

# Water

## Geothermal Cooling and Heating

**What Activities Require This Permit?** The construction of Open-Loop Geothermal Water Return Wells and Closed-Loop Geothermal Wells is a type of a heating, ventilation and air conditioning system that utilizes the relative constant temperature of the earth to provide heat exchange between the fluid and the subsurface. Open-Loop Geothermal Wells inject and recirculate groundwater into an aquifer to heat and cool structures, such that the total injected volume is essentially equal to that which is withdrawn / recirculated. These types of wells require the issuance of a permit prior to construction or operation. Closed-Loop Geothermal Wells recirculate potable water or some other approved additive in closed, continuous piping where the additive is isolated from the environment. These types of systems are “permitted by rule” and only require notification prior to construction or operation.

**What Is The Purpose of This Permit?** Conventional heating and cooling systems use air to transfer heat into and out of buildings. Geothermal systems use the nearly constant temperature of the ground as a heat source in the winter and as a heat sink in the summer. Properly designed and installed, these systems can heat and cool efficiently. Because these systems are often installed in underground sources of drinking water (USDW), the Underground Injection Control (UIC) Program of the N.C. Division of Water Resources (DWR) regulates the construction and operation of these systems in order to keep the groundwater suitable for drinking.

**Who Issues This Permit?** The N.C. Division of Water Resources, Water Quality Regional Operations Section (WQROS). Permit applications for Open-Loop Geothermal Wells are processed via the Central Office in Raleigh. Notification forms for Closed-Loop Geothermal Wells are processed via the applicable Regional Office where the wells are physically installed. The contact information for the appropriate office is provided on each form.

**How Much Will This Permit Cost?** There are no fees for geothermal injection well permits.

**What Are My Payment Options for Permit Application Fees?** Not applicable.

**If Paying by Check, Who do I Make the Check Payable to and Where Do I Send the Check?** Not applicable.

**Where Can I Get The Application For This Permit?** Application and Notification forms are available online at <https://deq.nc.gov/about/divisions/water-resources/water-resources-permits/wastewater-branch/ground-water-protection/ground-water-applications>. Open-Loop Geothermal Wells require a permit application to be submitted and a permit issued prior to construction and injection. The application form can be accessed by clicking on the hyperlink that says “[Geothermal Water Return Well Permit APPLICATION](#)”. Closed-Loop Geothermal Wells only require a notification to be submitted prior to construction or operation, which can be accessed by clicking on the hyperlink that says “Closed Loop Geothermal Notification Form”.

**How Long Will It Take To Review My Application?** Permits for Open-Loop Geothermal Wells are typically issued in 30-40 days, excluding time for additional information requests, scheduling a site visit, and sample collection. For Closed-Loop Geothermal Wells there is no application review time; however, notification shall be submitted 2 business days prior to installation for single family residences, and 30 days for commercial and/or governmental agencies.

**Where Do I Submit My Application?** Permit applications for Open-Loop Geothermal Wells are processed via the Central Office in Raleigh. Notification forms for Closed-Loop Geothermal Wells are processed via the respective Regional Office. The contact information/ mailing address for the appropriate office is provided on each form.

**How Long Is My Permit or License or Certificate Valid?** Permits for Open-Loop Geothermal Wells are valid for five years. Closed-Loop Geothermal Wells are “permitted by rule” indefinitely so long as they are constructed and operated in accordance with regulations. However, a permit may be required to bring a well in violation into regulatory compliance.

**Notes/Comments:** Rules governing underground injection control are found in title 15A North Carolina Administrative Code, Subchapter 2C, Section .0200 (15A NCAC 2C .0200). The use of injection wells to dispose of waste is prohibited.

**Legal Authority/Statute Reference:** GS 87-84; GS 87-86 through GS 87-87; GS 87-94 through GS 87-96; GS 143-211; GS 143-214.2; GS 143-215.1A; GS 143-215.3(a)(1); GS 143-215.3(c); 40 C.F.R. Part 144.52(a)(7); 40 C.F.R Part 145.11(a)(20);

# Water

## Geothermal Cooling and Heating

Continued

### Statewide Contact Information:

NC Division of Water Resources

Water Quality Regional Operations Section (WQROS)

Animal Feeding Operations and Groundwater Protection Branch

1636 Mail Service Center, Raleigh, NC 27699-1636

Telephone: (919) 807-6464

Fax: (919) 807-6496