State of Connecticut

REGULATION

of the

NAME OF AGENCY:

DEPARTMENT OF CONSUMER PROTECTION

Concerning

SUBJECT MATTER OF REGULATION:

Well Drilling and Geothermal Systems

[Description of Organization, Rules of Practice,]
Industry Standards of Practice, Registration Requirements, and
Regulations for [the] Well Drilling [Industry] and Geothermal Systems

Section 1. Section 25-128-33 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-33. Title of regulations

These regulations, together with the [regulatory] provisions of [Chapter] chapter 482 of the Connecticut General Statutes[,] and the [section of the Public Health Code] Regulations of Connecticut State Agencies, relating to wells, shall be collectively known as the Connecticut Well Drilling Code.

Sec. 2. Section 25-128-34 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-34. Purpose of regulations

The purpose of the regulations shall be to govern the construction, repair, development, and abandonment of wells and geothermal systems, in order to safeguard the public health, [and] to provide an adequate supply of clean and uncontaminated water for all persons in the state of Connecticut [.], and to provide for the safe and efficient use of the heating and cooling properties of the Earth.

Sec. 3. Section 25-128-35 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-35. Scope of regulations

(a) Well [Contractors and Drillers] drilling contractors and registered drillers. The regulations shall apply to any person who engages in the industry, procedures, or operation, full time or part-time, for compensation or otherwise, of obtaining water from a well or wells by drilling[,] or other methods[.], or of drilling geothermal bore holes. A well drilling contractor is any person regularly offering to the general public [the] their own personal services [of his] or the services of any employees [or himself] in the industry of obtaining water from a well for any purpose or use [.], or in the industry of drilling geothermal bore holes.

(b) Abandoned wells or geothermal bore holes. The regulations shall apply to any person who abandons and permanently discontinues the use of a well or geothermal bore hole, or to any person who is responsible by law for the abandonment of a well or geothermal bore hole except as provided by [Section] section 25-134 of the Connecticut General Statutes.

(c) Special exception for farmers. The regulations shall not require a person who personally constructs a well on [his own or leased] property owned or leased by said person, without compensation, intended for use only for farming purposes on [his] said person's farm, to obtain a certificate of registration or a permit, as provided by section 25-132 of the Connecticut General Statutes. A completion report shall be filed pursuant to sections 25-128-62a, of the Regulations of Connecticut State Agencies. A well that is constructed pursuant to this special exception shall not be converted to a public well unless such well was constructed by a licensed well driller, has a well drilling permit issued by local health and a completion report, and such conversion is approved by the Department of Public Health.

(d) Well development. The regulations shall apply to any person who performs work on a well for the purpose of increasing the yield of a well or otherwise improving the quality or quantity of water that might be obtained from [the] a well.

[(e) Non water-supply wells. Pursuant to Section 25-133 of the Connecticut General Statutes, non water-supply wells are exempt from these regulations except for sections 25-128-35, 25-128-58b, and 25-128-60b. Non water-supply wells shall be constructed according to the public health code, and any and all municipal ordinances. For the purposes of these regulations the term "non water-supply well" includes peizometers, containment recovery wells, and monitor wells.]

(e) Machine or equipment operators. An exemption from the registration requirements set forth in section 25-129 of the Connecticut General Statutes is provided for the operating of an excavating machine to a depth not greater than twenty (20) feet below the frost line for a well, bore hole or trench by an appropriately qualified machine or equipment operator subordinate, for the purposes of and to safely remove and or replace ground material within trenches or bore holes, provided such person has been delegated the task by and is under the direct supervision of a person registered for such work, and does not, in any way, implicate a safety concern.

Sec. 4. Section 25-128-36 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-36. Definitions

(a) Unless expressly stated otherwise, the following terms shall, for the purpose of the Connecticut Well Drilling Code and any permit or completion report filed pursuant to said Code, have the meanings indicated in this section.

(b) Words used in the present tense include the future; words used in the masculine gender include the feminine and neuter; the singular number includes the plural and the singular.

(c) Where the terms are not defined in this section or in [Section] section 25-126 of the Connecticut General Statutes, they shall have their ordinarily accepted meanings or such as the context may imply.

(1) Access port: A suitable opening into [the] a well to allow measurement of the water level.

(2) Annular space: The space between two objects, one of which is surrounded by the other. This includes the space between the wall of an excavation and the wall of a pit; between the wall of an excavation and the casing or piping of a well or geothermal bore hole; or between two casings.

(3) Aquifer: A water bearing [earth material] strata which can transmit water in significant quantity. It can be either consolidated rock, such as [ledge rock] bedrock, or unconsolidated material, such as sand, gravel, or soil with boulders.

(4) Artesian well: A well in which static water level rises above the top of the aquifer. The aquifer is confined by an impermeable geologic formation overlying the aquifer.

[(5) Bentonite clay grout: A mixture of bentonite clay and water with not less than two pounds of bentonite clay for every gallon of water.]

[(6)] (5) Board: The State Plumbing and Piping Work Examining Board.

[(7)] (6) Casing: A pipe placed in a well or geothermal bore hole to prevent the walls from caving, or to seal off surface drainage and other contaminants, so that they cannot enter the well or bore hole.

(7) Closed-loop geothermal fluid: The heat transfer fluid circulating within the piping and associated components of a closed-loop geothermal system. These fluids serve to transfer energy between the Earth or water surrounding the piping and the heat exchange components of the geothermal system. Fluids that have been approved for use by the Department are set forth in section 25-128-39b of these regulations.

(8) Closed loop geothermal surface water body: A surface water body, such as a pond, stream or lake, that is utilized as a heat source or heat sink for a closed loop geothermal system, No public drinking water reservoir, lake, pond or stream tributary to a public drinking water reservoir, or water body that has direct influence to a public well shall be utilized as a heat source or heat sink for a closed loop geothermal system.

(9) Closed loop geothermal surface water system: A closed-loop geothermal system that utilizes a closed loop geothermal surface water body as a heat source or heat sink.

(10) Closed-loop geothermal system: A heat exchange system consisting of piping buried or placed in a geothermal bore hole, trench, or closed loop geothermal surface water body. These self-contained systems are intended to transfer energy between the Earth or water surrounding the piping and the geothermal fluid circulating within the piping.

[(8) Construction of well: All acts necessary to construct or repair wells for any intended purpose of use, including the location and excavation of the well, placement of casings, screens, and fittings, and well development and testing.]

[(9)] (11) Contamination: The act of introducing into water, foreign materials of such nature, quality, and quantity as to cause degradation of the quality of the groundwater [in a], such as a bore hole or aquifer, or a surface water body.

(12) Department: Connecticut Department of Consumer Protection.

(13) Direct Exchange (DX) geothermal system: A heat exchange system which employs a refrigerant geothermal fluid that changes its physical state between liquid, vapor and gas as the fluid circulates through closed-loop geothermal piping. Also known as Direct Expansion.

[(10)] (14) Disinfection: The inactivation of harmful organisms present in water, through use of an accepted chlorine solution or other [accepted]disinfection material or procedure accepted by the Commissioner of the Department.

[(11)] (15) Drawdown: The extent of lowering of the water table or piezometric surface within or adjacent to the well, resulting from the discharge of water from the well. [Draw down] Drawdown is measured between the static water level and the pumping water level. The quantity of water available in the well from the static water level to the pump intake is known as the [draw down] drawdown available storage.

(16) Dug wells: Dug wells shall have the same meaning as defined in section 19-13-B51b of the Regulations of Connecticut State Agencies.

[(12)] (17) Established grade[ground surface]: The permanent elevation of the surface of the ground at the site of the well after completion of grading, excavation; or other land movements.

(18) Geothermal bore hole: Bore holes used solely for the purpose of heat transfer which are fitted with closed-loop or open loop heat exchange piping per section 25-128-39a of the Regulations of Connecticut State Agencies.

(19) Geothermal system: A closed-loop or open-loop heat system used for the purpose of exchanging heating or cooling by utilizing the relatively constant temperature of the Earth as a heat source or heat sink.

(20) Global Positioning System (GPS): A location-finding method whereby user-operated receivers determine their position by communicating with satellites. The United States Department of Defense developed this system, officially known as "Navigation Satellite Timing and Ranging Global Positioning System."

[(13)] (21) [Ground water]Groundwater: Water encountered below the ground surface of the Earth within the zone of saturation that can supply wells and springs.

[(14)] (22) Grout or grouting material: A low permeability material placed in the annular space between the casing and the formation or within [the borehole] a geothermal bore hole which is at least as impermeable as the soil formation. The purpose of the grout is to resist the migration of pollutants into the annular space.

