Queensland

Geothermal Energy Act 2010

Geothermal Energy Regulation 2022

Current as at 1 September 2022

Queensland

Geothermal Energy Regulation 2022

Contents

Contents

Geothermal Energy Regulation 2022

Part 1 Preliminary

1 Short title

This regulation may be cited as the *Geothermal Energy Regulation 2022*.

2 Commencement

This regulation commences on 1 September 2022.

3 Definitions

The dictionary in schedule 6 defines particular words used in this regulation.

4 Deciding large-scale geothermal production—Act, s 16

For section 16(2) of the Act, the following criteria are prescribed—

(a) the total amount of thermal power produced from all geothermal wells measured at the wellhead is 5 megawatts thermal (MW_{th}) or more when the temperature is 0°C and the atmospheric pressure is 1 atm;

Example of measurement of thermal power—

For a geothermal well that produces 50 tonnes an hour of geothermal fluid with specific enthalpy of 900 kilojoules a kilogram, the total amount of thermal power produced from the well measured at the wellhead is 12.5 MW_{th} (above 0°C).

(b) the geothermal production is for a commercial or industrial purpose.

Part 2 Requirements for proposed work programs and development plans

5 Proposed work program—Act, s 47

For section 47(1)(f) of the Act, the following matters are prescribed—

(a) a description of the geological model for the geothermal reservoirs in the area of the proposed geothermal permit;

(b) an assessment of the potential for the discovery of geothermal resources in the area of the proposed geothermal permit;

Examples of information that may be included in an assessment—

- an estimate of the recoverable thermal energy in the area using units of petajoules thermal (PJ_{th})
- the geoscientific information, standards and procedures used to make the estimate of recoverable geothermal energy

(c) an explanation of the rationale, having regard to the geological model mentioned in paragraph (a), for the activities proposed to be carried out under the proposed geothermal permit;

(d) an outline of the expected outcomes to be achieved by the proposed work program.

6 Proposed development plan—Act, s 89

For section 89(1)(e) of the Act, the following matters are prescribed—

(a) for each geothermal reservoir identified in the area of the proposed geothermal lease, the location of the boundaries of the classified geothermal resources in the reservoir;

(b) details, including the location, type and size, of the infrastructure intended to be located in the area of the proposed geothermal lease.

Examples of infrastructure—

- communication systems, compressors, pipelines, powerlines, pumping stations, reservoirs, roads, substations
- temporary structures or structures of an industrial or technical nature, including mobile and temporary camps

Part 3 Notice requirements

7 Purpose of part

This part prescribes, for section 192(1)(b) of the Act, the notices that a geothermal tenure holder must give to the chief executive in the approved form.

8 Notice of intention to drill a geothermal well

(1) A geothermal tenure holder must, at least 10 business days before starting to drill a geothermal well in the area of the tenure, give the chief executive a notice stating—

(a) that the well is to be drilled; and

(b) the proposed identifying name for the well.

(2) The proposed identifying name for the geothermal well must not be the same, or substantially the same, as an identifying name for another geothermal well recorded in the register.

9 Notice of completion, change or abandonment of geothermal well

(1) This section applies if any of the following events happen in relation to a geothermal well in the area of a geothermal tenure—

(a) drilling of the well is completed;

(b) the completion configuration of the well changes;

(c) the well is abandoned.

(2) The geothermal tenure holder must, within 10 business days after the event happens, give the chief executive a notice stating that the event has happened.

(3) For subsection (1)—

(a) drilling of a geothermal well in the area of the geothermal tenure is completed if—

(i) the drilling rig last used to drill the well is moved so it is no longer above the well; and

(ii) the geothermal tenure holder does not intend to continue drilling the well; and

(b) the completion configuration of a geothermal well in the area of the geothermal tenure changes if, after drilling of the well is completed—

(i) additional casing is installed in the well; or

(ii) any part of the well is plugged, other than for decommissioning the well; or

(iii) an interval in the well is changed in any other way.

10 Notice of intention to carry out geophysical survey or scientific or technical survey

(1) This section applies if a geophysical survey or a scientific or technical survey is to be carried out in the area of a geothermal tenure.

(2) The geothermal tenure holder must, at least 10 business days before the survey starts, give the chief executive a notice stating the following information—

(a) a proposed identifying name for the survey;

(b) the type of survey to be carried out;

Examples—

seismic, geochemical, geotechnical, gravity, magnetic, MT

(c) a description of the part of the area of the tenure to be surveyed;

(d) the day surveying will start;

(e) the expected duration of the surveying.

(3) The notice must be accompanied by spatial information showing the location of the part of the area of the geothermal tenure to be surveyed.

(4) The proposed identifying name for the survey must not be the same, or substantially the same, as an identifying name for another survey recorded in the register.

11 Notice of completion of geophysical survey or scientific or technical survey

(1) This section applies if a geophysical survey or a scientific or technical survey has been completed in the area of a geothermal tenure.

(2) The geothermal tenure holder must, within 10 business days after the survey is completed, give the chief executive a notice stating that the survey has been completed.

(3) For subsection (1), a survey is completed when all of the raw data for the survey has been recorded.

12 Notice of intention to carry out hydraulic fracturing activities

(1) This section applies if a geothermal tenure holder intends to carry out hydraulic fracturing activities in the area of the tenure.

(2) The holder must, at least 10 business days before starting the hydraulic fracturing activities, give the chief executive a notice stating the day the activities are to start.

13 Notice of completion of hydraulic fracturing activities

(1) This section applies if a geothermal tenure holder has completed hydraulic fracturing activities in the area of the tenure.

(2) The holder must, within 10 business days after completing the hydraulic fracturing activities, give the chief executive a notice stating the day the activities were completed.

Part 4 Report requirements

Division 1 Particular reports required under the Act

14 Definitions for division

In this division—

general area information, for a geothermal tenure, for a partial relinquishment report or surrender report, see section 15.

hazard information, for a geothermal tenure, means the following information for a hazard arising, or potentially arising, from activities carried out under the tenure—

(a) the nature of the hazard;

(b) the cause, or reasons for existence, of the hazard;

(c) the location of the hazard;

(d) measures taken to prevent or reduce the risk of the hazard or to mitigate the effects of the hazard.

partial relinquishment report means a report that must be given to the chief executive under section 190 of the Act.

relinquished area, for a geothermal tenure, means the part of the area of the tenure that is relinquished as required or authorised under the Act.

surrendered area, for a geothermal tenure, means the part of the area of the tenure that is the subject of the geothermal tenure holder's surrender application.

surrender report means a report that must accompany a surrender application under section 302(2) of the Act.

15 Meaning of *general area information*

The following information is ***general area information***, for a geothermal tenure, for a partial relinquishment report or surrender report for the tenure—

(a) spatial information showing the location of—

(i) the area of the tenure immediately before the relinquishment or surrender the subject of the report; and

(ii) the relinquished area or surrendered area the subject of the report; and

(iii) geothermal wells drilled under the tenure; and

(iv) seismic lines used to carry out seismic surveys for the tenure;

(b) structure contour spatial information showing the seismic horizons (seismic reflectors) in the relinquished area or surrendered area the subject of the report.

16 Requirement for geothermal viability report—Act, s 65

(1) For section 65(4)(a)(i) of the Act, it is a requirement that a geothermal viability report for an area must contain the following information—

(a) identification of each geothermal reservoir in the area;

(b) an estimate of all classified geothermal resources identified in each geothermal reservoir in the area;

(c) the geoscientific information, standards and procedures used to make the estimate mentioned in paragraph (b);

Examples of geoscientific information—

geological, geochemical, geophysical or geotechnical information

(d) a statement whether, in the geothermal permit holder's opinion, geothermal production in the area is commercially viable;

(e) if the geothermal permit holder's opinion is that geothermal production is not commercially viable—a statement about whether, in the holder's opinion, it is likely to become commercially viable within 10 years;

(f) supporting data, and an analysis of the data, to support the opinions mentioned in paragraphs (d) and (e).

(2) In this section—

area means the part of the area of a geothermal permit that is a potential geothermal commercial area.

numerical modelling study means a study of the likely performance of a geothermal reservoir using a numerical model.

resource assessment means an estimate of the future production of geothermal energy from a geothermal reservoir.

supporting data, for an area, includes—

(a) technical data relating to the geology of, and the geothermal reservoirs in, the area; and

(b) resource assessment and numerical modelling studies for geothermal reservoirs in the area; and

(c) market and financial data for the area.

