

DRAFT

Standard rules SR2025 No 4 – heat transfer to ground from closed-loop ground source heating and cooling systems

The Environmental Permitting (England & Wales) Regulations 2016

## Introductory note

This introductory note does not form a part of these standard rules.

When referred to in an environmental permit these rules will allow the operator to install and operate a closed loop ground source heating and cooling system at a specified location.

The net input of heat energy into the ground or groundwater shall not exceed 0.5 kilowatt hours per cubic metre of aquifer per year.

The system must be fully sealed so it does not discharge water or fluids. The thermal transfer fluid within the system must not contain any hazardous substances.

The system must not be within 50 metres of a well, spring or borehole used to supply water for domestic or food production purposes, and must not be within 50 metres of a protected site or ancient woodland.

The system must not cause pollution of surface water or groundwater or mobilise any contamination that may be present below the ground.

All system equipment must meet the relevant British Standards and Ground Source Heat Pump Association Standards, including grouting specifications, and must be decommissioned properly when it is no longer in use.

End of introductory note

Record of changes

|  |  |  |
| --- | --- | --- |
| Version | Date | Change |
| 1.0 | DATE | Published  |

# Rules

1. Management
	1. General management
		1. The operator shall manage and operate the activities:
		2. in accordance with a written management system that identifies and minimises risks of pollution, so far as is reasonably practicable, including those risks arising from operations, maintenance, accidents, incidents, non-conformances and those drawn to the attention of the operator as a result of complaints; and
		3. using sufficient competent persons and resources.
		4. Records demonstrating compliance with condition 1.1.1 shall be maintained.
		5. Any person having duties that are or may be affected by the matters set out in these standard rules shall have convenient access to a copy of the standard rules.
2. Operations
	1. Permitted activities
		1. The only activity authorised by the permit is the activity specified in Table 2.1 below.

**Table 2.1 activities**

| Description of activities | Limits of activity |
| --- | --- |
| The thermal transfer of heat to ground and groundwater from a closed-loop ground source heat exchanger. | The thermal transfer fluid within the system shall not contain any hazardous substances. There shall be no discharge of any fluids to ground. The activity will take place within boreholes or pipework that are fully sealed with no direct connection to any groundwater.The installation of the system shall not cause mobilisation of any contaminants present in the subsurface that could cause groundwater pollution.The system must not cause pollution of surface water or groundwater. |

* 1. The site
		1. The groundwater activity shall take place at the point(s) marked on the site plan attached to the permit.
		2. The activities shall not be carried out within:
			1. 50 metres of any well, spring or borehole that is used to supply water for domestic or food production purposes.
			2. 50 metres of a wetland designated as a European site, Ramsar site, or biological Site of Special Scientific Interest (SSSI).
			3. 50 metres of a Local Nature Reserve (LNR) that is water-based.
			4. 50 metres of an ancient woodland.
	2. Operating techniques
		1. The activities shall be operated using the techniques and in the manner described below.
			1. All equipment installed in relation to the system complies with the relevant design and manufacturing standards set down in:
		+ the relevant British Standards, and
		+ the relevant Ground Source Heat Pump Association standards
			1. Closed loops installed within boreholes shall be fixed into place using a grout with a hydraulic conductivity (K) not greater than 1 x 10-9 m/s.
			2. When the system ceases to be in operation it will be decommissioned by removing anything that could cause pollution such as thermal transfer fluid and sealing any structures such as boreholes or pipework.
1. Emissions and monitoring
	1. Emissions to water or land
		1. The limits given in table S3.1 shall not be exceeded.

**Table S3.1 Point source emission to groundwater – emission limits and monitoring requirements**

|  |  |  |  |
| --- | --- | --- | --- |
| **Emission point and source** | **Parameter** | **Limit (including unit)** | **Monitoring frequency and standard or method** |
| Subsurface closed-loop ground source heat exchanger | Heat | The net input of heat energy into the ground or groundwater shall not exceed 0.5 kilowatt hours per cubic metre of aquifer per year. | See table S3.3 |

* 1. Emissions of substances not controlled by emission limits
		1. For the activity referenced in Table 2.1, the operator shall take appropriate measures as far as is reasonably practicable:
			1. to prevent the input of hazardous substances to groundwater; and
			2. to limit the input of such non-hazardous pollutants to groundwater so as to ensure that inputs do not cause pollution of groundwater.
	2. Monitoring
		1. The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake monitoring for the parameters, at the locations and at not less than the frequencies specified in table S3.3.
		2. The operator shall maintain records of all monitoring required by these standard rules.