[(15) Cement grouts: A mixture of Portland cement, sand, and water. The mixture is usually composed of one bag of Portland cement weighing ninety-four (94) pounds, an equal volume of dry sand, and five to six gallons of water.

(A) Neat cement grout: A mixture of not more than six gallons of clear water to one bag of Portland cement.

(B) Sand cement grout: A mixture of not more than two parts sand to one part Portland cement, and not more than six gallons of clear water to each bag of cement.

(C) Concrete grout: A mixture of Portland cement, sand, gravel and water.

(D) Bentonite grout: mined processed bentonite clay.

(E) Bentonite cement grout: A mixture of cement grout or sand cement grout with approximately ten per cent (10%) bentonite added to reduce shrinkage.

(F) Natural grout: A mixture of water and natural materials excavated during drilling of the well. The materials shall be placed by whatever techniques are effective for the existing conditions to achieve maximum density, strength, and impermeability of the fill material.

(G) Sand clay grout: A mixture of bentonite clay and sand in equal proportions.]

[(16)] (23) Flowing artesian well: A well in which the static water level is higher than the top of the casing and water flows from the well.

(24) Gravel well: Shall have the meaning prescribed in section 19-13-B51b (7) of the Regulations of Connecticut State Agencies.

(25) Hazardous Substance: Shall have the meaning prescribed by the U.S. Environmental Protection Agency as codified at 42 U.S.C. Section 13101 et. seq. and the U.S. Department of Transportation as codified at 49 U.S.C. Section 101 et. seq. and the regulations promulgated thereunder.

(26) High water mark: Shall be the upper limit of any land area which water may cover, either standing or flowing, at any time during the year.

(27) Hydrofracturing: A method of well development used to improve the specific capacity of new or existing drilled wells whereby certain zones within the well are pressurized in an effort to force open fractures in the bedrock.

[(17)] (28) Installation of pumps and pumping equipment: The procedure employed in the placement and preparation for operation of pumps and pumping equipment, including all construction involved in making entrances to the well and to the building, establishing seals, installing pump piping, valves, wiring, electrical controls and tanks.

[(18)] (29) Liner pipe: Pipe that is installed inside a completed and cased well for the purpose of sealing off undesirable water or for repairing ruptured or punctured casing or screens. The liner pipe and screens may be constructed of PVC schedule forty (40) plastic that meets or exceeds the American Society for Testing and Materials (ASTM), standard D1785.

(30) Non-Hazardous Substance: Shall have the meaning prescribed by the U.S. Environmental Protection Agency as codified at 42 U.S.C. Section 13101 et. seq. and the U.S. Department of Transportation as codified at 49 U.S.C. Section 101 et. seq. and the regulations promulgated thereunder.

[(28) Non-water supply well: A well, other than a water supply well, not constructed for the purpose of obtaining or providing water for drinking or other domestic, industrial, commercial, agricultural, irrigation or recreational use. Said wells may include those constructed using horizontal or directional drilling techniques. Types of non water-supply wells include the following: Peizometers, containment recovery wells, aquifer remediation wells, and monitor wells which may be constructed for the purpose of aquifer testing or monitoring, ground contamination testing, obtaining samples of ground water quality and/or measuring ground water level.]

(31) Non-water supply well shall have the same meaning as defined in Connecticut General Statutes Section 25-126 (9).

(32) Open-loop geothermal well: A well within which a supply of ground water from an aquifer is directly withdrawn and employed as the heat transfer fluid in a geothermal system. Geothermal systems employing open-loop geothermal wells include "pump and discharge geothermal systems," "pump and recharge geothermal systems" and "standing column wells" depending upon the discharge or return point of the water.

[(19)] (33) Owner: Any person or [his] such person's agent who holds the title or other rights of property where a well or geothermal system is constructed, repaired, or abandoned.

[(20)] (34) Potable water: Water free from impurities in amounts sufficient to cause disease or other harmful physiological effects, with the minimum or maximum bacteriological, physical, and chemical composition as required in section 19-13-B102 of the Regulations of Connecticut State Agencies for public wells or section 19a-37-1(g) for private wells and semi-public wells. [applicable laws and regulations of the Department of Health Services]

(35) Private Well: Shall have the meaning prescribed in section 19a-37(a)(2) of the Connecticut General Statutes.

(36) Public Water System: Shall have the meaning prescribed in section 19-13-B102(a) of the Regulations of Connecticut State Agencies.

(37) Public Well: Shall have the meaning prescribed in section 19a-37(a)(3) of the Connecticut General Statutes.

(38) Pump and discharge geothermal system: A type of open-loop geothermal system where ground water from an aquifer is pumped directly from a water supply well to a building, where it transfers its heat energy to a heat pump. After leaving the building, the water is discharged to a permitted discharge point.

(39) Pump and recharge geothermal system: A type of open-loop geothermal system where ground water from an aquifer is piped directly from a water supply well to a building, where it transfers its heat energy to a heat pump. The water is then pumped back into the same aquifer via a second discharge or diffusion well with an immediate hydraulic connection to the source water supply.

[(21)] (40) Repair: Any work involved in the reaming, sealing, installing, changing of casing [depths] depth or height, perforating, screening, cleaning, [acidizing] acid washing, surging, [hydrofracting] hydrofracturing or other redevelopment of a well.

(41) Semi-public well (well for semi-public use): Shall have the meaning prescribed in section 19a-37 (a)(4) of the Connecticut General Statutes.

[(22)] (42) Specific capacity: The yield of a well expressed in gallons per minute per foot of drawdown, as abbreviated "gpm/ft."

(43) Standing column wells: A type of open-loop geothermal system where temperate water is withdrawn from a water supply well, circulated through a heat pump exchanger and returned to the water column in the same well.

[(23)] (44) Static water level: The depth to the surface of the water in a well measured from the land surface or other convenient, permanent, and specified datum, when no water is being discharged from the well and the water level has reached equilibrium.

(45) Surface Water Body: Water located on the surface of the Earth in water bodies such as lakes, rivers, streams, ponds, and reservoirs.

[(24)] (46) Water supply well: Shall have the meaning prescribed in Connecticut General Statutes Section 19a-37 (a)(5).

[(a) Well bored or augered: Any excavation made for water, or in exploration for water, using power driven equipment, where the drill consists of a continuous spiral of metal or a hollow cylinder or bucket attached to a shaft, and where the excavated material is brought to the ground service by upward movement along the surface of the spiral or removed by the bucket.]

[(b) Well gravel: A well constructed into unconsolidated material. In the zone immediately surrounding the well screen more permeability is obtained by hydraulic action or by removing the finer formation material and replacing it with artificially graded coarser material.]

[(c) Well drilled rock: A well drilled into consolidated rock in which that portion of the well drilled into the overlying unconsolidated material is supported by a casing.]

[(d) Well dug: A well excavated into a shallow aquifer.]

[(e) Well monitor: A well constructed for the purpose of aquifer testing, obtaining samples of ground water quality and/or measurement of ground water level.]

[(25) Well-seal: An approved arrangement or device used to cap a well or to establish and maintain a junction between the casing or curbing of a well and the pipe or equipment installed therein, the purpose or function of which is to prevent contaminants from entering a well at the upper terminal.]

(47) Well: Any water supply well or non-water supply well.

[29](48) Well abandonment: Actions taken to ensure that a well which is no longer in use shall not be a source or conduit for contamination of ground water resources.

[30](49) Well contractor: A [well drilling contractor is any]person regularly offering to the general public the personal services of [his]said contractor or the services of said contractor's employees in the industry of obtaining water from a well for any purpose or use.

[(28) Well hydrofracturing: A method of well development used to improve the specific capacity of new or existing drilled wells. Certain zones within the well are pressurized in excess of one hundred (100) psi with water in an effort to force open fractures in the bedrock.]

[(26)] (50) Well vent: An outlet at the upper terminal of a well casing to allow equalization of air pressure in a well but at the same time so constructed as to avoid entry of water and foreign material into the well.

(51) Yield: shall have the same meaning as section 19-13-B51b of the Regulations of Connecticut State Agencies.

[(27) Well yield: The quantity of water per unit of time which may flow or be pumped continuously from a well.]

[(31) Master well driller: A master well driller is any person experienced and skilled in the industry of obtaining water from a well for any purpose or use.]

Sec. 5. Section 25-128-37 of the Regulations of Connecticut State Agencies is amended as follows:

Sec. 25-128-37. Manner of construction

(a) The construction of any well or geothermal bore hole shall be planned and carried out in a manner to guard against waste and contamination of [ground water] groundwater resources.
(b) Standing column wells shall not be configured to be used concurrently as a potable water supply and a geothermal heating or cooling source. Any dual-use wells existing on or before the effective date of these regulations shall be allowed to remain active and shall be properly maintained.

