

Closed Loop Ground Source Heat Pumps

Considering installing a closed loop ground source heat Pump?

Closed loop ground source heat pumps (heat pumps) are systems that use the temperature differences in the ground to heat or cool a structure. They circulate a water-based solution, referred to as transfer fluid, through pipes and pass it through a heat exchanger. A closed loop system can be buried horizontally or drilled in a vertical arrangement. While heat pumps have been around for years, they have increased in popularity due to their environmental benefits, such as energy efficiency and affordability.

There are environmental impacts to consider when planning and constructing a heat pump. Following the four steps below will help you identify the permits, requirements, and conditions that apply to your project. The term "permit" also includes environmental review processes, authorizations, certifications, licenses, and approvals.

For free assistance with identifying environmental permits, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at <http://www.oria.wa.gov>.

Financial Incentives There may be rebates and tax credits available for heat pump installation. Check with your local electric utility and state and federal agencies.

Horizontal



Step 1:

Consider Environmental Factors.

When designing a heat pump system, there may be a number of environmental impacts depending on where and how the system is installed. For example, the transfer fluid may contain antifreeze, which is a potential contamination source to drinking water.

Both horizontal and vertical systems are regulated at the local level, and vertical systems are also regulated by the state and local health departments and the Department of Ecology.

Step 2:

Complete a draft State Environmental Policy Act (SEPA) Checklist.

Answering common SEPA questions will give you an idea of what questions agency staff will ask and what information you will need for your

application. For SEPA documents visit <http://www.ecy.wa.gov/programs/sea/sepa/e-review.html>.

Step 3:

Determine requirements for each permit and modify your proposal accordingly.

Agencies often have requirements and conditions that must be followed and guidelines that are recommended. If you have questions, contact the agency staff who will review your application. For help identifying your regional contacts, contact the ORIA Information Center.

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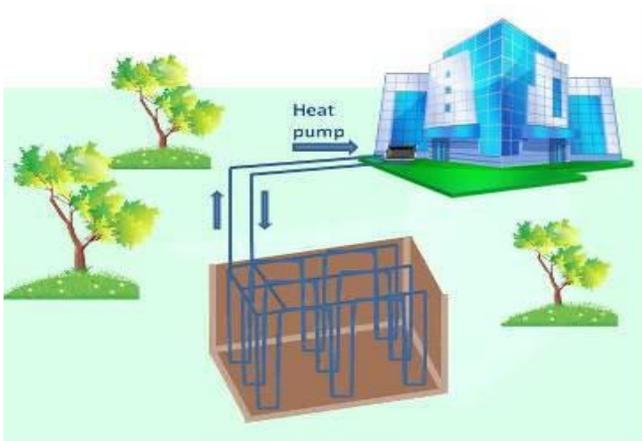
Local Jurisdictions (City or County) – SEPA, Shoreline Master Program, Critical Areas Ordinance, Grading, Building, Plumbing, and Mechanical.

City or County Contact: _____

Phone: _____

Email: _____

The city or county provides information about requirements that must be met during the planning and construction of the system. These may vary by jurisdiction. Use of the SEPA Checklist supports analysis of the environmental impacts of the project. SEPA must be completed before local, state, and federal permits can be issued. Permits under Shoreline Master Programs and Critical Areas Ordinances may be required if the project is located near a waterbody or other environmentally sensitive area. The city or county also issues building, grading, plumbing, and mechanical permits.



REMINDER The permitting process takes time. Depending on the complexity of the project, it may take 3 to 6 months or longer to obtain most of the applicable permits.

FACT The US Department of Energy estimates that heat pumps use 25-50% less electricity than conventional heating and cooling systems.

Vertical

The following requirements are for vertical heat pump systems.

State and Local Health Departments – Well Construction Inspection.

Health Department Contact: _____

Phone: _____

Email: _____

The Washington State Department of Health (DOH) has specific location and construction requirements for public drinking water wells. Heat pumps cannot be located within 100 feet of any drinking water supply, and in some cases may need to be further away. If a drinking water supply is near a potential location for a heat pump, contact the water supply authority or water well owner.

In addition to DOH requirements, the following local health departments approve and inspect new well construction: Clark, Grant, Jefferson, Mason, King, Kitsap, Kittitas, Okanogan, Pierce, San Juan, Skagit, Skamania, Snohomish, Spokane, Thurston, Whatcom, and Yakima.

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These local health departments protect drinking water by ensuring that surface water cannot reach aquifers. Health departments do this by inspecting the seals between the well casing and the hole.

Contact your local health department for applications, well requirements, and inspections before well construction
<http://www.doh.wa.gov/AboutUs/PublicHealthSystem/LocalHealthJurisdictions.aspx>.

Department of Ecology – Notice if Intent to Construct a Well.

Department of Ecology Contact: _____

Phone: _____

Email: _____

Vertical heat pump borings must be installed by a driller with a Washington State well operator's license. A property owner seeking to have a well-constructed is required to submit a Notice of Intent (NOI) to Ecology 72 hours prior to construction
<https://fortress.wa.gov/ecy/wrwater/wells/NoticeOfIntentGeneralInformation.aspx>.

Ecology also requires that a well report be submitted within 30 days of completion of the well.

Step 4:

Submit Applications

- Submit applications for local permits. Usually, the local jurisdiction serves as the SEPA lead agency.
- Contact the local health department to set up an inspection before construction for vertical heat pumps, if applicable.
- Comply with Ecology's requirements for wells- use a licensed driller and submit a Notice of Intent (NOI) and well report. The requirements are for vertical heat pumps only: <http://www.ecy.wa.gov/programs/wr/wells/wellhome.html>

Public Project Requirements

Public work, including publicly-funded projects, must comply with the Department of Labor and Industries (LNI) prevailing wage requirements as well as Ecology's regulations for well drilling.

Definitions for job types or workers (for example, well drillers) may be different under LNI and Ecology requirements. Public projects must meet both LNI and Ecology definitions. Check with each agency to verify requirements.

- LNI prevailing wage:
<http://www.lni.wa.gov/TradesLicensing/Prevwage/default.asp>
- Ecology construction and licensing:
<http://www.ecy.wa.gov/programs/wr/wells/wellhome.html>

Workers' Compensation The Department of Labor and Industries (LNI) has specific rates for different job classifications to provide statewide no-fault insurance coverage for employers and workers. Check with LNI to clarify requirements for well drillers.

If you require this document in another format, contact Office for Regulatory Innovation and Assistance. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call (877) 833-6341.