Examples of market and financial data—

- an engineering and economic feasibility study showing that geothermal production in the area can be economically and technically justified
- data showing the uses for the geothermal energy

17 Information for partial relinquishment report—Act, s 190

For section 190(2)(b) of the Act, the following information is prescribed for a partial relinquishment report for a geothermal tenure—

(a) the general area information for the tenure;

(b) the hazard information for the tenure;

(c) the day the relinquishment takes effect;

(d) identification of the blocks or sub-blocks comprising the relinquished area;

(e) the reason the geothermal tenure holder relinquished the relinquished area;

(f) a description of the geological model for the geothermal reservoirs in the relinquished area;

(g) a summary of the results of all authorised activities for the tenure carried out in the relinquished area since the tenure took effect;

(h) any conclusions drawn by the geothermal tenure holder based on the results mentioned in paragraph (g);

(i) an estimate of the total mass flow of geothermal fluid from each geothermal well in the relinquished area for each year since the tenure took effect;

(j) the period of the work program or development plan for the tenure;

(k) any other information stated in the relevant direction for the report.

18 Information for surrender report—Act, s 302

(1) For section 302(2)(c) of the Act, the following information is prescribed for a surrender report for a geothermal tenure—

(a) the general area information for the tenure;

(b) the hazard information for the tenure;

(c) a description of the methods used to produce geothermal energy in the surrendered area;

(d) an estimate of—

(i) the amount of geothermal energy produced from each geothermal well in the surrendered area for each year since the tenure took effect; and

(ii) the volume of water or disposal fluid injected into each injection well in the surrendered area;

(e) the surface temperature of the water or disposal fluid mentioned in paragraph (d)(ii) at the point of injection;

(f) a description of the geological features of the classified geothermal resources in the surrendered area from which geothermal energy was produced;

(g) the reason the geothermal tenure holder has applied to surrender all or part of the area of the tenure;

(h) any other information stated in the relevant direction for the report.

(2) In this section—

injection well means a well used to—

(a) return geothermal fluid to a geothermal reservoir after its use; or

(b) introduce another fluid into the reservoir.

Examples of a fluid—

water, supercritical carbon dioxide

19 Information for end of tenure report—Act, s 191

(1) For section 191(g) of the Act, the following information is prescribed—

(a) for an end of tenure report for a geothermal permit—the information required for a report under section 17;

(b) for an end of tenure report for a geothermal lease—the information required for a report under section 18.

(2) For subsection (1)—

(a) a reference in section 17 to the relinquished area is taken to be a reference to the area of the geothermal permit immediately before it ended; and

(b) a reference in section 18 to the surrendered area is taken to be a reference to the area of the geothermal lease immediately before it ended.

(3) Subsection (1) does not apply to the extent the information has already been included in either of the following reports given to the chief executive for the geothermal tenure—

(a) a partial relinquishment report;

(b) a surrender report.

Division 2 Other reports

20 Purpose of division

This division prescribes, for section 192(1) of the Act, information and reports that a geothermal tenure holder must keep or give to the chief executive.

21 Daily drilling report

(1) A geothermal tenure holder must keep a report for each day on which drilling of a geothermal well is carried out under the tenure (a ***daily drilling report***) containing the information stated in schedule 1, section 1.

(2) A copy of each daily drilling report for the geothermal well must be given to the chief executive with the well completion report for the well.

(3) Also, a copy of a daily drilling report for the geothermal well must be given to the chief executive at any time the chief executive asks for the copy.

22 Well completion report

(1) A geothermal tenure holder must, within 12 months after the rig release day for a geothermal well in the area of the tenure, give the chief executive a report about the completion of the well (a ***well completion report***) containing the information stated in schedule 1, section 2.

(2) If the geothermal well is plugged and abandoned on or before the rig release day for the well, the well completion report must be accompanied by a well abandonment report for the well.

23 Well abandonment report

(1) If a geothermal well in the area of a geothermal tenure is plugged and abandoned, the geothermal tenure holder must give the chief executive a report about the abandonment of the well (a ***well abandonment report***) containing the information stated in schedule 1, section 3.

(2) The well abandonment report must be given—

(a) for a well that is plugged and abandoned on or before the rig release day for the geothermal well—with the well completion report for the well; or

(b) otherwise—within 6 months after the day the plugging and abandoning of the well is completed in compliance with section 200 of the Act.

(3) If the well abandonment report for the geothermal well is given with the well completion report for the well, the well abandonment report need not contain information about the well already included in the well completion report.

24 Annual resources report

(1) A geothermal tenure holder must, within 60 business days after the last day of each 12-month period of the term of the tenure, give the chief executive a report about geothermal resources for the tenure (an ***annual resources report***) containing the information stated in schedule 1, section 4.

(2) However, the requirement to give an annual resources report for a 12-month period of the term of a geothermal tenure does not apply if the tenure ends during the 12-month period.

Note—

See section 191 of the Act, and section 19, for the requirements for an end of tenure report.

25 Production report

(1) A geothermal tenure holder must, within 60 business days after the last day of each 6-month period for the tenure, give the chief executive a report for the tenure (a ***production report***) containing the information stated in schedule 1, section 5.

(2) In this section—

6-month period, for a geothermal tenure, means a following period during which the tenure is in effect, for all or part of the period—

(a) 1 January to 30 June;

(b) 1 July to 31 December.

26 Production testing report

If production testing of a geothermal well is carried out under a geothermal tenure, the geothermal tenure holder must, within 40 business days after the production testing period ends, give the chief executive a report about the production testing during the period (a ***production testing report***) containing the information stated in schedule 1, section 6.

27 Injection report

(1) A geothermal tenure holder must, within 60 business days after the end of each 12-month period of the term of the tenure, give the chief executive a report for the tenure (an ***injection report***) containing the information stated in schedule 1, section 7.

(2) However, the requirement to give an injection report for a 12-month period of the term of a geothermal tenure does not apply if the tenure ends during the 12-month period.

Note—

See section 191 of the Act, and section 19, for the requirements for an end of tenure report.

28 Injection testing report

If injection testing of a geothermal well is carried out under a geothermal tenure, the geothermal tenure holder must, within 60 business days after the injection testing period ends, give the chief executive a report about the testing during the period (an ***injection testing report***) containing the information stated in schedule 1, section 8.

29 Geophysical survey report

If a geothermal tenure holder carries out a geophysical survey of the tenure, the holder must, within 12 months after the completion day for the survey, give the chief executive a report about the survey (a ***geophysical survey report***) containing the information stated in schedule 1, section 9.

30 Scientific or technical survey report

If a geothermal tenure holder carries out a scientific or technical survey for the tenure, the holder must, within 12 months after the completion day for the survey, give the chief executive a report about the survey (a ***scientific or technical***

survey report) containing the information stated in schedule 1, section 10.

31 Hydraulic fracturing activities completion report

If a geothermal tenure holder completes hydraulic fracturing activities in the area of the tenure, the holder must, within 6 months after the completion of the activities, give the chief executive a report about the activities (a ***hydraulic fracturing activities completion report***) containing the information stated in schedule 1, section 11.

Division 3 Stating amounts in reports

32 How amounts in reports must be stated

(1) For a report mentioned in this part, a measurement of an amount of a thing mentioned in column 1 must be stated by reference to the measurement unit stated in column 2.

Column 1	Column 2
injected water	tonnes
geothermal fluid	tonnes
separated steam	tonnes
disposal fluid	tonnes
energy generation, including electrical and thermal energy generation	megawatt hours (MWh)
specific enthalpy	kilojoule for each kilogram (kJ/kg)
geothermal resources—if thermal energy is generated	petajoules thermal (PJ_{th})

Column 1	Column 2
geothermal resources—if electrical energy is generated	petajoules electrical (PJ_e)

(2) Also, if the report includes information about the amount of heat that is generated, the base temperature on which the heat was calculated must be stated.