Sec. 6. Section 25-128-38 of the Regulations of Connecticut State Agencies is amended as follows:

Sec. 25-128-38. Application of public health [code] regulations

The regulations for the construction of water supply wells, as provided herein, shall be construed in a manner consistent with the provisions of sections 19-13-B51a to 19-13-B51m, inclusive, of the [Public Health Code]Regulations of Connecticut State Agencies. In the event any conflict shall appear, the interpretation of the regulations shall be made which affords the greater protection of the public health.

Sec. 7. Section 25-128-39 of the Regulations of Connecticut State Agencies is amended as follows:

Sec. 25-128-39. [Adequate relations of diameter,]Diameter, depth, and yield of water supply wells.

(a) All new water supply wells [Wells] shall be of adequate diameter and depth to be capable of

yielding the quantity of water required by the user. For the use of an individual household, a bedrock well [of six (6) inches in diameter] shall be satisfactory when it is capable of [yielding]:

[(a) five] 1. Yielding five (5) gallons per minute and in a six inch well has a storage available of seventy-five (75) gallons. In wells with a diameter other than six (6) inches an equivalent storage shall be required.;

[(b) three] 2. Yielding three and one half (3 1/2) gallons per minute and in a six inch well has a storage available of one hundred fifty (150) gallons. In wells with a diameter other than six (6) inches an equivalent storage shall be required.

[(c) two] 3. Yielding two (2) gallons [(2)] per minute and has a storage available of two hundred twenty-five (225) gallons. In wells with a diameter other than six (6) inches an equivalent storage shall be required;

[(d) one] 4. Yielding one gallon per minute and has a storage available of four hundred (400) gallons. In wells with a diameter other than six (6) inches an equivalent storage shall be required;

[(e) one] 5. Yielding one half (1/2) gallon per minute and [has a water column depth of four hundred fifty (450) feet or] has a storage available of six hundred (600) gallons. In wells with a diameter other than six (6) inches an equivalent storage shall be required.

[(f)] (b) [storage] Storage available shall be the volume of water from the level of the pump intake to the static water level of the well plus any usable water in a storage tank. Storage tanks may be provided using any combination of hydropnuematic tanks and non-pressurized tanks with booster pumps.

[(g)] (c) [wells] Water supply wells yielding less than one half (1/2) [gallons] gallon per minute shall be pump tested for at least eighteen (18) hours [(18)] to prove the water supply well yield. It is not recommended that a water supply well with less than one half (1/2) gallon per minute of yield be used as the only supply for an individual household.

(d) In the event that the Board determines that a special or unusual geological, hydrological, or other circumstance exists in the construction of any well, the Board may determine the minimum requirements of diameter, depth, and yield for the water supply well and shall render a final decision. The decision of the board shall be the final decision in accordance with section 4-180 for purposes of reconsideration in accordance with section 4-181a or appeal to the Superior Court in accordance with section 4-183.

Sec. 8. The Regulations of Connecticut State Agencies are amended by adding sections 25-128-39a, 25-128-39b, 25-128-39c and 25-128-39d as follows:

NEW
Sec. 25-128-39a. Geothermal bore holes

(a) The Inside Diameter of closed-loop geothermal bore holes shall be [a minimum of four (4) times the Inside Diameter ("ID") of the largest individual loop pipe employed in the] per manufacturer specifications of the geothermal system to allow for the proper installation of piping and grout. Where a single heat exchange pipe with no u-bend is in contact with the

grout, as in a concentric system where an internal supply pipe is suspended and completely surrounded by an external heat exchange pipe, the size of the bore hole shall be [a minimum of two and three quarter (2.75) inches larger than the outside diameter of the heat transfer pipe] per manufacturer specifications in order to provide for proper grouting via the tremie method.

(b) Open loop geothermal bore holes shall be constructed in a manner that complies with all water supply well requirements, including the separating distances to sources of pollution set forth Section 19-13-B51d of the Regulations of Connecticut State Agencies.

NEW
Sec. 25-128-39b. Closed-loop geothermal system fluid

(a) A well contractor shall only use the following closed-loop geothermal system fluids for use in closed-loop geothermal systems:

1. The refrigerants commonly referred to as R-134A, R-407C, and R-410A;

2. Drinking water, as defined in section 19-13-B102(a) of the Regulations of Connecticut State Agencies

3. Heat transfer fluids containing potable water combined with a maximum of twenty (20) percent propylene glycol [or potassium acetate] that [have] has been approved by the federal Food and Drug Administration.[;] All chemicals used or added to fluids circulating through a closed-loop geothermal system for heat exchange shall be those specified by the manufacturer and shall be subject to industry approved standards; and

4. Other geothermal system fluids or additives approved by the Department of Consumer Protection and the Department of Public Health.

[5. meet Standard Sixty (60) or Standard Sixty One (61) of NSF International ("NSF") or the American National Standards Institute ("ANSI"), be generally recognized as a direct food additive, or be approved by the Department of Consumer Protection in consultation with the Department of Public Health and the Department of Energy and Environmental Protection.]

NEW
Sec. 25-128-39c. Closed-loop geothermal system piping

(a) The only acceptable materials for the underground portion of a closed-loop geothermal system are as follows:

1. Copper, that has a cathodic protection system;

2. High density, polyethylene extrusion compound having a cell classification of PE 345434c or PE 355434c with an Ultraviolet ("UV") Stabilizer of C, D or E as specified in Standard D-3350 of the American Society for Testing and Materials ("ASTM") with the following exception: This material shall exhibit zero (0) failures when tested for one hundred ninety two (192) hours or more under ASTM D-1693, Condition C, as required in ASTM D-3350. This material shall maintain a one

hundred sixty (160) pounds per square inch ("psi") hydrostatic design basis at 73.4 degrees Fahrenheit per ASTM D-2837, and shall be listed in PPI TR4 as a PE 3408 piping formulation; and

3. Those materials approved by the Department of Consumer Protection in consultation with the Department of Public Health and the Department of Energy and Environmental Protection.

(b) The only acceptable methods for joining sections of buried geothermal piping are as follows:

1. For copper piping assemblies, by the use of brazed joints;

2. For polyethylene piping assemblies, by use of the heat fusion process in accordance with the pipe manufacturer's specifications, or by use of mechanical stab fittings approved by the International Ground Source Heat Pump Association ("IGSHPA"); and

3. For piping made of materials approved pursuant subsection (a)(3) of section 25-128-39c of the Regulations of Connecticut State Agencies, by the use of those methods approved by the Department of Consumer Protection in consultation with the Department of Public Health and the Department of Energy and Environmental Protection.

(c) All geothermal systems shall be pressure tested with water, air, or an inert gas to a minimum of one hundred fifty (150) percent above the heat pump manufacturer's operating specifications for a minimum period of thirty (30) minutes before being put into service. Any system found to leak shall be repaired or replaced and then retested before being put into service.

NEW
Sec. 25-128-39d. Fluids used in open-loop geothermal systems

Open-loop geothermal wells shall use only the natural groundwater, and no additives or other fluids are permitted.

Sec. 9. Section 25-128-40 of the Regulations of Connecticut State Agencies is amended as follows:

Sec. 25-128-40. Pumps and pumping equipment

(a) Pumps and pumping equipment shall be installed in the well to make the most efficient use of well storage.

(b) Pumps and pumping equipment shall be located to permit convenient access for inspection, maintenance and repair.

(c) In the event the base plate of a pump is placed directly over the well, the base plate shall be of a type designed to form a watertight seal with the well casing or pump foundation, as provided by Section 19-13-B51j of the [Public Health Code]Regulations of Connecticut State Agencies.

(d) The well shall be properly vented at the well head to allow for pressure changes within the well.

(e) The electrical wiring used in connection with the pump shall conform to specifications of the Connecticut State Building Code.

(f) Contaminated water shall not be used for the purpose of priming any pump.

(g) There shall be no connections made between a geothermal system and a water supply well or the water distribution system connected to the water supply well.

Sec. 10. Section 25-128-41 of the Regulations of Connecticut State Agencies is amended as follows:

Sec. 25-128-41. Location and protection of water supply wells

The location of any water supply well upon premises shall be subject to approval by the local health officer of the municipality in which the said premises are located, and shall be as provided by Section [19-13c] section 19a-39 of the General Statutes, and by [Sections 19-13-B50 to 19-13-B51, inclusive, of the Public Health Code] section 19-13-B51d of the Regulations of Connecticut State Agencies.

