

## **STATEWIDE GEOTHERMAL REGULATIONS**

### **PRE-RULEMAKING DISCUSSION DRAFT**

~~Strike Out~~ – existing language removed

Underline – new language proposed

~~Double Strike Out~~ – existing requirement, original location

Double Underline – existing requirement, reworded and relocated to new section

## **CHAPTER 4. DEVELOPMENT, REGULATION, AND CONSERVATION OF OIL AND GAS RESOURCES**

### **Subchapter 4. State-wide Geothermal Regulations**

#### **Article 2. Definitions**

##### **§ 1920.1. Definitions**

Unless context requires otherwise, the definitions set forth in this section govern both the construction of this subchapter, and implement, interpret, or make specific these terms as used in Public Resources Code, division 3, chapter 4.

(a) “Observation Well” means a well ~~drilled strictly for monitoring purposes that~~ has been classified as an observation well pursuant to the procedures described in Section 1931.4.

(b) “Exploratory Geothermal Well” means a well other than a development well drilled to discover or evaluate the presence of either low-temperature or high-temperature geothermal fluids, including steam, where the surface location of the well is at least .8 km or one-half mile from the surface location of an existing well capable of producing geothermal fluids in commercial quantities.

(c) “Development Well” means a well, other than an exploratory well, drilled for the purpose of producing either high-temperature or low-temperature geothermal fluids in commercial quantities.

(d) “Abandoned Well” means a well the Supervisor so designates after it has been demonstrated that all steps have been taken to protect underground or surface water suitable for irrigation or other domestic uses from the infiltration or addition of any detrimental substance, and to prevent the escape of all fluids to the surface.

(e) "Injection Well" is a service well drilled or converted for the purpose of injecting fluids.

(f) "High-Temperature Geothermal Fluid" means a naturally heated subterranean fluid with a surface temperature equal to or higher than the boiling point of water.

(g) "High-Temperature Well" means a well drilled to discover, evaluate, produce, or utilize high-temperature geothermal fluids.

(h) "High-Temperature Geothermal Field" means an area so designated by the Supervisor for administrative purposes. The area shall contain at least one well capable of producing high-temperature geothermal fluids in commercial quantities.

(i) "Low-Temperature Geothermal Fluid" means naturally heated subterranean fluid with a surface temperature below the boiling point of water at ambient atmospheric pressure.

(j) "Low-Temperature Geothermal Well" means a well drilled to discover, evaluate, produce, or utilize low-temperature geothermal fluids where the fluids will be used for their heat value.

(k) "Low-Temperature Geothermal Field" means an area the Supervisor so designates for administrative purposes. The area shall contain at least one well capable of producing low-temperature geothermal fluids in commercial quantities.

(l) "Idle Well" means a well, other than a suspended well, ~~that has not been officially plugged and abandoned, on which the operator has ceased all activity, including but not limited to drilling, production or injection~~ that for a period of 24 consecutive months has not either produced fluids or injected fluids, or, if the well is an observation well, that has had a total of six or more months within the calendar year during which reservoir data were not collected and reported to the Division. For purposes of determining whether a well is an idle well, production, injection, and reservoir data collection are subject to verification by the Division. An idle well continues to be an idle well either until the well has been properly abandoned in accordance with all applicable requirements, or until it has been shown to the Division's satisfaction that, since the well became an idle well, the well has for a minimum of 30 consecutive days been used for production of fluids or for injection of fluids, or, if the well is an observation well, that reservoir data has been collected from the well and reported to the Division for at least seven months during the calendar year.

(m) "Production Tested" means a well that the operator has tested for temperature, flow rate, and pressure.

(n) "A well capable of producing geothermal fluid in commercial quantities" means a well:

(1) Supplying geothermal fluid to an existing power plant or other facility for the purpose of generating electricity; or

(2) Production tested and scheduled to supply geothermal fluid to a power plant or other facility for the purpose of generating electricity for which:

(A) An application is pending before the California Energy Commission or the California Public Utilities Commission; or

(B) The California Energy Commission or California Public Utilities Commission has approved a site; or

(C) A contract has been executed between the supplier and a user and conditions have been fulfilled that commit the user to build a facility; or

(3) Supplying geothermal fluid or completed and scheduled to supply geothermal fluid to facilities existing, under construction, or committed for construction, for any nonelectric use of geothermal resources, including but not limited to space heating or food processing; or

(4) Production tested and, in the operator's opinion, able to supply sufficient geothermal energy to justify construction of a facility to utilize the energy, and designated capable of production by the Supervisor; or

(5) Production tested and found by the Supervisor, after a public hearing, to be capable of producing sufficient geothermal energy to be a commercially viable geothermal development project.

