

The Oregon Administrative Rules contain OARs filed through November 15, 2006

DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

DIVISION 20

GEOHERMAL REGULATIONS

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632-020-0005

Jurisdiction and Authority

(1) ~~The 1971 Geothermal Resources Act authorized~~ [ORS chapter 522 authorizes](#) the Department of Geology and Mineral Industries to control the drilling, redrilling, and deepening of wells for the discovery and production of geothermal resources so that such wells will be constructed, operated, maintained, and abandoned in the manner necessary to safeguard the life, health, property, and welfare of the people of this state and to encourage the maximum economic recovery of geothermal resources therefrom. The Act also gives the department responsibility for regulating re-injection of geothermal fluids into underground

reservoirs within prescribed limits of ORS 522.019(2) in a manner which will not be detrimental to beneficial use of waters of the state.

(2)

~~The Governing Board of the department shall:~~

~~(a) Administer and enforce the provisions of the Geothermal Resources Act; and~~

~~(b) In accordance with the applicable provisions of ORS Chapter 183, adopt rules and regulations and issue orders that it may deem necessary in carrying out the provisions of the Geothermal Resources act.~~

~~(3)~~ The permittee shall, in addition to complying with ~~the 1971 Geothermal Act~~ ORS chapter 522 and these ~~regulations-rules~~, comply with applicable laws and regulations of the Water Resources Department, Department of Environmental Quality, and any other agency having jurisdiction and control in the field of natural resources within the State of Oregon.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0010

Definitions

(1) "Abandonment" ~~shall mean~~s the ~~condition of failure to properly plug and decommission~~ a prospect or geothermal well ~~when it is permanently plugged to the satisfaction of the State Geologist~~ in accordance with the rules in this division.

(2) "Artesian" means the response of water or fluid under natural pressure whereby it rises above the level where it was originally encountered.

(3) "Blow-Out" means an uncontrolled escape of fluids, such as from a drilling well when high formation pressure is encountered.

(4) "Board" means Governing Board of the State Department of Geology and Mineral Industries.

(5) "By-Products" means any mineral or minerals, exclusive of helium or oil, hydrocarbon gas, or other hydrocarbon substances, ~~which that (i)~~ are found in solution or in association with geothermal resources and ~~which~~ have a value of less than 75 percent of the value of the geothermal resource or ~~(ii)~~ are not, because of quantity, quality, or technical difficulties in extraction and production, of sufficient value to warrant extraction and production by themselves.

(6) "Contamination" means any alteration of the physical, chemical, or biological properties of surface or groundwaters of the state; such alteration may not prevent the beneficial use of such waters.

(7) "Department" means the State Department of Geology and Mineral Industries.

(8) "Fresh Water" means water ~~which that~~ is used, or could be used, for irrigation or domestic purposes.

(9) "Geothermal Area" means any parcel of land that is, or reasonably appears to be, underlaid-underlain by Geothermal Resources.

(10) "Geothermal ~~Reinjection~~ Injection Well" means any well or converted well constructed to dispose of geothermal fluids derived from geothermal resources into an underground reservoir.

(11) "Geothermal well" includes any well drilled to explore for or produce geothermal resources from any depth, ~~other than a prospect well as defined in section (18) and~~ any geothermal injection well as defined in section (10) of this rule, ~~and any temperature gradient or geophysical test well deeper than 2,000 feet.~~

(12) "Observation Status" means that the department has authorized a geothermal well or prospect ~~will well~~ to remain unplugged for a specified and extended period to allow the well to be used to collect information about subsurface conditions.

(13) "Operator" means the person:

(a) Who possesses the legal right to drill a geothermal well ~~or prospect well, or~~

(b) Who has obtained a drilling permit pursuant to ORS 522.135 ~~or~~

(c) Who possesses the legal right to operate a completed geothermal well as described by ORS 522.185.

(14) "Owner" means the person who has the right to drill geothermal wells ~~and~~ or prospect wells, or to appropriate the production from a completed geothermal well, either for himself or for himself and others.

(15) "Permittee" means owner or operator.

(16) "Person" means any individual, corporation, company, association of individuals, joint venture, partnership, receiver, trustee, guardian, executor, administrator, ~~or~~ personal representative; or a state, federal, or local agency that is the subject of legal rights and duties under these regulations.

(17) "Pollution" means contamination or other alteration of the physical, chemical, or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, silt, or odor of the waters, or such radioactive or other substance into any waters of the state ~~which that~~ either by itself or in connection with any other substance present, will or can reasonably be expected to create a public nuisance or render such waters harmful, detrimental, or injurious to public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses or to livestock, wildlife, fish or other aquatic life, or the habitat thereof.

(18) "Prospect Well" means any well or hole drilled as a geophysical test well, [seismic shot hole, mineral exploration drilling, core drilling](#), or temperature gradient test well, ~~less than 2,000 feet in depth,~~ and drilled in prospecting for geothermal resources.

"Prospect Well" does not include a geothermal well as defined in section (11) of this rule.

(19) "Reservoir" means an aquifer or combination of aquifers or zones containing a common geothermal or groundwater resource.

(20) "Royalty Interest" means a right or interest in geothermal resources produced from land or in the proceeds of the first sale of those resources.

(21) "State Geologist" means the director of the Department of Geology and Mineral Industries.

(22) "Unit Agreement" means an agreement or plan of development and operation under the provisions of ORS 308.370, 522.015, 522.405 to 522.545, 522.815, 522.990 and this ~~Division~~ [division](#) of OAR 632 for the production and/or use of geothermal resources in separately owned interests as a single consolidated unit ~~and which~~ [that](#) provides for the allocation of costs and benefits.

(23) "Unit Operator" means the person designated in the unit agreement to manage and conduct the unit agreement.

(24) "Waste" means any physical waste, deleterious effects on surface and groundwater, including but not limited to underground waste resulting from the inefficient, excessive, or improper use or dissipation of reservoir energy, or resulting from the location, spacing, drilling, equipping, operation, or production of a geothermal resource well or prospect well in such manner that reduces or tends to reduce the ultimate economic recovery of the geothermal resources within a reservoir; and surface waste resulting from the location, spacing, drilling, equipping, operation, or production of a geothermal resource well or prospect well in such a manner that causes or tends to cause the unnecessary or excessive surface loss or destruction of geothermal resources released from the reservoir.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0015

Inspection and Supervision

The ~~State Geologist or his representative~~ [department](#) shall inspect and supervise geothermal operations for the purpose of enforcing compliance with the rules, and orders promulgated by the board.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0020

General Rules [and Special Rules](#)

General rules ~~shall be apply~~ statewide ~~in application unless otherwise specifically stated~~ and ~~applicable~~ to all lands within the jurisdiction of the State of Oregon [unless otherwise provided or superseded by a special rule](#).

