
DIAMETER
DN: 140
Depth: 460m
31.1 7.0
21.6 200.0
15.9 350.0
9.5 1042.19

SUMMARY
Operator: 7C Australia
Country: Australia
State: Queensland
Well legged: July 2020
Rig Name: 7C-13
Date: 7/2/2021
Rig released: 7/2/2021

LITHOLOGY LEGEND
Good
Fair
Poor
Trace

SHOW LEGEND
OIL
GAS

WIRELINE
Run 1: MCG-MON-MPL-MSS-MDL
Run 2: SGT TDF
Run 3: SGT DF
Run 4: SGT ZD
Time since circulation: 7 hours 24 minutes

WELL REMARKS
Exploration C60 core hole, G400 Basin, Cased and suspended.

SERVICES
Drilling Engineer:
WEL Designer:
Website: Weatherhill
Website: Weatherhill
Core Description: N/A
Cementing Plug

PD6 Petroleum and Gas Reporting Practice Direction
Department of Natural Resources, Mines and Energy
Version 1.0 September 2020

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2.3.5 Mud log

Where mud logging is undertaken, a graphic plot of the mud log must be submitted as part of the report. The corresponding digital data must also be provided as detailed in the associated data files section. A mud log is a record, with depth, detailing measurements on the concentration and composition of hydrocarbons in the circulating drilling fluids, a description of cuttings samples and any observations made thereon, and engineering information captured for the drilling operation.

Where mudlogging is undertaken the associated information must be provided. The following should be included in a mud log where available:

- well or bore name and number
- the wellbore identifier, where applicable
- the service company who acquired the mud logs
- a depth track in measured depth
- the top and base depth of the described lithotype interval
- approximate proportion of each lithotype or rock type in each interval
- the concentration(s) of total gas encountered during the drilling of the well or bore
- the compositional makeup of the gas encountered, in parts per million (ppm), of C1 (Methane), C2 (Ethane), C3 (Butane), C4 (Propane), and C5+ (Pentane and heavier hydrocarbons)
- details of hydrocarbon shows encountered including,
  - the sample type i.e. cuttings, mud, or core
  - the show type i.e. bleed, cut, fluorescence, gas, or stain
  - the depth of the top and base of the interval where shows occurred
- the rate of penetration (ROP)
- rotations per minute (RPM)
- weight on bit (WOB)
- standpipe pressure (SPP)
- hook load.

Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

| Associated data files: | Data - Mud log |

2.3.6 Well logs

A digital print of all geophysical logs acquired through logging by wireline, by drill string, or while drilling (LWD/MWD), must be provided in the appendix.

Where applicable information is available, the following must be included in a well log:

- the identifying name and number of the well or bore
- the wellbore identifier, where applicable
- the service company who acquired the well logs
- job number
- run number(s) with start and end dates
- casing shoe depths
- depth reference datum (GL, KB, RT) for logging with driller’s and logger’s total depth
- indication of reference to measured depth or true vertical depth (TVD)
- name of each logging tool or tool suite
- the log types (mnemonic and description) as well as units of measure
- depth interval(s) over which each wireline tool or tool suite was run.

The digital print must include a depth track and a suite of log tracks at a standard base-10 scale e.g. 1:100, 1:200, 1:500, 1:1000.
Borehole environmental conditions such as mud weight, and resistivity measurements for drilling mud, filter cake, and mud filtrate at standard temperature and pressure conditions, should be provided. All processing details and assumptions must be reported.

Please see Section 1 for a listing of mandatory associated sections and data files to be submitted with the report with further information on their requirements below.

| Associated data files: | Data – Well logs |

### 2.4 Data Files

All data files must be submitted in their accepted file formats. Where submission templates are the accepted file format these may be submitted in their original workbook format, or as comma-delimited ASCII or csv files. Submitted files may omit the metadata header rows. However, all mandatory fields must be complete and all data field headers (column names) must match those contained within the submission template workbook. All downhole depths reported in a well or bore must be relative to the elevation of the depth reference stated in the Well or Bore Summary. A list of data files submitted must be included in the written report.

#### 2.4.1 Data – Abandonment

Detailed information must be provided about the abandonment of a well or bore and must contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- the operator and name of the rig that performed the abandonment
- the date abandonment was completed
- The status of the well or bore at rig release i.e. capped and abandoned or, plugged and abandoned.
- The date and depth that the casing was cut for abandonment, where applicable
- details of any well caps and marker plates installed for future identification
- Abandonment data must be accompanied by the corresponding cementing, tubular, and other well configuration information current at the date of abandonment.

Any contractor reports, such as cementing reports, must be provided as an appendix with the associated data in the relevant section below. A list of acceptable file formats and applicable standards are detailed below. See Data – Cement for further details on digital submission requirements for cementing operations.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>American Petroleum Institute (API), International Association of Drilling Contractors (IADC), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

#### 2.4.2 Data – Ancillary reports

Any data that is included as part of a required ancillary report that has not already been included as a data file in another section, must be provided in a suitable file format.
Data that can be represented as tables or grids, must be provided in tabular format. All data must be clearly labelled with units of measure provided for each data field.

Grid files must have the following specifications:

- spatial coordinates with datum, projection, and zone specified
- attributes clearly labelled with units of measure
- a grid cell size half the average spatial frequency of the dataset e.g. half the average spacing between wells, seismic lines, sample locations
- interpolation method specified with data inputs and assumptions described in the associated report section.

Data from ancillary reports associated with hydraulic fracturing activities completion or production testing, may include:

- hydraulic fracturing operations
- results from any well testing activities
- analyses of fluid samples
- data associated with any interpretation reports.

Data from ancillary reports associated with well or bore completion or abandonment reports must be submitted as part of the report. For example, this could include:

- analyses on cuttings, core and fluid samples
- data associated with cementing operations
- well logging operations
- data associated with well testing, including any pressure related measurements
- directional survey
- lithology logging and mud logging
- data associated with any interpretation reports.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Multiple including - American Petroleum Institute (API), International Association of Drilling Contractors (IADC), Australian Stratigraphic Units Database (ASUD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Tabular data - *.ASCII, *.CSV; Spatial data - *.SHP</td>
</tr>
</tbody>
</table>

2.4.3 Data – Cement

Detailed information must be provided for all cement used in the well or bore and must contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- a unique observation identifier for each cement application
- for each application referred to above:
  - the component in the cementing process (e.g. lead, tail, main, top-up, squeeze)
  - the company that performed the cement application
  - whether cementing was for the purpose of a plug and abandon
  - cement class, as per API classification where applicable
  - top and base of the cemented depth interval
  - volume and density of cement
  - the displacement volume
  - an indication of if cement returns were obtained, and volumes where data is available
  - description of each additives used including:
    - the common or marketed name of the additive as provided by the supplier
the quantity used and its unit of measure
- the concentration where applicable

API classifications currently cover eight classes, designated Class A to Class H. Some classes are also available as either moderate sulphate-resistant (MSR) or high sulphate-resistant (HSR) grades.