(o) "Usable Thermal Energy" means the usable heat energy contained in geothermal fluid, expressed in British Thermal Units or gigajoules.

(p) "Notice" means an application for permission to do work on a well.

(q) "Drilling Log" means the recorded description of the lithologic sequence encountered while drilling a well.

(r) "Drilling Operations" means the actual drilling or re-drilling of a well for exploration, production, observation, or injection, including the running and cementing of casing and the installation of wellhead equipment. "Drilling Operations" do not include perforating, logging, or related operations after all the casing has been cemented.

(s) "Suspension" means the status assigned to a well that is temporarily abandoned pursuant to specified plugging requirements that are selected by the Division from the plugging and abandonment requirements contained in Article 8 Sections 1980, 1981, 1981.1, and 1981.2 of this subchapter, and the operations necessary to cause temporary abandonment have been carried out by the operator and approved by the Division.

(t) With respect to well depth:

(1) “Shallow” means deeper than 25 feet (about 8 meters) but no deeper than 250 feet (about 76 meters);

(2) “Intermediate” means deeper than 250 feet (about 76 meters) but no deeper than 1,000 feet (about 305 meters);

(3) “Deep” means deeper than 1,000 feet (about 305 meters).

(u) “BOPE” is an acronym for blowout prevention equipment.

(v) “Mineral Extraction Well” means a well drilled, converted, or reworked for the purpose of discovering, evaluating, or producing minerals or other products in solution from naturally heated subterranean fluids. A low- or high-temperature geothermal well may also be a mineral extraction well.

(w) “Temperature-Gradient Well” means a well located outside a known geothermal reservoir and being used solely for the purpose of measuring the temperature-gradient.

(x) “Subsidence” means sinking, lowering, collapsing, compaction or other movement of the land whether covered by water or not.

Authority: Sections 3712 and 3714, Public Resources Code. Reference: Section 3714 Public Resources Code.

### **Article 3. Drilling**

#### **§ 1931.4. Classification as an Observation Well**

(a) The Division may approve the classification of a well as an observation well if the well will be used for the sole purpose of collecting reservoir data from a reservoir in which fluids are being produced or injected.

(b) A request to classify a well as an observation well shall be made in writing to the local Division district deputy, and shall provide all of the following information:

- (1) The API number of the well;
- (2) Well identification including section, township, and range;
- (3) The name of the operator of the well;
- (4) Wellbore diagram with relevant geological markers
- (5) Top of reservoir
- (6) A map and list describing the identity and the location of all other observation wells within a half-mile radius of the well;
- (7) A description of the reservoir data that will be collected from the well;
- (8) A description of the methods that will be used to collect the reservoir data, including the frequency of collection;

(9) An explanation of the purpose for collecting reservoir data from the well;

(c) In addition to the information described in subdivision (b) of this section, the Division may require that the operator of the well provide other information as necessary to adequately demonstrate to the satisfaction of the Division that the well will fulfill a need for collecting reservoir data.

(d) After evaluating a request for classification as an observation well, including any additional information the Division may require in order to make its determination, the Division will provide a written response approving or denying the request for classification as an observation well.

(e) A well that has not received written approval from the Division for classification as an observation well is not an observation well, and shall be a "chargeable well," as described in Section 1933.1.

Authority: Section 3712, Public Resources Code. Reference: Sections 3714, 3716, 3724.5, and 3741, Public Resources Code.

### **§ 1936. Electric Logging**

(a) All wells, except ~~observation wells~~ temperature gradient and low-temperature ~~thermal~~ wells, shall be logged with an induction electrical log, or equivalent, from total depth to the bottom of the conductor pipe, except in the case where air is used as the drilling medium. This requirement may be waived by the Supervisor and may vary depending on geologic conditions ~~as stated in Section 1935.2(a)(2).~~

(1) In the event that a radioactive tool cannot be retrieved from a well, the operator shall immediately notify the Division and abandon the portion of the well containing the tool as described in Section 1982.2.