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72

632-020-0025

Supremacy of Special Rules

~~Special rules will be issued when required and shall prevail as against general rules if in conflict therewith.~~

~~Stat. Auth.: ORS 522~~

~~Stats. Implemented: ORS 522.305~~

~~Hist.: GMI 4, f. 7-20-72, ef. 8-1-72~~

632-020-0030

Application and Permit to Drill, Redrill, Deepen, or Alter Casing

(1) ~~The owner or operator of any geothermal well or prospect well~~ [before](#) commencing the drilling, redrilling, deepening, or altering of casing of any geothermal well or prospect well, [the owner or operator of any geothermal well or prospect well shall must](#) file with the ~~State Geologist or representative~~ [department](#) a written application for [a](#) permit to drill, redrill, deepen, or alter casing accompanied by a nonrefundable fee ~~of \$250 for each geothermal well or program of prospect wells~~ [in accordance with ORS 522.055 or 522.155](#). The application ~~shall contain the following~~ [must include, but is not limited to](#):

(a) The location(s) and ground elevation(s) of the proposed well(s). The location ~~shall~~ [includes](#) the township, range, and section, ~~together with and~~ the footage measurement from a section or quarter section corner. For prospect wells, a map may replace the footage measurements;

(b) ~~The number or other designation~~ [An identifying name or number for each well](#), approved by the ~~State Geologist, by which the well(s) shall be known~~ [department](#);

(c) The proposed geologic objectives and proposed well depth ~~(s)~~ [for each well; and](#)

(d) ~~Such e~~ Other pertinent data as the ~~State Geologist~~department may require ~~on forms supplied by the department or in other a~~ form acceptable to the ~~State Geologist~~department. The information on the permit application ~~shall be non-is not~~ confidential, with the exception of ~~Prospect prospect~~ Well-well locations.

(2) ~~The department will circulate an application to drill pursuant to ORS 522.125(1) for geothermal wells or ORS 522.065 for prospect wells. Circulation of the application to drill shall be in accordance with ORS 522.125(1).~~

(3) Upon receipt of the application, the fee, the bond required under OAR 632-020-0035, and after the comment period provided for by ORS 522.125 for geothermal wells and 522.065 for prospect wells, the ~~State Geologist or representative~~department will make a determination and issue ~~such person~~ a permit to drill, unless the drilling of the geothermal well or prospect well is contrary to law, rule, or order of the ~~Board~~board. The drilling, redrilling, deepening, or altering of casing of a geothermal well or prospect well is prohibited until a permit is obtained. If the permit is disallowed, the ~~State Geologist or representative~~department will immediately notify the person in writing giving the reasons ~~therefor~~.

(4)

~~Drilling, redrilling, deepening or altering casing operations must commence within one year from the date of issuance of the permit or such permit shall become invalid. The permit may be extended by the State Geologist for a maximum of an additional one year upon receipt of written request from the permittee before the expiration date giving reasons for an extension. The request shall be accompanied by a nonrefundable fee of \$250.~~

~~(5)~~ The issuance of a permit is not a finding of compliance with the Statewide Planning Goals (ORS 197.225) or compatibility with the acknowledged comprehensive plan. The applicant must receive ~~land land~~-use approval from the affected local government supported by written findings as provided in OAR 632-001-0015(5)(b)(A) before the use can commence.

~~(6)~~(5) After completion, suspension, or ~~abandonment~~-decommissioning of any well, the provisions of this section ~~shall~~ also apply to the deepening, redrilling, or altering casing of the well.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 1-1984, f. & ef. 1-23-84; GMI 1-1991, f. 9-5-91, cert. ef. 9-6-91; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0031

Active Permits

The permittee of any geothermal well or prospect well permit under which a well has been drilled and not ~~abandoned~~ shall decommissioned, must provide an annual nonrefundable fee ~~of \$500~~ in accordance with ORS 522.115 for geothermal wells or ORS 522.055 for prospect wells on or before the anniversary of the issuance date of each active permit issued by the ~~State Geologist~~department. As a courtesy, the department may notify the permittee with a notice prior to the anniversary date.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

His.: GMI 1-1991, f. 9-5-91, cert. ef. 9-6-91; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0035

Drilling Bond

(1) A permit for the drilling, redrilling, deepening, or altering of casing of a prospect well shall not be granted until the applicant has complied with the requirements of ORS 522.075 relating to surety bonds and security deposits.

(2) A permit for the drilling, redrilling, deepening, or altering of casing of a geothermal well shall not be granted until the applicant has complied with the requirements of ORS 522.145 relating to surety bonds and security deposits.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0040

Assignment, Transfers of Ownership

The owner or operator of an existing and/or proposed geothermal or prospect well ~~shall~~-must notify the department in writing, ~~in such form as the department may direct~~ a form acceptable to the department, of the sale, assignment, transfer, conveyance, or exchange of such well and/or a change in the lessor of the land upon which such well is situated within five days thereof. Each ~~such~~ notice shall contain the following:

(1) The name and address of the person to whom ~~such the~~ well or mineral rights was sold, assigned, transferred, conveyed, or exchanged-;

(2) The name and location of ~~such the~~ well-; and

(3) The date of ~~such~~ sale, assignment, transfer, conveyance, or exchange.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0045

Notice of Change in Ownership

Every person who acquires the ownership or the right of operation of a well or proposed well as described by OAR 632-020-0040 ~~shall~~must, within five days after acquiring such well or proposed well, notify the ~~State Geologist or representative~~ department in writing of the newly acquired ownership or right of operation. Each notice ~~shall~~must contain the following:

- (1) The name and address of the person from whom the well or proposed well was acquired~~-,~~
- (2) The name and location of ~~such the~~ well~~-, and~~
- (3) The date of ~~such the~~ acquisition.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83

632-020-0055

Proper Completion and ~~Abandonment~~Decommissioning

(1) A geothermal well or prospect well is properly completed for the purposes of this chapter when it is demonstrated that the well is capable of production, flow testing, monitoring temperature, pressure or other subsurface conditions, injecting fluids, or other approved purpose, and the person engaged in drilling, re-drilling, deepening, or altering casing of ~~such the~~ well has shown to the satisfaction of the ~~State Geologist~~department that the manner of conducting these activities is satisfactory.

(2) A well ~~shall be~~is considered properly ~~abandoned~~plugged and decommissioned, for the purpose of this chapter, when the conditions of ORS 522.005 to 522.990 and these rules are fulfilled and the person drilling, re-drilling, deepening, or altering casing of such well has shown to the satisfaction of the State Geologist that all proper steps have been taken to protect groundwater and surface water from pollution resulting from the ~~abandoned~~ decommissioned well and to prevent the escape of all fluids to the surface.