Any contractor cementing reports, will also need to be provided in the appendix. A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>International Association of Drilling Contractors (IADC), American Petroleum Institute (API), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

### 2.4.4 Data – Core

Detailed information must be provided on core acquired during drilling of a well or bore and must contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- core run number within the well
- core type e.g. conventional, wireline-retrievable, sidewall rotary
- size of the core expresses as one or both of:
  - core diameter
  - standard core barrel size
- top and base depth of the cored interval and depth reference datum
- the count of sidewall cores within the interval if applicable
- A lithological description of the core, see Data - Lithology

Digital images of all core acquired during the drilling of a well or bore should also be compiled and submitted in an associated document to the report. Images should have the following attributes:

- clear labelling of
  - the well or bore name and number
  - the date of photography
  - depths and core orientation
  - identification and depth of any samples taken
- one core tray per image
- image capture at a constant distance
- consistent illumination across the length of the core and between images
- unobscured by residual drilling fluid or cuttings
- core may be wet or dry to best illustrate the relevant lithologic features but should be consistent throughout the image set
- where available, a colour and grey-scale chart should be visible without obscuring the core.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII; Images - *.JPG, *.GIF, *.PNG; Compiled imaged - *.PDF</td>
</tr>
</tbody>
</table>
2.4.5 Data – Drilling bits

Detailed information must be provided for each drilling bit used in the well or bore and must contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- a unique observation identifier or sequence number for the bit used in the well or bore
- bit type
- bit manufacturer and model or serial number
- bit size in engineering units
- depth at which the bit commenced and finished drilling

Where applicable data is available, the following additional information should be reported:

- the total number of hours that the bit was used in the well or bore
- maximum, minimum and average force on bit
- maximum, minimum and average drilling/rotation rate of the bit (RPM)
- maximum, minimum and average rate of penetration
- dull bit grading in adherence to the IADC standard, or drill bit cutting structure general condition.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>International Association of Drilling Contractors (IADC), American Petroleum Institute (API), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

2.4.6 Data – Drilling fluids

Detailed information must be provided for all drilling fluids used in the well or bore and must contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- a unique observation identifier for each interval the drilling fluid was used in
- the media type such as mud, water, or air
- top and base of the depth interval where the drilling fluid was used
- weight or specific gravity of the drilling fluid
- description of each additives used including:
  - the common or marketed name of the additive as provided by the supplier
  - the quantity used and its unit of measure
  - the concentration where applicable

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>International Association of Drilling Contractors (IADC), American Petroleum Institute (API), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII</td>
</tr>
</tbody>
</table>
2.4.7 Data – Geophysics (non-seismic)

Where geophysical surveys are completed, the data that is acquired and/or processed, must be provided in the specified formats. Geophysical data consists of two types:

a) airborne surveys
b) ground-based surveys

Geophysical data from these survey types consists of:

- raw and processed located data (digital data)
- gridded data and images
- spatial data (see Data – Spatial information)
- acquisition report and interpretation of results (See Appendices – Ancillary reports).

**Airborne surveys**

Data to be submitted includes:

- spatial coordinates of final located line data (ASEG-GDF)
- grids of data
- survey outline polygons
- survey bounds or line plots
- acquisition, processing, and/or interpretation reports (Appendices – Ancillary reports).

**Ground-based surveys**

Data to be submitted includes:

- spatial coordinates of final located data (ASEG-GDF, ASEG-ESF)
- survey outline polygons
- grids of data
- acquisition, processing, and/or interpretation reports (Appendices – Ancillary reports).

Gravity data must include the station number, spatial coordinates (datum, projection, and zone specified), elevation relative to AHD, absolute observed gravity (specify datum), terrain correction, and must specify the methods and parameters used to calculate the Bouguer anomalies.

The Government Geoscience Information Committee (GGIC) of Australia has developed the standard *Australian Requirements for the Submission of Digital Exploration Data*. Where possible, adhere to the digital formats specified in this standard to enable direct loading of data into databases.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Society of Exploration Geophysicists - ASEG-GDF, ASEG-ESF; Government Geoscience Information Committee (GGIC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Grids - *.ASCII, *.GDB, *.ERS, *.GRD; Spatial data - *.SHP</td>
</tr>
</tbody>
</table>
2.4.8 Data – Hydraulic fracturing

Data acquired as part of hydraulic fracture or well treatment activities, must be provided. Information on the well treatment must contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- a unique treatment observation number for each treatment interval
- an identification of the natural underground reservoir its respective stratigraphic unit(s) (ASUD) that have been hydraulically fractured
- the stage of the treatment (i.e. pad, proppant, flush stages)
- top and base of the stimulated depth interval
- for each treatment interval and stage of the treatment:
  - treatment type
  - isolation method
  - service company that performed the well treatment
  - the start and end dates of treatment
  - fluid type
  - water source where known
  - total volume of fluid used for treatment
  - the volume of treatment water recovered and remediated, where known
  - the volume of treatment water disposed of, where known
  - treatment completion status (e.g. open, closed, squeezed, plugged, etc.)
  - rate of fluid injection
  - treatment pressure during injection at surface and bottom hole
  - proppant agent type, size, and amount
  - description of each additives used including:
    - the common or marketed name of the additive as provided by the supplier
    - the quantity used and its unit of measure
    - the concentration where applicable

Where applicable data is available, the following additional information should be reported:

- amount of proppant placed
- an indication of where treatment screen-out has occurred
- the percentage of the designed treatment pumped to completion.

A list of acceptable file formats and applicable standards are detailed below. The metadata for hydraulic fracturing activities must be provided in the submission template. All raw data acquired (i.e. continuous time-based measurements) must also be submitted as separate files and contain the following:

- casing pressure with time
- calculated bottom-hole pressure with time
- calculated bottom-hole proppant concentration
- injection/pump rate of hydraulic fracturing fluid
- proppant concentration in the hydraulic fracturing fluid with time
- maximum surface treatment pressure reached

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>American Petroleum Institute (API), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII; Raw data - *.ASCII, *.CSV</td>
</tr>
</tbody>
</table>
2.4.9 Data – Lithology

A lithological description must be provided for all core (full-hole and sidewall) and cuttings samples collected during the drilling of the well or bore. Wells that are exempt from the collection of cuttings, are exempt from providing lithological descriptions of cuttings. Lithological data may be submitted in the submission template, or with Mud Log ASCII data (see Data – Mud log) where acquired.

For cuttings, the descriptions must be provided at the resolution of the sampling rate and describe the composite sample for the interval. For core, descriptions must be provided at a resolution sufficient to describe the variation in lithofacies associations with depth. For example, where finely bedded sections exist, groupings of lithotypes that represent a lithofacies association may be described within a single interval.

Information on the lithology must contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- the top and base depth of each described interval
- approximate proportion of each lithotype or rock type in each interval
- a dictionary of lithotypes and any corresponding codes must be provided where company lithotype codes are used in lieu of Departmental codes.

Lithotype descriptions should include the following additional information, where applicable:

- colour and texture
- grain size, sorting, and sphericity
- visible porosity
- hydrocarbon indicators such visible oil staining, fluorescence and cut, colour of residue
- a qualitative contextual rock description as provided by a geologist.

Where fractured or faulted sections exist, these should be described as separate intervals in order to support structural and/or geomechanical interpretation.

The following information for structural features in core should be provided, where structural logging has been performed:

- the top and base depth of each described feature
- type of feature e.g. fault, fold axis, foliation, drilling induced fractures.
- the dip and dip direction
- the angle of intersection between the feature and the core axis (Alpha angle)
- the angle measured clockwise from a reference line to the farthest downhole position of the feature (Beta angle)
- the reference azimuth relative to true north against which beta angles are measured.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII; Raw data -</td>
</tr>
<tr>
<td></td>
<td>*.ASCII</td>
</tr>
</tbody>
</table>
2.4.10 Data – Mud log

In addition to the graphical representation of the mud log in the Appendix, the digital data acquired through mud logging of the well must be provided as an associated data file and must contain the following information, where applicable:

- well or bore name and number
- the wellbore identifier, where applicable
- the service company who acquired the mud logs
- a depth track in measured depth
- the top and base depth of the described lithotype interval
- approximate proportion of each lithotype or rock type in each interval
- the concentration(s) of total gas encountered during the drilling of the well or bore
- the compositional makeup of the gas encountered, in parts per million (ppm), of C1 (Methane), C2 (Ethane), C3 (Butane), C4 (Propane), and C5+ (Pentane and heavier hydrocarbons)
- details of hydrocarbon shows encountered including,
  - the sample type i.e. cuttings, mud, or core
  - the show type i.e. bleed, cut, fluorescence, gas, or stain
  - the depth of the top and base of the interval where shows occurred
- flow rate (GPM)
- the rate of penetration (ROP)
- rotations per minute (RPM)
- weight on bit (WOB)
- standpipe pressure (SPP)
- hook load.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>*.ASCII, *.TXT, *.CSV</td>
</tr>
</tbody>
</table>

2.4.11 Data – Perforation

Details must be provided in the Well Completion Report or Hydraulic Fracturing Activity Report on any perforated intervals. Details of new perforations for all wells perforated during the reporting period must be provided in a production report, where not otherwise reported.

