WATER RESOURCES DEPARTMENT

DIVISION 240

CONSTRUCTION, MAINTENANCE, ALTERATION, CONVERSION AND ABANDONMENT OF MONITORING WELLS, GEOTECHNICAL HOLES AND OTHER HOLES IN OREGON

690-240-0010

Definitions

The following definitions apply to terms as used in monitoring well, geotechnical hole and other hole rules, OAR 690-240-0005 to 690-240-0640. No other definitions of these same words apply:

(1) "Abandonment, Permanent" means to remove all or any portion of a monitoring well from service by filling it in such a manner that vertical movement of water within the well bore and within the annular space surrounding the well casing is effectively and permanently prevented. This term is synonymous with "decommission".

(2) "Abandonment, Temporary" means to remove a drilling machine from a well site after completing or altering a well provided the well is not immediately put into service, or to remove a well from service with the intent of using it in the future.

(3) "Altering a Well" means the deepening, re-casing, perforating, re-perforating, installation of packers or seals, and other material changes in the design or construction of a well. Material changes include but are not limited to the installation or modification of well casing including casing extensions, or installation or modification of liner pipe, or under reaming of the borehole.

(4) "Annular Space" means the space between the drillhole wall and the outer well casing.

(5) "Aquifer" means a geologic formation, group of formations, or part of a formation that contains saturated and permeable material capable of transmitting water in sufficient quantity to supply wells or springs and that contains water that is similar throughout in characteristics such as potentiometric head, chemistry, and temperature. (**Figure 240-1**)

(6) "Area of Known or Reasonably Suspected Contamination" means a site that is currently under investigation by the Oregon Department of Environmental Quality, U.S. Environmental Protection Agency, or other state or federal agency for the presence of contaminants, or a site where a prudent person would suspect contamination after conducting an appropriate inquiry consistent with good commercial or customary practice as to the nature of the property.

(7) "Artesian Aquifer" means a confined aquifer in which ground water is under sufficient head to rise above the level at which it was first encountered whether or not the water flows at land surface. If the water level stands above land surface the well is a flowing artesian well. (Figure 240-1).

(8) "Artesian Monitoring Well" means a monitoring well in which ground water is under sufficient pressure to rise above the level at which it was first encountered, whether or not the water flows at land surface. If the water level stands above land surface the well is a flowing artesian monitoring well.

(9) "Bored Well" means a well constructed with the use of earth augers turned either by hand or by power equipment.

(10) "Casing" means the outer tubing, pipe, or conduit, welded or thread coupled, and installed in the borehole during or after drilling to support the sides of the well and prevent caving. Casing can be used, in conjunction with proper seal placement, to shut off water, gas, or contaminated fluids from entering the hole, and to prevent waste of ground water.

(11) "Casing Seal" means the water tight seal established in the well bore between the well casing and the drillhole wall, above the filter pack seal, to prevent the inflow and movement of surface water or shallow ground water in the well annulus, or to prevent the outflow or movement of water under artesian or hydrostatic pressures.

(12) "Civil Engineer" means an individual registered by the State of Oregon to practice civil engineering.

(13) "Clay" means a fine-grained, inorganic material having plastic properties and with a predominant grain size of less than 0.002 mm.

(14) “Closed Loop Ground Source Heat Pump Boring” means a geotechnical hole, cased or uncased, constructed for the purpose of installing a closed loop heat exchange system for a ground source heat pump.

(1**5**) "Commission" means the Oregon Water Resources Commission.

(1**6**) "Committee" means the Oregon Ground Water Advisory Committee created by ORS 536.090.

(1**7**) "Confining Formation" means the "impermeable" stratum immediately overlying an artesian (confined) aquifer. (Figure 240-1)

(1**8**) "Consolidated Formation" means materials that have become firm through natural rock-forming processes. It includes, but is not limited to, materials such as basalt, sandstone, shale, hard claystone, and granite.

(1**9**) "Contamination" means any chemical, ion, radionuclide, synthetic organic compound, microorganism, waste or other substance that does not occur naturally in ground water or that occurs naturally but at a lower concentration.