Part 5 Core samples

33 Keeping core sample—Act, s 193

(1) For section 193(1) of the Act, the following matters are prescribed—

(a) a core sample for each geothermal well drilled under the geothermal tenure must be kept;

(b) the core sample must be kept until the later of the following—

(i) the end of the term of the tenure; or

(ii) when the sample, or part of the sample, is given to the chief executive under section 194 of the Act;

(c) the core sample must be kept in a way that prevents unnecessary deterioration or loss of the sample.

(2) Despite subsection (1), the geothermal tenure holder is not required to keep a core sample (the ***new sample***) for a geothermal well drilled under the tenure if, on written application by the holder, the chief executive exempts the holder from having to keep the new sample because—

(a) the holder has previously given the chief executive all or part of a core sample (the ***previous sample***) from the same geothermal well or another geothermal well drilling the same geothermal reservoir; and

(b) the new sample has similar properties to the previous sample.

34 Giving part of core sample—Act, s 194

The part of a core sample kept under section 33 that must be given to the chief executive under section 194 of the Act must—

(a) be at least 50% of the core recovered; and

(b) have as complete a vertical face as is practicable; and

(c) be given in a container suitable for its long-term storage and handling that is labelled with the following information—

(i) the identifying name of the geothermal well from which the core was recovered;

(ii) the depth in metres of the top and bottom of the interval from which the core was recovered;

(iii) if more than 1 core is recovered from the well—the number of the core;

(iv) the length in metres of the core recovered.

Part 6 Geothermal wells and shot holes

35 Ways to plug and abandon geothermal wells—Act, s 200

For section 200(3)(a) of the Act, a geothermal well must be plugged and abandoned in the way stated in schedule 2.

36 Requirement to plug shot holes

(1) A geothermal tenure holder must ensure that, if a hole is drilled in the area of the tenure for use as a shot hole—

(a) as soon as practicable after the hole is no longer required for use as a shot hole—

(i) the hole is plugged with solid material; and

Example of solid material—

concrete, rock or soil

(ii) any area surrounding the hole that has been disturbed by the firing of an explosive is restored as far as is practicable to its original state; and

(b) if the hole caves in or collapses after it is plugged as required under paragraph (a)—all subsequent damage caused by the hole caving in or collapsing is remedied.

Maximum penalty—20 penalty units.

(2) Despite subsection (1), to the extent that a requirement under the subsection is inconsistent with a relevant environmental condition for the geothermal tenure, the relevant environmental condition prevails.

(3) In this section—

shot hole means a hole that has been drilled in the area of a geothermal tenure for the purpose of firing an explosive in connection with carrying out a seismic survey.

Part 7 Required information—confidentiality period and publication

37 Confidentiality period for required information for geothermal tenures—Act, s 196

(1) For section 196(1) of the Act, the confidentiality period for the required information mentioned in schedule 3, column 1—

(a) starts on the day the information is given to the chief executive; and

(b) ends on the day stated in schedule 3, column 2 for the information;

(2) However, there is no confidentiality period for making a well abandonment report for a geothermal well available to the holder of a petroleum tenure or a coal or oil shale mining tenement under the Mineral Resources Act if the well was drilled within the area of the tenure or tenement.

(3) Also, there is no confidentiality period for required information not mentioned in schedule 3, column 1.

38 Publication of required information—Act, s 196

(1) For section 196(1)(a) of the Act, the publication of required information in each of the following ways is prescribed—

(a) in a journal published by the department or under the Minister's authority;

(b) in another publication the chief executive considers appropriate;

(c) on a Queensland Government website;

(d) in a publicly available database;

(e) for spatial data—by making it available to the public for inspection or purchase;

(f) in digital form;

Example—

providing the information on a universal serial bus (commonly known as a 'usb')

(g) by displaying it on a notice that is available to the public for inspection at—

(i) the department's head office; or

(ii) another place the chief executive considers appropriate;

(h) by telling it to another person or presenting it to the person in a visual form.

(2) In this section—

Queensland Government website means a website with a URL that contains 'qld.gov.au', other than the website of a local government.

Part 8 Geothermal royalty

Division 1 Preliminary

39 Disapplication of part

This part does not apply to a geothermal producer in relation to geothermal energy produced by or for the geothermal producer before 1 July 2030.

40 Definitions for part

In this part—

component, of the wellhead value of geothermal energy produced by or for a geothermal producer in a royalty return period, means—

(a) an element used to work out the projected amount under section 43(1)(a) for the geothermal energy; or

(b) an expense, or an amount contributing to an expense, mentioned in section 41(1)(a), (c) or (d), for the geothermal energy.

geothermal royalty decision see section 45(1).

operating expenses, for geothermal energy produced by or for a geothermal producer in a royalty return period, see section 41.

royalty return period means each of the following 3-month periods in a year—

(a) 1 January to 31 March;

(b) 1 April to 30 June;

(c) 1 July to 30 September;

(d) 1 October to 31 December.

wellhead value, of geothermal energy produced by or for a geothermal producer in a royalty return period, means the wellhead value worked out for the geothermal energy under section 43 for the period.

41 Meaning of *operating expenses*

(1) The ***operating expenses***, for geothermal energy produced by or for a geothermal producer in a royalty return period, means each of the following—

(a) a toll, tariff or other charge paid or payable by the geothermal producer to a third party for producing the geothermal energy during the royalty return period if the charges are worked out—

(i) on a commercial basis; or

(ii) if the Minister believes another basis for working out the charges is a more practical basis—on the other basis;

(b) depreciation of capital costs on an operating plant or pipeline owned by the geothermal producer and used for producing the geothermal energy or transporting it from the wellhead of the geothermal well in which it was produced to the point of its disposal, allocated over—

(i) 10 years; or

(ii) if the Minister believes a shorter period is appropriate having regard to the expected potential for geothermal production from the well in which the geothermal energy was produced—the shorter period decided by the Minister;

(c) an operating cost incurred, or to be incurred, by the geothermal producer that relates directly to—

(i) treating, processing or refining the geothermal energy; or

(ii) transporting the geothermal energy to the point of its disposal;

Examples of operating costs that may be directly related to treating, processing, refining or transporting geothermal energy—

- catering, accommodation and travel costs for personnel
- communication costs
- consumable stores used at the site at which the energy is produced
- costs associated with transporting the geothermal energy, including a reasonable share of road maintenance and repairs, motor vehicle costs, wharfage and harbour fees
- geothermal energy storage costs
- geothermal tenure rents
- personnel wages and salaries
- repairs and maintenance of, and insurance costs for, operating plant and pipelines used to produce geothermal energy or transporting it from the wellhead to the point of its disposal

(d) another expense incurred, or to be incurred, by the geothermal producer in relation to the operation of the site at which the geothermal energy was produced that is approved by the Minister for the purpose of this section.

(2) However, expenses are not operating expenses under subsection (1) if the expenses are any of the following—

(a) an expense incurred by the geothermal producer in producing the geothermal energy;

Example for paragraph (a)—

lifting costs

(b) office overhead costs for an office that is not located in the area of the geothermal tenure or at the site at which geothermal energy is produced;

(c) marketing costs for producing geothermal energy;

(d) Commonwealth excise levies;

(e) a civil penalty, or interest on an amount, payable by the geothermal producer under the Act.

Division 2 Working out geothermal royalty

42 Geothermal royalty rate—Act s, 105

For section 105(b) of the Act, the rate of geothermal royalty payable by a geothermal producer for a royalty return period is 2.5% of the wellhead value of all geothermal energy produced by or for the geothermal producer in the period.

43 Working out wellhead value of geothermal energy

(1) The wellhead value of geothermal energy produced by or for a geothermal producer in a royalty return period is—

(a) the amount the geothermal producer could reasonably expect to realise if the geothermal energy were sold on a commercial basis (the ***projected amount***); less

(b) the sum of the following for the period—

(i) the operating expenses for the geothermal energy;

(ii) any negative wellhead value deductable under subsection (2).

(2) If, for a royalty return period, the operating expenses are more than the projected amount—

(a) the amount of the excess is a ***negative wellhead value*** for the royalty return period; and

(b) the negative wellhead value may be deducted under subsection (1)(b)(ii) in a later royalty return period in the same year.

(3) To remove any doubt, it is declared that a geothermal producer is not entitled to receive any payment in relation to a negative wellhead value.