Details must include the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- a unique observation identifier for each perforation job
- date of perforation, unless pre-perforated
- the company performing the perforation operation
- top and base depth of the perforated interval
- the type of perforation (i.e. jet, bullet, or combination)
- perforation hole diameter
- total perforation count
- perforation spacing/density

A list of acceptable file formats and applicable standards are detailed below.
2.4.12 Data – Petroleum production

Data acquired during production of petroleum must be provided and contain the following information in the specified format:

For all resource authorities from which petroleum is permitted to be produced:

- the type and number of the petroleum resource authority
- within each resource authority referred to above, for each production interval from which petroleum was produced:
  - the corresponding stratigraphic unit(s) (ASUD) contributing to production
  - monthly production over a 6 month period of the production and usage volumes over the 6-month reporting period, of the following:
    - oil
    - liquid petroleum gas (LPG)
    - condensate
    - raw natural gas
    - hydrocarbons vented
    - hydrocarbons flared
    - hydrocarbons used in production
    - water
  - the number of wells that contributed any petroleum production at any time during the reporting period.

All reportable permits and volumes must be reported including where a volume is equal to zero.

For all wells from which coal seam gas was produced during the reporting period:

- the name and number of each well that coal seam gas was produced from during the reporting period
- for each well or bore referred to above:
  - the current operator
  - each production interval or geological unit water was produced from
  - the six-monthly cumulative volume of associated water produced
- the method of volume determination i.e. measured, estimated, allocated, or pro-rated.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Stratigraphic Units Database (ASUD), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission template - *.XLS, *.XLSX, *.ASCII</td>
</tr>
</tbody>
</table>
2.4.13 Data – Petroleum reserves and resources

The data for reserves and resources of petroleum within the area of a petroleum resource authority, must be provided and contain the following information:

- the type and number of the petroleum resource authority
- the name of each petroleum field in the resource authority where reserves are located
- the reporting year for which reserves and resources are estimated and the effective date on which the estimates were made
- the reservoir unit type e.g. Coal Seam Gas, Conventional, Shale Gas
- for each petroleum resource authority for last day of the 12 month reporting period:
  - the developed, undeveloped, and totals of:
    - the volume of proved (1P) reserves
    - the volume of proved and probable (2P) reserves
    - the volume of proved, probable, and possible (3P) reserves
  - the total volume of 2C (best estimate) contingent resources
- Where reserves and/or resources are reported, the volumes provided for each confidence level must be stated against the following petroleum products:
  - natural gas (PJs)
  - liquefied petroleum gas - LPG (kilotonnes))
  - condensate (MMBbls)
  - oil (MMBbls).

Volumes must be estimated and classified in accordance with the current Petroleum Resources Management System (PRMS) and auditable under the Reserves Audit Standards (2007). In accordance with the Australian Competition & Consumer Commission (ACCC), quantities must be reported as those available for sale after excluding the gas consumed, flared or lost in operations.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Competition &amp; Consumer Commission (ACCC), Petroleum Resources Management System (PRMS), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII</td>
</tr>
</tbody>
</table>

2.4.14 Data – Petroleum reserve and resource maturity

The data for reserve and resource development status within a petroleum field, must be provided and contain the following information:

- the name of the petroleum field
- the name of the basin where the petroleum field is located
- the reporting year for which reserves and resources are estimated and the effective date on which the estimates were made
- for 2P proved and probable reserves:
  - on production
  - approved for development
  - justified for development
- for 2C best estimate contingent resources:
  - development pending
  - development on hold
  - development unclarified
  - development not viable
A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Competition &amp; Consumer Commission (ACCC), Petroleum Resources Management System (PRMS), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.*XLS, *.*XLSX, *.*ASCII</td>
</tr>
</tbody>
</table>

### 2.4.15 Data – Petroleum reserves movement

A clear distinction between natural depletion by production and revision of reserves based on technical or commercial merit, is required for 2P reserves. The net variance for the 2P reserves in each petroleum hosting basin or field during the reporting period must be provided and contain the following information:

- the name of the basin
- the reporting year for which reserves and resources are estimated and the effective date on which the estimates were made
- any change during the reporting period equal to or greater than 10% in 2P reserves at at a field-level or basin-level due to the following reasons, in standard reporting units:
  - production of hydrocarbons
  - extension
  - reserves reassessment (i.e. upgrades to and downgrades)
  - other revisions
- the total remaining 2P reserves at the end of the reporting period, in standard reporting units.
- the reason for reserves reassessment or other revisions, stated in remarks.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Competition &amp; Consumer Commission (ACCC), Petroleum Resources Management System (PRMS), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.*XLS, *.*XLSX, *.*ASCII</td>
</tr>
</tbody>
</table>

### 2.4.16 Data – Production for ATP or PL relinquishment

Data for the production of petroleum within the relinquished area of an Authority to Prospect or Petroleum Lease must be provided and contain the following information in the specified format:

- the name and number of each petroleum well on the relinquished area that petroleum was produced from since initial commencement of production
- the name of the production intervals and their associated stratigraphic unit(s) (ASUD) that each well produced from
- the name of the petroleum field where the production interval is located
- for each well, for each year since initial commencement of production the volumes of the following petroleum products produced:
  - natural gas (PJs)
  - liquefied petroleum gas – LPG (kilotones)
  - condensate (MMBbls)
  - oil (MMBbls)
  - water (ML).
2.4.17 Data – Production for ATP surrender

Data for the production of petroleum within surrendered area of an Authority to Prospect administered under the Petroleum Act 1923 (Qld) must be provided and contain the following information in the specified format:

- the name of all production intervals and corresponding stratigraphic unit(s) (ASUD) that petroleum was produced within the surrendered area since initial commencement of production
- the name of the petroleum field where the production interval is located
- for each production interval, for each year since initial commencement of production the volumes of the following petroleum products produced during the day in standard reporting units:
  - natural gas (PJs)
  - liquefied petroleum gas – LPG (kilotonnes)
  - condensate (MMBbls)
  - oil (MMBbls)
  - water (ML)

2.4.18 Data – Production testing

The metadata for production testing activities must be provided in the submission template whilst the raw data acquired (e.g. continuous time-based measurements) must be submitted as separate files. Data and metadata acquired during production testing of a well or bore must be provided and contain the following information:

- the name and number of the well or bore
- current operator
- petroleum field where defined
- for each well or bore referred to above, during the reporting term of the test:
  - an identification of every production interval or geological unit(s) that was produced from, and reservoir class (e.g. coal seam gas, conventional, shale gas),
  - for each production interval or geological unit referred to above, for the period, as reported at period end
    - the volumes of the following petroleum products produced during the period in standard reporting units:
      - raw natural gas
      - liquefied petroleum gas (LPG)
      - condensate
      - oil
    - the cumulative volumes of gas used in production, gas vented, and gas flared
    - the cumulative volume of associated water produced
    - the oil specific gravity in API, where applicable
where known, the gas quality, or calorific value
f. flow measurement details (Data – Well test).
  o any changes to the configuration of perforations (Data – Perforations) or tubular (Data – Tubular) in the well since the configuration was last reported.

Raw data such as continuous time-based measurements must be provided in the prescribed formats (see Data – Ancillary reports). A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Stratigraphic Units Database (ASUD), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII Raw Data - *.ASCII, *.CSV</td>
</tr>
</tbody>
</table>

### 2.4.19 Data – Prospects and leads

Interpretations of the extents of all leads and prospects in a relinquished or surrendered area must be provided as spatial information and must contain the following information:

- name of the feature
- category as lead or prospect
- the type such as conventional – structural, conventional – stratigraphic, CSG, shale gas, basin-centred gas, etc
- key target reservoirs and their stratigraphic units (ASUD)
- the name of the lower contact horizon that defines the boundary and the contour level in metres above sea level (AHD), where relevant
- identification of any other features used to define the boundary
- current version and its effective date.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Stratigraphic Units Database (ASUD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>*.ASCII, *.CSV, *.SHP</td>
</tr>
</tbody>
</table>

### 2.4.20 Data – Remote sensing

Where remote sensing surveys are completed, the data that is acquired and/or processed, must be provided. These may include interpretations from satellite, airborne or ground-based data.

