

CODE LINK

STATE OF OREGON • BUILDING CODES DIVISION

JANUARY/FEBRUARY 2001

Underground injection systems and drinking water protection

By Barbara Priest, Underground Injection Program Coordinator, Oregon Department of Environmental Quality, Water Quality Division



EPA has updated the existing federal underground injection control regulations for Class V injection systems due to the loss of a federal lawsuit. In addition, a DEQ programmatic review has found Oregon to be out of compliance with the existing federal rules. The resulting changes to state DEQ rules will affect building codes, municipal storm-water systems, and privately owned systems statewide.

Background: Underground injection systems pose a threat to groundwater

Injection wells, as defined by the Environmental Protection Agency include any bored, drilled, or driven-shaft wells; any dug holes with depths greater than their largest surface dimension; improved sinkholes; and subsurface fluid-distribution systems.

There are several classes of injection wells (also called injection systems) designated as Classes I through V. This article addresses new regulations that apply to the more common Class V injection systems.

Typical Class V injection systems found in Oregon include stormwater (e.g., sumps and drywells), industrial/commercial/utility systems (e.g., process and wastewater-disposal drainfields), geothermal reinjection wells, domestic wastewater disposal (cesspools

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or septic systems serving 20 or more people or with a design capacity of 2,500 gpd), motor-vehicle drains, aquifer recharge wells, subsidence control/dewatering wells, aquifer remediation wells, and agricultural drainage. DEQ estimates that there are more than 60,000 of these types of injection systems in Oregon. The bulk of the injection systems are associated with the subsurface disposal of stormwater runoff.

DEQ is concerned about injection systems because they are designed to move fluid directly to the subsurface without treatment. They can affect the quality of groundwater as well as nearby surface water. More than 30 percent of the contaminated sites on DEQ's groundwater cleanup list are associated with injection systems. In addition, over the past decade there has been a 20-percent increase in toxic discharge to the subsurface. Pollutants of concern in Class V systems include heavy metals, toxic organic chemicals, nutrients, pesticides, salts, and microorganisms (e.g., bacteria, viruses, *Giardia lamblia* and *Cryptosporidium*). Owners and operators of injection systems are liable should contamination occur to groundwater from normal use, accidental spills, or illicit operation.

UIC program regulations

The federal Underground Injection Control program (UIC) was enacted in 1974, under the *Safe Drinking Water Act*, and is administered under 40 CFR 144-146. DEQ was delegated as the primary agency in 1984, which means that DEQ is responsible for developing rules and administering the program. The intent of the federal UIC program is to protect drinking water aquifers (all freshwater aquifers) and public water suppliers. In December 1999, EPA adopted new regulations applying to certain high-risk injection systems and required states to update their rules by 2001. Oregon was found to be out of compliance with existing federal requirements and was required to revise its rules to meet existing

federal requirements. Registration inventory of all types of injection systems is one of the key elements in the federal program.

In December 1999, the EPA revised the UIC regulations associated with cesspools, automotive drains, preclosure requirements, and remediation sites (clean up).

The focus was on high-risk injection systems located near sources of drinking water (e.g., delineated drinking water protections under the Source Water Assessment Program) and the protection of the drinking water source from potential contamination. Specifically, the new regulations prohibited new large-capacity cesspools and motor-vehicle waste-disposal systems as of April 2000. This part of the new regulations does not affect Oregon, as both large-capacity cesspools and automotive drains are disallowed under existing rules. Existing cesspools must be phased out by April 2005 under the new federal rules. Existing automotive drains that do not discharge to an approved disposal system (e.g., wastewater treatment plant) in Oregon have been illegal since 1991, so will not be given a phase-out time. Automotive drains connected to on-site sanitary systems and drainfields are illegal because such systems are not designed to treat this type of discharge.

A 30-day pre-closure notification is now required when an injection system is about to be closed. Depending on the type of discharge and risk (e.g., automotive service drains), DEQ may request sediment and fluid testing for contamination.

DEQ has revised Oregon administrative rules (OAR 340-44) that regulate injection systems with the assistance of a UIC task force, which included members of the business and industry community, public water suppliers, state agencies, and consultants. DEQ's revised rules went out for public hearings in August 2000 and will go to the Environmental Quality Commission for adoption in 2001.