Sec. 11. The Regulations of Connecticut State Agencies are amended by adding section 25-128-41a as follows:

NEW Sec. 25-128-41a. Location of closed loop geothermal systems

(a) The following are the separating distance specifications for all closed loop geothermal systems. Distances cited are minimum separating distances based on horizontal measurements, except for non-vertical closed-loop geothermal bore holes, which shall maintain the minimum separation distances when measured from any point along the borehole:

Separating distances to subsurface sewage disposal systems shall be as prescribed in Section II of the Technical Standards for Subsurface Sewage Disposal Systems published by the Commissioner of Public Health pursuant to Section 19-13-B103d (b) of the Regulations of Connecticut State Agencies.

25 feet from a below ground tank containing a non-hazardous substance.

50 feet from a below ground tank containing a hazardous substance.

10 feet from surface water or ground water drainage structures or piping, water supply piping, public sewer laterals or mains, and fuel or utility piping. Stone below a foundation floor is not considered part of the groundwater drainage system relative to this separation distance.

10 feet from high water mark of any body of water, except when the subject body of water is employed in a closed loop geothermal surface water system.

50 feet from a private well or a semi-public well. The distance may be reduced to be no closer than 25 feet from a non-borehole system. When a closed-loop geothermal system is located on the same property as a private well or semi-public well, the distance may be reduced to be no closer than 25 feet to such private well or semi-public well.

75 feet from a public well with a withdrawal rate of less than 10 gallons per minute. Such distance shall not be reduced.

150 feet from a public well with a withdrawal rate of 10 to 50 gallons per minute. Such distance shall not be reduced.

200 feet from a public well with a withdrawal rate greater than 50 gallons per minute. Such distance shall not be reduced.

(b) Sources of pollution, for the purposes of this subsection, shall not include curtain drains, foundation drains, gutter drains, and similar drains that may carry water.

Sec. 12. Section 25-128-42 of the Regulations of Connecticut State Agencies is amended as follows:

Sec. 25-128-42. Drilling[, general] of water supply wells

(a) [The well] Water supply wells shall be so constructed that a pump of capacity equal to the desired yield can be installed and operated for different yields.
(b) Any water used shall be disinfected or of drinking water quality.

(c) Any chemicals or other additives used in drilling shall be cleaned out from the well.

(d) Rock cuttings shall be cleaned out of the well.

(e) [The well shall be tested as provided by Section 19-13-B51of the Public Health Code.] Water supply wells shall be tested in accordance with section [19a-37-1(f) of the Regulations of Connecticut State Agencies for private and semi-public wells and sections] 19-13-B102 of the Regulations of Connecticut State Agencies for public wells and section 19-13-B101d of the Regulations of Connecticut State Agencies, as may be amended, for private and semi-public wells.

[(f) The well driller shall prepare and maintain a log on forms supplied by the Board, and shall submit copies of the log to the Board and to the owner or owners of the well, respectively. The log shall clearly identify the location of the well upon the premises.]

[(g)] (f) Well development shall be performed only by properly registered persons.

[(h)] (g) Subcontracted work shall be performed only by properly registered persons.

[(i)] (h) No solder containing more than 0.2 per cent lead shall be used in making joints and fittings in any public water system or private potable water supply system or any water user's pipelines and shall conform to the specifications of the Connecticut State Building Code.

Sec. 25-128-43. Casing of drilled wells

(a) The bottom end of the primary casing shall be equipped with a hardened drive shoe of the appropriate size.

(b) The casing shall extend at least six (6) inches above the land surface. Annular space shall be grout filled from the frost level to the bottom of the casing, except that, where special or unusual conditions exist, the annular space shall be filled with grout from the frost level to a distance of at least ten (10) feet below the land surface.

(c) Upon completion of the well unit and until such time as the well is equipped with a pump, the top of the casing shall be a metal cap fixed to prevent unwarranted access.

(d) The primary casing shall be new steel and shall be free of pits, breaks, or other serious imperfections. All casing pipes and couplings used shall have minimum weights and wall thicknesses per diameter, as specified in Table 1.

(e) In the event casing pipes are assembled together, they shall be joined by means of watertight welded joints, screw coupling joints, or slip joints. In the use of welded joints, the weld shall be at least as thick as the wall thickness of the well casing.

(f) In the event the diameter of a casing is reduced at any point along its length, the annular space between the larger and smaller casings shall be made watertight.

Sec. 25-128-44 Length of casing, drilled wells

A twenty (20) foot minimum length of casing pipe shall be required in the construction of any drilled well, subject to the following exceptions for specific, geological and hydrological conditions:

(a) All unconsolidated overburden and other loose, caving zones shall be cased.

(b) The casing pipe shall extend at least five (5) feet into the bedrock, as shown by Figure 1.

(c) In the event, however, that the overburden or the upper five (5) feet of the bedrock constitute the primary potable water producing zones, the requirement of length of subsection (b) shall not apply.

(d) In the condition of the presence of caving zones, the casing pipe or other adequate protective seal shall extend as great a distance below the caving zone as the driller deems necessary to insure well stability.

(e) In the event geological conditions require telescoping of the casing pipe and the use of linear pipe, the respective lengths and diameters necessary to accomplish effective drilling shall be used, the annular spaces shall be made watertight where appropriate to prevent the travel of contaminants.

Sec. 25-128-45 Length of casing, gravel wells

(a) The length of the casing in a gravel well shall be such that the pumping level does not drop below the top of the screen.

(b) In conditions of aquifers alternated with silt clay and other undesirable zones, the casing shall extend at least two (2) feet into the aquifer underlying the cased zones, as shown by figure 2.

(c) In conditions of aquifer overlain by layers of clay, silt, fine sand, or any other sand that cannot be developed for ground water, the casing pipe shall extend at least five (5) feet into the aquifer. But if the aquifer thickness is less than five (5) feet, the casing shall extend into the aquifer as much as feasible to serve the general purpose of casing, as shown by Figure 3.

(d) In conditions of aquifer overlain by till, the casing pipe shall extend at least five (5) feet below the bottom of the till. But if the aquifer is less than five (5) feet thick, the casing shall extend into the aquifer as much as feasible to serve the general purpose of casing, as shown by Figure 4.

(e) In conditions of aquifer overlain by clay, the casing shall extend at least five (5) feet below the bottom of the clay. But if the aquifer is less than five (5) feet thick, the casing shall extend into the aquifer as much as feasible to serve the general purpose of casing, as shown by Figure 5.

(f) In conditions of aquifer overlain by unconsolidated material without clay beds, the length of the casing shall be such that the pumping water levels do not drop below the top of the screen.

(g) In the event the aquifer consists of very coarse gravel and no screen is used, the casing pipe shall extend into the aquifer as much as feasible to develop the required quantity of water.

Sec. 25-128-46 Well screens

(a) Any well constructed to obtain water from an unconsolidated formation may be equipped with a screen, for the purpose of preventing the entrance of formation material into the well after the well has been developed and completed.

(b) The well screen shall: (1) be of a standard design and manufacture, for the specific purpose of well construction; (2) be made of material adequate to withstand normal physical and chemical forces, applied to it during and after installation; (3) shall have openings free of rough edges, irregularities, or other defects that may contribute to corrosion or clogging; and (4) shall be provided with such fittings as are necessary to seal the top of the screen to the casing and to close the bottom.

(c) Any well constructed in very coarse gravel shall not, however, be required to have a screen; or, if a screen is used, the bottom may be left open.

(d) Any well constructed with multiple screens shall not connect aquifers or zones which have differences in water quality, classification or which maintain different piezometric surfaces.

Sec. 25-128-47 Gravel packed wells, gravel

(a) The gravel in a gravel packed well shall be composed of material that does not react chemically with the water in the well, and will not create or enhance encrustation or corrosion.

(b) The gravel shall be clean, rounded, uniform, water-washed, and free from clay, silt, or other deleterious substance.

(c) The size of the gravel shall be as determined by a grain size analysis of the formation material.

(d) The gravel shall be disinfected by adding sufficient chlorine to the placement fluid to produce a chlorine residual of approximately one hundred parts per million (100 ppm).

(e) The gravel shall be placed in such a manner that no bridging or layering occurs.

(f) The gravel pack shall not connect aquifers or zones which have differences in water quality classification or in static water levels.

(Effective May 21, 1993)

Sec. 25-128-48 Gravel packed wells, construction

In a gravel packed well in which the top of the gravel does not extend inside the outer casing, a [cement group] bentonite plug of at least five (5) feet in thickness shall be placed in the annular space directly on top of the gravel. The remaining space shall be filled with grout except that the upper ten (10) feet below the frost level shall be filled with cement grout. Centering guides shall be attached to pipe extensions about the well screen and to blank pipes separating different screened sections. The gravel filled pipes shall be properly capped.