Any non-copyright data or images must be submitted with a detailed description of each scene and metadata detailing image capture and processing of each image including: time and date of capture, atmospheric and other radiometric corrections, image enhancements, the remote sensing platform. Where images are supplied in false colour formats the displayed bands must be stated. Images must have some means of locating the data on the ground relative to national grids, and specify the datum and projection.

The processed data must be submitted as a georeferenced image or in a standard exchanged format (e.g. ERS or BIL file).

A list of acceptable file formats and applicable standards are detailed below.
2.4.21 Data – Reservoirs

Reservoirs may be conventional or unconventional and comprised of any lithology capable of storing and producing hydrocarbons such as sandstones, carbonates, coals, and shales. Detailed information must be provided in the well completion report on the measured or interpreted properties of any reservoirs in the well or bore. The reservoir details of all wells that have been deepened during the reporting period and created new reservoir exposure must be provided in a production report, where not otherwise reported.

Details must include the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- the name of the reservoir unit and corresponding stratigraphic unit(s) (ASUD)
- the target resource type i.e. conventional, coal seam gas, shale gas, tight gas
- the depths of the top and base of the interval
- the thickness of the gross pay interval
- the cumulative thickness of the net pay
- the fluid type contained within the reservoir.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Society of Exploration Geophysicists - ASEG-GDF, ASEG-ESF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Grids - *.ERS, *.BIL; Images - *.PDF, *.JPEG, *.TIFF</td>
</tr>
</tbody>
</table>

2.4.22 Data – Samples and analysis

Metadata must be provided on samples collected and any subsequent analysis completed. Examples of samples include cuttings and core, soil or rock from outcrop, fluid samples, and atmospheric samples such as gas and volatiles present at surface or from existing wells or bores.

The data provided for samples collected must contain the following information:

- well or bore name and number, and the wellbore identifier, where applicable, or
- spatial coordinates if not associated with a defined well or bore
- a unique sample identifier
- sample type e.g. core, cuttings, wellhead fluid, other water specimen, hand sample
- sample material e.g. coal, water, cement, sediment
- the date of sampling
- the depth or depth interval where the sample was taken if taken from a well or bore

The results of analyses are to be submitted as raw data in their original form as part of ancillary reports. Key information for common analyses must be lodged in the corresponding submission templates.

The data provided for analyses collected must contain the following information:
• the unique job number or analysis id
• the unique sample identifier
• the company or laboratory who performed the analysis
• the start and end date of the analysis
• mandatory raw data as specified in the submission templates for the following analysis types:
  o adsorption isotherm
  o desorption and gas composition analysis
  o maceral kerogen
  o maceral maturity
  o paleo maturity
  o proximate analysis
  o pyrolysis
  o routine core and shale rock analysis
  o rock mechanics
  o x-ray diffraction (XRD).

Digital images of any physical sample acquired or sample set should also be submitted at a sufficient resolution, within the appendices. Images must be in focus with adequate lighting and an appropriate and unambiguous scale marker. See Data – Core, for specific core sample requirements.

The method used in conducting the test and any assumptions must be adequately described for comparison with results from similar activities.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Laboratory standards including ISO 9002, AS 3980, Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
</table>

### 2.4.23 Data – Seismic acquisition

The metadata obtained from a seismic survey acquisition must be provided in the specified format and contain the following information:

For seismic survey acquisition, supply the following:

• the name and unique identifier for the survey
• the petroleum resource authority(s) name and number
• name of the holder of the petroleum resource authority(s) and operator, where applicable
• the name of the company that performed the survey
• the commencement and completion dates of survey acquisition
• the survey environment, i.e. land, marine, or transition
• the dimension of the survey as 2D, 3D, or 4D
• the target basin(s) of the survey.
• all seismic survey energy sources used in acquisition
• for each source referred to above:
  o the type of energy source(s) used e.g. vibroseis, dynamite, noise source (passive)
  o the make and model of the equipment used to generate the energy source, where applicable
  o for a vibroseis survey
    ▪ the number of sweeps
    ▪ sweep type (e.g. linear, variable)
- sweep duration
- starting and ending sweep frequency
- move up distance and taper for the sweep.
  - for a dynamite survey
    - the size of the charge used
  - for a multi-source array, the number of separate energy sources per shot point, distance between sources, and type of array used (e.g. linear, circular)

<table>
<thead>
<tr>
<th>Data standards</th>
<th>Society of Exploration Geophysicists (SEG), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

### 2.4.24 Data – Seismic processing

The metadata obtained from a seismic survey processing (including re-processing) must be provided in the specified format and contain the following information:

For a seismic survey processing, supply the following additional information:

- the name and unique identifier for the original survey being processed
- the name of the processed survey
- whether the activity is a processing or reprocessing
- name of the holder of the petroleum resource authority(s) and operator, where applicable
- the name of the company who completed the survey
- each type of processed set (e.g. brute stack, final stack, final migrated stack) and generic narrative description of the steps used during processing
- for each of the processed sets referred to above:
  - the commencement and completion dates of survey processing
  - the total receiver line kilometres (2D) or square kilometres (3D) processed in the survey

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards</th>
<th>Society of Exploration Geophysicists (SEG), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

### 2.4.25 Data – Seismic 2D lines and 3D coverage

Data describing the 2D survey lines or 3D survey coverage that comprise the survey acquisition or processing (including reprocessing), must be provided and contain the following information:

For a 2D seismic survey:

- the name and unique identifier for the survey acquisition or processed survey
- the name and unique identifier for each seismic survey line
- for each line referred to above:
  - whether the line includes reflection, refraction, or both types of recording
  - the cumulative receiver line length acquired or processed
  - the average subsurface coverage of Common Depth Point values for a seismic survey acquisition i.e. the CDP fold
  - the identifier or number of the station at the start and at the end of each seismic line

For a 3D seismic survey:
the name and unique identifier for the survey acquisition or processed survey
the total area covered by the seismic acquisition or processing activity
the nominal fold coverage of the survey design
the north reference for the lines (i.e. true north, magnetic north, grid north)
the average in-line spacing and azimuth
the average cross-line spacing and azimuth

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Society of Exploration Geophysicists (SEG), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

### 2.4.26 Data – Seismic shell processing support

The data which provides information on positioning of a seismic survey, must be provided. For seismic survey acquisition this must describe the full coverage of the survey, for seismic survey processing and reprocessing this must describe the extent of the processed portion of the survey. Data provided must contain the following information in Shell Processing Support (SEG-SPS) format:

- the SPS format version
- a description of the survey area including
  - the petroleum resource authority(s) name and number
  - the survey name
  - the dimension of the survey as 2D or 3D
  - the survey number assigned by the Department
- the commencement and completion dates of survey acquisition, i.e. the first and last dates of on-ground activity
- the tape or disk identifier
- name of the holder of the petroleum resource authority(s) and operator, where applicable
- the name of the service company that recorded the survey
- the equipment used to acquire the survey
- the coordinated universal time zone
- the geodetic datum attributes
- the vertical datum used
- the projection type, grid and zone
- where a Vibroseis source was used to acquire the survey a comment line of the number of sweeps
- each seismic survey line
- for each 2D survey line record, or each 3D survey in-line and cross-line record referred to above:
  - the record identification i.e. S – source, R – receiver, X – Cross Reference
  - the line name the record relates to
  - all point numbers, and for each point:
    ▪ any static correction, where applicable
    ▪ the point depth, where applicable
    ▪ the water depth, where applicable
    ▪ the easting and northing
    ▪ the surface elevation
    ▪ the day of the year that recording occurred

See Appendix 1 for an example of minimum metadata in SEG-SPS format.
Any additional relevant metadata described in the latest SPS technical standards document should be provided.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Society of Exploration Geophysicists (SEG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Raw data – SEG-SPS</td>
</tr>
</tbody>
</table>

### 2.4.27 Data – Seismic data (raw)

The data obtained from a seismic survey acquisition must be provided in the specified format and contain the following information:

- observers logs
- daily recorded data
- quality control notes
- shot point station information
- static corrections data
- velocity data.