(3) Proper completion and ~~abandonment shall be conditioned also upon~~decommissioning requires adequate protection of the environment and of aesthetic qualities of the surface in the area of operation.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0060

Filing of Well Records, Confidentiality

(1) The operator of a geothermal well ~~shall~~must keep ~~and provide the department~~ copies of well records and related information as provided in ORS 522.355 and 522.365. In addition, the operator ~~shall~~must:

- (a) Record the amount, size, and weight of casing used; and the size, type and depths of perforations; and
- (b) File with the department, within 60 days after completion, suspension, or decommissioning of a well, all logs, samples, history, surveys, and other required data ~~within 60 days after completion, suspension, or abandonment of the well.~~

(2) The operator of a prospect well ~~shall~~must keep and provide the department with records including a log describing the type of rocks penetrated, depths of water-bearing formations, bottom hole temperature, and well location.

(3) Records filed with the department pursuant to ORS 522.365 and sections (1) and (2) above ~~shall~~will not be disclosed to the public for four years from the date of completion, suspension, or abandonment of the well, whichever occurs first. ~~Thereafter~~After four years, the records shall be available for public inspection under the provisions of ORS 192.410 to 192.505. If an operator claims that any record continues to be exempt from disclosure as a trade secret under ORS 192.501, the operator must notify the department and explain the basis for its claim at least 30 days before the end of the ~~four~~four-year period.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 1-1984, f. & ef. 1-23-84; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0065

Sundry Applications and Reports

(1) A written application for a permit to do work or to change plans previously approved must be filed with the ~~State Geologist~~ department unless otherwise directed, and must be approved by ~~him~~ the department before work is begun. Approval or denial must be given within 15 days by the ~~State Geologist~~department. If, in case of emergency, an application is submitted orally or by ~~wire~~email, and approval is obtained, the transaction ~~shall~~must be confirmed in writing. A subsequent report of the work performed must also be filed with the ~~State Geologist~~department.

(2) Before the repairing or performance of work to permanently alter the casing of a well, an application setting forth in detail the proposed work must be filed with, and approved by, the ~~State Geologist~~department. A detailed report of the work accomplished and the methods employed, including all dates and the results of such work, must be filed within 60 days after completion of the work.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83

632-020-0070

Well Designations

Every person drilling any well for geothermal resources or operating, owning, or controlling or in possession of any well drilled for geothermal resources, ~~shall~~must paint or stencil and post and keep posted in a conspicuous place near the well, the name of the person drilling, operating, owning, or controlling the well, the name of the lease, the number of the well, and the number of the permit for the well, together with the Section, Township, and Range.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72

632-020-0090

Noise Abatement

The lessee ~~shall~~must minimize noise when conducting air drilling operations or when the well is allowed to produce while drilling or drilling is conducted. Welfare of the operating personnel and the public must not be affected as a consequence of the noise created by the expanding gases. The method and degree of noise abatement ~~shall~~must be as approved by the department and ~~shall~~must comply with the ~~regulations and standards pertaining thereto~~pertinent rules adopted by the Oregon Department of Environmental Quality.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0095

Casing Requirements

(1) The owner or operator of any geothermal well or prospect well ~~shall~~must properly case ~~such the~~ well with adequate grade casing and cement ~~such the~~ casing where necessary to provide adequate anchor for blow-out preventers. ~~Design of casings shall~~Casing design must take into account stress imposed by the maximum expected temperature and the physical effects of produced fluids and gases on casing durability. Surface casing for any well with a proposed depth of more than 500 feet ~~shall~~must be set at a depth of at least ten percent of the proposed total depth of the well, or at least 25 feet into consolidated, competent rock, whichever is deeper, unless otherwise approved by the department. In areas with no nearby drilling history, surface casing ~~shall~~must be set to a minimum of 300 feet, unless otherwise ~~permitted~~approved by the department.

(2) The owner or operator of ~~any such a~~ geothermal or prospect well ~~shall~~must shut out pollution from strata containing water used for irrigation or domestic purposes and from surface water used for ~~such these~~ purposes. The operator of ~~any a~~ geothermal or prospect well ~~drilled for geothermal resources which that~~ penetrates a usable fresh water aquifer shall be required to set casing or tubing through this formation and cement such casing or tubing from bottom to top unless the department approves a different program.

(3) Casing and casing seals used for prospect wells, where the temperature of groundwater does not exceed 250°F., ~~shall~~must comply with the general standards for the construction and maintenance of water wells set by the State Water Resources Department.

(4) Each ~~fluid fluid~~-bearing zone above the producing horizon in a geothermal resources well ~~shall~~must be cased and sealed off to prevent ~~effectively~~ the migration of formation fluids to other areas. Such casing and sealing off ~~shall~~must be ~~effected~~completed and tested ~~in such manner and by such the~~ methods and means ~~as may be~~ prescribed by the department.

(5) Cements used in cementing casing and sealing formations ~~shall~~must be of a grade and type best suited for expected reservoir temperature, formation water chemistry and bonding properties. Cements acceptable for use in ~~high high~~-temperature holes include Modified Type A or G, Alumina Silica Flour, Phosphate Bonded Glass, or other equivalent ~~high high~~-temperature design cement.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0100

Removal of Casings

No person shall remove a casing, or any part ~~thereof of a casing~~, from any geothermal well or prospect well without applying in advance and obtaining approval in writing from the ~~State Geologist or representative~~ department.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83

632-020-0105

Directional Drilling

(1) The maximum point at which a well penetrates the producing formation ~~shall~~ must not vary from the vertical drawn from the center of the hole at the surface by more than 5 degrees. Deviation is permitted without special permission for short distances to straighten the hole, sidetrack junk, or to correct other mechanical difficulties.

(2) Except for the purposes of straightening the hole, sidetracking junk, or correcting mechanical difficulties as provided in this rule, no well shall be intentionally deviated from the vertical unless the operator ~~thereof shall~~ first ~~file~~ files an application and obtains a permit from the ~~State Geologist~~ department. If drilling is in progress, the operator must notify the department immediately of the deviation of the hole or ~~his of the~~ intention to deviate the hole. When an operator follows this procedure, ~~he must file~~ an application must be filed as soon as ~~practicable~~ possible.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0110

Serving Orders

Whenever the ~~State Geologist or representative~~ department gives any written direction concerning the drilling, testing, or other operations conducted with respect to any geothermal well or prospect well drilled, in the process of being drilled, redrilled, deepened, altered, or in the process of being ~~abandoned~~ decommissioned, and the operator, owner, or designated agent of either, serves written notice, either personally or by mail, addressed to the ~~State Geologist or representative~~ department, requesting that a definite order be made upon such subject, the ~~State Geologist or representative~~ department shall, within a reasonable time after receipt of the notice, deliver a final written order on the subject matter. Any such final written order of the ~~State Geologist~~ department may be appealed to the board and further redress may be sought in the manner provided in ORS Chapter 183 for appeals from final orders in contested cases.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0115