44 Minister may request information or geothermal royalty decision in particular circumstances

(1) This section applies if the Minister reasonably believes, in particular circumstances, that for working out the wellhead value of geothermal energy produced by or for a geothermal producer in a royalty return period—

(a) the projected amount under section 43(1)(a) is less than the market value of the geothermal energy; or

(b) the operating expenses for the geothermal energy are more than the expenses that would reasonably be incurred in the circumstances.

(2) Without limiting subsection (1), the Minister may form the reasonable belief because of any of the following circumstances—

(a) the geothermal energy is used in a power station owned by the geothermal producer;

(b) the geothermal energy is acquired by an associated entity or related party of the geothermal producer;

(c) an expense was paid or payable to an associated entity or related party of the geothermal producer.

(3) The Minister may ask the geothermal producer—

(a) to give the Minister information or documents that support that 1 or more components of the wellhead value are based on arms-length transactions at market value; or

(b) to apply to the Minister under section 45 for a geothermal royalty decision.

(4) The geothermal producer must comply with the Minister's request made under subsection (3) within—

(a) 40 business days after the request is made; or

(b) if the Minister has, within the 40 business days, agreed to a longer period—the longer period.

(5) The Minister may ask the geothermal producer for additional information or documents about a transaction if—

(a) the Minister made a request under subsection (3)(a); and

(b) the geothermal producer complied with the request as required under subsection (4).

(6) Subsection (7) applies if—

(a) the geothermal producer does not comply with a request made under subsection (3) or (5); or

(b) for a request made under subsection (3)(a), the geothermal producer—

(i) complies with the request; but

(ii) the information or documents do not satisfy the Minister that 1 or more components of the wellhead value are based on arms-length transactions at market value.

(7) The Minister may make a geothermal royalty decision for 1 or more components of the wellhead value as if the geothermal producer had made an application for a geothermal royalty decision under section 45.

(8) In this section—

associated entity, of a geothermal producer, means an entity that, within the meaning of the Corporations Act, section 50AAA, is an associated entity of the geothermal producer.

related party, of a geothermal producer, means an entity that, within the meaning of the Corporations Act, section 228, is a related party of the geothermal producer.

45 Geothermal producer may apply for geothermal royalty decision

(1) A geothermal producer may apply to the Minister for a decision (a ***geothermal royalty decision***) about how 1 or more components of the wellhead value of geothermal energy produced by or for the geothermal producer in a royalty return period must be worked out for a particular transaction or particular period.

(2) The application must be made—

(a) before the geothermal energy is produced; or

(b) before, or as soon as practicable after, a material change of circumstances that may affect whether the components mentioned in subsection (1) are based on an arms-length transaction at market value.

(3) The application must—

(a) be in writing; and

(b) be given to the chief executive at the office of the department stated on the department's website; and

(c) state why the geothermal producer is seeking the geothermal royalty decision; and

(d) include a statement about how the geothermal producer proposes the components mentioned in subsection (1) should be worked out for the particular transaction or particular period; and

Examples—

- a fixed value with adjustments in particular circumstances
- a formula for deciding the market value

(e) include a statement about each of the following—

(i) the proposed period for which the geothermal royalty decision will apply;

(ii) whether or not the geothermal royalty decision is to be reviewed;

(iii) if the geothermal producer proposes that the geothermal royalty decision be reviewed—when the decision is to be reviewed.

46 Deciding application for geothermal royalty decision

(1) The Minister must make a geothermal royalty decision for an application made under section 45.

(2) The geothermal royalty decision may state—

(a) a method or formula—

(i) for deciding the market value of the geothermal energy; or

(ii) for working out a particular toll, tariff or other charge paid or payable by the geothermal producer; or

(iii) for adjusting the market value of the geothermal energy or the tolls, tariffs or other charges in particular circumstances; or

(iv) for working out any other component of the wellhead value of the geothermal energy; and

(b) the period for which the geothermal royalty decision applies; and

(c) if applicable—when the geothermal royalty decision is to be reviewed.

(3) In making the geothermal royalty decision, the Minister may consider the following matters—

(a) the amount received for geothermal energy sold in similar circumstances;

(b) how the value of the geothermal energy can be adjusted to reflect changes to the market value of geothermal energy;

(c) the expenses likely to be incurred by the geothermal producer in arms-length transactions at market value;

(d) the period for which the geothermal royalty decision, or aspects of the decision, will apply;

(e) the need for any future adjustment of the geothermal royalty decision or aspects of the decision;

(f) any submissions made to the Minister by the geothermal producer in relation to a component of the wellhead value of the geothermal energy;

(g) any other matter the Minister considers relevant.

(4) The Minister must give the geothermal producer written notice of the geothermal royalty decision and the reasons for the decision.

47 Minister may amend geothermal royalty decision

(1) The Minister may amend a geothermal royalty decision applying to a geothermal producer if there has been a material change of circumstances since the making of the decision.

(2) If the Minister proposes to amend a geothermal royalty decision applying to a geothermal producer on the Minister's own initiative, the Minister must—

(a) give the geothermal producer notice of the proposed change at least 60 business days before the first day of the next royalty return period to which the proposed amended royalty decision would apply; and

(b) invite the geothermal producer to make submissions about the proposed amendment within 30 business days (the ***submission period***) after giving the notice.

(3) In amending a geothermal royalty decision applying to a geothermal producer, the Minister—

(a) must consider any submissions made by the geothermal producer in the submission period; and

(b) may consider the matters stated in section 46(3)(a) to (e) and (g).

(4) If the Minister amends the geothermal royalty decision, the Minister must give the geothermal producer written notice of the decision and the reasons for the decision.

(5) The amended geothermal royalty decision must state the period to which the decision applies.

48 Geothermal producer may apply for amendment of geothermal royalty decision

(1) A geothermal producer may apply to the Minister to amend a geothermal royalty decision.

(2) The geothermal producer's application must be made at least 60 business days before the first day of the royalty return period to which the proposed amended geothermal royalty decision would apply.

(3) Sections 45(3) and 46 apply to the application as if the reference in the provisions to the geothermal royalty decision were a reference to an amendment of the geothermal royalty decision.

Part 9 Miscellaneous provisions

49 Way for making or giving an application, document or submission—Act, s 363

(1) For section 363(2)(b) of the Act, the prescribed way is using the online system on the department's website.

(2) However, if a person makes or gives an application, document or submission as mentioned in subsection (1), the chief executive may, by notice given to the person, require the person to also lodge a hard copy of the application, document

or submission at the place mentioned in section 363(2)(a) of the Act.

(3) If a person makes or gives an application, document or submission as mentioned in subsection (1) after 4.30p.m. on a business day and before 8.30a.m. on the next business day (the ***later day***), the application, document or submission is taken to have been made or given at 8.30a.m. on the later day.

50 Annual rent—Act, s 130

(1) For section 130(1) of the Act, the annual rent payable for each geothermal tenure is stated in schedule 4.

(2) For section 130(2) of the Act, the annual rent, or a pro-rata amount of the annual rent if the period to which the rent relates is less than a year, must be paid on or before—

(a) on the grant of the geothermal tenure, if the Minister has not already required payment of the rent—the 20th business day after the tenure takes effect; or

(b) otherwise—31 August each year.

(3) If the annual rent is paid for a year and the geothermal tenure ends during the year, the proportion of the rent that relates to the remainder of the year may be refunded.

51 Security for geothermal tenure—Act, s 204

(1) For section 204(2)(a) of the Act, the following forms of security are prescribed—

(a) cash, including an electronic funds transfer of cash;

(b) an unconditional security issued by a financial institution that—

(i) is in favour of the 'State of Queensland' and is payable on demand; and

(ii) has no expiry date; and

(iii) states the type and number of the geothermal tenure or proposed geothermal tenure; and

(iv) states the address of the financial institution; and

(v) is signed by an officer of the financial institution who has authority to sign the security;

(c) a combination of the forms mentioned in paragraphs (a) and (b).

(2) For section 204(2)(b) of the Act, the following amounts are prescribed—

(a) for a geothermal permit or proposed geothermal permit—$14,748;

(b) for a geothermal lease or proposed geothermal lease—$43,017.

52 Prescribed interest on amounts owing to the State—Act, s 372

For section 372(2) of the Act, the rate of interest is 15% a year.

53 Fees

The fees payable under the Act are stated in schedule 5.