DEQ's rules require registration of all injection systems, protect resources based on land use, and set up general restrictions, but leave design and treatment up to the developer. Due to the wide range of injection systems, DEQ has chosen not to set strict design parameters. Instead, the federal performance standard to protect drinking water will be the focus and driving force behind the design and treatment type used on a site-specific basis.

Inventory data is used to determine if the injection system needs a permit or qualifies as "rule authorized," which means that no permit is necessary as long as the injection operations do not threaten underground sources of drinking water and comply with other federal/state UIC program requirements. Upon registration, DEQ sends letters to owners, notifying them of their status.

To date, only a small fraction of Oregon's Class V systems have been registered. **The DEQ is giving registration amnesty to jurisdictions and agencies for existing injection systems until December 31, 2000.** Registration amnesty covers all types of injection systems. Public and private owners and operators of new injection systems are expected to register prior to use and notify DEQ 30 days prior to closure. The official amnesty timeline for privately owned systems ended on January 1, 2000. A de facto amnesty for privately owned systems is in effect until new rules are adopted. There are no fees for registration.

Integration with building codes

Building department staff who review site plans are asked to warn developers of the need to register injection systems (e.g., sumps, drywells, French drains, large on-site systems) with DEQ prior to use. Please direct the public to DEQ's Web site:

www.deq.state.or.us/wq/groundwa/uichome.htm. The Web site includes registration forms and guideline documents for public use. DEQ also requires that a pre-closure form be submitted prior to closure of a system. Once the new

rules are in place, DEQ will be focusing enforcement efforts on high-to-medium-risk facilities (e.g., industrial, commercial). DEQ will be making roof gutter drains "rule authorized" (no permit needed) and is not likely to enforce the registration requirement for residential injection systems (e.g., roof drains) due to the low environmental risk from contamination.

Stormwater discharges

For stormwater there are **basic** setback and location requirements to protect the groundwater resources:

- A 500-foot setback from a drinking water well or the two-year time of travel is necessary
- Injection discharge must not cause movement of contaminants into groundwater over drinking-water standards
- Mixed-waste streams are not allowed (e.g., stormwater mixed with sanitary effluent)
- Options that provide the best treatment should be used
- Injection systems must terminate 10 feet above the high-water table and must be no deeper than 100 feet
- There must be either a natural confinement barrier or an engineered filtration medium (treatment) between the aquifer and the injection system
- The system must be designed and operated in a manner that prevents spills

DEQ is proposing additional requirements for stormwater discharges based on land-use types – municipal, industrial, commercial, and residential. These requirements will be based on the type of risk associated with the land use from potential contamination. For example, a facility with more than 500 stormwater-injection systems is regulated at a higher level than a site with 12. Industrial sites having toxics exposed to stormwater

Continued on Page 4



will be regulated at a higher level than those with no exposure. Spill plans, stormwater management plans, BMPs, and monitoring may be requested, depending on circumstances.

Integration with the source water assessment program

Source Water Assessment Reports by OHD and DEQ in 2003 will provide a delineation of public-water systems drinking water protection areas (DWPA) and a map showing how far water will travel in two years. The delineation will help water-system administrators determine relationships between local land use and drinking water quality. The report will include a sensitivity map indicating where within the DWPA the aquifer supplying the water system is most sensitive to potential contamination to help water purveyors prioritize efforts to protect their resource.

The sensitivity determination relies in part on the permeability of the soils at the surface (i.e., how easy is it for a contaminant to potentially move down with infiltrating water).

Injection systems can short-circuit the natural protection that soils provide if the potentially contaminated water is introduced below the soil zone. Because underground injection systems can threaten drinking water sources, it is in a water system's best interest to register injection systems and ensure proper management, particularly within the DWPA. The assistance of local building departments in helping address this critical issue is important.