Measurement of Geothermal Resources

The lessee ~~shall~~ must measure or gauge all production from each well in accordance with methods approved by the department or may arrange with the department for other acceptable methods of measuring and recording production. The quantity and quality of all production shall be determined in accordance with the standard practices, procedures, and specifications generally used in the industry. For wells on federal land, the department will establish acceptable methods in concert with the Federal Authorized Officer.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0117

Spacing Plan

The Board may, on its own motion ~~may~~, or at the request of ~~may any~~ interested party, ~~shall~~ hold a hearing to determine the maximum efficient rate at which any geothermal well in the state can produce a geothermal resource without waste. After the hearing, the Board may set production rates by order.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: DGMI 2-1999, f. & cert. ef. 8-30-99

632-020-0120

Production Reports

The owner or operator of any well producing geothermal resources ~~shall~~ must file with the department, before the 20th day of each month, a statement of the geothermal resources production from ~~such the~~ well during the preceding calendar month. ~~Such~~ The report ~~shall be submitted on such forms and in such manner as may be prescribed by~~ must be in a form acceptable to the department.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0125

~~Abandonment~~ Decommissioning

(1)

~~Notice of Intention. Protection of water and geothermal resources:~~

~~(a) Before beginning any operation is commenced to abandon plug and decommission any prospect or geothermal well, the owner or operator of such well shall must apply to the department for a permit to abandon approval to decommission the well on a form acceptable to the department, giving the condition of the well and the proposed method of abandonment; An application for decommissioning a well must include a proposed decommission plan that describes the well and the proposed method of plugging the well and restoring the well site and the fee required under ORS 522.115.~~

~~(a) The department will review the decommissioning plan to determine whether it is adequate to protect land, water, and geothermal resources.~~

~~(b) If the department determines the plan is adequate, it will approve the plan and notify the applicant. If the department determines the plan is inadequate, it may order the plan to be revised to include whatever additional provisions are needed to protect land, water, and geothermal resources.~~

~~(c) The owner or operator shall must notify the department at least 24 hours before the proposed date for the commencement of abandonment decommissioning operations. Notification may be made by phone, but must be followed by written application. The department shall either approve or deny the application within ten days. A representative of the department may be present during any abandonment decommissioning operation, and shall approve the procedure if found to be satisfactory;~~

~~(e)(d) The owner or operator of such well shall furnish the department any additional information that may be requested regarding the condition of the well and the proposed method of abandonment, at any time between the filing of the notice of intention to abandon the well and the completion of abandonment with a written report of the decommissioning as provided in ORS 522.225(2).~~

(2) Geothermal resource, environment, and water resources to be protected:

(a) Before any prospect or geothermal well or any producing horizon encountered therein shall be abandoned is decommissioned, the owner or operator shall must use such means, methods, and procedures as may be necessary to prevent water from entering any geothermal resources bearing formation, and to protect any underground or surface water, that is suitable for domestic or irrigation purposes from waste, downward drainage, harmful infiltration, and addition of deleterious substances;

(b) Prior to granting approval for final abandonment approving the decommissioning of any prospect or geothermal well drilled for geothermal resources, the department shall determine that the site be has been restored to as near its original state as possible.

(3) Observation status. Suspension, Unlawful Abandonment, Removal of Equipment:

(a) At the time of permit issuance, the department may grant provisional observation status to prospect or geothermal wells if the wells are designed to be constructed and maintained as information gathering wells for an extended period of time period. After drilling activities for such a well is completed, the board may grant observation status for a stated period of time period;.

(b) The board may authorize a permittee to suspend operations or remove equipment from a well for the period stated in the Board's written authorization, given upon written application of the permittee and his or its affidavit showing good cause. The period of suspension may be extended by the board, upon written application made before expiration of the previously authorized suspension, accompanied by affidavit of the permittee showing good cause for granting of such extension;.

(c) After operations on or at a well have been suspended with the approval of the board pursuant to subsection (a) of this section, if operations are not resumed within six months from the date specified in such approval of suspension, an intention to abandon and unlawful abandonment shall be presumed unless the permittee has obtained from the Board an extension of time of such suspension, upon his or its written application and affidavit showing good cause for the granting of such extension;.

(d) Whenever operations on or at any well shall have been suspended for a period of six months without compliance with these regulations, the well shall will be presumed unlawfully abandoned;.

(e) A well shall will be deemed unlawfully abandoned if, without notice given to the board as required by these rules, any drilling or producing equipment is removed;.

~~(f) Any unlawful abandonment under these regulations shall be declared by the Board and such declaration of unlawful abandonment shall be entered in the board minutes and written notice thereof delivered by registered mail both to such permittee at the last known post office address as disclosed by the records of the board, to the registered agent of the permittee, if any, and to the permittee's surety; and the board may thereafter proceed against the permittee and permittee's surety;~~

(g) All ~~decommissioned~~ wells ~~abandoned or declared unlawfully abandoned as herein provided shall~~ must be plugged as ~~required by law and by these regulations unless an alternative procedure is approved by the State Geologist~~ provided in section (4) of this rule unless an alternative plugging is specifically approved by the department.

(4) Plugging Methods and Procedure, Geothermal Wells or Prospect Wells 2,000 Feet or More in Depth:

(a) The well ~~shall~~ must be filled with mud-laden fluid from bottom to top consisting of mud weighing 9.0 pounds per gallon of not less than 36 viscosity (API Full Funnel Method), with the exception of intervals required to be plugged with cement. Other fluids may be used upon approval of the department; ~~;~~

(b) At the top of each producing formation, or fluid zone at greater than hydrostatic pressure, a cement plug ~~shall~~ must be placed which extends either from the bottom of the well or from a point 50 feet below the top of each such producing formation or zone ~~;~~

(c) If a well is uncased through a freshwater zone, a cement plug ~~shall~~ must extend from 50 feet below the bottom of the water-bearing zone to at least 50 feet above the water zone; ~~;~~

(d) If the surface string of casing is set below the deepest freshwater-bearing formation, and the well is uncased below this point, a cement plug ~~shall~~ must be placed in the well extending from a point at least 50 feet below the base of the surface casing and 50 feet into the bottom of the casing; ~~;~~

(e) The top of all casing strings ~~shall~~ must be cut off at least 4 feet below ground surface, and casing and all annuli ~~shall~~ must be plugged with cement to a depth of at least ten feet; ~~;~~

(f) The operator ~~shall have~~ has the option as to the method of placing cement in the well:

(A) Pumping through tubing; or

(B) Pump and plug displacement; or

(C) Other method approved by the department.

