

Construction Standards for Groundwater Systems

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In a recent visit to Eastern Oregon, I had an opportunity to provide information to both new and old groundwater systems. It was brought to my attention that not all systems were created equal. Although the construction standards for groundwater systems are clearly stated in the rules, it still seems important to review them when looking at your system just to make sure. As time goes by, things can change that may lead to straying away from the black and white requirements.

In this article, I would like to state the actual requirements as stated in the Oregon Administrative Rules, Chapter 333. As you read them, I hope they serve as a reminder to such things as: placement of chemicals in the vicinity of your well, sampling taps and their location, acquisition of the proper easements, and other issues including well-head protection. As I travel, I also notice that older systems are changing sources, and new ones are just in the beginning stages of development. If you already have an existing groundwater system, I hope that these rules serve as helpful review. If you are just beginning construction of a new system or modifying an existing one, these rules may also help to keep on track. I always encourage that by conducting your own 'in house' surveys, you may be more likely to avoid deficiencies and the accompanying violations incurred by the Department. This article will include those rules pertaining to groundwater systems only. The construction standards pertaining to springs, and treatment systems can be found in following articles. Here are the construction standards for groundwater systems:

333-061-0050 Construction Standards

(1)General:

(a) These standards shall apply to the construction of new public water systems and to major additions or modifications to existing public water systems and are intended to assure that the system facilities, when constructed, will be free of public health hazards and will be capable of producing water which consistently complies with the maximum contaminant levels;

(b) Public water systems which may not comply fully with these construction standards, shall be allowed to continue in operation and shall not be required to undertake alterations to existing facilities unless the maximum contaminant levels are being exceeded.

Existing facilities are:

(A) Facilities at public water systems constructed or installed prior to August 21, 1981; and

(B) Facilities at public water systems which have been in continual use in or as a public water system and not inoperative for more than 1 year.

(C) Non-public water systems that are converted to public water systems shall be modified as necessary to conform to the requirements of this rule.

(D) Facilities at public water systems shall be designed and constructed in a manner such that contamination will be effectively excluded, and the structures and piping will be capable of safely withstanding external and internal forces acting upon them;

(E) Only materials designed for potable water service and meeting National Sanitation Foundation Standard 61, Section 9 - Drinking Water System Components - Health Effects (Revised September, 1994) or equivalent shall be used in those elements of the water system which are in contact with potable water;

(F) New tanks, pumps, equipment, pipe valves and fittings shall be used in the construction of new public water systems, major additions or major modifications to existing water systems. The Department may permit the use of used items when it can be demonstrated that they have been renovated and are suitable for use in public water systems;

(G) Prior to construction of new facilities, the water supplier shall submit plans to the Department for approval as specified in OAR 333-061-0060(1)(a).

(H) Construction may deviate from the requirements of this section provided that documentation is submitted, to the satisfaction of the Department, that the deviation is equal to or superior to the requirements of this section as

specified in OAR 333-061-0055 (variances from construction standards).

(I) A public water system or other Responsible Management Authority using groundwater, or groundwater under the direct influence of surface water, derived from springs, confined or unconfined wells that wish to have a state certified wellhead protection program shall comply with the requirements as specified in OAR 333-061-0057, 0060, and 0065, as well as OAR 340-040-0140 through 0200. Additional technical information is available in the Oregon Wellhead Protection Guidance Manual.

(J) All new groundwater sources are subject to consideration for potential direct influence of surface water as prescribed in OAR 333-061-0032(7).

(2) Groundwater:

(a) Wells:

(A) The area within 100 feet of the well shall be owned by the water supplier, or a perpetual restrictive easement shall be obtained by the water supplier for all land (with the exception of public rights-of-way) within 100 feet of the well. The easement shall be recorded with the county in which the well is located and with the recorded deed to the property. A certified true copy shall be filed with the Department;

(B) Notwithstanding paragraph (2)(a)(A) of this rule, wells located on land owned by a public entity, (Federal, State, County, Municipality) which is not the water supplier, a permit issued by the public entity to the water supplier shall suffice in lieu of an easement. Said permit shall state that no existing or potential public health hazard shall be permitted within a minimum of 100 feet of a well site;

(C) Notwithstanding paragraph (2)(a)(A) of this rule, in those areas served by community gravity sanitary sewers, the area of ownership or control may be reduced to 50 feet;

(D) Public or private roadways may be allowed within 100 feet of a confined well, provided the well is protected against contamination from surface runoff or hazardous liquids which may be spilled on the roadway and is protected from unauthorized

access;