The raw data acquired from a seismic survey must be submitted as separate files. In addition to this, operational reports from the company(s) that perform and analyse the seismic survey data (details provided in Ancillary Reports).

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Society of Exploration Geophysicists (SEG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.*XLS, *.*XLSX, *.*ASCII, *.CSV, *.*TXT, Seismic data - *.*SEG-Y, *.*SEG-D; Images - *.*CMB, *.*PDF, *.*TIFF, *.*JPEG; Tabular data – *.*ASCII, *.*CSV</td>
</tr>
</tbody>
</table>

### 2.4.28 Data – Seismic data (processed)

The data obtained from processing of a seismic survey or re-processing of data from a seismic survey must be provided in the specified format and contain the following information:

- final stack and migrated data, including near/mid/far sub-stacks and pre-stack time and depth migration, where produced
- processing results and information

Data must be provided in SEG-Y format, where applicable, and comply with the SEG standard for these file types. Within the header of the SEG-Y file, the following information must be included:

- the name of the survey
- the name of the seismic lines
- the type of the survey as 2D or 3D and environment (e.g. land, marine)
- the type of energy source
- the type of post stack data
- the sample interval
- the seismic reference datum, as referenced to sea level (AHD);
- the replacement velocity, in metres per second
• the time, in milliseconds, to the first sample
• the geodetic datum, projection, and zone
• the first and last CDP number
• the first and last station number
• the number of traces per station
• the byte location in the trace header of the following items:
  o SP number
  o CDP number
  o Coordinate scale factor
  o CDP coordinates
  o coordinate units
  o lag time A
  o number of samples per trace
  o sample interval
• the type and number of the petroleum resource authority(s) where the survey took place
• the name of the operator of the resource authority(s) where the survey took place
• the company that acquired the survey
• the year that the data was acquired
• the year that the data was processed
• the company that processed the data.

For 3D surveys, the inline and crossline ranges must also be included in the SEG-Y header.

All available additional relevant metadata described in the latest SEG-Y technical standards document should be provided.

A list of acceptable file formats and applicable standards are detailed below.

The processed data acquired from seismic surveys must also be submitted as separate files. In addition to this, operational and interpretive reports from the company(s) that perform and analyse the seismic survey data (details provided in Ancillary Reports).

### Data standards:

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Society of Exploration Geophysicists (SEG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Seismic data - *.SEGY; Tabular data - *.ASCII, *.CSV</td>
</tr>
</tbody>
</table>

#### 2.4.29 Data – Spatial information

Spatial data locating the activity, activities, study area, or features that are the subjects of the report must be provided where they have not been offered through other statutory reporting or available in the public domain. This includes, but is not limited to:

• sampling points for scientific or technical surveys
• survey outlines for non-seismic geophysical surveys
• survey lines where applicable
• any other permanent feature directly related to data capture for the survey or feature
• the location of the pipeline in a surrendered area, including access to the pipeline
• all petroleum wells, seismic lines, and other authorised activities for the end, relinquishment, or surrender of a tenure or part thereof
• the location of each natural underground geological unit that has produced petroleum or water in an area being relinquished or surrendered.
Files must be populated with sufficient metadata to identify the type of feature and any attributes that are relevant to the specific feature type. Files should not include other non-reportable spatial layers. A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>DNRME Geological Spatial Data Submission Standard (2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>*.SHP, *.ASC, *SEG-SPS</td>
</tr>
</tbody>
</table>

2.4.30 Data – Stratigraphy
Details must be provided in the well completion report on the stratigraphic intervals intersected in the well or bore. The stratigraphic intervals of all wells that have been deepened during the reporting period and intersected new formations must be provided in a production report, where not otherwise reported.

For each geological or stratigraphic unit, the following details must be provided:

- well or bore name and number
- the wellbore identifier, where applicable
- the name, in accordance with the Australian Stratigraphic Units Database
- the measured depth at the top of the stratigraphic interval
- the measured depth at the base of the stratigraphic interval, where intersected
- the true vertical depth at the top of the stratigraphic interval
- the conformity relationship that describes the surface, if determined

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Stratigraphic Units Database (ASUD), International Commission on Stratigraphy (ICS), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

2.4.31 Data – Surface geology
Any spatial data associated with new or updated interpretations of surface geology from a survey, must be provided. The following information may be included:

- spatial coordinates of field stations including boundaries or section line traverses and observation points
- boundaries of interpreted geological units (ASUD)
- linear features and their classifications including fold axes, faults, dykes, etc. Indication of fault type and throw should be included
- other polygonal geological features and their classifications
- dip and dip direction measurements with dip direction in degrees from true north and dip in degrees from the horizontal plane
- sampling localities.

Spatial coordinates of field stations, observations, measurements, and samples must have datum, projection, and zone specified.

All information provided must be clearly identified in the data files including where interpretation is actual or inferred. Geological units must utilise the ASUD standard, where applicable. Petrological
descriptions at observation points or from samples may be provided in a tabular form, so long as reference to their spatial locations is provided.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Stratigraphic Units Database (ASUD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Tabular data - *.ASCII, *.CSV; Spatial data - *.SHP</td>
</tr>
</tbody>
</table>

### 2.4.32 Data – Tubular

Detailed information must be provided for all tubulars such as casing, liner and production tubing installed in the well or bore at time of rig release for well completion and abandonment reports. Tubular configuration must be provided as part of production testing reports where the configuration has changed since last reported. Tubular configuration must be provided in a petroleum production report for all wells with reportable production that had new tubular installed during the reporting period, where not otherwise reported.

Details must contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- a unique tubing observation identifier for each installation
- the date of installation
- the date of removal where applicable
- the depth intervals over which each tubular string is installed
- the types of each tubular string installed
- the diameter of each tubular in engineering units
- the tubular material or tubular grade
- tubular coupling type
- tubular density reported in mass per unit of length, where applicable.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>International Association of Drilling Contractors (IADC), American Petroleum Institute (API), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

### 2.4.33 Data – Velocity survey

The data obtained from a velocity survey must be provided in the specified format and contain the following information:

- well or bore name and number
- the wellbore identifier, where applicable
- the company that conducted the survey
- the unique identifier of the survey and the run number
- the type of survey i.e. VSP, inline checkshot, walk-away checkshot
- the type of VSP where applicable being upgoing or downgoing
- the seismic reference datum with respect to AHD
• whether the seismic path is one-way or two-way
• top and base depth of each survey interval
• velocity type and value for each survey interval
• travel time for each survey interval as per the seismic path.

The metadata for velocity survey activities must be provided in the submission template whilst the raw data acquired (e.g. continuous depth-based measurements) must also be submitted as separate files. A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Society of Exploration Geophysicists (SEG), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT; Raw Data - *.CSV, *.ASCII</td>
</tr>
</tbody>
</table>

2.4.34 Data – Water analysis

Where petroleum production occurs from a coal seam gas reservoir, the following analyses for associated water is required and must contain the following information:

• the unique job number or analysis id
• the unique sample identifier
• the company or laboratory who performed the analysis
• the start and end date of the analysis
• For each sample referred to above:
  o The type of water sample i.e. produced, injection water, disposal water
  o any salinity measurements in ‘Total Dissolved Solids’ reported in mg/L
  o any measurements of electrical conductivity, where taken
  o the pH reading for each day of the reporting term on which it was measured.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Stratigraphic Units Database (ASUD), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>
2.4.35 Data – Well or bore summary

The detailed information provided in the well or bore summary must be submitted as digital data to capture key metadata and must contain the following information:

- well or bore name and number
- name of the holder of the petroleum resource authority and operator of the well or bore
- petroleum resource authority name and number
- name of the petroleum field where defined
- current class (Exploration, Appraisal, Development)
- well type (Petroleum, CSG, Water Injection, etc.)
- well design (vertical, deviated, or lateral)
- status at time of rig release (cased and suspended, completed, on injection, on production, plugged and abandoned, water bore)
- surface location of the well or bore in either;
  - latitude and longitude in decimal degrees with geographic coordinate system or,
  - easting and northing with projected coordinate system and zone
- elevation of the ground (GL)
- the depth reference (GL), rotary table (RT) or kelly bushing (KB), and its elevation
- total depth (TD) reached (driller’s depth, logger’s depth, and true vertical depth)
- primary and secondary target basin
- primary and secondary stratigraphic unit target
- primary and secondary resource target (e.g. conventional, unconventional, coal seam gas).
- the shut-off method, where applicable, including;
  - suspension method
  - bridge plug set depth
  - completion date and type
- details of all drill rigs that performed drilling activities on the well or bore, including
  - the rig operating company
  - rig name
  - key dates (spud date, total depth (TD) date, and rig release date)
- details of all component wellbores within a well or bore, including;
  - wellbore identifier (ST01, DW1, WB01 etc.) where applicable
  - the rig that drilled the wellbore
  - the top and base depth of each wellbore
  - where the information is available, the parent wellbore for all child branches, i.e. the preceding wellbore that the reported wellbore originated from.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

2.4.36 Data – Well completion

A Well Completion is a set of one or more contact intervals with stratigraphic zones that function as a single unit for the purpose of production, injection or service. Details on all well completion intervals must be provided in the well completion report and in subsequent reports if altered since last reported.

