



## FACT SHEET

### UIC Domestic Geothermal Injection Wells

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#### **Nevada UIC Permit Domestic Geothermal Injection Wells – GU08DG**

This guidance applies to all domestic geothermal owners for new and existing injection wells. Nevada Revised Statutes require a permit for all injection through a well or subsurface distribution system. NDEP regulates these types of wells under the Underground Injection Control Program as Class 5 wells through various types of permits, and the UIC regulations under NAC 445A.810 – 445A.925.

This permit shall also cover domestic/residential injection wells that use ambient (non-geothermal) ground water for geo-heat pump units.

#### **General Permit Overview**

The Domestic Geothermal Injection General Permit is intended to regulate the construction and use of underground injection wells which are less than 600 feet deep on a single residential or small commercial property for domestic geothermal purposes. Permitting is required to protect against groundwater degradation as a result of domestic geothermal wells being improperly used or maintained. A well depth limit of 600 feet and daily flow rates of less than 35,000 gallons per day have been set to be covered under this general permit. Wells deeper than this will require an individual UIC permit, unless otherwise approved by the Division to be covered under the general permit.

A permittee must meet all conditions of the general permit, apply through the UIC program by submitting a completed U211 form, and must obtain final approval for underground injection.

A 600 foot limit for well depth has been set due to issues with well construction greater than 600 feet; including, issues with sanitary seal requirements, issues with crossing multiple aquifer zones.

A 35,000 gallons per day limit for daily maximum flow rate has been set to due to issues with larger flows, and 15 gpm or 21,600 gals/day is considered a high flow rate for residential and small commercial systems.

UIC General Permit GU08DG naming convention:

(G – general permit, U – UIC permit, 08 – year issued, DG – domestic geothermal)

#### **Discharge Characteristics**

The injectate associated with a domestic geothermal injection well will be limited to geothermal fluid produced from the same reservoir or a reservoir with equivalent water quality. **Extraction, conveyance and injection must be accomplished in a closed system.** The geothermal fluid may not come into contact with any foreign substance or chemical.

#### **Domestic Geothermal Well Considerations and Requirements**

##### **Design / Construction Considerations**

- 1) Location and construction of an injection well shall be:
  - (a) Situated on a well-drained site not subject to inundation by local drainage (The well should not be in a local low-point subject to surface water accumulation at the wellhead).

- (b) Well depth shall not exceed 600 feet below ground surface (unless otherwise approved).
  - (c) If necessary, sited in such a way that it injects into a formation which is separated from any underground source of drinking water by a confining zone that is free of known open faults or fractures within the area of review.
  - (d) Easily accessible for maintenance, repair, testing, or such other attention as may be necessary.
  - (e) Separated by a minimum horizontal distance of 50 feet from any water-tight conduit, e.g sewer lines.
  - (f) Separated by a minimum horizontal distance of 100 feet from any septic tank, drain field or other facility for the collection or disposal of other liquid waste.
  - (g) Separated by a minimum horizontal distance of 10 feet from the boundary of any adjoining property.
  - (h) Cased from the finished surface to the top of the zone for injection and constructed so that no contamination can occur as a result of conditions on the surface surrounding the well.
  - (i) Cemented (with neat cement or cement grout) to prevent movement of fluid into or between underground sources of drinking water. The casing and cement used in the construction of each injection well must be designed to endure for the life expectancy of the well. Note a standard 50 foot casing may not be sufficient for injection wells.
- 2) The well must be drilled in accordance with Nevada water well (NAC 534), including NAC 534.362 for thermoplastic casing use, Minerals Commission regulations (NAC 534A) and underground injection control (NAC 445A.908) regulations;
  - 3) The source well is producing groundwater from a similar depth and/or quality of water;
  - 4) The wellhead shall be sealed and secured to prevent leakage from or into the injection well and wellhead;
  - 5) The injection well seal (cement/grout material behind casing) should be placed as deep as possible;
  - 6) Extraction, conveyance and injection must be accomplished in a “closed” system. The heat pump system must be a closed surface system, meaning water originates from the producing well, passes through the heat pump/exchange unit, and is sent directly to the injecting well without the introduction of foreign substances or chemicals.

### **Application Requirements**

- 1) Property / Site Map showing:
  - a) All injection and production well(s) – existing and proposed
  - b) All major structures and property lines
  - c) All water wells and surface bodies of water on the proposed and adjacent parcels
  - d) All septic systems and/or sewer lines on your property and the adjacent properties
  - e) All contact information for owners of all contiguous properties.
- 2) Well Construction Plans Including
  - a) Well details - size of drilled hole, type of casing, thickness and grade, well depth, screen interval
  - b) Type and installation procedure for grout/cement
  - c) Show how wellheads will be secured to prevent
    - i) Leakage of surface water or other contaminants into or around well
    - ii) Leakage of water from wellhead or casing, and
    - iii) Tampering by unauthorized persons
- 3) Geothermal System Description including
  - a) Components – including process / treatment, ports, valves, gauges, and pumps. Submit a manufacturer’s brochure for system components
  - b) Any additive, chemicals, or other foreign material that will be added to the geothermal heat pump and the water flow
  - c) Describe the working fluid (e.g. Freon, propylene glycol, ethanol)
  - d) Total number of wells (production and injection)
  - e) Average injection rates and pressure
- 4) Water Quality sample (standard domestic drinking water analysis), obtained from an on-site well.
- 5) Well Driller’s Log for all production and injection wells; with-in 30 days of well completion.

### **Injection Limitations**

- 1) Injection activities shall not cause groundwater or injectate to surface;
- 2) Injection activities shall not cause groundwater degradation;
- 3) Fluids other than those produced from the approved production well are prohibited from being injected into the injection well, including, but not limited to, surface water, chemicals, etc;
- 4) No other discharges or releases from the system are authorized by this letter, and if any occur, must be reported within 1 business day to the Division;
- 5) During operation, the owner/operator of the injection well shall comply with all provisions of the UIC regulations, Nevada Administrative Code (NAC) 445A.810 through 445A.925, and all other pertinent laws and regulations; and
- 6) If the well is deemed abandoned, the well shall be plugged by the property owner in accordance with State Engineers requirements, NAC 534.
- 7) If the holder of the permit or the Division finds the injection to demonstrate a loss of mechanical integrity during operation, the operation of the injection well must be stopped immediately and may not be resumed until approved by the Division.
- 8) In the event of any change in control or ownership, the Permittee shall notify the succeeding owner or controller of the existence of this permit, by letter, a copy of which shall be forwarded to the Division within 10 days of such change. All transfer of permits shall be approved by the Division of Environmental Protection.

**All Application / Approval Correspondence should be sent to:**

Nevada Division of Environmental Protection  
Bureau of Water Pollution Control  
c/o UIC Program  
901 South Stewart St, Suite 4001  
Carson City, NV 89701