Part 10 Transitional provisions

54 Definition for part

In this part—

expired regulation means the expired *Geothermal Energy Regulation 2012*.

55 Existing requirement to give a notice, report or information

(1) This section applies if—

(a) before the commencement—

(i) a person was required to give the chief executive a notice, report or information under the Act; and

(ii) the expired regulation, part 3 or 4, prescribed matters for the notice, report or information, including, for example, the requirement to give the notice, report or information; and

(b) immediately before the commencement, the period within which the notice, report or information was required to be given had not ended.

(2) The expired regulation continues to apply in relation to the requirement to give the notice, report or information as if this regulation had not been made.

(3) In this section—

information includes documents, records and samples.

56 Existing requirement to keep a sample

(1) This section applies if—

(a) before the commencement—

(i) a person was required to keep a sample under the Act; and

(ii) the expired regulation, part 4, division 3, prescribed matters for the requirement, including, for example, the samples that must be kept; and

(b) immediately before the commencement, the period for which the sample was required to be kept had not ended.

(2) The expired regulation continues to apply in relation to the requirement to keep the sample as if this regulation had not been made.

57 Required information given before commencement

Section 37 applies to required information mentioned in that section and given to the chief executive before the commencement if, on the commencement, the information has not been published under section 196(1) of the Act.

Schedule 1 Information to be included in particular reports

sections 21 to 32

1 Daily drilling report

A daily drilling report for drilling a geothermal well under a geothermal tenure must include the following information—

(a) the type and number of the tenure;

(b) the identifying name of the well;

(c) the name and postal address of the operator of the well;

(d) the name of the geothermal tenure holder;

(e) spatial information showing the location of the well;

(f) the day the report is completed, in day-month-year format;

(g) the following information for the day to which the report relates—

(i) the well's depth in metres at the end of the day;

(ii) the type of drilling rigs used to drill the well on the day;

(iii) the bit record for the well at the end of the day;

(iv) the drilling fluids and additives used to drill the well on the day;

(v) a summary of the drilling operations carried out on the day;

(vi) diagrams showing the hole sizes of the well at the end of the day;

(vii) the depth in metres of the top and bottom of any geothermal feature intervals identified in the well on the day;

(h) a description of the following for the day to which the report relates—

(i) all surveys, tests and measurements carried out during the day's drilling, including the results of the surveys, tests and measurements;

Examples of tests—

completion test, injectivity test, drill stem test, pressure fall-off test, pressure build-up test

Examples of measurements—

injectivity index, permeability thickness, stable reservoir pressure

(ii) all core samples taken on the day;

(iii) all casing and cementing activities carried out on the day;

(iv) all surface observations made about the geothermal feature intervals identified in the well on the day;

(i) any other information stated in the relevant direction for the report.

2 Well completion report

A well completion report for a geothermal well in the area of a geothermal tenure must include the following information—

(a) the type and number of the tenure;

(b) the identifying name of the well;

(c) the name and postal address of the operator of the well;

(d) the name of the geothermal tenure holder;

(e) spatial information showing the location of the well;

(f) the day the report is completed, in day-month-year format;

(g) the following days—

(i) the day drilling of the well started;

(ii) the day the total depth of the well was reached;

(iii) the rig release day for the well;

(h) the well's total depth in metres;

(i) the type of drilling rigs used to drill the well;

(j) the bit record for the well;

(k) the drilling fluids and additives used to drill the well;

(l) the ground level in metres for the well;

(m) the kelly bushing level in metres for the well;

(n) diagrams showing the hole sizes of the well;

(o) information about the path of the well;

Example—

a survey that plots the path of the well

(p) the depth in metres of the location of each core or cutting sample taken from the well;

(q) the details of—

(i) the casing and equipment installed in the well, with a diagram showing their location in the well; and

(ii) the cementing in the well, including its location, the type of cement used and the depth in metres of the top and bottom of each cemented interval;

(r) the type of any perforations in the well, the depth in meters of the top and bottom of the perforated intervals and the perforation spacing in meters;

(s) if stimulation of the well was carried out during the drilling of the well—

(i) the depth in metres of the top and bottom of the geothermal feature intervals in the well over which stimulation was carried out; and

(ii) a description of the equipment used to carry out the stimulation; and

(iii) for the chemicals and other additives used in the fracturing fluid used to carry out the stimulation, the concentration of the chemicals and additives

from the time the stimulation starts to the time the stimulation ends; and

(iv) a copy of all records made about the stimulation by the person who carried it out; and

(v) any other details about the stimulation that are reasonably necessary to make a future assessment of the impact of the stimulation on the safety of the well;

(t) an assessment of—

(i) the geothermal production potential of the well; and

(ii) the impacts the well may have on the future management of the geothermal reservoirs in the area of the tenure; and

(iii) the data obtained from geophysical (or wireline) logs run in the well; and

(iv) the status of the well on the rig release day for the well;

Examples of status—

abandoned, injecting, producing

(u) identification of the geothermal feature intervals in the well that have the potential to produce geothermal energy;

(v) the geothermal tenure holder's reasons for choosing the location of the well;

(w) for a directional well—the position, expressed in relation to the total vertical depth in metres of the well and the horizontal plane of the well, of—

(i) the geological units that the well intersects; and

(ii) the bottom of the well; and

(iii) any other geothermal wells that intersect the directional well;

(x) the raw data, in digital form, of each geophysical (or wireline) log run in the well;

(y) a digital image of—

(i) the core samples taken from the geothermal well; and

(ii) a digital image of the graphic representations of the raw data mentioned in paragraph (x);

(z) a description of—

(i) the geological model for the well; and

(ii) the alteration type of the rock surrounding the well; and

Examples for subparagraph (ii) —

phyllic alteration, potassium alteration, propylitic alteration

(iii) the stratigraphy of the rock layers that the well intersects; and

(iv) all core samples taken during the drilling of the well; and

(v) all surveys, tests and measurements carried out during the drilling of the well, including the results of the surveys, tests and measurements;

Examples of tests—

completion test, injectivity test, drill stem test, pressure fall-off test, pressure build-up test

Examples of measurements—

injectivity index, permeability thickness, stable reservoir pressure

(za) any other information stated in the relevant direction for the report.

3 Well abandonment report

(1) A well abandonment report for a geothermal well in the area of a geothermal tenure must include the following information—

(a) the type and number of the tenure;

(b) the identifying name of the well;

(c) the name and postal address of the operator of the well;

(d) the name of the geothermal tenure holder;

(e) the day the report is completed, in day-month-year format;

(f) the well's total depth in metres;

(g) the type of drilling rigs used to drill the well;

(h) the bit record for the well;

(i) the drilling fluids and additives used to drill the well;

(j) the top and bottom, and thickness, of any of the following intersected by the well—

(i) an alteration zone;

(ii) a geothermal reservoir;

(iii) an aquifer;

(k) diagrams showing the hole sizes of the well;

(l) details of the casing and equipment installed in the well, with a diagram showing their location in the well;

(m) the type of any perforations in the well, the depth in meters of the top and bottom of the perforated intervals and the perforation spacing in meters;

(n) the following details of squeeze cementing or cement plugging carried out in the well—

(i) the type of cement and additives used in the well;

(ii) the depth in metres of the top and bottom of each cemented interval in the well;

(iii) any losses of cement caused by seepage in voids or permeable strata;

(iv) the method, materials and volume of cement used to cement the voids;

(v) the method used to overcome losses of cement;

(o) a description of—

(i) all surveys, tests and measurements carried out during the drilling of the well, including the results of the surveys, tests and measurements; and

Examples of tests—

completion test, injectivity test, drill stem test, pressure fall-off test, pressure buildup test

Examples of measurements—

injectivity index, permeability thickness, stable reservoir pressure

(ii) any other procedures used to abandon the well;

(p) if stimulation of the well was carried out before it was plugged and abandoned—

(a) the depth in metres of the top and bottom of the intervals in the well over which the stimulation was carried out; and

(b) a description of the equipment used to carry out the stimulation; and

(c) a copy of any record made about the stimulation by the person who carried it out; and

(d) any other details about the stimulation that would help a person to make a future assessment of the impact of the stimulation on the safety of the well;

(q) any other details of the activities carried out in relation to drilling, plugging and abandoning the well that would help a person in making an assessment of the potential risks to the safe and efficient future operation of the well;

(r) a summary and history of the well;

(s) spatial information showing the location of the well;

(t) the day the completion report for the well was given to the chief executive;

(u) any other information stated in the relevant direction for the report.