(**20**) "Continuing Education" means that education required as a condition of licensure under ORS 537.747, to maintain the skills necessary for the protection of ground water, the health and general welfare of the citizens of Oregon and the competent practice of the construction, alteration, abandonment, conversion, and maintenance of water supply wells, monitoring wells, and geotechnical holes.

(2**1**) "Continuing Education Committee" means the Well Constructor Continuing Education Committee authorized under Chapter 496, Oregon Laws 2001 (ORS 537.765).

(2**2**) "Continuing Education Course" means a formal offering of instruction or information to licensees that provides continuing education credits.

(2**3**) "Continuing Education Credit" (CEC) means a minimum of 50 minutes of instruction or information approved by the Continuing Education Committee.

(2**4**) "Converting" a well means changing the use of an existing well or hole not previously used to either withdraw or monitor water such that the well or hole can be used to either withdraw or monitor water.

(2**5**) "Deepening a well" means extending the well bore of an existing well through previously undisturbed native material. Deepening is a type of alteration.

(2**6**) "Department" means the Oregon Water Resources Department.

(2**7**) "Director" means the Director of the Department or the Director's authorized representatives.

(2**8**) "Documentation of Completion" means written evidence or documentation demonstrating attendance and completion of a continuing education course, including but not limited to: a certificate of completion, diploma, transcript, certified class roster, or other documentation as approved by the Continuing Education Committee.

(2**9**) "Dug Well" means a well in which the excavation is made by the use of digging equipment such as backhoes, clam shell buckets, or sand buckets. (See Hand dug well)

(**30**) "Excavation" means a free-standing cavity with greater width than depth constructed in the earth's surface which has a primary purpose other than seeking water or water quality monitoring.

(3**1**) "Figure", when used herein, refers to an illustration and is made a part of the primary article and section by reference.

(3**2**) "Filter Pack" means the granular material placed in the annular space between the well screen and the borehole.

(3**3**) "Filter Pack Seal" means the fine grained sand or dry bentonite which is placed in the annulus above the filter pack and prevents grout infiltration into the filter pack.

(3**4**) "Geologic Formation" means an igneous, sedimentary or metamorphic material that is relatively homogeneous and is sufficiently recognized as to be distinguished from the adjacent material. The term is synonymous with "formation".

(3**5**) "Geologist" means an individual registered by the State of Oregon to practice geology.

(3**6**) "Geotechnical hole" means a hole constructed to collect or evaluate subsurface data or information, monitor movement of landslide features, or to stabilize or dewater landslide features. **“Geotechnical hole” includes closed loop ground source heat pump borings.** Geotechnical holes are not monitoring wells or water supply wells as defined below. Various classes and examples of geotechnical holes are listed in OAR 690-240-0035(6)–(9).

(3**7**) "Grout" means approved cement, concrete or bentonite sealing material used to fill an annular space of a well or to abandon a well.

(3**8**) "Grout Pipe" means a pipe which is used to place grout at the bottom of the sealing interval of a well.

(3**9**) "Hand dug well" means a well in which the excavation is only made by the use of picks, shovels, spades, or other similar hand operated implements. (See Dug Well)

(**40**) "Hazardous Materials Training" means training as defined by OAR 437-002-0100 Adoption by Reference Subdivision H Hazardous Materials 1910.120 Hazardous Waste Operations and Emergency Response.

(4**1**) "Hazardous Waste" means a substance as defined by ORS 466.005.

(4**2**) "Health Hazard" means a condition where there are sufficient concentrations of biological, chemical, or physical, including radiological, contaminants in the water that are likely to cause human illness, disorders, or disability. These include, but are not limited to naturally occurring substances, pathogenic viruses, bacteria, parasites, toxic chemicals, and radioactive isotopes. Sufficient concentrations of a contaminant include but are not limited to contaminant levels set by the Oregon Department of Environmental Quality and Oregon Health Division.

(4**3**) "Health Threat" means a condition where there is an impending health hazard. The threat may be posed by, but not limited to: a conduit for contamination, or a well affecting migration of a contaminant plume, or the use of contaminated water. A well in which the construction is not verified by a monitoring well report or geophysical techniques may be considered a conduit for contamination in certain circumstances. Those circumstances include, but are not limited to: an unused and neglected well or a well for which no surface seal was required. A well in which the casing seal, filter pack seal, or watertight cap has failed, or was inadequately installed may be considered a conduit for contamination.