(5) Plugging Methods and Procedure, Prospect Wells Less than 2,000 Feet in Depth. Before ~~abandoning~~ decommissioning any prospect well ~~which less than 2,000 feet deep, that~~ penetrates a usable fresh-water horizon, it ~~shall be~~ is the duty of the owner or operator ~~of such prospect well~~ to plug the well in such a manner as to protect ~~properly~~ all freshwater-bearing formations; ~~;~~ and ~~within~~ Within 60 days after ~~the~~ plugging, the permittee must file an affidavit ~~shall be filed~~ with the department ~~by the owner or operator~~, setting forth the location of the prospect well and the method used ~~in plugging the well~~ to protect water-bearing formations, if any were penetrated. Plugging ~~shall~~ consists of the following procedures unless a different method is approved by the department. These procedures may be done in open hole if the well is being ~~abandoned~~ decommissioned, or in the annulus around the tubing if the well is being completed as a temperature gradient well:

(a) In wells where water is not encountered, the hole ~~shall is~~ to be filled with heavy mud-laden fluid or with drill cuttings and a ~~ten~~ (10)-foot cement plug placed at the top of the hole, buried at least two feet in such a manner as not to interfere with soil cultivation; ~~;~~

(b) In wells where groundwater is encountered, but is not under artesian pressure, the hole ~~shall~~ must be filled with cement to a point at least 50 feet above the water zone, or if the top of the zone is less than 50 feet from the ground surface, the cement ~~shall~~ must extend to the ground surface. If a well penetrates below a freshwater zone, a cement plug ~~shall~~ must extend from 50 feet below the bottom of the zone to at least 50 feet above the zone; ~~;~~

(c) In wells where artesian water is encountered, the well ~~shall~~ must be plugged with cement from bottom to top.

(6) Report on Completion. Within ~~60~~ 45 days after the completion of the plugging and decommissioning of a geothermal well or prospect wells, the owner or operator ~~thereof shall~~ must file a report with the department setting forth in detail the method used in plugging the ~~well(s)~~ well or wells. ~~Such report shall be made on a form supplied by or approved by~~ The report must be in a form acceptable to the department.

(7) Wells Used for Fresh Water:

(a) When the well to be ~~plugged~~ decommissioned may safely be used as a freshwater well and ~~such~~ this use is desired by the land owner, the well need not be filled above the required sealing plug set below fresh water; ~~provided, however,~~ authorization for use of any such well ~~shall be~~ is obtained from the Water Resources Department;

(b) Application for leaving the well partially unplugged as a fresh water well ~~shall~~ must be made to the department by the land owner, accompanied by his affidavit as to his need of water and the intended use of the well, together with a copy of the Water Resources Department's order or permit authorizing such use; and

(c) The operator ~~shall~~ must leave the fresh water well in a condition approved by the department.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.175 & ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95; DGMI 2-1999, f. & cert. ef. 8-30-99

632-020-0130

Subsequent ~~Abandonment~~ Decommissioning Report

(1) Within ~~60~~ 45 days after the ~~abandonment~~ decommissioning of ~~any~~ well, the owner or operator ~~of such well shall~~ must make, ~~in such form as the department may direct, a written~~ a report; in a form acceptable to the department, of all work done with respect to the abandonment.

(2) Failure to ~~abandon~~ decommission in accordance with the approved ~~method of abandonment~~ decommission plan, failure to submit to the department any application or report required by these rules, or failure to furnish the department, upon request, with any information regarding the condition of ~~the a~~ well(s), ~~shall~~ constitutes sufficient grounds for disapproval of the ~~abandonment~~ decommissioning.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.175 & ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0134

Naming of Fields

The board, on its own or upon request of any interested person, may, after a public hearing, name a geothermal field and set the boundaries of the field. Using the same procedure, the board may later change the boundaries of a field.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0135

Well Spacing

The board shall approve proposed well-spacing programs for geothermal wells in a field or prescribe such modifications to the programs as it determines necessary for proper development. The board may do this by rule or order. In determining well spacing, the board shall ~~give consideration to~~ consider such factors as:

- (1) Topographic characteristics of the area;
- (2) Hydrologic and geologic conditions in the reservoir;
- (3) Minimum number of wells required for adequate development; and
- (4) Protection of the environment.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0138

Unit Agreements

(1) When voluntary unitization occurs under ORS 522.405 to 522.545, the operator of the unit ~~shall~~ must pay ~~to the board a fee; a fee to the department for the administration of the unit. The amount of the fee will~~ to be determined by the board on a case-by-case basis ~~for administration of the unit~~. The unit operator shall collect equitable shares of this fee from all persons, or state or local governing bodies, special districts, or agencies with a royalty interest in the unitized development.

(2) When the board requires the development of a unit agreement under ORS 522.405 to 522.545, the operator of the unit ~~shall~~ must pay ~~to the board~~ a fee to the department for the creation and administration of the unit. The amount of the fee will be determined by the board on a case-by-case basis, for creation and administration of the unit. The unit operator shall collect equitable shares of this fee from all persons, or state or local governing bodies, special districts, or agencies with a royalty interest in the unitized development.

(3) The State Geologist shall review voluntary unit agreements governing production of geothermal resources to ensure compliance with the provisions of ORS 522.405 to 522.545.

(4) The operator or person proposing a board-initiated unit agreement shall make application to the board.

(5) The State Geologist shall enforce, when necessary, board-approved or initiated unit agreements.

(6) The board may change or approve proposed changes in the boundaries of a unit area; upon application by the unit operator or interested person. Such changes shall not jeopardize pre-existing contractual relationships between participating parties.

(7) The board may levy fees upon any operator, person, state or local governing body, special district, or agency that holds a royalty interest in a unit area to cover reasonable costs associated with the development and administration of a unit agreement. If such a fee is not paid when due, the board may require the fee to be paid from proceeds of the sale of the unit production.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305 & ORS 522.405

Hist.: GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0140

Commingling Production

The department may authorize the lessee to commingle the production from different wells and/or leases with the production of other operators subject to such conditions as may be prescribed.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0145

Pits or Sumps

(1) Materials and fluids ~~or any fluid~~ necessary ~~to for~~ the drilling, production, or other operations by the permittee may be discharged or placed in pits and sumps ~~if only with the approval to do so is obtained from of~~ the department and the ~~State~~ Department of Environmental Quality. The operator ~~shall~~ **must** provide pits and sumps of adequate capacity and design to retain all materials. In no event shall the contents of a pit or sump be allowed to:

- (a) Contaminate streams, artificial canals or waterways, groundwaters, lakes, or rivers;
- (b) Adversely affect the environment, persons, plants, fish, and wildlife and their populations; or
- (c) Damage the aesthetic values of the property or adjacent properties.

