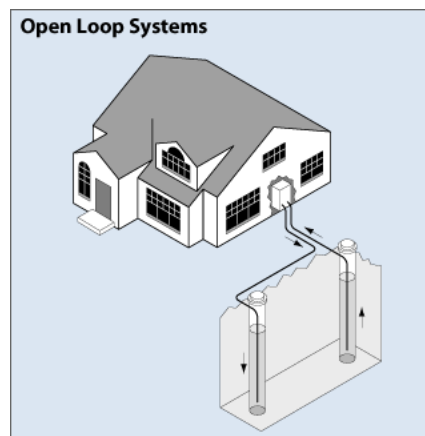# Groundwater Thermal Exchange Device Fact Sheet

What is a Groundwater Thermal Exchange Device (GWTED)?

A GWTED is a type of once-through geothermal groundwater system. However, unlike the traditional "pump and dump," the water in a GWTED is discharged back into the aquifer from which it was drawn. Thus, it does not draw down aquifer levels or cause problems at the discharge point.

The Legislature set higher annual water use rates ($420/MGY) to discourage once-through systems that use groundwater and discharge it to surface water. GWTEDs do not cause aquifer declines, since the water is returned to the source aquifer, so a higher water use rate is not necessary.

How did the law change in 2015?

The 2015 Legislature changed Minnesota Statutes, chapter 103G.271, to address groundwater thermal exchange devices. The 2014 changes to law prohibited the DNR from issuing permits for these systems. These systems would also be charged a high water use fee rate, even though the use is non-consumptive. For these reasons, the DNR proposed the law be modified to:

- Allow for permitting of GWTEDs, both existing and newly constructed systems
- Reduce the annual water use fee rate for GWTEDs to that of traditional water uses, versus the higher once-through system rate

These changes were approved and **landowners who need a GWTED permit from the DNR must:**

- Submit a Preliminary Well Construction Approval (WPCA) request to the DNR
- Obtain a permit to install the system from the Minnesota Department of Health (MDH) and have the system installed by an MDH licensed well contractor (see the section on Groundwater Thermal Exchange Devices at http://www.health.state.mn.us/divs/eh/wells/geothermal.html)
- Apply for a permit under permit use type "geothermal groundwater exchange with reinjection (HVAC)"
- Recognize that the DNR permit authorizes operation only while the system reinjects water to the original source aquifer. If the reinjection system fails, discharge to the surface is not authorized and pumping must cease. Changes or repairs to the system likely require a permit amendment with the DNR.

How do I apply for preliminary well construction approval and a water use permit?

You may apply for these online using the Minnesota DNR Permitting and Reporting System (MPARS) at www.mndnr.gov/mpars/signin. On the MPARS home page, click on the line in the "Actions" box called "Apply for a New Permit/Authorization" and answer the questions.

If you need a paper copy of the permit application, please request a copy from your local DNR staff person. You may find their contact information at http://files.dnr.state.mn.us/waters/area_hydros.pdf.

What do I need to know about the GWTED water use permit?

1. The water use permit type for these systems is called "geothermal groundwater exchange with reinjection (HVAC)." When you apply for your permit, be sure to select this type of water use.
2. The definition associated with this water use states: "A groundwater thermal exchange device (GWTED) with reinjection of water to the same source aquifer for space heating, ventilating, air conditioning or refrigeration used for any type of temperature or humidity control application, utilizing groundwater. It is a once-through system that reinjects the water to the aquifer. These are also known as hybrid standing column wells or geothermal hybrid systems. GWTED require authorization by the Minnesota Department of Health under MS 103I.621."
3. Specific permit condition language will go on GWTED permits stating that the permit only authorizes reinjection to the original source aquifer, and that if the system fails, discharge to the surface is not permitted.

What other terms might contractors use for these systems?

Contractors have many names for these systems. However, most are simply derivations of the following:

- Geothermal groundwater exchange device
- Geothermal groundwater exchange device with reinjection
- Groundwater thermal exchange device with reinjection to the aquifer
- Hybrid standing column well
- Geothermal hybrid system