(2) For subsection (1)(j), the top and bottom of an alteration zone, a geothermal reservoir or an aquifer must be identified in relation to—

(a) for a directional well—

(i) the total vertical depth in metres of the well; and

(ii) the horizontal plane of the well; or

(b) otherwise—the depth in metres of the well.

(3) In this section—

alteration zone means a depth interval in a geothermal well with abundant altered minerals.

permeable strata means a rock layer (or geological unit) that has enough permeability to allow fluid to circulate through it.

squeeze cementing, of a geothermal well, means the process of forcing, by pressure, cement slurry into a part of the well.

Examples of parts of a geothermal well—

channels or perforations

void, in relation to a geothermal well, means the porous intervals intersected by the well and identified by fractures or channels.

4 Annual resources report

An annual resources report for a geothermal tenure for a 12-month period must include the following information—

(a) the type and number of the tenure;

(b) the following information for the period, for each geothermal reservoir in the area of the tenure—

(i) the location, and estimated amount, of all classified geothermal resources identified on the first day and the last day of the period;

(ii) details of all material changes to the geothermal resources mentioned in subparagraph (i) during the period;

Examples of material changes to a geothermal resource—

fluid temperature changes, fluid chemical change, fluid flow rate changes

(c) any other information stated in the relevant direction for the report.

5 Production report

A production report for a geothermal tenure for a 6-month period must include the following information—

(a) the type and number of the tenure;

(b) the identifying name of each geothermal well in the area of the tenure;

(c) identification of—

(i) each geothermal reservoir in the area of the tenure; and

(ii) each geological unit in the area of the tenure that produced geothermal fluid during the period;

(d) the total number of geothermal wells in the area of the tenure that produced geothermal fluid during the period;

(e) for any electrical and thermal energy produced in the area of the tenure during the period—

(i) the total amount of electrical and thermal energy; and

(ii) the total amount of the electrical and thermal energy used for internal consumption during the period;

(f) the total mass flow of any geothermal fluid produced from a geothermal well in the area of the tenure during the period;

(g) for the geothermal fluid mentioned in paragraph (f)—the total amount of the geothermal fluid released into the environment during the production of electrical and thermal energy in the period and the reasons for its release;

(h) for each geothermal well that produced geothermal fluid during the period, the following details about the well—

(i) any changes in the wellhead pressure of the well during the period;

(ii) any scaling and corrosion problems met with during the period and the preventative measures taken to reduce the scaling and corrosion;

(i) for a geothermal well mentioned in paragraph (h), the following details about any geothermal fluid taken from the well—

(i) changes in the chemistry or chemical composition of the fluid during the period;

(ii) changes to the fluid-specific enthalpy of the fluid during the period;

(j) any other information stated in the relevant direction for the report.

6 Production testing report

(1) A production testing report for production testing of a geothermal well under a geothermal tenure must include the following information—

(a) the type and number of the tenure;

(b) the identifying name of the well;

(c) identification of—

(i) each geothermal reservoir in the area of the tenure identified by the testing during the production testing period; and

(ii) the geological units that produced geothermal fluid in the area of the tenure during the production testing period; and

(iii) the geological units in the area of the tenure that were injected with disposal fluid during the production testing period;

(d) details of the wellhead pressure of the geothermal well measured during the production testing period;

(e) the duration of the production testing;

(f) the type of testing methods used during the testing;

(g) the specifications of the equipment used during the testing;

(h) for any geothermal fluid produced during the testing—

(i) the value of the specific enthalpy of the fluid calculated in situ at the wellhead; and

(ii) details of all changes to the specific enthalpy of the fluid calculated in situ at the wellhead; and

(iii) details of the chemistry of the fluid;

(i) details of—

(i) the air-lifting program, if any, used to stimulate the well during the testing; and

(ii) all downhole surveys (pressure, temperature and spinner) carried out during the testing; and

(iii) the calculations made of the geothermal well's productivity index, including the methods used to calculate the productivity index during testing; and

(iv) the location of any major and secondary feed zones made in the well during the testing; and

(v) the wellhead pressure of the well when it was in full open discharge during the testing; and

(vi) the wellhead pressure of the well's throttled discharges during the testing; and

(vii) the output characteristics of the well expressed as a function of the wellhead pressure of the well during the testing; and

(viii) any wellbore simulation modelling carried out during the testing;

(j) an estimate of the total mass flow of any geothermal fluid produced during the testing;

(k) an estimate of the mass flow rate of all brine and steam separated during the testing;

(l) details of all changes in the steam separation pressure values during the testing;

(m) any other information stated in the relevant direction for the report.

(2) In this section—

feed zones means the intervals in a geothermal well that have the potential to produce geothermal fluid.

7 Injection report

An injection report for a geothermal tenure for a 12-month period must include the following information—

(a) the type and number of the tenure;

(b) the identifying name of each geothermal well in the area of the tenure;

(c) identification of—

(i) each geothermal reservoir in the area of the tenure; and

(ii) each geological unit in the area of the tenure that was injected with water or disposal fluid during the period;

(d) the surface temperature of the water or disposal fluid mentioned in paragraph (c)(ii) measured at the point of injection;

(e) the total mass flow of—

(i) all water or disposal fluid injected into the geothermal wells in the area of the tenure during the period; and

(ii) disposal fluid reinjected into the geothermal wells in the area of the tenure during the period;

(f) the surface temperature of the water or disposal fluid mentioned in paragraph (e)(i) measured at the point of injection;

(g) the surface temperature of the disposal fluid mentioned in paragraph (e)(ii) measured at the point of reinjection;

(h) the following details about each geothermal well in the area of the tenure that was injected with water or disposal fluid during the period—

(i) any changes in the wellhead pressure of the well during the period;

(ii) any scaling and corrosion problems met with in the well during the period and the preventative measures taken to reduce the scaling and corrosion;

(i) any other information stated in the relevant direction for the report.

8 Injection testing report

An injection testing report for injection testing of a geothermal well under a geothermal tenure must include the following information—

(a) the type and number of the tenure;

(b) the identifying name of the well;

(c) identification of the geological units that were injected with water or disposal fluid during the injection testing period;

(d) the wellhead pressure of the well measured during the duration of the testing;

(e) the following information about the testing—

(i) the duration of the testing;

(ii) the types of testing methods used during the testing;

(iii) the specifications of the equipment used during the testing;

(iv) the temperature of the water or disposal fluid injected during the testing;

(v) the chemistry of the water or disposal fluid injected during the testing;

(vi) all downhole surveys (pressure, temperature and spinner) carried out during the testing;

(vii) the calculations made of the well's injectivity index, including the methods used to calculate the injectivity index, during the testing;

(viii) any changes in the wellhead pressure of the well measured during the testing;

(ix) any wellbore simulation modelling carried out during the testing;

(x) an estimate of the total mass flow of water or disposal fluid injected during the testing;

(f) any other information stated in the relevant direction for the report.

9 Geophysical survey report

A geophysical survey report for a geophysical survey of a geothermal tenure must include the following information—

(a) the location of the area surveyed;

(b) a description of—

(i) the type of survey carried out; and

(ii) how the raw data obtained from the survey was processed or, if applicable, how it was reprocessed; and

(iii) each method used to acquire the raw data from the survey, including the equipment used to acquire the data and the techniques and equipment used to record and test the data;

(c) spatial information showing the location of the sites used to carry out the survey;

(d) if the report is not accompanied by files for the area surveyed in digital form, details of—

(i) the interpreted data for the area surveyed; and

(ii) the isopach map and depth to basement map obtained from the survey;

(e) a summary of the geology of the area surveyed;

(f) a summary of the objectives of the survey;

(g) details of the activities carried out for the survey, including the days the activities were carried out;

(h) an interpretation of the processed or reprocessed data obtained from the survey;

(i) each of the following in digital form—

(i) the raw data obtained from the survey;

(ii) the records made as the raw data was recorded (commonly known as the 'observer's logs');

(iii) the location of the area surveyed, including the coordinates and elevation of each site used to carry out the survey;

(iv) the processed or reprocessed data obtained from the survey;

(v) a graphical representation of the processed or reprocessed data;

(vi) if an activity for the survey was carried out by a contractor of the geothermal tenure holder—a copy of all reports given to the geothermal tenure holder by the contractor about the activity;

(j) any other information stated in the relevant direction for the report.