(4**4**) "Horizontal Well" means a well that intentionally deviates more than 20 degrees from true vertical at any point.

(4**5**) "Hydrologic Cycle" is the general pattern of water movement by evaporation from sea to atmosphere, by precipitation onto land, and by return to sea under influence of gravity.

(4**6**) "Impermeable Sealing Material" means cement or bentonite which is used to fill the open annulus.

(4**7**) "Jetted Well" means a well in which the drillhole excavation is made by the use of a high velocity jet of water.

(4**8**) "Leakage" means movement of surface and/ or subsurface water around the well casing or seal.

(4**9**) "Monitoring Well" means a well designed and constructed to determine the physical (including water level), chemical, biological, or radiological properties of ground water.

(**50**) "Monitoring Well Constructor" means any person who has a current water well constructor's license with a monitoring well endorsement issued in accordance with ORS 537.747(3).

(5**1**) "Monitoring Well Constructor's License" means a Water Well Constructor's License with a monitoring well endorsement issued in accordance with ORS 537.747(3).

(5**2**) "Monitoring Well Drilling Machine" means any driving, jetting, percussion, rotary, boring, auguring, or other equipment used in the construction, alteration, or abandonment of monitoring wells.

(5**3**) "Order" means any action satisfying the definition given in ORS Chapter 183 or any other action so designated in ORS 537.505 to 537.795.

(5**4**) "Other Hole" means a hole other than a water supply well, monitoring well, or geotechnical hole, however constructed, in naturally occurring or artificially emplaced earth materials through which ground water can become contaminated. Holes constructed under ORS Chapters 517, 520, and 522 are not subject to these rules. Examples of other holes are listed in OAR 690-240-0030.

(5**5**) "Perched Ground Water" means ground water held above the regional or main water table by a less permeable underlying earth or rock material. (**Figure 240-1**)

(5**6**) "Permeability" means the ability of material to transmit fluid, usually described in units of gallons per day per square foot of cross-section area. It is related to the effectiveness with which pore spaces transmit fluids.

(5**7**) "Person" includes individuals, corporations, associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, the state and any agencies thereof, and the Federal Government and any agencies thereof.

(5**8**) "Petcock Valve" is a valve used to contain pressure which when opened will drain the line or pipe.

(5**9**) "Piezometer" means a type of monitoring well designed solely to obtain ground water levels. Piezometers are prohibited in areas of known or reasonably suspected contamination. This term is synonymous with observation well.

(**60**) "Porosity" means the ratio of the volume of voids in the geologic formation being drilled to the overall volume of the material without regard to size, shape, interconnection, or arrangement of openings.

(6**1**) "Potable Water" means water which is sufficiently free from biological, chemical, physical, or radiological impurities so that users thereof will not be exposed to or threatened with exposure to disease or harmful physiological effects.

(6**2**) "Potentiometric Surface" means the level to which water will rise in tightly cased wells. (Figure 240-1).

(6**3**) "Pressure Grouting" means a process by which grout is confined within the drillhole or casing by the use of retaining plugs or packers and by which sufficient pressure is applied to drive the grout slurry into the annular space or zone to be grouted.

(6**4**) "Professional" means [*any*] **a** person licensed or registered by the State of Oregon to construct monitoring wells, water supply wells, or practice geology or civil engineering. **All licenses and registrations must be valid at the time of monitoring well, water supply well or geotechnical hole construction, alteration or abandonment as required by these rules.**

(6**5**) "Public-at-Large" means a person not actively engaged in the well industry.

(6**6**) "Refusal to Renew" means a provision in an order, or as allowed by ORS 537.747, that prohibits renewal of a well constructor's license, for a specified term not to exceed one year from the expiration date of the current license.

(6**7**) "Remediation Well" means a well used for extracting contaminated ground water from an aquifer. This term is synonymous with "extraction well" and "recovery well".

(6**8**) "Respondent" means the person against whom an enforcement action is taken.

(6**0**) "Responsible Party" means the person or agency that is in charge of construction or maintenance, or the landowner of record and is either in violation as specified in a notice of violation or who may benefit from that violation.