Sec. 13. Section 25-128-48a of the Regulations of Connecticut State Agencies is amended by adding subsections (c) through (g) as follows:

Sec. 25-128-48a. Annular space

(a) Unless otherwise specified in section 19-13-B51f of the Regulations of Connecticut State Agencies, any [Any] annular space between the outside of the piping or casing and the natural materials penetrated by [the] a well or geothermal bore hole shall be filled with suitable material to make this space as impervious to the movement of fluids and competent to support the piping or casing as are the natural materials surrounding the well or geothermal bore hole. The annular space for a geothermal bore hole shall be grouted in accordance with subsection (g). The driller may fill the

annular space with the natural materials excavated during the drilling of a water supply [the] well to meet the following requirements:

(1) the annular space shall be [fitted] filled as completely as possible from the bottom of the casing to the land surface without any depressions, voids, holes or channels;

(2) the driller shall employ whatever techniques are effective for the existing conditions to achieve maximum density, strength and impermeability of the fill material; and

(3) the surface of the fill material shall be sloped away from the casing.

(b) In [cases] locations where potentially contaminating or corrosive fluids are encountered, or impermeable natural materials cannot be adequately placed and compacted to where geologic conditions or the isolation distance may not be adequate, the annular space shall be grouted for the full length of the casing, or the portion thereof below the frost line or pitless adaptor, so that no fluids may move in the zone needing to be grouted.

(c) A well driller shall only use the following grouts in the process of drilling wells or geothermal bore holes, or in the abandonment of wells or geothermal bore holes:

1. Bentonite cement grout: A mixture of cement grout or sand cement grout with a minimum of ten per cent (10%) bentonite added to reduce shrinkage.

2. Bentonite clay grout: A mixture of mined, processed bentonite clay and water with not less than two pounds of bentonite clay for every gallon of water.

3. Cement grouts: A mixture of Portland cement, sand, and water. The mixture is commonly composed of one bag of Portland cement weighing ninety-four (94) pounds, an equal volume of dry sand, and five to six gallons of water.

4. Concrete grout: A mixture of Portland cement, sand, gravel and water.

5. Natural grout: A mixture of water and natural materials excavated during drilling of a well. The materials shall be placed by whatever techniques are effective for the existing conditions to achieve maximum density, strength, and impermeability of the fill material.

6. Neat cement grout: A mixture of not more than six (6) gallons of clear water to one (1) bag of Portland cement weighing ninety-four (94) pounds.

7. Sand cement grout: A mixture of not more than two (2) parts sand to one (1) part Portland cement, and not more than six (6) gallons of clear water to each ninety-four (94) pound bag of Portland cement.

8. Sand clay grout: A mixture of bentonite clay and sand in equal proportions, and clear water.

(d) Notwithstanding subsection (c), above, a well driller shall use salt water resistant grout to seal the annular spaces in a water supply well when such water supply well is located within 75 feet of a roadway where road salt is applied or in a coastal area in which the water supply well may be subject to brackish or salt water. Any additives to the grout other than silica sand and water shall meet

Standard Sixty (60) of NSF International ("NSF") or the American National Standards Institute ("ANSI").

(e) All closed-loop geothermal bore holes, upon installation of loop piping, are to be grouted with one of the following grouting materials:

1. Grout 111, as developed by Brookhaven National Laboratories for use with copper piping typically employed in a Direct Exchange geothermal system, or as directed per manufacturer recommendations. [an equivalent material;]

2. High grade bentonite or thermally enhanced bentonite compounds [containing a minimum of twenty percent (20%) by weight of bentonite, with a maximum coefficient of permeability of 10^{-7} cm/s] based upon manufacturer's recommendation; or

3. Other grouting materials approved by the Department of Consumer Protection in consultation with the Department of Public Health.

(f) Grouts are to be mixed and installed in accordance with the manufacturer's specifications. Grouts may be used whether consolidated or unconsolidated formations are encountered. All closed-loop geothermal system bore holes shall be grouted within seven days of the completion of drilling. After installation of piping, the bore hole shall be covered with a protective layer of grout at least one (1) foot thick and three feet in diameter, centered over the bore hole. Detectable underground tape shall be installed above all bore hole locations.

(g) All closed-loop geothermal system bore holes shall be filled using the tremie method. The entire bore hole shall be filled with grout beginning at the bottom of the bore hole. The tremie employed shall be properly sized for the type of grout used, the ground conditions encountered, and the type of loop system installed. [A minimum three and one half (3.5) inch diameter drilled.] The minimum bore hole diameter shall be that specified by the manufacturer and subject to industry approved standards. Drilling mud and cuttings shall not be mixed into the bore hole.

Sec. 14. Section 25-128-49 of the Regulations of Connecticut State Agencies is amended as follows:

25-128-49. Well head completion and equipment

The completion of the well head and the equipment used shall be as follows:

(a) The top of the casing shall be cut off reasonably smooth and level.

(b) In the event the well head is enclosed, the enclosure shall be adequately drained. In the event a well pit is used, it shall be constructed in the manner provided by [Section 19-13-B51 of the Public Health Code] sections 19-13-B51h and 19-13-B51i of the Regulations of Connecticut State Agencies.

(c) All water piping shall be protected against freezing.

(d) The well shall be equipped with a tightly fixed vented cap or a sanitary seal with an access port for ventilation. The access port shall have a minimum, inside diameter of one quarter (1/4) inch. It shall be installed and maintained in such a manner as to prevent the entrance of water, dust, insects,

or other foreign material, and to permit ready access for the purpose of water level measurement.

Sec. 15. The Regulations of Connecticut State Agencies are amended by adding section 25-128-49(a) as follows:

NEW
25-128-49a. Geothermal bore hole termination

Geothermal bore holes shall be terminated a minimum of four (4) feet below the proposed finished grade and shall be fed to the point of termination, except that bore holes terminating in a structure shall be terminated flush with the finished floor. Casing, if used during bore hole drilling, shall be capped from the time of installation until the installation of the geothermal system piping. As the bore hole is being grouted, the casing may be withdrawn.

Sec. 16. Section 25-128-51 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-51. Tests of yield

All new and repaired water supply wells, with the exception of repairs limited to well casing extensions, shall be tested for yield and capacity, as provided by [Section 19-13-B51 K (b) of the Public Health Code] section 19-13-B51k of the Regulations of Connecticut State Agencies, and all static and pumping water levels and well discharge shall be measured and recorded, with the pumping rate held constant. The test shall be made by one of the following methods: the pump method, the bailer-recovery method, the air rotary drill method, or the air lift method. For wells serving a single family the well may be tested for yield by removing as much water as is practicable from the well and measuring the rate of recovery. Geothermal bore holes for closed-loop geothermal systems are not required to be yield tested.

Sec. 17. Section 25-128-52 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-52. Disinfection of wells

All wells shall be disinfected by chlorination as provided by [19-13-B51 K (c) of the Public Health Code] section 19-13-B51k (c) of the Regulations of Connecticut State Agencies when such wells are constructed, repaired or developed.

Sec. 18. Section 25-128-53 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-53. Construction of non-water supply wells and geothermal boreholes

All non-water supply wells [used for other purposes than the supply of water for human consumption,] and all geothermal bore holes, shall be constructed, repaired and maintained in such a manner that they are not a source or cause of [ground water] groundwater contamination.

Sec. 19. Section 25-128-54 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-54. Maintenance and repair of wells, geothermal systems and pumping equipment

All wells and geothermal systems shall be maintained in a proper condition to conserve and protect ground water resources, and shall not be a source or cause of contamination or pollution of the water supply of any aquifer. All materials and construction practices used in the maintenance, repair, or replacement of any well shall be the same as those required for the construction of a new well or geothermal system. All maintenance, repair, hydrofracturing, developing and replacement work shall be done only by a [registered well driller] person holding the appropriate registration issued by the Department pursuant to section 25-129 of the Connecticut General Statutes, or by a licensed plumber or electrician acting within the scope of the person's license, as provided by [Section] section 25-129(d) of the Connecticut General Statutes[, and Articles 5 and 6 of the regulations].

Sec. 20. Section 25-128-55 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-55. Promulgation of construction standards

The regulations for the construction, maintenance, and repair of wells and geothermal systems, as provided herein shall be promulgated in cooperation with the [State] Department of Public Health [Services] and the Department of Energy and Environmental Protection.