### **§ 1937.1. Records Required to be Filed with the Division**

(a) Drilling Log and Core Record. The drilling log shall show the lithologic characteristics and depths of formations encountered; the depths and temperatures of water-bearing and steam-bearing strata; and the temperatures, chemical compositions, and other chemical and physical characteristics of fluids encountered from time to time, so far as ascertained. ¶¶ The core record shall show the depth, lithologic character and fluid content of cores obtained, so far as determined.

(b) Well History. The history shall describe in detail in chronological order on a daily basis all significant operations carried out and equipment used during all phases of drilling, testing, completion, recompletion and plugging and abandonment of the well.

(c) Well Summary Report. The well summary report shall accompany the core record and well history reports. It is designed to show data pertinent to the condition of a well at the time of completion of work done.

(d) Production Records. Monthly production records shall be filed with the Division on or before the 30th day of each month, for the last preceding calendar month.

(e) Injection Records. Monthly injection records shall be filed with the Division on or before the 30th day of each month, for the last preceding calendar month.

(f) Observation Well Records. The operator of an observation well shall file with the Division, on or before the 30th day of each month, for the last preceding calendar month, a statement of the reservoir data collected from the observation well. This statement shall consist of, for each observation well:

(1) An average of the temperature data collected at the wellhead during the month, expressed in degrees Fahrenheit; and/or

(2) An average of the pressure data collected at the wellhead during the month, expressed in pounds per square inch.

If no reservoir data were collected from the observation well during the month, the statement shall so indicate and provide an explanation for why data were not collected.

(gf) Other Records. The following shall also be filed with the Division, if run: electric logs, physical or chemical logs, tests, water analyses, and surveys (including temperature surveys and directional surveys).

Authority: Section 3712, Public Resources Code. Reference: Sections 3714, 3716, 3724.5, 3741, and 3745 Public Resources Code.

## Article 7. Subsidence

### **~~§ 1971. Imperial Valley Subsidence Regulations~~**

~~(a) Surveys and Bench Marks:~~

~~—— (1) Subsidence bench marks, at wellsites, tied to existing first- and/or second-order networks, are required for all wells that will be tested or produced. These bench marks shall be the responsibility of and at the expense of the operator. Surveys shall precede extensive production testing of the well.~~

~~—— (2) All survey work shall be coordinated with the County Surveyor.~~

~~—— (3) All work shall be done under the direct supervision of a Registered Civil Engineer or Licensed Land Surveyor.~~

~~—— (4) An adequate series of bench marks shall be set as required by the Division and shall be tied to existing survey nets.~~

~~———— (5) All field work, computations, etc., shall conform to National Geodetic Survey (N.G.S.) standards. Refer to “Manual of Geodetic Leveling” (1948).~~

~~———— (6) All surveys shall be second-order or better.~~

~~———— (7) All single-point tie-ins shall be double-run. Survey loops between two points on existing surveys may be single-run.~~

~~———— (8) Equipment shall be equal to or better than that accepted by the N.G.S. for second-order surveys. The N.G.S. procedures shall be followed.~~

~~———— (9) Types of acceptable bench marks are:~~

~~———— (A) Brass rod driven to refusal or 9 meters (about 30 feet) and fitted with an acceptable brass plate.~~

~~———— (B) Permanent structure (head walls, bridges, etc.) with installed plate.~~

~~———— (10) Bench marks at well sites shall be situated so as to minimize the possibility of being destroyed during any subsequent work-over activity at the wells. Each bench mark shall be well marked so as to be plainly visible to work-over crews.~~

~~———— (11) Between the well site and the network, bench marks shall be set at one-half mile intervals or as specified by the Division.~~

~~———— (12) Surveys shall be run annually by and at the expense of the operator while well(s) are being produced unless otherwise specified by the Division.~~

~~———— (13) The adjusted data from all surveys shall be submitted to the Division within 60 days after leveling is completed.~~

~~———— (14) Resurveys of the first- and second-order networks shall be coordinated by the Division.~~

~~(b) Reservoir Engineering.~~

~~———— (1) Initial bottom-hole pressures and temperatures (allowing a minimum of one month static time) shall be submitted to the Division within thirty (30) days of completion of work.~~

~~———— (2) All preliminary test data shall be submitted to the Division within 30 days of completion of the tests.~~

~~———— (3) Monthly surface recordings of production, injection, temperature, and pressure shall be reported to the Division on the appropriate forms.~~

~~———— (4) Periodic development and review meetings between operators and the Division shall be required (at least one per year).~~

## **§ 1971. Subsidence Monitoring and Mitigation Plans**

(a) Each operator shall have a subsidence monitoring and mitigation plan or plans that cover all of the operator’s wells. Subsidence monitoring and mitigation plans shall be reviewed and approved by the Division prior to the commencement of

production or injection of fluids in a well. The subsidence monitoring and mitigation plan shall include subsidence and uplift tolerances for potential impacts to life, health, property, and natural resources, and shall prescribe particular actions, such as discontinuing or reducing production or injection, in the event tolerances are exceeded.