(**70**) "Rough Drilling Log" means a record kept on the well site of the information needed to complete the well report for the well being constructed.

(7**1**) "Revoke" means termination of a well constructor's license.

(7**2**) "Sand" means a material having a prevalent grain size ranging from 2 millimeters to 0.06 millimeters.

(7**3**) "Silt" means an unconsolidated sediment composed predominantly of particles between 0.06 mm and 0.002 mm in diameter.

(7**4**) "Slope Stability Geotechnical Hole" means a geotechnical hole excavated, drilled or bored for studying and/or monitoring movement of landslide features, including water levels, or other mass-wasting features to detect zones of movement and establish whether movement is constant, accelerating, or responding to remedial measures. Hole(s) excavated, drilled or bored for the purpose of slope remediation or stabilization shall be considered a slope stability geotechnical hole. Slope stability geotechnical holes are not monitoring wells, piezometers, or water supply wells.

(7**5**) "Sponsor" means an institution, professional organization, individual, or business that offers continuing education courses to licensees. This term is synonymous with provider.

(7**6**) "Static Water Level" means the stabilized level or elevation of water surface in a well not being pumped.

(7**7**) "Stratum" means a bed or layer of a formation that consists throughout of approximately the same type of consolidated or unconsolidated material.

(7**8**) "Sump" means a hole dug to a depth of ten feet or less with a diameter greater than ten feet in which ground water is sought or encountered.

(7**9**) "Suspension" means the temporary removal of the privilege to construct wells under an existing license for a period of time not to exceed one year.

(**80**) "Unconsolidated Formation" means naturally occurring, loosely cemented, or poorly indurated materials including clay, sand, silt, and gravel.

(8**1**) "Underground Injection" means the emplacement or discharge of fluids to the subsurface.

(8**2**) "Underground Injection System" means a well, improved sump, sewage drain hole, subsurface fluid distribution system, or other system or ground water point source used for the emplacement or discharge of fluids.

(8**3**) "Upper Oversize Drillhole" means that part of the well bore extending from land surface to the bottom of the surface seal interval.

(8**4**) "Violation" means an infraction of any statute, rule, standard, order, license, compliance schedule, or any part thereof and includes both acts and omissions.

(8**5**) "Water Supply Well" means a well, other than a monitoring well, that is used to beneficially withdraw or beneficially inject ground water. Water supply wells include, but are not limited to, community, dewatering, domestic, irrigation, industrial, municipal, and aquifer storage and recovery wells.

(8**6**) "Water Supply Well Constructor" means any person who has a current water well constructor's license with a water supply well endorsement issued in accordance with ORS 537.747(3).

(8**7**) "Water Supply Well Constructor's License" means a Water Well Constructor's License with a water supply well endorsement issued in accordance with ORS 537.747(3).

(8**8**) "Water Table" means the upper surface of an unconfined water body, the surface of which is at atmospheric pressure and fluctuates seasonally. The water table is defined by the levels at which water stands in wells that penetrate the water body. (See Figure 240-1)

(8**9**) "Water Well Constructor's License" means a license to construct, alter, deepen, abandon or convert wells issued in accordance with ORS 537.747(3). Endorsements are issued to the license and are specific to the type of well a constructor is qualified to construct, alter, deepen, abandon or convert.

(**90**) "Well" means any artificial opening or artificially altered natural opening, however made, by which ground water is sought or through which ground water flows under natural pressure, or is artificially withdrawn or injected. This definition shall not include a natural spring, or wells drilled for the purpose of exploration or production of oil or gas. Prospecting or exploration for geothermal resources as defined in ORS 522.005 or production of geothermal resources derived from a depth greater than 2,000 feet as defined in ORS 522.055 is regulated by the Department of Geology and Mineral Industries.

[ED. NOTE: Figures referenced are available from the agency.]