(2) When no longer needed, pits and sumps are to be filled and covered and the premises restored to a near natural state.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0150

Disposal of Solid and Liquid Wastes

~~(1) The Department of Geology and Mineral Industries has authority for regulating injection of geothermal fluids derived from geothermal resources as specified in ORS 522.025 and 522.019(2) and the Department of Environmental Quality has authority for regulating other methods for disposing of fluids and wastes derived from geothermal operations.~~

~~(2) Injection of geothermal fluids shall not pollute waters of the state, create a public nuisance, impair beneficial uses of waters, or degrade the biologic habitat of aquatic life and domestic and wild animals. Permits for prospect and geothermal wells will be issued in accordance with ORS 522.019, 522.025, and 522.135. The department will coordinate with the Department of Environmental Quality and the Department of Water Resources to ensure that permit conditions are consistent and protective of natural resources and the environment.~~

~~(3) Methods of handling geothermal fluids derived from geothermal resources other than injection may be approved by the State Geologist or his representative if after consultation with the Director of the Department of Environmental Quality or his representative it is determined that no pollution will occur.~~

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0151

Handling of Test Fluids

Prior to conducting formation and production tests, the operator ~~shall~~ **must** provide adequate storage for anticipated volumes of formation fluids and drilling mud. Arrangements for ultimate disposal of waste fluids ~~shall~~ **must** be made with the ~~local~~ department and the Department of Environmental Quality ~~representative if disposal is by a means other than subsurface injection in a well.~~

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4-1980, f. & ef. 10-2-80; DGMI 2-1999, f. & cert. ef. 8-30-99

632-020-0154

Injection and Conservation

Injection ~~shall be~~ **is** the preferred method for handling geothermal fluids derived from geothermal resources to conserve natural heat energy and to maintain reservoir temperature and pressure. This rule applies to fluids derived from geothermal wells as defined in ORS 522.005(12) and that are subject to departmental regulation under ORS 522.025 ~~and to wells 2,000 feet in depth or deeper used for injection of geothermal fluids regardless of temperature of the fluids.~~

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0155

Application to Drill Injection Wells

~~(1) No person shall engage in the drilling or operating of any geothermal injection well without first obtaining a permit issued under the authority of the State Geologist, and without complying with the conditions of such permit. The provisions of this rule~~

apply to applications for geothermal wells intended for the injection of geothermal fluids, and are in addition to the requirements of OAR 632.030.

- (2) An application for a permit to inject a geothermal fluid into any underground reservoir ~~shall contain all the information required by the State Geologist, including~~ must include, but is not limited to, the following:
- (a) A plan of injection explaining the proposed system including facilities other than the injection well necessary to conduct the operations;
 - (b) A map of adequate scale (preferably 1:24,000, but not less than 1:62,500 or 1" = 1 mile) to show all existing and proposed wells, pipelines, and other surface facilities. All wells ~~shall~~ must be distinguished by type;
 - (c) The injection fluid characteristics such as quality, quantity, source, chemical analysis, chemical reactivity, toxicity, temperature, etc.;
 - (d) The characteristics of the proposed injection zone including: volume capacity of the zone, geologic formation and structure, porosity, permeability, chemical analysis of zonal water, static formation pressures and temperatures, anticipated zonal fluid reactivity to the injected fluids, any previous history of injection operations into the same or similar formations, any injectivity tests which may have been conducted, and other pertinent data;
 - (e) Hydrology of the surrounding area, including groundwater quality, quantities, and analyses, and the predicted effects of contamination by injected fluids on the existing surface and groundwaters;
 - (f) Subsurface maps and cross sections of the producing and injecting zone structure and lithology and any available logs or histories of a well or other wells penetrating the injection zone, that have not ~~previously~~ been previously submitted. Discuss the effects of injection on such factors as potable water, seismicity, and local tectonic conditions;
 - (g) Representative injection well drilling program;
 - (h) Proposed downhole and surface injection equipment and metering facilities with capacity, design capabilities, and design safety factors, in sufficient detail to enable adequate environmental analysis. Construction and engineering design plans should be included; and
 - (i) Proposed injectivity surveys and other means to monitor injection performance.

~~(3) The State Geologist shall circulate copies of an application to construct an injection well to those agencies specified in ORS 522.125. Any of those agencies desiring to suggest conditions under which a permit should be granted shall provide such information to the department within 30 days of receipt of the copy of the application. Such conditions may be stipulated by the State Geologist as conditions of the permit.~~

~~(4) An application for a injection well permit shall be accompanied by a \$250 fee to cover cost of processing.~~

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.019 & ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0156

Permit for Injection

(1)

~~Within 30 days after receipt of the application for an injection well permit, the State Geologist or representative shall issue, deny, suspend, modify, revoke, or not renew a permit subject to the right of appeal by the applicant described in OAR 632-020-0165.~~

~~(2) The State Geologist or representative department may issue the permit after finding that issuance thereof is consistent with the purposes set forth in ORS 468A.010, 468B.015, 468B.030, 537.525, and ORS 522.~~

~~(3)(2) A water pollution control facilities permit shall Appropriate approval must be obtained from the Department of Environmental Quality, if required, under ORS 468B.050 before Quality before re-injection is commenced. ~~The Department of Environmental Quality may, by agreement with the State Department of Geology and Mineral Industries, waive this requirement for injection into the reservoir from which the fluid came where adequate standards and tests have been adopted to insure the fluid and its residues will not cause pollution.~~~~

~~(4) Issuance of a geothermal well permit allowing for reinjection permit does not relieve any person from any obligation to register or to obtain a permit under ORS 468B.050 or ORS 468B.195 to 468B.197 (Department of Environmental Quality).~~

~~(5) The State Geologist or representative department shall not issue a permit for injection of geothermal fluids until the operator has posted a bond in compliance with OAR 632-020-0035.~~

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95; DGMI 2-1999, f. & cert. ef. 8-30-99

632-020-0157

Construction of Injection Wells

(1) Injection wells ~~shall~~ must be constructed in compliance with the standards required in OAR 632-020-0095 and 632-020-0125.

(2) Special standards may be required by the ~~State Geologist~~ department to allow for corrosive effects of injected fluids, precipitation of dissolved minerals, more extensive cementing of casings, specifications for tubing packers and casing packers, or other construction practices generally accepted by the industry.

(3) All wells for injection of produced fluids ~~shall~~ must be tested for mechanical integrity at least once ~~very~~ every five years to determine that there is no leak in the casing; and that there is no fluid movement into an underground source of water other than that from which the fluid was produced, unless otherwise approved by the department. Acceptable tests include pressure build-up profiles, pressure testing, and casing thickness logs to demonstrate integrity of the casing. The department may, on a ~~case~~ case-by ~~by~~-case basis, approve tracer surveys, noise logs, temperature logs, spinner surveys, or other methods ~~approved by the department~~ may be acceptable to detect water movement adjacent to the wellbore. The department ~~shall~~ must be notified to witness mechanical integrity tests, and the results ~~shall~~ must be submitted as required by OAR 632-020-0060.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0158

Wellhead Equipment, Injection Wells

Adequate wellhead equipment ~~shall~~ must be installed to control expected pressures. Where underground conditions are unknown, the same equipment ~~shall~~ must be used as required for exploration holes.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0159

Monitoring Injection

(1) The department shall require monitoring of injection operations to insure that there will be no escape of geothermal fluids from the casings or through the annular space between casings and open hole except in the zone for which injection is permitted.