Sec. 25-128-56. Abandonment of wells, responsibility

(a) Any well that is abandoned shall not be a source or cause of contamination or pollution of ground water resources. Abandonment procedures shall be performed or directed only by a [registered] licensed well driller. The [registered]licensed well drilling contractor who performs the work of abandonment shall be responsible for compliance with the procedure of abandonment of the well, as provided in Section 25-128-57.

(b) A contractor shall, within 60 days of completion of a well abandonment, file a Completion Report Form on a form and in a manner prescribed by the Commissioner in accordance with Section 25-128-62a. Copies of said form shall be concurrently submitted to the owner, the Departments of Consumer Protection, Public Health and Energy and Environmental Protection, and the local health department or district.

Sec. 21. Section 25-128-57 of the Regulations of Connecticut State Agencies is amended to read as follows:

Sec. 25-128-57. Procedure of abandonment

In the event of abandonment of any water supply well or other type of well the proper procedure and materials shall be used as follows:

(a) The well shall be plugged to prevent the entrance of surface water, circulation of water between or among producing zones, or any other process resulting in the contamination or pollution of ground water resources.

(b) In the event of temporary abandonment or discontinuance of the use of any well, the well shall be sealed with a watertight cap or seal, as provided by Section 25-128-42 (c).

(c) The well shall be chlorinated prior to abandonment using a chlorine solution with a minimum concentration of one hundred fifty parts per million (150 ppm) of chlorine.

(d) The well shall be checked from land surface to the entire depth of the well before it is sealed, to insure against the presence of any obstruction that will interfere with sealing operations.

(e) The well bore shall be filled and sealed with any of the following materials: neat cement grout, sand cement grout, bentonite clay grout, or sand clay or bentonite cement grout. Dug wells may be abandoned with clean sand and gravel.

(f) The grout material shall be placed in such a way to prevent voids in the grout or dilution of the grout.

(g) Any well constructed in a consolidated rock formation, may be filled with fine sand in the zone or zones of consolidated rock. The top of the sand fill shall be at least ten (10) feet below the bottom of the casing, and the remaining portions of the well shall be filled with [any of the materials specified in subsection (e).]neat cement grout, sand cement grout, bentonite clay grout, or sand clay or bentonite cement grout.

(h) Any test well or bore shall be abandoned in such a manner that it does not become a channel for the vertical movement of water or other substance to the potable ground water resources.

(i) Deep waste disposal or oil wells with casings free of any breaks, and extending below the potable ground water zones, may be sealed with a watertight cap or welded plate.

(j) Upon completion of abandonment of the well, the top of the casing or grout material may be terminated at least four (4) feet below the ground surface.

Sec. 22. The Regulations of Connecticut State Agencies are amended by adding Section 25-128-57a as follows:

NEW

Sec. 25-128-57a. Abandonment of geothermal systems

When abandoning a geothermal system, closed-loop geothermal fluid shall be displaced with bentonite grout or a substance approved by the Department of Consumer Protection in consultation with the Department of Public Health and the Department of Energy and Environmental Protection, or otherwise be evacuated from the geothermal system by a process approved by the Department of Consumer Protection. After displacement or evacuation of the fluid, the bore hole and excavation shall be filled and covered with grout to provide a cap at least twelve (12) inches thick over the bore hole. All fluids or gases shall be contained and properly disposed of.

Sec. 23. Sections 25-128-58a through 25-125-62 of the Regulations of Connecticut State Agencies are hereby repealed.

[Sec. 25-128-61 Permit requirement

(a) Before commencing work on the construction, repair, development, hydrofracturing or abandonment of any well, a registered well contractor shall apply to the Board for a permit, as

provided by Section 25-130 of the Connecticut General Statutes. The applicant shall be required to agree by his signed, written oath that all work under the permit shall be done in strict compliance with the Connecticut Well Drilling Code, unless a special exemption from one or more of the regulations of the Board has been granted.

(b) The contractor shall then submit the completed, signed permit application with the proper fee to the local director of health or his agent who shall approve such permit if said proposed well conforms to the public health code. No well shall be drilled until such a permit has been issued and approved.

(c) Water supply well permits shall be evaluated according to their content with regard to proper separating distances as outlined in the public health code.

(Effective May 21, 1993)

Sec. 25-128-62 Contents of permit application

The application for a permit by a registered well driller shall include an appropriate map or plot plan, showing the location of the proposed well and the premises on which the well is located, in relation to roads, intersections, and other permanent land features. All permit applications shall be signed by a master driller, as representative of the registered well-drilling contractor.]

Sec. 24. The Regulations of Connecticut State Agencies are amended by adding section 25-128-62a as follows:

NEW

Sec. 25-128-62a. Completion Reports

(a) A contractor shall, within 60 days of completion of a water supply well or a geothermal system, file a Completion Report on a form and in a manner prescribed by the Commissioner. The Completion Report shall be concurrently submitted to the owner and the Department of Consumer Protection. Said report shall include but not be limited to the following:

(1) Contractor Information: Name of the contractor; address; registration number; type of work completed, i.e. drill bore holes, install and grout loops, bore hole abandonment.

(2) Water Supply Well or System Location: Town; driller map number; GPS coordinates to the nearest [second]fifth decimal; address; zip code; nearest two cross streets; casing details (length, diameter, weight per foot, manner of connection sections of casing, information on use of a drive shoe, information on grouting of well casing and type of grout used); yield test information (bailed, pumped, compressed air, duration of yield test in hours, yield in gallons per minute; water level information (static water level, water levels during yield test); depth of completed well; well screen details; geological materials and thickness of materials penetrated in feet; date well was completed; permit number; registration number; date of report; signature of well driller; and schematic diagram showing location of completed well with measurements to at least two fixed points.

(3) Well or System Owner: Name; address; city; state; zip code; telephone number.

(4) When Applicable, Bore Hole Specifications: Date first bore hole drilled; date last bore hole drilled; total number of bore holes drilled; total number of bore holes used in system; diameter of bore holes; depth of bore holes in feet; spacing intervals of bore holes in feet; average depth to bedrock in feet; geologic materials and thickness of materials penetrated; amount and type of casing, if any; static water levels, type of grout used, amount of grout used.

(5) When Applicable, Loop Field Installation: Installer name; registration number; piping loop material used; number of loops installed; depth of closed loop in feet; date last loop installed; date bore hole grouted; type of grout used; average number of bags to grout each loop; pounds per bag of grout; cubic feet of grout used for each bore hole. The type and volume of closed-loop geothermal fluid to be used in closed loops shall be denoted, and the form shall provide for a confirmation that detectable underground tape has been installed above the bore hole location.

(b) Attached to each form shall be a diagram prepared or approved by the contractor showing geothermal bore holes, major buildings, septic systems, and water supply wells on site.

Sec. 25-128-63 Exemption from construction standards

As provided by Section 25-133 of the Connecticut General Statutes, as amended, where the Board finds that compliance with the regulations and construction standards adopted herein would result in undue hardship, an exemption from any one or more of the standards may be granted by the Board to the extent necessary to ameliorate such undue hardship, and to the extent such exemption can be granted without impairing the intent and purpose of the regulations. An application for a special exemption shall be made at the office of the Board, and shall be in writing on a form to be supplied by the Board. The application shall include all information regarding circumstances and conditions of construction of the well as the Board deems necessary. The decision of the Board to grant or deny the exemption requested, in whole or in part, shall be made within thirty (30) days, and the Board shall notify the applicant by certified mail of its decision. Exemptions may only be granted by the Board pertaining to the requirements of Chapter 482 of the Connecticut General Statutes and the regulations promulgated thereunder and without violating Chapter 368a of the Connecticut General Statutes and the regulations promulgated thereunder.

Sec. 25. Section 25-128-64 of the Regulations of Connecticut State Agencies is hereby repealed.

[Sec. 25-128-64 Emergency permits

Notwithstanding any provision of this article, the Board may grant a permit for the construction, repair, or abandonment of any well by its informal, verbal authorization, if it determines that an emergency situation exists with respect to the necessity for the construction, repair, or abandonment of the well. The well drilling contractor shall also obtain the approval of the local director of health or his agent, for the work intended to be done. Within a reasonable time after giving its authorization, the Board shall require that a written application for a permit, and, if necessary, a written application for a special exemption shall be made, in compliance with the provisions of this article and Sections 25-130 and 25-133 of the General Statutes. In the event the formal application for the permit or exemption is refused, the well drilling contractor shall, upon written notification by the Board, immediately cease all work on the well.]