Stat. Auth.: ORS 536.090 & 537.505 - 537.795
Stats. Implemented: ORS 536.090 & 537.505 - 537.795
Hist.: WRD 14-1990, f. & cert. ef. 8-9-90; WRD 8-1993, f. 12-14-93, cert. ef. 1-1-94; WRD 2-1995, f. 5-17-95, cert. ef. 7-1-95; WRD 7-2001, f. & cert. ef. 11-15-01; WRD 1-2003, f. & cert. ef. 3-14-03; WRD 4-2004, f. & cert. ef. 6-15-04; WRD 2-2006, f. & cert. ef. 6-20-06; WRD 3-2008, f. 12-22-08, cert. ef. 1-2-09

690-240-0035

Geotechnical Holes: General Performance and Responsibility Requirements

(1) A geotechnical hole is defined in OAR 690-240-0010 [*(35)*] **(36)**. Geotechnical holes**,** [*may be either*] cased or uncased, [*and*] are **generally** constructed to evaluate subsurface data or information (geologic, hydrogeologic, chemical, or other physical characteristics). [*Geotechnical holes are not "wells" because their construction and/or duration of use are different than wells and therefore are not subject to the same requirements as wells.*] Geotechnical holes are [*broken*] **divided** into the following classifications:

(a) Temporary (abandoned within 72 hours) geotechnical holes;

(b) Cased permanent geotechnical holes;

(c) Uncased permanent geotechnical holes; or

(d) Slope stability geotechnical holes.

(2) A geotechnical hole report [,] **shall be** signed by [*the responsible*] **a** professional [,] **and** must be submitted to the department if [*any of the criteria listed in subsections (a) through (d) below is met. T*] **t**he geotechnical hole is:

(a) Greater than 18 feet deep; [*or*]

(b) Within 50 feet of a water supply or monitoring well; [*or*]

(c) Used to make a determination of water quality; or

(d) Constructed in an area of known or reasonably suspected contamination.

(3) Geotechnical holes [*greater than*] **between** ten [*feet in depth*] and [*less than*] eighteen feet in depth that do not meet any of the criteria spelled out in OAR 690-240-0035(2) **do not require a geotechnical hole report to be filed with the Department, but** shall **be required to** have a professional [person] as described in OAR 690-240-0035(4)(c) **be** responsible for the construction, alteration or abandonment of the geotechnical hole [*but do not require a 'Geotechnical Hole Report' to be filed*].

(4)(a) Although enforcement actions may be exercised against other parties, the landowner of the property where the geotechnical hole is constructed is ultimately responsible for the condition, use, maintenance, and abandonment of the geotechnical hole;

(b) Conversion of a geotechnical hole to a water supply or monitoring well shall be considered by the [*Water Resources*] Department on a case by case basis;

(c) When a geotechnical hole report is required, or if it is between 10' and 18' **in depth**, [*any person (professional) who is*] **the professional** responsible for the construction, alteration or abandonment of a geotechnical hole shall have one of the following certifications **or licenses at the time the professional signs the geotechnical hole report**:

(A) A [*current*] **valid** Oregon Monitoring Well Constructor's License;

(B) A [*current*] **valid** Oregon Water Supply Well Constructor's License;

(C) [*Be registered by the*] **Valid certification** by the State of Oregon as a Registered Geologist; or

(D) [*Be registered*] **Valid certification** by the State of Oregon as a Professional Engineer.

(d) The professional shall [*show*] **provide** proof of license**, certification** or registration and [*a current*] photo identification to Department employees upon request.

(e) In order to protect the ground water resource, all geotechnical holes shall be constructed, operated, used, maintained, and abandoned in such a manner as to prevent contamination or waste of ground water, or loss of artesian pressure.

(f) If the geotechnical hole is completed above ground, it shall have a minimum casing height of one foot above finished grade and a lockable cap with lock shall be attached to the top of the casing. If a geotechnical hole, except a slope stability hole, is completed flush with the land surface, a lockable watertight cap with lock, shall be attached to the top of the casing. A vault or monument designed to be watertight, level with the ground surface, shall be installed to prevent the inflow of surface water. The cover must be designed to withstand the maximum expected loadings.

(5)(a) A 'Geotechnical Hole Report' shall be prepared for each geotechnical hole, including unsuccessful geotechnical holes, constructed, altered, converted, or abandoned if the hole meets any of the requirements of OAR 690-240-0035(2) above.