Details must include the following information:

- well or bore name and number
- the wellbore identifier, where applicable
• A unique observation identifier for each completion interval
• an identification of each production interval completed and its respective stratigraphic unit(s) (ASUD)
• the method of completion
• top and base of the completed depth interval.

A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Stratigraphic Units Database (ASUD), International Association of Drilling Contractors (IADC), American Petroleum Institute (API), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
</tbody>
</table>

### 2.4.37 Data – Well logs and directional surveys

Detailed information must be provided for all petrophysical and directional logging conducted in the well or bore. The type of file submitted must reflect standard industry usage of the data. For example, image log data (e.g. FMI, CMI) should be submitted in DLIS format, standard log suites in Log ASCII Standard (LAS) format, and velocity logs (VSP) in SEG-Y format. Log data provided in LAS format must be in LAS version 2.0 unwrapped format. Where multiple wellbores (e.g. sidetracks) exist, a directional survey must be provided for each, and referenced back to the well or bore origin at surface. Downhole logs must contain the following information:

- **Well information**, including:
  - well name and number
  - the wellbore identifier, where applicable
  - the top and bottom depths of the logging run
  - the step increment of measurement values
  - the specified null value
  - the operating company of the well or bore
  - the petroleum field where the well or bore is located
  - petroleum resource authority name and number
  - the coordinate reference system and projected coordinate zone
  - latitude and longitude
  - the service company who conducted the logging
  - the date the logging was completed

- **Curve information** for all logging curves acquired, including:
  - a depth track
  - specification of all logs acquired including
    - mnemonic and unit
    - API codes where applicable
    - a curve description

- **Parameter information**, including:
  - the run ID
  - job number
  - the depth reference datum elevation, relative to the Australian Height Datum (AHD)
  - the depth reference datum e.g. Rotary Table (RT), Ground Level (GL)
  - logging run number
  - driller and logger total depth
  - the survey type (e.g. MWD, Totco, Magnetic) for directional surveys
the tool conveyance method for petrophysical logs (e.g. wireline, MWD, pipe-conveyed)
the bottom depth of any casing installed in the well or bore

- ASCII log data, including:
  - index data in the first column i.e. depth or time
  - array data for all curves described in the curve information section
  - all array data must be decimal or integer values separated by at least one space per column
  - all null values must be present in the array and represented as specified in the well information section.

Where applicable data is available, the following should be reported:

- borehole environmental conditions including mud weight and resistivity measurements for drilling mud, filter cake, and mud filtrate at standard temperature and pressure conditions.
- the maximum temperature recorded during logging
- circulation stop time and date, and time since circulation.

The following mandatory specifications apply as per Section 30 of the Petroleum and Gas (Safety) Regulation (Qld) 2018:

- For a lateral well, or another well or a bore that intersects a coal seam more than 1m in thickness, the holder of the petroleum resource authority must ensure that as soon as practicable after drilling of the well or bore, but not later than three months after the rig release day from the well or bore, a downhole survey of the well or bore is carried out.

- For all lateral wells or bores the downhole survey must achieve a level of accuracy that is within ±0.5° for inclination and ±1.0° azimuth, or for each 1000m of the drilled hole, ±6m vertically and ±20m laterally. However, if a lateral well intersects another well, the level of accuracy achieved by the downhole survey of the lateral well must be at least as good as the level of accuracy achieved by the downhole survey of the other well.

- For all other wells or bores that intersect a coal seam more than 1m in thickness, the downhole survey must achieve a level of accuracy that is within ±0.5° for inclination and ±2.0° azimuth for a well or bore with an inclination less than 6.0°, and within ±0.5° for inclination and ±1.0° azimuth for a well or bore with an inclination greater-than-or-equal-to 6.0°.

See Appendix 2 for an example of a directional survey with minimum metadata in LAS 2.0 format.
See Appendix 3 for an example of a petrophysical well log with minimum metadata in LAS 2.0 format.
Any ancillary reports (including contractor/consultant reports) must be provided in the appendix with any associated data files. A list of acceptable file formats and applicable standards are detailed below. The metadata for directional surveys must be provided in the submission template whilst the raw data acquired must also be submitted as separate files.

| Data standards: | International Association of Drilling Contractors (IADC), American Petroleum Institute (API), Log ASCII Standard (LAS), Digital Log Information Standard (DLIS), Professional Petroleum Data Management Association (PPDM) |
2.4.38 Data – Well tests

Detailed information must be provided for all well testing completed in the well or bore including, but not limited to:

- Drill Stem Testing (DST) and Diagnostic Fracture Injection Testing (DFIT)
- Wireline formation tests (i.e. Repeat Formation Testing (RFT))
- Formation Integrity Testing (FIT), Leak-off Testing (LOT) and other pressure-related measurements and calculations.

Data acquired during well tests must be provided and for each test must contain the following information:

- Well or bore name and number
- Wellbore identifier, where applicable
- A run number identifying a run or trip into the well for the purpose well testing
- Test number within a trip or run
- Event number within a test (e.g. 1 – initial flow, 2 – final flow or multiple repeat tests), where applicable
- Company that conducted the well test
- Date the test was performed
- Type (e.g. DST, DFIT, RFT) and where applicable, the sub-type of test conducted signifying the method of isolation
- Depth interval or point of the test
- Reservoir(s) tested and associated stratigraphic unit(s) (ASUD)
- Flow and shut-in durations
- Choke size
- Measured depth of the pressure gauge during testing
- Maximum hydrostatic pressure measurement recorded
- Pressure measurements recorded during shut-in

The metadata for well testing activities must be provided in the submission template. Operational reports from the company(s) that perform and analyse the well test must be provided (details provided in Ancillary Reports) including raw data (e.g. continuous time-based measurements) submitted as separate files. A list of acceptable file formats and applicable standards are detailed below.

<table>
<thead>
<tr>
<th>Data standards:</th>
<th>Australian Stratigraphic Units Database (ASUD), International Association of Drilling Contractors (IADC), American Petroleum Institute (API), Professional Petroleum Data Management Association (PPDM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted file formats:</td>
<td>Submission Template - *.XLS, *.XLSX, *.ASCII, *.CSV, *.TXT</td>
</tr>
<tr>
<td></td>
<td>Raw data - *.ASCII, *.CSV</td>
</tr>
</tbody>
</table>
# 3 Checklist

This section provides a checklist for content and format requirements for statutory reports.