(b) The subsidence monitoring and mitigation plan shall describe the benchmarks, methods, and technology to be employed to ensure that the identified tolerances are not exceeded. The subsidence monitoring and mitigation plan shall provide for employment of InSAR, or other high precision leveling methods approved by the Division, that can detect small-scale changes with sufficient accuracy to be in effective for ensuring that the identified tolerances are not exceeded. Monitoring surveys conducted under the subsidence monitoring and mitigation plan shall be performed at least annually and shall be performed under the direct supervision of a Registered Engineer, Professional Geologist, or Licensed Land Surveyor.

(c) The operator shall adhere to the requirements of the subsidence monitoring and mitigation plan at all times during operation of the covered wells. The Division will annually review subsidence monitoring and mitigation plans for potential updates that would improve the protection of life, health, property, and natural resources.

(d) The operator shall provide data collected through subsidence monitoring to the Division annually. The monitoring data shall be provided in an electronic format acceptable to the Division.

(e) Subsidence monitoring and mitigation plans developed by the operator and approved by a local permitting agency will be accepted by the Division to meet this requirement provided the plan includes specific monitoring and mitigation measures that the Division has determined are likely to successfully prevent and mitigate subsidence caused by operations.

Authority: Section 3712 Public Resources Code. Reference: Section 3714 Public Resources Code.

## **Article 8. Plugging & Abandonment**

### **§ 1980. Geothermal Well Plugging and Abandonment - Objectives**

The objectives of the plugging and abandonment requirements for geothermal wells abandonment plugging are is to block interzonal migration of fluids so as to:

(a) Prevent contamination of ~~the fresh waters~~ freshwater or other natural resources.

(b) Prevent damage to geothermal reservoirs.

- (c) Prevent loss of reservoir energy.
- (d) Protect integrity of geothermal reservoirs.
- (e) Protect life, health, environment and property, and natural resources.

Authority: Section 3712 Public Resources Code. Reference: Section 3714, 3729, and 3746 Public Resources Code.

**§ 1981. Geothermal Well - Permit to Plug and Abandon General Requirements**

~~The following are general requirements which are subject to review and modification for individual wells or field conditions. The Division may require the witnessing of any or all of the field operations listed below.~~

(a) Notice of Intention. A Notice of Intention to plug and Abandon a Geothermal Resources Well (Form OGG108 1/2018) is required for all wells must be submitted and Division approval received prior to plugging and abandoning any geothermal well.

(1) The information provided by the notice shall include operator name and contact information, well designation and location. A description of the present condition of the well, including total and effective depth, and base of freshwater aquifer if known, as well as date of last production and production rate, well head pressure, and complete casing record including plugs, junk-in-hole, and hole problems, and well schematic, are also required. Finally, the operator must submit a proposed work plan for the plugging and abandonment, and must certify that the information provided is a complete and accurate representation of the well and proposed operations. The Division may request additional information if needed to evaluate the proposal and may require modifications of the proposed work plan.

(b) Permit to Conduct Well Operations. Upon approval of the proposed work plan, the Division shall issue a Permit to Conduct Well Operations listing the permit conditions that must be met to obtain final approval of the completed plugging and abandonment. The operator shall immediately notify the Division of any change in circumstance or condition that may require a modification to the approved work plan.

(1) The permit shall identify which activities under the work plan may require witnessing by the Division. The operator shall give the appropriate district office sufficient prior notice as specified in the permit to allow the Division the opportunity to witness these activities.

(c) Expiration of Permit. The permit to plug and abandon a geothermal well will expire if the proposed operations have not commenced within one year of the approval date.

(1) The permit may be extended for one year if the operator submits a written request for extension and receives Division approval prior to the expiration of the permit.