More information available

For more information, see DEQ's UIC Web guideline documents, frequently asked questions, fact sheets, and registration forms: www.deq.state.or.us/wq/groundwa/uichome.htm. For additional assistance regarding underground injection systems, contact Barbara Priest, DEQ-WQ, (503) 229-5945. For information on the proposed UIC rules, contact Karla Urbanowicz, DEQ-WQ, (503) 229-6099. ■



First Alert fire extinguishers recalled

In cooperation with the U. S. Consumer Product Safety Commission (CPSC), BRK Brands Inc. of Aurora, Illinois, is voluntarily recalling about 600,000 First Alert household fire extinguishers. The extinguishers can fail to discharge when the trigger is activated, thereby failing to put out a fire and putting consumers at risk of fire-related injuries and property damage.

Only First Alert model FE1A10G with serial numbers beginning with RY, RK, RL, RP, RT, RU, or RW are included in this recall.

The serial number is located on the extinguisher's label, above the model number in a rectangular box. "First Alert" is written on the unit's label and pressure gauge. The fire

extinguishers are either red or white. Home centers, mass merchandisers, and hardware stores nationwide sold the fire extinguishers from September 1999 through September 2000.

First Alert fire extinguishers with a "100% Quality Tested" sticker attached to the fire extinguisher label are not included in the recall, regardless of the serial number.

Consumers possessing the recalled fire extinguishers should immediately call First Alert, (866) 669-2736, or visit the First Alert Web site, www.firstalert.com, for instructions on how to get a coupon for a new extinguisher. ■

From "The Gated Wye"

New licensing requirements for elevator journeymen



Prior to the 1999 legislative session, ORS 479.630 required licensing only for those working on elevator¹ electrical equipment. The 1999 legislature passed a new law (House Bill 3556) that requires licensing for persons working on the mechanical aspects of elevators.

The legislature's reasoning was sound. For many years, anyone could work on an elevator's mechanical equipment without any qualifications. But serious consequences can result when maintenance, adjusting, and repair of elevator mechanical components are not done by competently trained technicians.

The new law provides for adoption of rules that establish elevator-apprenticeship-program criteria. They also provide criteria for prior elevator-related experience (prior to the enactment of the law on October 23, 1999). These new rules were filed October 1, 2000.

Essentially, the new rules require that all persons working on elevator mechanical equipment obtain a license as either an elevator apprentice or an elevator journeyman.

The Electrical and Elevator Board is authorized to approve elevator apprenticeship programs. These programs are required to incorporate certain mechanical-related training. New programs will normally be submitted to the Bureau of Labor and Industries Apprenticeship and Training Division.

After BOLI determines program compliance with established criteria, it will bring the program to the board for review and approval.

There are three journeyman licenses created by these new rules: Class 1 General Journeyman Elevator Mechanic (GEM); Class 2 Limited Journeyman Elevator Mechanic (LEM); and Restricted Elevator Mechanic (REM).

A Class 1 license is issued to a person who successfully completes a minimum four-year apprenticeship program. A journeyman in this category is able to work on all types of elevator equipment. A Class 2 limited license restricts the holder to vertical and inclined wheelchair lifts and stairway chairlifts for commercial and residential applications. A two-year apprenticeship program is required for this license. The restricted elevator mechanic license is designed to cover those persons whose past experience may be limited to specific types of equipment (i.e., dumbwaiters, residential elevators, etc.). A minimum of two years of work experience must be verified on particular types of equipment, and the applicant must pass a division-administered exam to obtain the REM license.

Those not licensed who are working in the industry as journeymen must obtain licenses no later than April 1, 2001. Those who have limited elevator journeyman licenses issued under the electrical law [ORS 479.630(6)] may continue to work under those licenses until they expire on October 1, 2002. At that time, such persons must renew their limited elevator journeyman licenses and apply for Class 1 GEM licenses.

Apprentices currently working in the industry must enter an apprenticeship program no later than October 1, 2001. These apprentices will be licensed by BOLI in a manner similar to electrical apprentices.

Electricians and other employees working in industrial plants are allowed to perform mechanical maintenance and minor repairs on elevator equipment that is not accessible to the general public. In all cases, a person

Please see "New licensing," Page 6

¹The term "elevator" in the law includes a myriad of equipment: passenger and freight elevators, dumbwaiters, escalators, and moving walks, residential elevators, wheelchair lifts, and stairway chairlifts, vertical reciprocating lifts, sidewalk elevators, etc..