<table>
<thead>
<tr>
<th></th>
<th>Every report submitted includes:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• title page</td>
</tr>
<tr>
<td></td>
<td>• table of contents</td>
</tr>
<tr>
<td></td>
<td>• report sections</td>
</tr>
<tr>
<td></td>
<td>• references</td>
</tr>
<tr>
<td></td>
<td>• appendices (if applicable)</td>
</tr>
<tr>
<td></td>
<td>• data files</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Written in English (Australian)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The title page includes:</td>
</tr>
<tr>
<td></td>
<td>• report name</td>
</tr>
<tr>
<td></td>
<td>• project name</td>
</tr>
<tr>
<td></td>
<td>• resource authority (tenure) type</td>
</tr>
<tr>
<td></td>
<td>• resource authority (tenure) number</td>
</tr>
<tr>
<td></td>
<td>• name of the resource authority holder</td>
</tr>
<tr>
<td></td>
<td>• name and affiliation of the author of the report</td>
</tr>
<tr>
<td></td>
<td>• name and affiliation of the person submitting the report</td>
</tr>
<tr>
<td></td>
<td>• the report period, or activity start and end dates, in day-month-year format</td>
</tr>
<tr>
<td></td>
<td>• the date of the report, in day-month-year format.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Table of contents list all key content in the report including associated data and appendices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The report sections includes the required information as outlined in this Practice Direction</td>
</tr>
<tr>
<td></td>
<td>All reports (and sections) are saved PDF in ISO19005-1 compliant (PDF/A) format</td>
</tr>
<tr>
<td></td>
<td>References are provided in the standard format</td>
</tr>
<tr>
<td></td>
<td>Appendices are provided in the standard format</td>
</tr>
<tr>
<td></td>
<td>Definitions are provided in the standard format</td>
</tr>
<tr>
<td></td>
<td>Maps are provided in the preferred format</td>
</tr>
<tr>
<td></td>
<td>Data files are provided to the specified standard and in the preferred format</td>
</tr>
<tr>
<td></td>
<td>All other common requirements have been met</td>
</tr>
</tbody>
</table>
3.1 How to structure references

A list of all references used by the author to compose a report must be provided in standard format (author, date, name, publication) as per the following examples:

For a company report, departmental report, record or publication currently held in the Open Data Portal:


For a technical journal, paper or other publication:


3.2 Definitions

<table>
<thead>
<tr>
<th>Figure</th>
<th>Illustrative diagram located within report text or provided as a separate file</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map</td>
<td>Spatial data file (GIS) — see Data - Spatial information for more information on map formats</td>
</tr>
<tr>
<td>Data file</td>
<td>Data associated with report content must be submitted as separate files with the report PDF(s) and listed in the report table of contents. Associated data files that are too numerous or large to be provided separately, can be compressed.</td>
</tr>
<tr>
<td>Map file</td>
<td>Submit associated maps as a separate file and list in the table of contents. Numerous or large files can be provided separately as a ZIP file.</td>
</tr>
<tr>
<td>Petroleum resource authority name and number</td>
<td>The type and number of the resource authority assigned by the Department of Natural Resources, Mines, and Energy e.g. PL 1, ATP 2, WMA 3.</td>
</tr>
<tr>
<td>Well name and number</td>
<td>The name and number assigned to the well or bore by the operator as supplied in the “Notice of intention to drill a petroleum well or bore” (PGGD-01)</td>
</tr>
</tbody>
</table>
| Wellbore identifier         | Any number or alphanumeric name assigned to a wellbore (i.e. sidetrack, branch) of a well or bore by the operator e.g. ST1 (first
sidetrack), DW1 (first deviated well drilled out from a pilot hole), WB01 (wellbore 01), WB02 (wellbore 02).

3.3 Abbreviations and acronyms

<table>
<thead>
<tr>
<th>ABBREVIATION</th>
<th>TERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHD</td>
<td>Australian Height Datum</td>
</tr>
<tr>
<td>ATP</td>
<td>Authority to Prospect</td>
</tr>
<tr>
<td>DAA</td>
<td>Data Acquisition Authority</td>
</tr>
<tr>
<td>DNRME</td>
<td>Department of Natural Resources, Mines and Energy</td>
</tr>
<tr>
<td>GGIC</td>
<td>Government Geoscience Information Committee</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GSQ</td>
<td>Geological Survey of Queensland</td>
</tr>
<tr>
<td>PCA</td>
<td>Potential Commercial Area</td>
</tr>
<tr>
<td>PFL</td>
<td>Petroleum Facility Licence</td>
</tr>
<tr>
<td>PL</td>
<td>Petroleum Lease</td>
</tr>
<tr>
<td>PPDM</td>
<td>Professional Petroleum Data Management Association</td>
</tr>
<tr>
<td>PPL</td>
<td>Petroleum Pipeline Licence</td>
</tr>
<tr>
<td>PSL</td>
<td>Petroleum Survey Licence</td>
</tr>
<tr>
<td>WMA</td>
<td>Water Monitoring Authority</td>
</tr>
</tbody>
</table>
4 Appendices

3.3 Appendix 1 – SEG-SPS Minimum Metadata

<table>
<thead>
<tr>
<th>Item</th>
<th>Definition of Field</th>
<th>Cols</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>H00</td>
<td>SPS format version num.</td>
<td>SPS 2.1;</td>
<td></td>
</tr>
<tr>
<td>H01</td>
<td>Description of survey area</td>
<td>PL 4567,PINEAPPLE HILLS,2D,123789;</td>
<td></td>
</tr>
<tr>
<td>H02</td>
<td>Date of survey</td>
<td>21.05.1990,28.05.1990;</td>
<td></td>
</tr>
<tr>
<td>H021</td>
<td>Post/plot date of issue</td>
<td>30.06.1990;</td>
<td></td>
</tr>
<tr>
<td>H022</td>
<td>Tape/disk identifier</td>
<td>123789_SPS1;</td>
<td></td>
</tr>
<tr>
<td>H03</td>
<td>AuthTenureHolder</td>
<td>GasExtractCo Ltd.;</td>
<td></td>
</tr>
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<td>H04</td>
<td>Geophysical contractor</td>
<td>GeophysAcquire Co.,Crew No 123;</td>
<td></td>
</tr>
<tr>
<td>H05</td>
<td>Geophysical contractor</td>
<td>GeophysAcquire Co.,Crew No 123;</td>
<td></td>
</tr>
<tr>
<td>H06</td>
<td>Geophysical contractor</td>
<td>GeophysAcquire Co.,Crew No 123;</td>
<td></td>
</tr>
<tr>
<td>H07</td>
<td>Field instrument system(s)</td>
<td>Zland Generation 2 Nodal;</td>
<td></td>
</tr>
<tr>
<td>H08</td>
<td>Coordinate location</td>
<td>centre of source pattern and centre of receiver pattern;</td>
<td></td>
</tr>
<tr>
<td>H10</td>
<td>Clock time w.r.t. GMT</td>
<td>+10:00,Coordinated Universal Time (UTC);</td>
<td></td>
</tr>
<tr>
<td>H12</td>
<td>Geodetic datum,spheroid</td>
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<td>GDA2020 to WGS84-2017.6;dx=595.000;dy=11.300;dz=478.000;rx=0.000;ry=0.000;rz=0.000;ds=0.000;</td>
<td></td>
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<td>Vertical datum description</td>
<td>Australian Height Datum (AHD);</td>
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<td>Projection Type</td>
<td>Transverse Mercator;</td>
<td></td>
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<tr>
<td>H19</td>
<td>Projection Zone,Grid Name</td>
<td>Zone 55,MGA94;</td>
<td></td>
</tr>
<tr>
<td>H20</td>
<td>Description of grid units</td>
<td>Metre;</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>Item</td>
<td>Definition of Field</td>
<td>Cols</td>
</tr>
<tr>
<td>H26</td>
<td>1</td>
<td>Record identification</td>
<td>1-1</td>
</tr>
<tr>
<td>H26</td>
<td>2</td>
<td>Line name</td>
<td>(right adj)</td>
</tr>
<tr>
<td>H26</td>
<td>3</td>
<td>Point number</td>
<td>(right adj)</td>
</tr>
<tr>
<td>H26</td>
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</tr>
<tr>
<td>H26</td>
<td>5</td>
<td>Point index</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>6</td>
<td>Point code</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>7</td>
<td>Static correction</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>8</td>
<td>Point depth</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>9</td>
<td>Seismic datum</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>10</td>
<td>Upright time</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>11</td>
<td>Water depth at point</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>12</td>
<td>Point easting (m)</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>13</td>
<td>Point northing (m)</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>14</td>
<td>Surface elevation at point</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>15</td>
<td>Day of Year (Julian day)</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>16</td>
<td>Time “hhmmss”</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>17</td>
<td>Petroleum and Gas Reporting Practice Direction</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>18</td>
<td>Department of Natural Resources, Mines and Energy</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>19</td>
<td>Version 1.0</td>
<td></td>
</tr>
<tr>
<td>H26</td>
<td>20</td>
<td>September 2020</td>
<td></td>
</tr>
</tbody>
</table>