(2) Monitoring required by the department may include gauging pressure between casings, periodic testing for casing leaks, surveys to detect movement of fluid in adjacent rock formations, cement bond logs, temperature measurements, analyses of water chemistry, special well-head equipment or other methods employed by industry to monitor re-injection operations.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0160

Appeals From Board Actions

Application for rehearing by person adversely affected by order of board. Any person adversely affected by any rule, regulation, or order of the Board may, within 30 days after its entry, apply to the board for a rehearing. Such application shall be acted upon by the board within 30 days from its filing date; and, if granted, such rehearing shall be held without undue delay.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0165

Judicial Review of Board Actions

Any person adversely affected by any rule or order by the board may obtain judicial review thereof pursuant to ORS Chapter 183.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95

632-020-0170

Environmental Protection

The permittee shall conduct operations under this chapter so as not to pollute land, water or air, pollute streams, damage the surface or pollute the underground water. The operator must comply with ~~Federal~~ federal and ~~State~~ state air and water quality standards. Plans for disposal of well effluents must take into account the effect on groundwaters, streams, plants, fish and wildlife and their populations, atmosphere, or any other effects ~~which that~~ which that may cause or contribute to pollution, ~~and such p~~ Plans must be approved by the department before action is taken under them.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.305

Hist.: GMI 4, f. 7-20-72, ef. 8-1-72; GMI 2-1995, f. & cert. ef. 3-10-95

Geothermal Blowout Prevention

Blowout Prevention, Prevention for Geothermal Wells and Prospect Wells 2,000 Feet or More in Depth

(1) Cementing of Casing. The conductor and surface casing strings ~~shall~~ must be cemented with a quantity of cement sufficient to fill the annular space back to the surface. The intermediate casing string ~~shall~~ must be cemented to fill the annular space back to the surface unless otherwise approved by the department. Production casing ~~shall~~ must be cemented with a high temperature resistant cement, unless waived by the department and ~~shall~~ must be cemented in a manner necessary to exclude, isolate, or segregate overlying formation fluids from the geothermal resources zone and to prevent the movement of fluids into possible fresh water zones. Production casing ~~shall~~ must be cemented back to the surface or, if lapped, to the top of the lap. A temperature or cement bond log may be required by the department after setting and cementing the production casing and after all primary cementing operations if an unsatisfactory cementing job is indicated. Proposed well cementing techniques differing from the requirements of this paragraph will be considered by the department on an individual well basis.

(2) Pressure Testing:

(a) Prior to drilling out the casing shoe after cementing, all surface casing strings ~~shall~~ must be pressure tested, ~~measured at the surface gauge,~~ to a minimum pressure of 1,000 psi, or 1.5 psi per foot of casing, or to the working pressure of the casing, whichever is lesser. A higher test pressure may be specified in permit stipulations for casing strings set to greater than 1,000 feet. Exceptions to these minimum pressures may be allowed with the specific prior permission of the department. Such test ~~shall~~ must not exceed the rated working pressure of the casing or the blowout preventer stack assembly, whichever is lesser; ~~;~~

(b) In the event of casing failure during the test, the casing must be repaired or recemented until a satisfactory test is obtained. A pressure decline of 10 percent or less in 30 minutes ~~shall be~~ is considered satisfactory. ~~The department may require an affidavit signed by the operator or contractor conducting the pressure test certifying that a satisfactory pressure test has been obtained;~~

(c) Casing test results ~~shall~~ must be recorded in the driller's log and reported to the department within 60 days after ~~the completion of such test. Advance notice of all casing and lap tests shall be given in sufficient time to enable the department to be present to witness such tests.~~ The casing and lap test reports ~~shall~~ must give a detailed description of the test; including mud and cement volumes, lapse of time between running and cementing casing and testing, method of testing, and test results.

(3) Blowout Prevention Equipment and Procedures. All necessary precautions ~~shall be~~ must keep all wells under control at all times, utilize trained and competent personnel, and utilize properly maintained equipment and materials. Blow-out preventers and related well control equipment ~~shall~~ must be installed, tested immediately ~~thereafter, after installation~~ using water, and maintained ready for use until drilling operations are completed. Certain components, such as packing elements and ram rubbers, ~~shall~~ must be of ~~high-high~~ temperature resistant material as necessary. All kill lines, blowdown lines, manifolds, and fittings ~~shall~~ must be steel and ~~shall~~ have a temperature derated minimum working pressure rating equivalent to the maximum anticipated wellhead surface pressure. Subject to subsections (a) and (b) of this section, blowout prevention equipment ~~shall~~ must have hydraulic actuating systems and accumulators of sufficient capacity to close all of the hydraulically operated equipment and have a minimum pressure of 1,000 psi remaining on the accumulator. The department may approve manually operated blow-out preventers. Dual control stations ~~shall~~ must be installed with a ~~high-high~~ pressure backup system. One control panel ~~shall~~ must be located on the ground at least 50 feet away from the wellhead or rotary table. Air or other gaseous fluid drilling systems ~~shall~~ must have blow-out prevention assemblies. Such assemblies may include, but are not limited to, a rotating head, a double ram blow-out preventer or equivalent, a banjo-box or an approved substitute therefor and a blind ram blow-out preventer or gate valve, below the banjo-box. Exceptions to the requirements of this paragraph will be considered by the department only for certain geologic and well conditions such as stable surface areas with known low subsurface formation pressures and temperatures:

(a) Conductor Casing. In certain instances a remotely controlled hydraulically operated expansion type preventer or an acceptable alternative, approved by the department, including a drilling spool with side outlets or equivalent may be required by the department in areas where shallow thermal zones are indicated; ~~;~~

(b) Surface, Intermediate, and Production Casing. ~~Unless otherwise approved by the department, b~~ Before drilling below any of these strings, the blowout prevention equipment shall include a minimum of the following, unless otherwise approved by the department:

(A) One expansion-type preventer and accumulator or rotating head;

(B) A manual and remotely controlled hydraulically operated double ram blowout preventer or equivalent having a temperature derated minimum working pressure rating ~~which~~ that exceeds the maximum anticipated surface pressure at the anticipated reservoir fluid temperature;

(C) A drilling spool with side outlets or equivalent;

(D) A kill line equipped with at least one valve; and

(E) A blowdown line equipped with at least two valves; and securely anchored at all bends and at the end. At least one valve must be adjustable and one must be a complete shut off.

(c) Testing and Maintenance:

(A) Ram type blowout preventers and auxiliary equipment ~~shall~~ must be tested to a minimum of 1,000 psi, 1.5 psi per foot of casing, or to the working pressure of the casing or assembly, whichever is the lesser. Expansion type blowout preventers ~~shall~~

must be tested to 70 percent of the above pressure testing requirements. The blowout prevention equipment ~~shall~~must be pressure tested:

(i) When installed;

(ii) Prior to drilling out plugs and/or casing shoes; and

(iii) Following repairs that require disconnecting a pressure seal in the assembly.