10 Scientific or technical survey report

A scientific or technical survey report for a scientific or technical survey of a geothermal tenure must include the following information—

(a) a description of—

(i) the location of the area surveyed; and

(ii) the type of survey carried out; and

(iii) how the raw data obtained from the survey was processed or, if applicable, how it was reprocessed; and

(iv) each method used to acquire the raw data from the survey, including the equipment used to acquire the data and the techniques and equipment used to record and test the data;

(b) a summary of the geology of the area surveyed;

(c) a summary of the objectives of the survey;

(d) details of the activities carried out for the survey, including the days the activities were carried out;

(e) an interpretation of the processed or reprocessed data obtained from the survey;

(f) details of all measurements made or samples taken during the survey;

(g) each of the following in digital form—

(i) the raw data obtained from the survey;

(ii) the processed or reprocessed data obtained from the survey;

(h) any other information stated in the relevant direction for the report.

11 Hydraulic fracturing activities completion report

(1) A hydraulic fracturing activities completion report for hydraulic fracturing activities in the area of a geothermal tenure must include the following information—

(a) the type and number of the tenure;

(b) the identifying name of each geothermal well subject to the activities;

(c) the name and postal address of the person who carried out the activities;

(d) the name of the person submitting the report;

(e) the day the report is completed, in day-month-year format;

(f) for each geothermal well subject to the activities—

(i) the day the activities for the well started; and

(ii) the day the activities for the well ended; and

(iii) the depth in metres of the top and bottom of each interval of the well; and

(iv) the depth in metres of the top and bottom of each geological unit in the well and the name of each geological unit;

(g) for each of the activities, an identification of each method used to carry out the activities;

(h) a summary of the operations carried out at each stage of the activities, including the volume and type of chemicals used at each stage;

(i) an assessment of the impact of the activities on the future management of each geothermal reservoir in the area of the tenure;

(j) a graphic representation of the following—

(i) the casing pressure from the time the activities start to the time the activities end;

(ii) the calculated bottom hole pressure from the time the activities start to the time the activities end;

(iii) the calculated bottom hole temperature from the time the activities start to the time the activities end;

(iv) the rate at which hydraulic fracturing fluid is pumped into the well from the time the activities start to the time the activities end;

(v) the concentration of liquid chemicals and other additives used in the hydraulic fracturing fluid from the time the activities start to the time the activities end;

(vi) the maximum surface treatment pressure reached during each stage of the activities;

(vii) the estimated targeted fracture pressure for the activities carried out over each interval in the well;

(k) details of the equipment used to perform and monitor the activities;

(l) details of the diagnostic techniques used to monitor the activities;

(m) if known, details of—

(i) all geological connections between each interval in each geothermal well subject to the activities and an aquifer; and

(ii) the distance between each interval in each geothermal well subject to the activities and an aquifer;

(n) details of the total mass flow of hydraulic fracturing fluid, in tonnes, used in each geothermal well subject to the activities during each stage of the activities;

(o) if a known event relating to the activities has caused material environmental harm, or serious environmental harm, within the meaning of the *Environmental Protection Act 1994*—details of each step taken to mitigate the harm;

(p) the following information about the hydraulic fracturing fluid used to carry out the activities—

(i) the composition of the fluid;

(ii) the quantity of each component of the fluid in kilograms, litres or tonnes, as appropriate;

(iii) the concentration of each component in the fluid;

(iv) the name of all chemical compounds in the fluid;

(q) any other information stated in the relevant direction for the report.

(2) In this section—

hydraulic fracturing fluid means a fluid that—

(a) is a mixture of water, liquid chemicals and other additives, including, for example, proppants; and

(b) is commonly known as slurry.

Schedule 2 Ways to plug and abandon geothermal wells

section 35

Part 1 Requirements for all geothermal wells

1 Removal of particular equipment

(1) All equipment, other than casing, that may create a hazard that is in, or immediately adjacent to, a geothermal well must be removed before the well is plugged and abandoned.

(2) However, if it is not reasonably possible to comply with subsection (1)—

(a) the location of the equipment must be surveyed before the well is plugged and abandoned; and

(b) details of the equipment and its location must be included in an end of tenure report.

2 Abandonment to be consistent with good industry practice

A geothermal well must be abandoned in compliance with good industry practice, to the extent that the practice is consistent with this regulation.

3 Capping of well

A geothermal well must be capped with a metal plate inscribed with the following information—

(a) the identifying name of the well;

(b) the total depth in metres of the well;

(c) the date the well was abandoned.

4 Casing to be sealed

(1) The casing of a geothermal well must be sealed below ground level.

(2) The stub of the casing must be buried below the surface at a depth that—

(a) allows for efficient later re-entry to the well; and

(b) will not adversely interfere with the normal activities of the owner of the land on which the well is located.

Part 2 Additional requirements for wells other than horizontal wells

5 Isolation of aquifers and porous formations

An aquifer or porous formation intersected by a geothermal well must be isolated so there is no interconnection of gas, steam or water at the point at which the aquifer or porous formation intersects the well.

Example of isolating an aquifer or porous formation—

cementing an interval in a well, where an aquifer or porous formation is intersected by the well, to seal off the aquifer or porous formation

6 Casing of prescribed well

(1) Steel casing must be removed from all sections of a geothermal well that are within or immediately adjacent to geothermal fluid.

(2) However, subsection (1) need not be complied with if it is not technically or commercially feasible to remove the casing.

Example—

production casing that has been cemented in place and can not feasibly be removed

7 Cement to be used for plugs

(1) A geothermal well must have a surface plug of cement in the casing.

(2) Also, if a geothermal well has more than 1 casing string and any inner casing string does not reach the surface, the inner casing string must, if required to comply with section 5, be plugged with cement at the top of the string.

(3) The cement used as a plug in the well must—

(a) be of an industry accepted grade, having regard to the salinity of the fluids in the surrounding strata; and

(b) be tested to ensure that it complies with industry accepted practices and standards.

(4) A plug in, or adjacent to, geothermal fluid in the well must, if reasonably practicable, be adequately secured.

8 Requirement for packer left in well

A packer in, or adjacent to, a geothermal well that is not to be removed from the well must, if reasonably practicable—

(a) be made of a material that is intrinsically safe; and

(b) be adequately secured.

9 Fluid to be left in well

A geothermal well must be left full of fluid that is of sufficient density to—

(a) help maintain the structural integrity of the well; and

(b) prevent gas influx.

Part 3 Additional requirement for horizontal wells

10 Requirement for liner

(1) A horizontal geothermal well must be abandoned containing a slotted liner that is not made of steel.

Example of a slotted liner not made of steel—

a slotted PVC liner

(2) However, if the horizontal geothermal well has the potential to cause a hazard to future mining because of high levels of methane, the geothermal tenure holder must conduct a risk assessment that includes an assessment of whether a fire resistant anti-static (or FRAS) liner should be used in the well.