~~(b) History of Geothermal Resources Well shall be filed within 60 days after completion of the plugging and abandonment.~~

~~(c) The Division's Report of Well plugging and abandonment, will not be issued until all records have been filed and the site inspected for final cleanup by a Division engineer.~~

~~(d) Subsequent to the plugging and abandonment of the hole, all casings shall be cut off at least 2 meters (6 feet) below the surface of the ground, all concrete collars and other structures shall be removed, and the surface location restored, as near as practicable, to original conditions. The landowner has the option to assume legal responsibility for a well; however, to do so he or she must have legal clearance from the Division.~~

~~(e) Good quality, heavy drilling fluid approved by the Supervisor shall be used to replace any water in the hole and to fill all portions of the hole not plugged with cement.~~

~~(f) All cement plugs, with the possible exception of the surface plug, shall be pumped into the hole through drill pipe or tubing.~~

~~(g) All open annuli shall be filled solid with cement to the surface.~~

Authority: Section 3712 Public Resources Code. Reference: Section 3714, 3716, 3724, 3729, 3747, and 3748 Public Resources Code.

### **~~§ 1981.1. Exploratory Well Requirements (No Production Casing)~~**

~~(a) — Base of fresh waters - a minimum of 30 meters (about 100 feet) of cement straddling the interface or transition zone whether behind casing or uncased.~~

~~(b) — Shoe plug (all casing, including conductor pipe) straddle with 30 meters (about 100 feet) of cement.~~

~~(c) — Where the well has been drilled with air, a bridge plug shall be placed at the shoe of the surface casing and the bridge plug shall be capped with at least 60 meters (about 200 feet) of cement.~~

~~(d) — Surface plug 15 meters (about 50 feet) minimum. May be either neat cement or concrete mix.~~

### **~~§ 1981.2. Cased Wells~~**

~~Cased exploratory, uncompleted development, former producing and injection wells.~~

- ~~(a) Geothermal zones uncased or perforated. Cement plugs shall extend from the bottom of the zone or perforations to 30 meters (about 100 feet) over the top of the zone or perforations.~~
- ~~(b) Liners. Cement plugs shall be placed from 15 meters (about 50 feet) below to 15 meters (about 50 feet) above liner tops.~~
- ~~(c) Casing may be salvaged within protection, if first approved by the Division. A minimum overlap of 15 meters (about 50 feet) is required.~~
- ~~(d) Casing stubs and laps. Cement plugs shall be placed, if possible, from 15 meters (about 50 feet) below to 15 meters (about 50 feet) above top of casing. If unable to enter stub or lap, 30 meters (about 100 feet) of cement shall be placed on the top of the stub or lap.~~
- ~~(e) Fish, collapsed pipe, etc. Cement plugs shall be squeezed, with the use of a retainer or bradenhead, with sufficient cement to fill across the production zone or perforations and to 30 meters (about 100 feet) above the zone or perforations.~~
- ~~(f) Base of fresh waters—a minimum of 30 meters (about 100 feet) of cement straddling the interface or transition zone, whether behind casing or uncased.~~
- ~~(g) Shoe plug (all casing, including conductor pipe) straddle with 30 meters (about 100 feet) of cement.~~
- ~~(h) Where the well has been drilled with air, a bridge plug shall be placed at the shoe of the surface casing and the bridge plug shall be capped with at least 60 meters (about 200 feet) of cement.~~
- ~~(i) Surface plug 15 meters (about 50 feet) minimum. May be either neat cement or concrete mix.~~

## **§ 1982. Geothermal Well Plugging and Abandonment – General Requirements**

The following are general requirements for plugging and abandonment of geothermal wells. These requirements are subject to review and modification for individual wells or field conditions as needed to achieve the objective of this chapter.

(a) Blowout Prevention Equipment. Blowout prevention equipment shall be required during plugging and abandonment operations unless determined unnecessary by the Division. Temperature-gradient wells are exempt from this requirement. Blowout prevention inspection requirements will be detailed as a condition of the permit.

(b) Cement and Cement Plugs. In general, cement plugs will be placed across specified intervals to protect geothermal and freshwater zones, to prevent degradation of geothermal resources and freshwater, to protect surface conditions, and for public health and safety purposes.

(1) All cements used in plugging and abandonment of high-temperature geothermal wells must include an additive to prevent thermal degradation of the cement over time.

(2) In low-temperature geothermal wells, other materials may be mixed with cement or replace the cement.

(3) All cements and cement alternatives must be approved by the Division.

(c) Hole Fluid. Mud fluid having the proper weight and physical characteristics to prevent movement of other fluids into the wellbore shall be placed across all uncemented intervals above the lowermost cement plug.