PD6 Petroleum and Gas Reporting Practice Direction
Department of Natural Resources, Mines and Energy
Version 1.0 September 2020

60
### Appendix 2 – Directional Survey LAS 2.0 Minimum Metadata

<table>
<thead>
<tr>
<th>VERS.</th>
<th>2.0</th>
<th>WRAP.</th>
<th>NO</th>
</tr>
</thead>
</table>

#### #Well Information

<table>
<thead>
<tr>
<th>MNEM.UNIT</th>
<th>DATA</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#-----.----</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>STRT .M</td>
<td>4.2</td>
<td>Start</td>
</tr>
<tr>
<td>STOP .M</td>
<td>900.5</td>
<td>Stop</td>
</tr>
<tr>
<td>STEP .M</td>
<td>10.000</td>
<td>Step increment</td>
</tr>
<tr>
<td>NULL.</td>
<td>-999.25</td>
<td>Null value</td>
</tr>
<tr>
<td>COMP.</td>
<td>GSQ Petroleum</td>
<td>Company</td>
</tr>
<tr>
<td>WELL.</td>
<td>FAIR GULLY 42 ST1</td>
<td>Well</td>
</tr>
<tr>
<td>FLD.</td>
<td>FAIR GULLY</td>
<td>Field</td>
</tr>
<tr>
<td>LIC.</td>
<td>PL 314</td>
<td>Licence Number</td>
</tr>
<tr>
<td>CRS.</td>
<td>GD2020</td>
<td>Coordinate Reference System</td>
</tr>
<tr>
<td>ZONE.</td>
<td>55</td>
<td>Projected Coordinate Zone</td>
</tr>
<tr>
<td>LOC1.</td>
<td>22° 29' 13.0&quot; S</td>
<td>Latitude</td>
</tr>
<tr>
<td>LOC2.</td>
<td>144° 25' 54&quot; E</td>
<td>Longitude</td>
</tr>
<tr>
<td>SRVC.</td>
<td>Baker Halliford</td>
<td>Service company</td>
</tr>
<tr>
<td>DATE.</td>
<td>13-Mar-2099</td>
<td>Logging date</td>
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#### #Curve Information

<table>
<thead>
<tr>
<th>MNEM.UNIT</th>
<th>API CODES</th>
<th>CURVE DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#-----.----</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>DEPT .M</td>
<td>00 001 00 00</td>
<td>Logged depth</td>
</tr>
<tr>
<td>TDEP .M</td>
<td>75 960 00 00</td>
<td>True Depth</td>
</tr>
<tr>
<td>VTLT .degs</td>
<td>75 620 01 00</td>
<td>Borehole Tilt</td>
</tr>
<tr>
<td>VAZT .degs</td>
<td>76 630 01 00</td>
<td>Borehole Azimuth (True)</td>
</tr>
</tbody>
</table>

#### #Parameter Information

<table>
<thead>
<tr>
<th>MNEM.UNIT</th>
<th>VALUE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#-----.----</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>RNID . VerticalityAnalysis</td>
<td>31415</td>
<td>Run ID</td>
</tr>
<tr>
<td>SON .</td>
<td>31415</td>
<td>Job Number</td>
</tr>
<tr>
<td>DREF .</td>
<td>464.3</td>
<td>Elevation of depth reference</td>
</tr>
<tr>
<td>DREF .M</td>
<td>KB</td>
<td>Depth reference</td>
</tr>
<tr>
<td>GL .M</td>
<td>460.1</td>
<td>Ground elevation</td>
</tr>
<tr>
<td>RUN .</td>
<td>2</td>
<td>Run number</td>
</tr>
<tr>
<td>TDD .M</td>
<td>910.00</td>
<td>TD (driller)</td>
</tr>
<tr>
<td>TDL .M</td>
<td>980.75</td>
<td>TD (logger)</td>
</tr>
<tr>
<td>DSET .</td>
<td>MWD</td>
<td>Directional Survey Equipment Type</td>
</tr>
</tbody>
</table>

#### #Other Information

Borehole positional error is derived assuming the following parameters.

<table>
<thead>
<tr>
<th>TILT (degrees)</th>
<th>AZIMUTH (degrees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Error+/−</td>
<td>0.1000 +/-5.0</td>
</tr>
<tr>
<td>Maximum Error+/−</td>
<td>0.2000 +/-8.0</td>
</tr>
</tbody>
</table>

#### #ASCII Log Data

<table>
<thead>
<tr>
<th>DEPT</th>
<th>TDEP</th>
<th>VTLT</th>
<th>VAZT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.200</td>
<td>4.20</td>
<td>0</td>
<td>211.5</td>
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</tbody>
</table>
3.5 Appendix 3 – Well Logs LAS 2.0 Minimum Metadata

Note: Only the depth or time reference log is required in any individual run. However, all logs run must be recorded in the Curve Information section of the LAS file.

---

**Version Information**

VERS. 2.0 : CWLS Log ASCII Standard - Version 2.00
WRAP. NO : One line per depth step

---

**Well Information**

<table>
<thead>
<tr>
<th>MNEM.UNIT</th>
<th>DATA</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>STRT .M</td>
<td>4.2</td>
<td>Start</td>
</tr>
<tr>
<td>STOP .M</td>
<td>900.5</td>
<td>Stop</td>
</tr>
<tr>
<td>STEP .M</td>
<td>10.000</td>
<td>Step increment</td>
</tr>
<tr>
<td>NULL .</td>
<td>-999.25</td>
<td>Null value</td>
</tr>
<tr>
<td>COMP .</td>
<td>GSQ Petroleum</td>
<td>Company</td>
</tr>
<tr>
<td>WELL .</td>
<td>FAIR GULLY</td>
<td>Field</td>
</tr>
<tr>
<td>FLD .</td>
<td>FAIR GULLY</td>
<td>Field Number</td>
</tr>
<tr>
<td>LIC .</td>
<td>PL 314</td>
<td>Licence Number</td>
</tr>
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<td>CRS .</td>
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<tr>
<td>LOC2 .</td>
<td>144° 25' 54&quot; E</td>
<td>Longitude</td>
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<td>SRVC .</td>
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<tr>
<td>DATE .</td>
<td>13-Mar-2099</td>
<td>Logging date</td>
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**Curve Information**

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<th>CURVE DESCRIPTION</th>
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<tr>
<td>HVOL .F</td>
<td>70 0 0 00</td>
<td>Hole Volume</td>
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<tr>
<td>DEN .G/C3</td>
<td>42 350 1 00</td>
<td>Compensated Density</td>
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<tr>
<td>CLDC .IN</td>
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<td>GRGC .GAPI</td>
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<td>CGXT .DEGC</td>
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<td>DOR .G/C3</td>
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<td>DDDL .OHMM</td>
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<td>DSLL .OHMM</td>
<td>11 220 9 00</td>
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<td>DT35 .US/F</td>
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<td>3-5’ Compensated Sonic</td>
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**Parameter Information**

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<td>DREF .</td>
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<td>TDL .M</td>
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<td>TD (logger)</td>
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<td>CSGD .M</td>
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<tr>
<td>CSGL .M</td>
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**Other Information**

# RUN NUMBER 1 IS THE PRIMARY DEPTH REFERENCE LOG ON 10 MARCH 2099 BY BAKER HALLIFORD. ALL OTHER RUNS ARE CORRELATED BACK TO THIS LOG.

---

A

<table>
<thead>
<tr>
<th>DEPT</th>
<th>HVOL</th>
<th>DEN</th>
<th>CLDC</th>
<th>GRGC</th>
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PD6 Petroleum and Gas Reporting Practice Direction
Department of Natural Resources, Mines and Energy
Version 1.0 September 2020
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6. Authorisation

Approved by:
Deputy Director General
Georesources
September 2020