Schedule 3 Confidentiality periods for required information

section 37(1)

Required information	End of confidentiality period
annual resources report given under section 24	6 months after the last day of the period to which the report relates
daily drilling report given under section 21 for an exploration well or appraisal well	3 years after the rig release day for the well
daily drilling report given under section 21 for a development well	5 years after the rig release day for the well
geophysical survey report given under section 29	3 years after the completion day for the survey to which the report relates
hydraulic fracturing activities completion report given under section 31	5 years after the day on which the hydraulic fracturing activities are completed
injection report given under section 27 for a geothermal well	6 months after the last day of the period to which the report relates
injection testing report given under section 28 for injection testing under a geothermal permit	3 years after the last day of the injection testing period for the injection testing to which the report relates
injection testing report given under section 28 for injection testing under a geothermal lease	5 years after the last day of the injection testing period for the injection testing to which the report relates
production report given under section 25(1) for a geothermal well	6 months after the last day of the period to which the report relates

Required information	End of confidentiality period
production testing report given under section 26 for production testing under a geothermal permit	3 years after the last day of the production testing period for the production testing to which the report relates
production testing report given under section 26 for production testing under a a geothermal lease	5 years after the last day of the production testing period for the production testing to which the report relates
scientific or technical survey report given under section 30	3 years after the completion day for the survey to which the report relates
well abandonment report given under section 23 for an exploration well or appraisal well	3 years after the rig release day for the well
well abandonment report given under section 23 for a development well	5 years after the rig release day for the well
well completion report given under section 22 for an exploration well or appraisal well	3 years after the rig release day for the well
well completion report given under section 22 for a development well	5 years after the rig release day for the well
a part of a core sample given to the chief executive under section 194(1) of the Act—for an exploration well or appraisal well	2 years after the day the part of the sample is given to the chief executive under that section
a part of a core sample given to the chief executive under section 194(1) of the Act—for a development well	5 years after the day the part of the sample is given to the chief executive under that section

Schedule 4 Annual rent

section 50(1)

		$
1	For a geothermal permit—for each sub-block included in the area of the permit	3.00
2	For a geothermal lease—for each square kilometre included in the area of the lease	162.00

Schedule 5 Fees

section 53

		Fee units
1	Application for geothermal permit (Act, s 36(e))	1,356.00
2	Application for declaration of all or part of the area of a geothermal permit as a potential geothermal commercial area for the permit (Act, s 65(2)(b))	1,081.00
3	Application for geothermal lease over all or part of the area of a geothermal permit (Act, s 78(f))	1,356.00
4	Application for approval to amend development plan for a geothermal lease (Act, s 100(2)(b))	544.00
5	Making available to a person information for a geothermal tenure (Act, s 196(1)(b))—	
	(a) if the information is made available in electronic form on a tape or cartridge; or	338.20
	(b) if the information is made available in electronic form in any other way	168.90
6	Application for renewal of a geothermal tenure (Act, s 292(c)(i))	676.00

Schedule 6 Dictionary

section 3

annual resources report, for a geothermal tenure for a 12-month period, see section 24(1).

appraisal well means a geothermal well drilled to work out the size of a geothermal resource in an area of the geothermal tenure and how geothermal production in the area of the tenure can be efficiently developed.

bit record, for a geothermal well, means a historical record of how a bit performed in the well, including information about—

(a) the size, type and depth of the bit used in the well; and

(b) the distance the bit drilled into the well; and

(c) the hours the bit was used on bottom or rotating.

classified geothermal resource means a geothermal resource evaluated and classified in accordance with the document titled 'Specifications for the application of the United Nations framework classification for fossil energy and mineral reserves and resources 2009 (UNFC-2009) to geothermal energy resources' published by the United Nations.

completion day, for a geophysical survey, scientific or technical survey, or seismic survey, means—

(a) if raw data recorded or recovered for a previous survey is reprocessed—the day on which reprocessing of the data is completed; or

(b) otherwise—the last day on which raw data is recorded or recovered for the survey.

component, of the wellhead value of geothermal energy produced by or for a geothermal producer in a royalty return period, for part 8, see section 40.

core sample means a sample of a core taken from a geothermal well during drilling of the well.

daily drilling report, for drilling a geothermal well under a geothermal tenure, see section 21(1).

development well means a geothermal well drilled in the area of a geothermal tenure to enable geothermal production in the area to start.

directional well means part of a geothermal well drilled in the area of a geothermal tenure that is not drilled vertically.

disposal fluid means any spent fluid from a geothermal reservoir.

end of tenure report means a report that must be given to the chief executive under section 191 of the Act.

exploration well means a geothermal well drilled to obtain stratigraphic, petrological and thermal information for the purpose of exploring for geothermal energy.

general area information, for a geothermal tenure, for a partial relinquishment report or surrender report, for part 4, division 1, see section 15.

geochemical survey means a chemical analysis of rocks, soil, sediment, plants, steam or water.

geophysical survey means the systematic collection of geophysical data associated with the subsurface features of land, including burials data, to map the subsurface structure of the earth's crust, and includes reprocessing previously obtained data.

geophysical survey report, for a geophysical survey of a geothermal tenure, see section 29.

geotechnical survey means an analysis of rocks, soil consistency and structure, bedrock and groundwater levels.

geothermal fluid means naturally occurring liquid, steam and any associated gases from which heat can be extracted from the earth's crust.

geothermal reservoir means a depth interval that contains potentially economic extractable geothermal heat in a well.

geothermal royalty decision, for part 8, see section 45(1).

hazard means a thing or situation with potential to cause harm to—

(a) a person, including, for example, financial losses or increased liabilities; or

(b) property; or

(c) the environment.

hazard information, for a geothermal tenure, for part 4, division 1, see section 14.

hydraulic fracturing activities means a form of stimulating a geothermal well by injecting specially engineered fluids at a high pressure and rate into a geothermal reservoir to open fractures in the reservoir.

hydraulic fracturing activities completion report, for hydraulic fracturing activities in the area of a geothermal tenure, see section 31.

identifying name—

(a) for a geothermal well, means the unique identifying name and number for the well recorded in the register; or

(b) for a geophysical survey or scientific or technical survey, means the unique identifying name or number for the survey recorded in the register.

injection report, for a geothermal tenure, see section 27(1).

injection testing, for a geothermal well, means the evaluation or testing of a geothermal reservoir to work out the rate at which—

(a) geothermal fluid can be returned to the reservoir using the well; or

(b) other fluids can be introduced into the reservoir using the well.

Examples of a fluid—

water, supercritical carbon dioxide

injection testing period, for injection testing of a geothermal well, means—

(a) if the testing is carried out for not more than 30 days—the period starting on the day testing first starts and ending 30 days after testing starts; or

(b) otherwise—the period starting on the day testing first starts and ending on the day testing ends.

injection testing report, for injection testing of a geothermal well under a geothermal tenure, see section 28.

operating expenses, for geothermal energy produced by or for a geothermal producer in a royalty return period, for part 8, see section 41.

operator, of a geothermal well, means the entity that has responsibility for the management for the drilling and operation of the well.

partial relinquishment report, for part 4, division 1, see section 14.

production report, for a geothermal tenure for a 6-month period, see section 25(1).

production testing, for a geothermal well, means the evaluation or testing of a geothermal reservoir to work out the rate at which geothermal fluid can be extracted from the reservoir using the well.

production testing period, for production testing of a geothermal well, means—

(a) if the testing is carried out for not more than 30 days—the period starting on the day the testing first starts and ending 30 days after that day; or

(b) otherwise—the period starting on the day the testing first starts and ending on the day the testing ends.

production testing report, for production testing of a geothermal well under a geothermal tenure, see section 26.

relevant direction, for a report, means a direction, or a part of a direction, included in the manual kept by the chief executive under the Common Provisions Act, section 202, stating the information that must be included in the report.

relinquished area, for a geothermal tenure, for part 4, division 1, see section 14.

rig release day, for a geothermal well in the area of a geothermal tenure, means the day—

(a) the drilling rig last used to drill the well is moved so it is no longer above the well; and

(b) the geothermal tenure holder does not intend to continue drilling the well.

royalty return period, for part 8, see section 40.

scientific or technical survey, for a geothermal tenure, means a geochemical or geotechnical survey, other than a geophysical survey, of the area of the tenure, and includes reprocessing previously obtained data.

scientific or technical survey report, for a scientific or technical survey of a geothermal tenure, see section 30.

seismic survey, for a geothermal tenure, means a survey carried out to work out the subsurface features of a part of the area of the tenure by transmitting sound waves into the ground and measuring the time the sounds take to return to the surface.

specific enthalpy means a measure of the total transferable heat of a mass relative to a specified base temperature in joules per kilogram (J/kg).

stimulation, of a geothermal well, means increasing the permeability of a geothermal reservoir by using hydraulic fracturing, cavitations, fracture acidising, proppant treatments or other techniques.

surrendered area, for a geothermal tenure, for part 4, division 1, see section 14.

surrender report, for part 4, division 1, see section 14.

well abandonment report, for a geothermal well in the area of a geothermal tenure, see section 23(1).

well completion report, for a geothermal well in the area of a geothermal tenure, see section 22(1).

wellhead value, of geothermal energy produced by or for a geothermal producer in a royalty return period, for part 8, see section 40.