### **§ 1982.1. Junk-in-Hole**

(a) "Junk" means objects that have fallen into, or become stuck in, a well.

(b) To facilitate safe operation and proper plugging and abandonment, the operator shall make a diligent effort to remove all junk from the well.

(c) If the operator demonstrates to the satisfaction of the Division that removal of junk from a well is infeasible, but in the judgment of the Division the continued presence of the junk unacceptably hinders the safe operation or proper plugging and abandonment of the well, the operator shall down-squeeze cement through or past the junk as necessary to complete plugging below the junk and place a 100-foot cement plug on top of the junk. If cement cannot be down-squeezed through or past the junk, the operator shall place a 100-foot cement plug on top of the junk and complete such other plugging as the Division determines to be necessary under the circumstances.

Authority: Section 3712 Public Resources Code. Reference: Section 3714, 3729, 3739, 3746, and 3748 Public Resources Code.

### **1982.2 Lost Radioactive Tool**

(a) In the event that a radioactive tool cannot be retrieved from a well, the operator shall do all of the following:

(1) Immediately notify the Division.

(2) Abandon the portion of the well containing the tool by doing the following:

(A) Place a 100-foot standard color dyed (red iron oxide or equivalent red cement dye) cement plug on top of the radioactive tool.

(B) Place a whipstock or other approved deflection device on top of the cement plug to prevent accidental or intentional mechanical disintegration of the radioactive source.

(3) Ensure compliance with California Department of Public Health regulations in Section 30346 of Title 17, Division 1, Chapter 5, Subchapter 4, Group 3, Article 7, of the California Code of Regulations.

Authority: Section 3712 Public Resources Code. Reference: Section 3714, 3729, 3739, 3746, and 3748 Public Resources Code.

**§ 1983. Geothermal Temperature-Gradient Wells**

(a) Temperature-gradient wells drilled after the effective date of this section must be plugged and abandoned within one year of completion unless the operator can demonstrate a compelling need to the Division's satisfaction.

(b) An operator who has or knows of temperature-gradient wells within their project boundaries that are more than 1 year old and not subject to subdivision (a), shall notify the Division of the location and API number, if known, of the temperature-gradient well.

(c) Temperature-gradient wells shall be plugged from total depth to surface with cement or other material as approved by the Division.

Authority: Section 3712 Public Resources Code. Reference: Section 3714 and 3724.35 Public Resources Code.

**§ 1984. Geothermal Wells – Plugging Requirements**

The following are specific requirements for cement plugs which must be used to ensure there will be no interzonal migration of fluids once plugging and abandonment operations are complete. The permit for plugging and abandonment operations may specify additional plugging requirements where needed.

(a) Plugging of Geothermal Zones.

(1) When plugging a geothermal well with an open-hole configuration (no casing), the operator shall include a cement plug extending from at least 100 feet below the top of the geothermal zone to at least 100 feet above the top of the geothermal zone.

(2) When plugging a geothermal well with a cased-hole configuration, the operator shall include a cement plug extending from at least 100 feet below the top of the uppermost open interval to at least 100 feet above the top of the open interval, the top of the landed liner, the casing cementing point, or the geothermal zone, whichever is highest.

(3) When plugging a geothermal well with an open-hole configuration (no casing) below the lowermost casing shoe located in a geothermal zone, the operator shall include a cement plug extending from at least 100 feet below the shoe to at least 100 feet above the shoe. If the hole cannot be cleaned out to 100 feet below the shoe, the cement plug shall be placed as deep as possible.

(b) Air Drilled Wells. When a well has been drilled with air, a bridge plug shall be placed at the shoe of the surface casing and the bridge plug shall be capped with at least 200 feet of cement.

(c) Plugging at Casing Shoe. All casing shoes, including the conductor pipe, shall be plugged with cement from at least 50 feet below the shoe to 50 feet above the shoe unless the well was drilled with air.

(d) Plugging at Liner Top. All cemented liners shall be plugged with cement from at least 50 feet below the top of the liner to at least 50 feet above the top of the liner.

(e) Plugging at Surface. The casing and all annuli shall be plugged with cement from the surface to at least 50-feet down.

(f) Special Requirements. Where conditions warrant, the Division may set forth other requirements for the plugging of wells as needed to achieve the objectives of this chapter. Such conditions include, but are not limited to:

(1) The plugging of a high-pressure water zone.

(2) The plugging of a freshwater zone.