**Table S3.3 Activities – monitoring requirements**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Monitoring point** | **Parameter** | **Monitoring frequency** | **Monitoring method** | **Other specifications** |
| Thermal transfer fluid | Heat | Continuous | Thermometer and flow meter | Operator shall calculate the net heat input into the ground or groundwater per year to demonstrate compliance with the limits in Table S3.1. |
| Thermal transfer fluid | Fluid Pressure | Continuous | Pressure gauge | In line with activity limits in Table 2.1, the system shall have an alarm to alert if fluid pressure is outside normal operating pressures as set out in the manufacturer’s recommendations. |

1. Information
	1. Records
		1. All records required to be made by conditions 3.3.2 and 4.3.2 of these standard rules shall:
			1. be legible;
			2. be made as soon as reasonably practicable;
			3. if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
			4. be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made,
		2. The operator shall maintain convenient access, in either electronic or hard copy, to the records, as-built plans including sub-surface installation details, and management system required to be maintained by these standard rules.
	2. Reporting
		1. The operator shall send all reports and notifications required by these standard rules to the Environment Agency using the contact details supplied in writing by the Environment Agency.
	3. Notifications
		1. The Environment Agency shall be notified as soon as reasonably practicable following detection, within the site of the regulated facility of:
			1. any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution; and any breach of a limit specified in these standard rules. Any other significant adverse environmental effects, which may have been caused by the activity, shall also be notified to the Environment Agency as soon as reasonably practicable following detection.
		2. The operator shall submit written confirmation of actual or potential pollution incidents and breaches of emission limits to the Environment Agency within 24 hours.
		3. The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

* + - 1. any change in the operator’s trading name, registered name or registered office address; and
			2. any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

* + - 1. any change in the operator’s name or address; and
			2. any steps taken with a view to the dissolution of the operator.

4.3.4 Where the operator proposes to make a change in the nature of the activity by the addition of, or allowing the introduction of, a pollutant to the activity to an extent that the operator considers could have a significant adverse environmental effect on the groundwater or other receiving waters, and the change is not the subject of an application for approval under the EP Regulations or under the terms of this permit:

(a) the Environment Agency shall be notified in writing at least 14 days before the increase or addition or allowing the introduction; and

(b) the notification shall contain a description of the proposed change.

* 1. Interpretation
		1. In these standard rules the expressions listed below shall have the meaning given.
		2. In these standard rules references to reports and notifications mean written reports and notifications, except where reference is made to notification being made “as soon as reasonably practicable” in which case it may be provided by telephone.

“accident” means an accident that may result in pollution.

“ancient woodland” means any area that has been wooded continuously since at least 1600 AD, including ancient semi-natural woodland and plantations on ancient woodland sites.

“biological SSSI” means for the purpose of these standard rules either:

* + - 1. a SSSI which has been designated due to the presence of flora or fauna.
			2. a SSSI that contains surface water or springs that can provide habitat for flora or fauna.

“closed-loop ground source heat exchanger” means an array of horizontally or vertically installed pipework and associated operational infrastructure.

“decommissioned” means, prior to abandonment, to have removed or made safe a structure such that it is not a present or future danger to the environment.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the permitted activities, which are not controlled by an emission limit.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“European site” means a European site within the meaning of Regulation 8 of the Conservation of Habitats and Species Regulations 2017.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“groundwater Source Protection Zone 1” means a zone—

(a) within 50 metres of a point at which water is abstracted for domestic or food production purposes from any underground strata, or

(b) defined by a 50-day travel time for groundwater to reach a groundwater abstraction point that is used to supply water for domestic or food production purposes,

whichever is larger.

“Local Nature Reserve” means an area designated by a local authority under the National Parks and Access to the Countryside Act 1949.

“pollution” means the direct or indirect introduction, as a result of human activity, of substances, heat or biological entities or micro-organisms into air, water or land which may—

(a) be harmful to human health or the quality of aquatic ecosystems or terrestrial ecosystems directly depending on aquatic ecosystems,

(b) result in damage to material property, or

(c) impair or interfere with amenities or other legitimate uses of the environment

“Ramsar site” means a wetland of international importance, designated under the Ramsar Convention (an international agreement signed in Ramsar, Iran, in 1971). It is government policy to treat Ramsar sites the same as European sites.

“relevant British Standards” means:

* + - 1. BS EN 378-1:2016+A1:2020 Refrigerating systems and heat pumps – Safety and environmental requirements, Part 1: Basic requirements, definitions, classification and selection criteria
			2. BS EN 378-2:2016 Refrigerating systems and heat pumps – Safety and environmental requirements, Part 2: Design, construction, testing, marking and documentation
			3. BS EN 378-3:2016+A1:2020 Refrigerating systems and heat pumps – Safety and environmental requirements, Part 3: Installation site and personal protection
			4. BS EN 378-4:2016+A1:2019 Refrigerating systems and heat pumps – Safety and environmental requirements, Part 4: Operation, maintenance, repair and recovery
			5. BS EN 805:2000 Water supply – Requirements for systems and components outside buildings
			6. BS 5930:2015+A1:2020 Code of practice for ground investigations

“relevant Ground Source Heat Pump Association Standards” means:

1. the Closed-loop Vertical Borehole Design, Installation and Materials Standards, issue 1.0, dated 2020 and published by the Ground Source Heat Pump Association,
2. the Shallow Ground Source Standard, Version 2, dated January 2018 and published by the Ground Source Heat Pump Association, and
3. the Thermal Pile Design, Installation and Materials Standards, Version 2, dated September 2018 and published by the Ground Source Heat Pump Association.

“significant adverse visible effect” means dead or distressed fish, other animals, or plants; appreciable deposit of solid material; significant fungal or algal growth; appreciable discolouration.

“SSSI” means Site of Special Scientific Interest within the meaning of the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000).

“water-based Local Nature Reserve” means a Local Nature Reserve containing water features or ecosystems that are directly dependent on groundwater.

“water features” means boreholes, wells, adits, springs, seepage and wetland areas, ponds, lakes and watercourses.

“year” means calendar year commencing on 1st January.

End of standard rules