(b) The 'Geotechnical Hole Report' shall be filed with the Department within 30 days of the completion of the geotechnical hole;

(c) The report shall be prepared in triplicate on forms furnished or previously approved in writing by the Department. The original shall be furnished to the Director, the first copy shall be retained by the professional, and the second copy shall be given to the landowner or customer who contracted for the construction of the geotechnical hole;

(d) In the event any drilling equipment or other tools are left in a geotechnical hole the professional shall enter this fact on the Geotechnical Hole Report;

(e) A copy of any special authorizations or special standards issued by the Director shall be attached to the Geotechnical Hole Report. See OAR 690-240-0006 for information concerning special standards;

(f) The report of geotechnical hole construction shall include, as a minimum, the following:

(A) Landowner name and address;

(B) Started/Completed date;

(C) Location of the geotechnical hole by County, Township, Range, Section, tax lot number, if assigned, street address, or nearest address, and either the 1/4, 1/4 section or Latitude and Longitude as established by a global positioning system (GPS);

(D) Use of geotechnical hole;

(E) Type of geotechnical hole;

(F) Depth;

(G) Map showing location of geotechnical hole on site must be attached and shall include an approximate scale and a north arrow;

(H) General hydrologic and geologic information as indicated on the Geotechnical Hole Report; and

(I) Such additional information as required by the Department.

(6) Temporary geotechnical holes:

(a) Temporary geotechnical holes include but are not limited to: drive points, soil and rock borings, temporary sample holes, permeability test holes, and soil vapor holes;

(b) Temporary geotechnical holes shall be abandoned within 72 hours of initial construction;

(c) Any temporary casing that has been installed shall be removed as part of the abandonment.

(7) Cased permanent geotechnical holes:

(a) Cased permanent geotechnical holes include but are not limited to: gas migration holes, cathodic protection holes, vapor extraction holes, and air sparging holes;

(b) If permanent casing is installed in a geotechnical hole, it shall meet the casing requirements in OAR 690-240-0430, 690-210-0210, or 690-210-0190 and the sealing requirements in 690-240-0475.

(8) Uncased permanent geotechnical holes:

(a) Uncased permanent geotechnical holes include but are not limited to: pneumatic and electrical piezometers;

(b) Temporary casing can be used during the construction of the uncased permanent geotechnical hole but must be removed prior to completion. Surface casing (5 feet maximum) may be installed for placement of logging or recording equipment.

(9) Slope stability geotechnical holes.

(a) Slope stability geotechnical holes include but are not limited to: slope instrumentation holes such as slope inclinometers, and slope remedial holes.

(b) Slope stability geotechnical holes are defined in OAR 690-240-0010(72). Such holes shall be constructed, operated, used, maintained, and abandoned in such a manner as to prevent contamination or waste of ground water.

(c) When a Geotechnical Hole Report is required under OAR 690-240-0035(2) for a slope stability geotechnical hole that is constructed to facilitate water level measurements, an affidavit from an engineer or geologist qualified to perform geotechnical investigations shall be attached to the Geotechnical Hole Report. The affidavit shall have the qualified engineer or geologist's stamp on it and shall certify that the slope stability geotechnical hole is on a landslide or a mass-wasting feature.

(10) Geotechnical Holes abandonment:

(a) Geotechnical holes shall be abandoned so that they do not:

(A) Connect water bearing zones or aquifers;

(B) Allow water to move vertically with any greater facility than in the undisturbed condition prior to construction of the geotechnical hole; or

(C) Allow surface water to enter the hole.

(b) Temporary geotechnical holes constructed to collect a water quality sample shall be abandoned in accordance with OAR 690-240-0510.

Stat. Auth.: ORS 537.780
Stats. Implemented:
Hist.: WRD 2-1995, f. 5-17-95, cert. ef. 7-1-95; WRD 7-2001, f. & cert. ef. 11-15-01; WRD 1-2003, f. & cert. ef. 3-14-03; WRD 4-2004, f. & cert. ef. 6-15-04; WRD 2-2006, f. & cert. ef. 6-20-06; WRD 3-2008, f. 12-22-08, cert. ef. 1-2-09

690-240-0040

Closed Loop Ground Source Heat Pump Boring – General Requirements

(1) In addition to the requirements for cased permanent and uncased permanent geotechnical holes contained in 690-240-0035, a closed loop ground source heat pump boring greater than 18 feet deep shall meet the following requirements:

a) Prior to installation, the professional responsible for the construction of the ground source heat pump boring is encouraged to notify the Department's regional office.

b) Ground source heat pump borings shall not be used for any purpose other than heat exchange.

c) After completion, ground source heat pump borings shall not be converted to a monitoring well or a water supply well without written approval by the Department.

d) The professional shall ensure that the ground source heat pump boring is constructed in accordance with 690-240-0040 through 690-240-0049.