Sec. 26. The Regulations of Connecticut State Agencies are amended by adding Figures Six (6) and Seven (7) to the Appendix following section 25-128-64 of the Regulations of Connecticut State Agencies as follows:

FIG. 6 Termination of exterior geothermal bore holes:

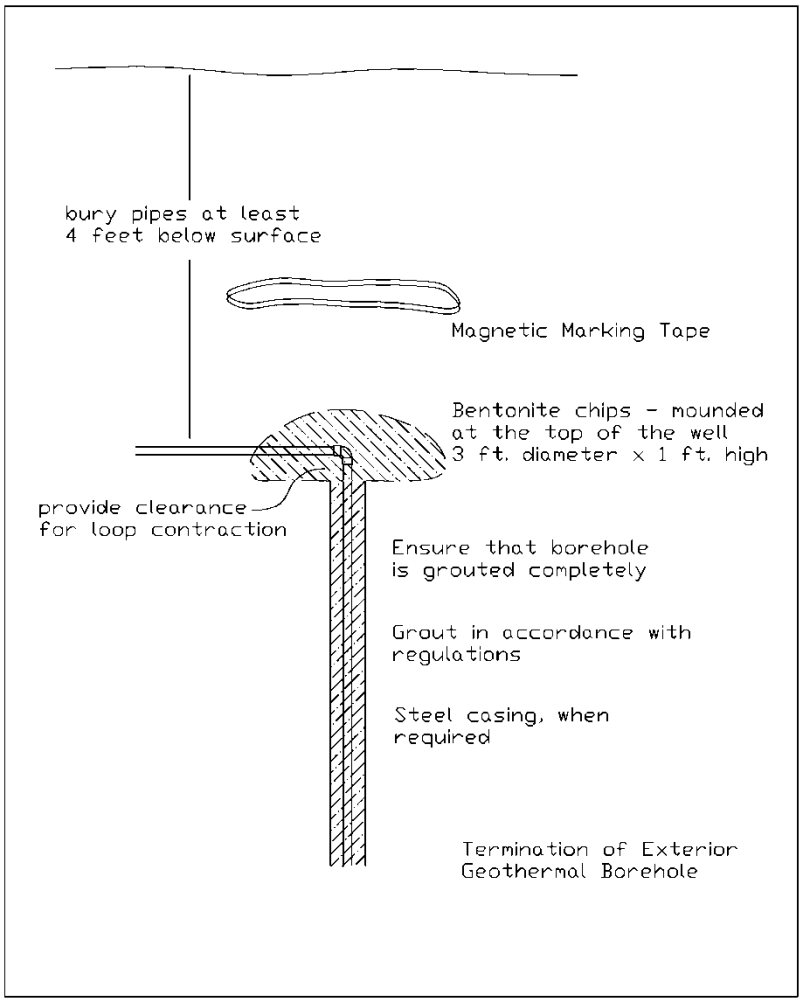
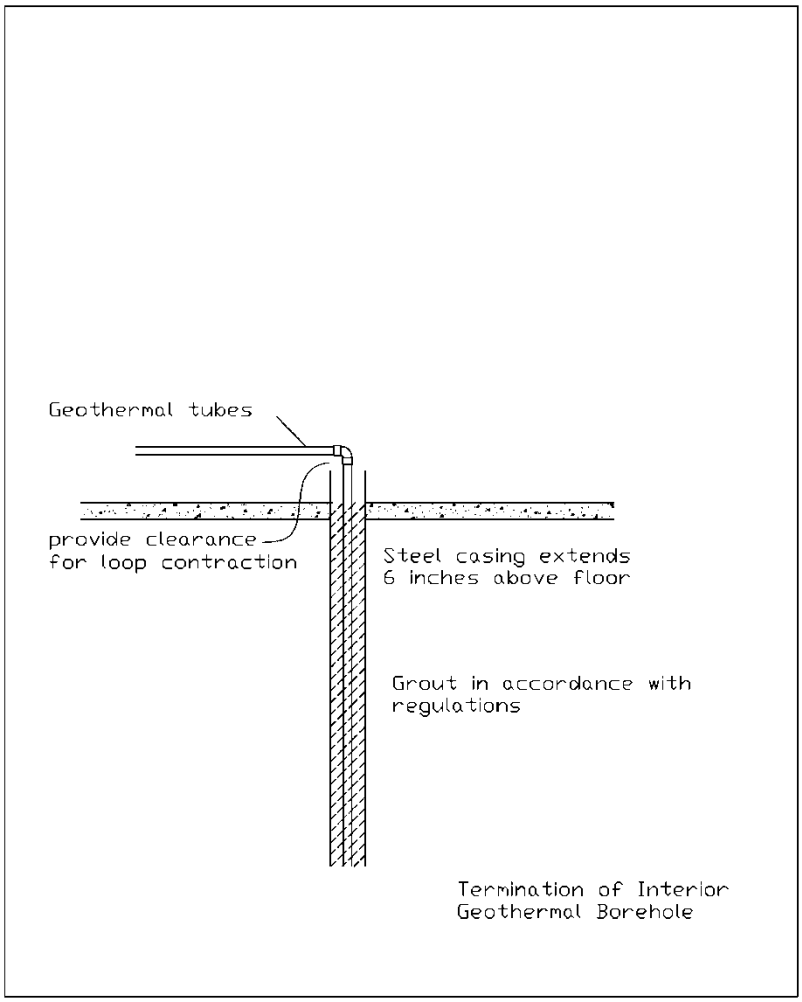


FIG. 7 Termination of interior geothermal bore holes:



Sec. 27. Sections 25-129-1 and 25-129-2, inclusive, of the Regulations of Connecticut State Agencies are hereby amended to read as follows:

Sec. 25-129-1. Unlimited Well Driller Contractor W-1

(1) A person holding a W-1 registration may perform any work as defined by section 25-129 of the Connecticut General Statutes. This registration permits the registrant to construct a well. Before any registration is issued to any individual, the Department or Board shall require that the applicant submit an application, on a form and in a format prescribed by the commissioner of consumer protection, demonstrating that such person has met certain education, job training and test requirements. Registrants shall maintain insurance as specified in section 25-129 of the Connecticut General Statutes.

(2) Documentation that the applicant has been actively engaged in well drilling as a well driller for a period of twenty-four (24) months prior to the date of application and/or has held a valid W-2 registration for at least two (2) years;

(3) Applicant must evidence that he or she has passed a written examination conducted pursuant to sections 21a-7(1) and 21a-8(5) of the Connecticut General Statutes.

Sec. 25-129-2. Unlimited Well Driller W-2

(1) The requirements for this registration shall be twenty-four (24) months as a driller trainee or possessing equivalent experience and training. This registration permits the registrant to construct a well, including but not limited to, the installation, repair and maintenance of pumps, pump motors, pump piping, valves, wiring, electric controls and tanks only while the registrant is in the direct and regular employment of a contractor registered for such work. The applicant shall demonstrate knowledge of well drilling by passing a written examination conducted pursuant to sections 21a-7(1) and 21a-8(5) of the Connecticut General Statutes.

Sec. 25-129-3. Limited Non-Water Supply Contractor W-3

(1) As provided by section 25-129 of the Connecticut General Statutes, the Board hereby establishes certain requirements for the registration of well drilling contractors. This registration permits the registrant to construct a non water-supply well, as defined in section 25-128-36(c) of these regulations, including but not limited to, the installation, repair and maintenance of pumps, pump motors, pump piping, valves, wiring, electric controls and tanks. Before any registration is issued to any individual the Department or Board shall require that the applicant submit:

(2) Documentation that the applicant has been actively engaged in the well drilling trade as a well driller for a period of twenty-four (24) months prior to the date of application and/or has held a valid W-4 registration for at least two years. The applicant shall demonstrate knowledge of well drilling by passing a written examination conducted pursuant to sections 21a-7(1) and 21a-8(5) of the Connecticut General Statutes.

Sec. 25-129-4.Limited Non-Water Supply Driller W-4

The requirements for this registration shall be one (1) year as a driller trainee or possessing equivalent experience and training. This registration permits the registrant to construct a non-water supply well, as defined in section 25-128-36(c) of these regulations, including but not limited to, the installation, repair and maintenance of pumps, pump motors, pump piping, valves, wiring, electric controls and tanks, only while the registrant is in the direct and regular employment of a contractor registered for such work. The applicant shall demonstrate his or her knowledge of well drilling by passing a written examination conducted pursuant to sections 21a-7(1) and 21a-8(5) of the Connecticut General Statutes.

Sec. 25-129-5.Limited Well Casing Extension Contractor W-5

The requirements for this registration of a contractor limited to well casing extension W-5 shall be a contractor license to perform plumbing and piping work pursuant to Chapter 393 of the Connecticut General Statutes. This registration permits the registrant to perform well casing extension, repair and

maintenance work. The applicant shall demonstrate knowledge of well casing extension, its repair and maintenance work by passing a written examination conducted pursuant to section 20-333 of the Connecticut General Statutes. The W-5 registrant's ability to repair shall be limited solely to the well casing extension and shall exclude any other parts of a well.

