

## **15A NCAC 02C .0224 GEOTHERMAL HEATING AND COOLING WATER RETURN WELLS**

(a) "Geothermal Heating and Cooling Water Return Wells" means wells that reinject groundwater used to provide heating or cooling for structures. These wells shall not be approved by the Director unless the temperature of the injection fluid does not exceed 30 degrees Fahrenheit above or below the naturally occurring temperature of the receiving groundwater, including wells using a geothermal fluid source. No Geothermal Heating and Cooling Water Return Well shall be constructed, repaired, or operated without a permit.

(b) Permit Applications. In addition to the permit requirements set forth in Rule .0211 of this Section, an application shall be submitted, in duplicate, to the Director made using one form per operation supplied by the Director and shall include the following:

- (1) the well owner's name, address, telephone number, email address (if available), and whether the owner is a federal, State, private, public, or other entity. If the well operator is different from the owner, then the same information shall be provided for the well operator;
- (2) the physical address of the location of the well site if different than the well owner's mailing address;
- (3) a description of the injection activities proposed by the applicant;
- (4) a scaled, site-specific map showing at a minimum, the following:
  - (A) any water supply well and surface water body; septic system including drainfield, waste application area, and repair area; and any other potential sources of contamination listed under Rule .0107 of this Subchapter within 250 feet of the proposed injection wells;
  - (B) property boundaries within 250 feet of the parcel on which the proposed wells are located; and
  - (C) an arrow orienting the site to one of the cardinal directions;
- (5) the proposed average and maximum daily injection rate, volume, pressure, temperature, and quantity of fluid to be injected;
- (6) plans and specifications of the surface and subsurface construction details of the system including a schematic of the injection and source wells construction;
- (7) the heating and cooling system installation contractor's name, address, email address (if available), and telephone number; and
- (8) any other information necessary for the Department to ensure compliance with G.S. 87-84.

(c) Permit Renewals. Application for permit renewal shall be made at least 120 days prior to the expiration date of the permit.

(d) Well Construction.

- (1) A water supply well providing water for a separate geothermal heating and cooling injection well shall be constructed in accordance with the requirements of Rule .0107 of this Subchapter.
- (2) A geothermal heating and cooling water return injection well constructed with a well screen shall also be constructed in accordance with the requirements of Rule .0107 of this Subchapter except that the entire length of the casing shall be grouted from the top of the sand or gravel pack to the land surface in such a way that there is no interconnection of aquifers or zones having differences in water quality that would result in the degradation of groundwater quality of any aquifer or zone.
- (3) For open-end geothermal heating and cooling water return wells (also referred to as open-hole wells), the casing shall be grouted from the bottom of the casing to the land surface in such a way that there is no interconnection of aquifers or zones having differences in water quality that would result in degradation groundwater quality of any aquifer or zone.
- (4) The injection well system shall be constructed such that sampling taps or other collection equipment approved by the Director provides a functional source of water when the system is operational. Such equipment shall provide the means to collect a water sample after emerging from the water supply well (influent sample), and immediately prior to injection into the return well (effluent sample).

(e) Operation and Maintenance.

- (1) Pressure at the well head shall be limited to ensure that the pressure in the injection zone does not initiate new fractures or propagate existing fractures in the injection zone, initiate fractures in the confining zone, or cause the migration of injected or formation fluids outside the injection zone or area.
- (2) Injection between the outermost casing and the well borehole shall be prohibited.
- (3) The well owner shall monitor the operating processes and protect the well against damage during construction and use.

(f) Monitoring and Reporting.

- (1) Monitoring of any well may be required by the Director as necessary to ensure compliance with G.S. 87-84.
- (2) The well owner shall retain copies of records of site maps showing the location of the injection wells and any testing, calibration, or monitoring information done on-site. Upon sale or transfer of the property, the owner shall give a copy of these records to the new property owner or owners.
- (3) The permittee shall record the number and location of the wells with the register of deeds in the county in which the facility is located.
- (4) A record of the construction, abandonment, or repairs of the injection well shall be submitted to the Director within 30 days of completion of the specified activities.

*History Note:* Authority G.S. 87-87; 87-88; 87-90; 87-94; 87-95; 143-211; 143-214.2(b); 143-215.1A; 143-215.3(a)(1); 143-215.3(c);  
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