(2) A minimum setback of 50 feet is required from any potential source of groundwater contamination, including but not limited to, temporarily abandoned water supply wells, water wells, septic tanks, drain fields, fuel oil or other petroleum tanks, cesspools, chemical storage or preparation areas.

(3) All fluids used in the construction of a closed loop ground source heat pump boring and associated ground source heat pump system shall meet International Groundwater Source Heat Pump Association standards in place at the time of construction and shall be handled, utilized, and installed in a manner that does not contaminate the groundwater resource.

690-240-0043

Construction Standards

(1) If permanent casing is needed in a ground source heat pump boring, it shall meet the standards set out in OAR 690-210-0190 through 690-210-0220 for steel and plastic.

(2) Site specific conditions shall be assessed to determine the best method and materials to be used for sealing the boring annulus to protect the groundwater

resource and that method shall meet the standards set out in OAR 690-210-0300 through 690-210-0360 for sealing wells.

(3) The diameter of the borehole for cased and uncased ground source heat pump borings shall allow placement of the heat exchange loop and tremie pipe to the bottom of the boring as follows:

a) For installation of a ¾ inch loop, the diameter of the borehole shall be a minimum of 4 inches;

b) For installation of a 1 inch loop, the diameter of the borehole shall be a minimum of 4 ½ inches; and

c) For installation of a 1 ¼ inch loop, the diameter of the borehole shall be a minimum of 5 inches.

690-240-0046

Grouting of Uncased Boring

(1) Grouting of an uncased boring shall be completed after the heat exchange loop is installed and shall be completed in a manner to allow ease in locating the boring if maintenance or abandonment is necessary The area near land surface where the ground source heat pump boring will be connected to a manifold or to the closed loop system may be filled with earth materials.

(2) Sealing shall be completed using active solids content bentonite grout slurry (minimum 20% active solids by weight) or high solids fluid mixture of cement. Controlled density fill (CDF), fly ash, drill cuttings or drilling fluids shall not be used in grouting the uncased boring.

(3) Mixes of bentonite or cement slurry shall be installed by pumping through a tremie pipe in a continuous operation from the bottom of the boring upward. The tremie pipe shall extend the full depth of the borehole before pumping begins. Minimum slurry volume used shall be equal to or exceed the calculated annulus volume in the borehole. Grouting material shall surround all pipes remaining in the borehole.

690-240-0049

Reporting Requirements

(1) The professional responsible for construction of the ground source heat pump boring(s) shall prepare a complete and certified boring log for each ground source heat pump boring.

(2) Boring logs shall be prepared in triplicate; an original and two copies. The original shall be submitted to the Department and contain a site map showing the location of each ground source heat pump boring. One copy shall be retained by the professional responsible for construction of the ground source heat pump boring and the second copy shall be provided to the customer/landowner who contracted for the construction of the ground source heat pump boring.

(3) The Professional shall file the boring log with the Department within 30 days after the completion of the ground source heat pump boring.

(4) The boring log required in section (2) of this rule shall be recorded on a form provided or previously approved in writing by the Department. The form shall include, as a minimum, the following:

(a) Name and Address of Landowner;

(b) Start/Completion date;

(c) Location of the boring by county, Township, Range, Section, tax lot number, if assigned, street address, or nearest address, and either the 1/4, 1/4 section or Latitude and Longitude as established by a global positioning system (GPS);

(d) A description and depth of each change of formation;

(e) Total depth and diameter of the completed closed loop heat pump boring

(f) Depth of the surface seal, if any;

(g) The nominal diameter and depth of the casing, if any;

(h) The type and amount of grout material used;

(i) The type of grout additives used;

(j) The depth the borehole is grouted to; and

(k) Such additional information as required by the Department.