Sec. 25-129-6. Limited Well Casing Extension Journeyperson W-6

(1) The requirements for the registration of a journeyperson limited to well casing extension W-6 shall be a journeyperson's license to perform plumbing and piping work pursuant to chapter 393 of the Connecticut General Statutes. This registration permits the registrant to perform well casing extension, repair and maintenance work only while in the employ of a contractor licensed for such work. The applicant shall demonstrate knowledge of well casing extension, repair and maintenance work by passing a written examination conducted pursuant to section 20-333 of the Connecticut General Statutes.

Sec. 25-129-7. Limited Geothermal Contractor W-7

(1) This registration permits the registrant to construct a geothermal bore hole or geothermal system up to and including the manifold connection, as defined in section 25-128-36(c) of these regulations, including but not limited to, the installation, repair, and maintenance of piping, casing, heat transfer media, pumps, pump motors, and valves, but excluding Direct Exchange systems as defined within section 25-128-36(c). Before any registration is issued to any individual the board shall require that the applicant submit:

(2) Documentation that the applicant has been actively engaged in the geothermal bore hole drilling trade as a Geothermal Driller for a period of twenty-four (24) months prior to the date of application and/or has held a valid W-8 registration for at least two years. Applicant must evidence that he or she has passed a written examination conducted pursuant to sections 21a-7(1) and 21a-8(5) of the Connecticut General Statutes.

Sec. 25-129-8 Limited Geothermal Driller W-8

(1) The requirements for this registration shall be one (1) year as a Geothermal Driller trainee or possessing equivalent experience and training. This registration permits the registrant to construct a geothermal bore hole or geothermal system up to and including the manifold connection, as defined in section 25-128-36(c) of these regulations, including but not limited to, the installation, repair and maintenance of piping, casing, heat transfer media, pumps, pump motors, and valves, but excluding Direct Exchange systems as defined within section 25-128-36(c), only while the registrant is in the direct and regular employment of a contractor registered for such work. The applicant shall demonstrate knowledge of well drilling by passing a written examination conducted pursuant to sections 21a-7(1) and 21a-8(5) of the Connecticut General Statutes.

Sec. 25-129-9. Limited Direct Exchange Geothermal Contractor W-9

(1) This registration permits the registrant to construct a geothermal bore hole or geothermal system up to and including the manifold connection, but limited to those bore holes employing Direct Exchange or Direct Expansion technology, as defined within section 25-128-36(c) of these regulations, including but not limited to, drilling associated with the installation of copper or other piping containing a Direct Exchange heat transfer medium, the installation, repair and maintenance of

piping, casing, and heat transfer media. Before any registration is issued to any individual the Board shall require that the applicant submit:

(2) Documentation that the applicant has been actively engaged in the geothermal bore hole drilling trade as a Direct Exchange Driller for a period of twenty-four (24) months prior to the date of application and/or has held a valid W-10 registration for at least two (2) years. Applicant must evidence that he or she has passed a written examination conducted pursuant to sections 21a-7(1) and 21a-8(5) of the Connecticut General Statutes.

Sec. 25-129-10. Limited Direct Exchange Geothermal Driller W-10

(1) The requirements for this registration shall be one (1) year as a Direct Exchange Geothermal Driller Trainee or possessing equivalent experience and training. This registration permits the registrant to construct a geothermal bore hole or geothermal system up to and including the manifold connection, but limited to those bore holes employing Direct Exchange or Direct Expansion technology, as defined within section 25-128-36(c), and associated components of a direct exchange system including but not limited to, drilling associated with the installation of copper or other piping containing a Direct Exchange hear transfer medium, the installation, repair and maintenance of piping, casing, heat transfer media, only while the registrant is in the direct and regular employment of a contractor registered for such work. The applicant shall demonstrate knowledge of Direct Exchange geothermal bore hole drilling by passing a written examination conducted pursuant to sections 21a-7(1) and 21a-8(5) of the Connecticut General Statutes.

Sec. 25-129-11. Driller Trainee

(1) Driller Trainees may perform the work for which they are being trained, but only in the presence and under the supervision of a properly registered contractor driller. Nothing in chapter 482 of the Connecticut General Statutes shall be construed to prohibit the employment of one driller trainee by a registered contractor and an additional driller trainee or apprentice for each person employed by a contractor who holds a drilling registration for such work.

(2) Driller Trainees, under the supervision of a registered contractor or the holder of a driller registration, may do minimal cleaning work not in the presence of such supervising contractor or driller.

NEW

Sec. 28. The Regulations of Connecticut State Agencies are hereby amended by adding Section 25-130-1, as follows:

Sec. 25-130-1. Permit requirements

(a) Before commencing work on the construction, repair, development, hydrofracturing or abandonment of any well or geothermal system, a well contractor shall complete an application for a permit in a format acceptable to the Commissioner of Consumer Protection, and such application shall be filed with the authority having jurisdiction for the issuance of a permit, as provided by section 25-130 of the Connecticut General Statutes. By filing said application, the applicant agrees that all work under the permit shall be done in strict compliance with the Connecticut Well Drilling Code, unless a special exemption from one or more of the applicable regulations has been granted by the Department.

(b) The contractor shall then submit the completed, signed permit application for each well or geothermal system, with the proper fee to the local director of health or the director's agent. The local director of health or their agent shall approve such permit if said proposed work to each new or existing water supply well or geothermal system conforms to sections 19-13-B51a through 19-13-B51m, inclusive, of the Regulations of Connecticut State Agencies for wells, or section 25-128-41a of these regulations for geothermal systems. No well or geothermal system shall be installed repaired or altered until such a permit has been issued and approved.

(c) Water supply well permits shall be evaluated according to their content with regard to proper separating distances as outlined in the Connecticut Well Drilling Code and section 19-13-B51d of the Regulations of Connecticut State Agencies for water supply wells. The local director of health may approve a permit for repair to an existing private well or semi-public well that does not conform to the Regulations of Connecticut State Agencies, when the repair allows for better protection of public health.

(d) The application for a permit by a well contractor shall include an appropriate map or plot plan, showing the location of each proposed well or geothermal bore hole on the premises in relation to roads, intersections, and other permanent land features. The Commissioner or local director of health may request other information for inclusion on the map or plot plan as deemed necessary to protect public health and safety. All permit applications shall be signed by an appropriately registered well contractor.

(e) Notwithstanding any provision of this section, the local health director may grant an emergency request to construct, repair, or abandon a well or bore hole if it determines that an emergency situation exists with respect to the necessity for the construction, repair, or abandonment of the well or bore hole and the application complies with the provisions of this subsection. A well contractor shall submit a written request, which may be electronic and sent by electronic mail, to the Department and the director of the local health department in which the well or bore hole that is the subject of the emergency request is located. The electronic request shall contain information regarding the precise location of the subject well or bore hole, the specific proposed work to be performed on the well or bore hole and the reason that is necessary to complete the work on an emergency basis. No work contemplated by the emergency request shall be started or completed until the well contractor has received approval from the director of the local health department or their designee. The local health director shall send written approval to the well contractor. After work completion, the well contractor shall provide the Department and the local health director with written documentation attesting to and detailing the specific form and manner of the work that was completed in connection with the emergency request. Any work that is not completed in compliance with this subsection and the specific approval granted may be subject to an order of removal or other remedial action.

(f) Permit applications, permits, and completion reports may be filed or transmitted electronically as required by each recipient.

Statement of Purpose

Pursuant to CGS Section 4-170(b)(3), "Each proposed regulation shall have a statement of its purpose following the final section of the regulation." Enter the statement here.

(A) **Purpose:** The purpose of this regulation is to update the Connecticut Well Drilling Code to conform with current industry practices, to incorporate standards related to geothermal bore hole drilling and system installation, including four new geothermal-specific limited license categories, to make technical changes to existing language for clarity, to re-number existing sections to more properly track the applicable underlying statutes, and to provide gender neutrality in the language employed.

(B) **Summary:** These regulations provide for updated definitions which conform to current industry practice, and also to incorporate specific definitions for geothermal bore hole drilling. Additional provisions are added to regulate geothermal systems to help assure that the water supply is not contaminated due to substandard drilling practices or component installation. The Department believes these regulation changes will protect the public health and safety, and in particular, help to protect the water supply from contamination.

(C) **Legal Effects:** The regulation implements changes to the Well Drilling Code, which is part of the regulatory structure of the Department of Consumer Protection.