(E) The following sanitary hazards are not allowed within 100 feet of a well which serves a public water system unless waived by the Department: any existing or proposed pit privy, subsurface sewage disposal drain field; cesspool; solid waste disposal site; pressure sewer line; buried fuel storage tank; animal yard, feedlot or animal waste storage; untreated storm water or gray water disposal; chemical (including solvents, pesticides and fertilizers) storage, usage or application; fuel transfer or storage; mineral resource extraction, vehicle or machinery maintenance or long term storage; junk/auto/scrap yard; cemetery; unapproved well; well that has not been properly abandoned or of unknown or suspect construction; source of pathogenic organisms or any other similar public health hazards. No gravity sewer line or septic tank shall be permitted within 50 feet of a well which serves a public water system. Clearances greater than indicated above shall be provided when it is determined by the Department that the aquifer sensitivity and degree of hazard require a greater degree of protection. Above-ground fuel storage tanks provided for emergency water pumping equipment may be exempted from this requirement by the Department provided that a secondary containment system is in place that will accommodate 125% of the fuel tank storage;

(F) Wells shall not be located at sites which are prone to flooding. In cases where the site is subject to flooding, the area around the well shall be mounded, and the top of the well casing shall be extended at least 2 feet above the anticipated 100-year (1%) flood level;

(G) Except as otherwise provided herein, wells shall be constructed in accordance with the general standards for the construction and maintenance of water wells in Oregon as prescribed in OAR Chapter 690, Departments 200 through 220;

(H) Before a well is placed into operation as the source of supply at a public water system, laboratory reports as required by OAR rule 333-061-0036 shall be submitted by the water supplier;

(I) Water obtained from wells which exceed the maximum contaminant levels shall be treated as

outlined in section (4) of this rule;

(J) The pump installation, piping arrangements, other appurtenances, and well house details at wells which serve as the source of supply for a public water system, shall meet the following requirements:

(i) The line shaft bearings of turbine pumps shall be water-lubricated, except that bearings lubricated with non-toxic approved food-grade lubricants may be permitted in wells where water-lubricated bearings are not feasible due to depth to the water;

(ii) Where turbine pumps are installed, the top of the casing shall be sealed into the pump motor. Where submersible pumps are installed, the top of the casing shall be provided with a watertight sanitary seal;

(iii) A casing vent shall be provided and shall be fitted with a screened return bend;

(iv) Provisions shall be made for determining the depth to water surface in the well under pumping and static conditions;

(v) A sampling tap shall be provided on the pump discharge line;

(vi) Piping arrangements shall include provisions for pumping the total flow from the well to waste;

(vii) A method of determining the total output of each well shall be provided. This requirement may be waived by the Department at confined wells which serve as the source of supply for Transient Non-Community water systems;

(viii) A reinforced concrete slab shall be poured around the well casing at ground surface. The slab shall be sloped to drain away from the casing;

(ix) The ground surface around the well slab shall be graded so that drainage is away from the well;

(x) The top of the well casing shall extend at least 12 inches above the concrete slab;

(xi) Provisions shall be made for protecting pump controls and other above-ground appurtenances at the well head. Where a wellhouse is installed for this purpose, it shall meet applicable building codes and shall be insulated, heated and provided with lights, except that where the wellhouse consists of a small removable box-like structure the requirement for lights may be waived by the Department;

(xii) The wellhouse shall be constructed so that the well pump can be removed.

(K) The area in the vicinity of a well, particularly the area uphill or upstream, shall be surveyed by the water supplier to determine the location and nature of any existing or potential public health hazards;

(L) The requirements with respect to land ownership, clearances from public health hazards, and protection against flooding for wells in an unconfined aquifer shall be the same or more restrictive than those prescribed for wells in confined aquifers, as determined by the Department.

(M) Before a well is placed into operation as the source of supply for a public water system, the following documents shall be submitted by the water supplier:

(i) Reports on pumping tests for yield and drawdown for unconfined wells;

(ii) Reports of laboratory analyses on contaminants in the water as required by OAR 333-061-0036;

(iii) Performance data on the pumps and other equipment;

(iv) Proposals for disinfection as required by section (5) of this rule, if applicable.

(v) Reports on determination of potential direct influence by surface water into groundwater source as prescribed in section (3) of this rule.

I trust that everything is as clear as mud at this point...what with the sections, proposals, the shall(s), will(s), and various Roman Numerals, the a(s), b(s), and c(s) of the OARs. However, these remain to be the written guide to help maintain compliance with the various construction standards of your water system. The operative word here should be 'standards'. Following these standards are important because they provide a guideline that when adhered to, will help protect your water from adverse conditions as well as facilitate your passing a "sanitary survey" with flying colors!