(B) During drilling operations, blowout prevention equipment ~~shall~~must be actuated to test proper functioning as follows: once each trip for blind and pipe rams but not less than once each day for pipe rams; and at least once each week on the drill pipe for expansion type preventers~~;~~.

(C) All flange bolts ~~shall~~must be inspected at least weekly and retightened as necessary during drilling operations. The auxiliary control systems ~~shall~~must be inspected daily to check the mechanical condition and effectiveness and to insure personnel's acquaintance with the method of operation. Blowout prevention and auxiliary control equipment ~~shall~~must be cleaned, inspected, and repaired, if necessary, prior to installation to assure proper functioning. Blowout prevention controls ~~shall~~must be plainly labeled, and all crew members ~~shall~~must be instructed on the function and operation of ~~such~~the equipment. A blowout prevention drill ~~shall~~must be conducted weekly for each drilling crew. All blow-out prevention tests and crew drills ~~shall~~must be recorded on the driller's log.

(4) Related Well Control Equipment. A full opening drill string safety valve in the open position ~~shall~~must be maintained on the rig floor at all times while drilling operations are being conducted. A kelly cock ~~shall~~must be installed between the kelly and the swivel.

(5) Drilling Fluid. The properties, use, and testing of drilling fluids and the conduct of related drilling procedures shall be such as are necessary to prevent the blow-out of any well. Sufficient drilling fluid materials to ensure well control ~~shall~~must be maintained in the field area readily accessible for use at all times.

(6) Drilling Fluid Control. Before pulling drill pipe, the drilling fluid ~~shall~~must be properly conditioned or displaced. The hole shall be kept reasonably full at all times~~;~~; however, in no event shall the annular mud level be deeper than 100 feet from the rotary table when coming out of the hole with drill pipe. Mud cooling techniques shall be utilized when necessary to maintain mud characteristics for proper well control and hole conditioning. The department may require the use of mud cooling equipment.

(7) Drilling Fluid Testing:

(a) Mud testing and treatment consistent with good operating practice ~~shall~~must be performed daily or more frequently as conditions warrant. Mud testing equipment ~~shall~~must be maintained on the drilling rig at all times;

(b) The following drilling fluid system monitoring or recording devices ~~shall~~must be installed and operated continuously during drilling operations, with mud, occurring below the shoe of the conductor casing. No exceptions to these requirements will be allowed without the specific prior ~~permission~~approval of the department:

(A) High-low level mud pit indicator including a visual and audio-warning device;

(B) Degassers, desilters, and desanders;

(C) A mechanical, electrical, or manual surface drilling fluid temperature monitoring device. The temperature of the drilling fluid going into and coming out of the hole ~~shall~~must be monitored, read, and recorded on the driller's or mud log for a minimum of every 30 feet of hole drilled below the conductor casing; and

(D) A hydrogen sulfide indicator and alarm ~~shall~~must be installed in areas suspected or known to contain hydrogen sulfide gas ~~which~~that may reach levels considered ~~to be dangerous~~dangerous to the health and safety of personnel in the area.

(8) Well-head Equipment and Testing:

(a) Completions. All wellhead connections ~~shall~~must be fluid pressure tested to the API or ASA working pressure rating. Cold water is required as the testing fluid, unless otherwise approved by the department at the time of permitting. Welding of wellhead connections ~~shall~~must be performed by a certified welder using materials in conformance with ASTM specifications;

(b) Well-head Equipment. All completed wells ~~shall~~must be equipped with a minimum of one casinghead with side outlets, one master valve, and one production valve, unless otherwise ~~authorized~~approved by the department. All casingheads, Christmas trees, fittings, and connections ~~shall~~must have a temperature derated working pressure equal to or greater than the surface shut-in pressure of the well at reservoir temperature. Packing, sealing mediums, and lubricants ~~shall~~must consist of materials or substances that function effectively at, and are resistant to, high temperatures. Wellhead equipment, valves, flanges, and fittings ~~shall~~must meet minimum ASA standards or minimum API Standard 6A specifications. Casinghead connections ~~shall~~must be made such that fluid can be pumped between casing strings.

(9) Supervision. From the time drilling operations are initiated and until the well is completed or ~~abandoned~~decommissioned, a member of the drilling crew or the toolpusher ~~shall~~must monitor the rig floor at all times for surveillance purposes, unless the well is secured with blowout preventers or cement plugs.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.155 & ORS 522.305

Hist.: GMI 8, f. & ef. 11-17-76; GMI 4-1980, f. & ef. 10-2-80; GMI 2-1995, f. & cert. ef. 3-10-95; DGMI 2-1999, f. & cert. ef. 8-30-99

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Blowout Prevention Rules for Prospect Wells

All prospect wells drilled below a depth of 500 feet ~~shall~~must have adequate casing and wellhead controls installed, unless otherwise approved by the department. The casing ~~shall~~must extend from the surface to at least ten percent of the proposed total depth of the well; and be cemented back to the surface. Wellhead controls ~~shall~~must consist of an annular preventer or double ram preventer or pipe rams and gate valve. Controls may be manual or hydraulic.

(1) If hot water or flowing steam at 65° C. (150° F.) or greater is encountered, further drilling ~~shall~~must stop immediately, the operator ~~shall~~must notify the department, and the hole will be either:

(a) Completed as an observation hole using steel tubing cemented from total depth to surface; or

(b) Abandoned by plugging with cement from total depth to surface; or

(c) Deepened only after a review of the adequacy of ~~well head~~wellhead control equipment and ~~permission of~~approval from the department. If the prospect well is deepened as described in this section, it ~~shall~~must be completed as described in subsections (a) and (b) of this section.

(2) If cold flowing artesian water is encountered, the hole will be completed as in subsection (1)(a) or (b) of this rule, except that plastic tubing may be used.

(3) Locations proposed in natural thermal areas within a 1,000 foot radius of hot springs, fumaroles, or other surface geothermal indicators, or in areas of known artesian water flow, will require a detailed drilling program for each hole; approved by the department. The department may require special drilling and completion techniques ~~for such holes~~ (such as cemented surface casing and simple expansion type blowout preventers) to safely control formations containing geothermal or other resources ~~which~~that may be penetrated.

(4) A supply of mud and lost circulation material ~~shall~~must be kept on hand while drilling to control abnormal pressure if rotary equipment is used.

Stat. Auth.: ORS 522

Stats. Implemented: ORS 522.155 & ORS 522.305

Hist.: GMI 8, f. & ef. 11-17-76; GMI 4-1980, f. & ef. 10-2-80; GMI 1-1983, f. & ef. 9-30-83; GMI 2-1995, f. & cert. ef. 3-10-95