(3) Perforating and squeeze cementing previously uncemented casing within and above a geothermal zone.

(4) The plugging of particular zones or specifying cleanout intervals within a wellbore.

(5) The plugging of casing holes and damaged casing.

Authority: Section 3712 Public Resources Code. Reference: Section 3714, 3729, 3746, and 3748 Public Resources Code.

### **§ 1985. Geothermal Wells – Site Restoration**

(a) All well casings shall be cut off at least 5 feet but no more than 10 feet below the surface of the ground. As conditions warrant, the Division may approve a different cut-off depth.

(b) After the surface plug has been placed and well casings cut off, the operator will notify the Division to provide the opportunity to inspect the plugging for compliance with permit conditions.

(c) A steel plate at least as thick as the outer well casing shall be spot welded to the top of the outer casing. The steel plate shall show the well's identification indicated by the last five digits of the API well number.

(d) Once the plugging has been approved, the operator shall:

(1) Remove all equipment associated with the well;

(2) Remove flow lines from the well to the nearest active junction;

(3) Remove all concrete cellars and other structures no longer in use;

(4) Level the surface of the site;

(5) Undertake any additional activities which may be required by the Division as a condition of the permit.

(e) Site restoration activities must be completed within 60 days of the completion of the surface plug to the Division's satisfaction.

Authority: Section 3712 Public Resources Code. Reference: Section 3714, 3729 and 3748 Public Resources Code.

#### **§ 1986. Geothermal Well - Report of Abandonment**

(a) Within 60 days of completion of the plugging and abandonment work plan, including site restoration, the operator shall submit a complete history of operations and the dates thereof on the History of Geothermal Well (Form OGG103 01/2018) to the Division. Information provided by the history shall include operator name and contact information, well designation and location. It shall report in complete detail all operations authorized by a specific permit. The operator must certify that the information provided is a complete and accurate representation of well conditions and reported operations.

(b) The Division's final approval will not be issued until the Division approved work plan is complete, including ensuring that the well has been plugged satisfactorily, all records have been filed and the site restoration has been completed to the Division's satisfaction.

Authority: Section 3712 Public Resources Code. Reference: Section 3714, 3716, 3729, 3733, 3735, and 3750 Public Resources Code.

NATURAL RESOURCES AGENCY  
DEPARTMENT OF CONSERVATION  
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

API No. \_\_\_\_\_

**HISTORY OF GEOTHERMAL WELL**

Operator \_\_\_\_\_ Field \_\_\_\_\_ County \_\_\_\_\_

Well \_\_\_\_\_ Sec. \_\_\_\_\_ T. \_\_\_\_\_ R. \_\_\_\_\_ B.&M. \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_  
(Person submitting report) (President, Secretary, or Agent)

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone \_\_\_\_\_ E-mail \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

Use the "HISTORY" field below to report in complete detail all operations (including the dates thereof) authorized by a specific permit for geothermal well operations. Include such items as hole size, production or injection test results, volumes and type of cement, top and bottom of plugs, perforation details, junk-in-hole, initial production date, and zone temperature. (Attach separate sheets if needed).

DATE

**HISTORY**

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Failure to provide a complete and accurate representation of the operations completed under this permit may result in the imposition of civil penalties.

**NOTICE OF INTENTION TO ABANDON  
A GEOTHERMAL WELL**

Operator \_\_\_\_\_ Field \_\_\_\_\_ County \_\_\_\_\_

Well \_\_\_\_\_ Sec. \_\_\_\_\_ T. \_\_\_\_\_ R. \_\_\_\_\_ B.&M. \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_  
(Person submitting report) (President, Secretary, or Agent)

Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone \_\_\_\_\_ E-mail \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

The present condition of the well is as follows:

1. Total depth: \_\_\_\_\_ Effective depth: \_\_\_\_\_
2. Base of freshwater aquifer: \_\_\_\_\_
3. Last produced: \_\_\_\_\_, \_\_\_\_\_  
*Date Year*

\_\_\_\_\_  
(Production rate)

4. Well head pressure: \_\_\_\_\_
5. **Complete casing record, including plugs, junk-in-hole, and hole problems (attach a separate sheet and well schematic):**

**To fulfill the abandonment requirements of the Division, the following work is proposed (attach a complete proposed work program, including a site restoration plan):**

**Failure to provide a complete and accurate representation of the well and proposed operations may result in rescission of the permit and/or the imposition of civil penalties.**