New licensing, *continued*

must be appropriately licensed under the current electrical law to perform any electrical work on elevators in any environment.

These new rules may seem confusing. The Elevator Safety Program will be working with industry to ensure that persons are properly licensed and to correct any problems

encountered during the administration of these new licenses.

Questions should be directed to the Elevator Safety Program, (503) 373-1298, during regular business hours.

The following tables should help clarify current apprenticeship and licensing requirements. ■

REQUIREMENTS



License type	Minimum classroom training	Minimum on-the-job-training	Allowed to work w/ indirect supervision
Class 1 General Journeyman Elevator Mechanic	144 hours/year	8,000 hours (4 years)	6,800 hours (85% or about 3 years)
Class 2 Limited Journeyman Elevator Mechanic	144 hours/year	4,000 hours (2 years)	3,400 hours (85% or about 1 year and 10 months for a VRL endorsement)
VRL Endorsement (Vertical reciprocating lift)	144 hours/year	2,000 hours (1 year); OJT hours may run concurrently with Class 2 hours)	
Restricted Elevator Mechanic	Must be able to verify past experience	4,000 hours for any other type of equipment not listed above	Must pass a division-administered exam

WHEN A LICENSE MUST BE OBTAINED

If you currently...	You must obtain a license no later than...	Type of license to obtain...	Fee required
possess a limited elevator journeyman license under ORS 479. 630(6)	October 1, 2002	Class 1 General Journeyman Elevator Mechanic	\$60 for 3 years (Prorated at \$20/yr.)
are employed as a journeyman without a license	April 1, 2001	Class 1 or 2 Elevator Journeyman or a Restricted Elevator Journeyman	\$60 for 3 years (Prorated at \$20/yr.)
are an apprentice with access to an approved program	April 1, 2001	Apprentice license indicating the term of apprenticeship	\$20/full year term; \$10/half year term; no fee if issued by BOLI
are an apprentice without current access to an approved program	October 1, 2001		

Chief plumbing inspector issues interpretation



Subject: Ratproofing

Code sections: Oregon Plumbing Specialty Code (OPSC) Section 313.12.3 and One- and Two-Family Dwelling Specialty Code Section 3113.12.2

Code edition: 2000

Date issued: September 29, 2000

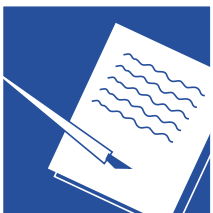
Question:

Do the provisions of OPSC Section 313.12.3 require that all pipe penetrations in walls, floors, or ceilings shall be made ratproof by the installation of approved metal collars fastened to the structure?

Answer:

No. Code Section 313.12.3 is referring only to openings for pipes that are not sleeved and sealed under the provisions of Section 313.10. Rough openings made for pipes, which are not adequately sealed, may allow a passageway for rats and should be protected by the installation of approved metal collars securely fastened to the adjoining structure. Properly sleeved and sealed openings do not require further protection. ■

Interpretive ruling rescission signed

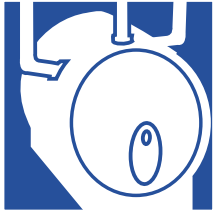


Rescission of the following ruling was approved by the division administrator and mailed to building officials.

92-23 Insulation Requirements for Speculative Commercial Buildings

It was determined that users of the energy code have been using the building code provisions concerning additions, alterations, and change of use of structures long enough to make the need for this ruling unnecessary. ■

Pressure relief valves: Do they work?



Recently, the National Board of Boiler and Pressure Vessel Inspectors had a news item on its Web site concerning the explosion of a water heater in a Massachusetts high school. The photos in the report from Massachusetts chief inspector Mark Mooney show the devastating effects of this explosion. However, this damage and threat to safety might have been avoided if the relief valve had been properly inspected, maintained, and replaced when signs of leakage were apparent.

During periodic inspection, pressure-relief devices should be examined for any signs of leakage, from either bonnet vents or discharge piping. A collection of solids or discoloration from the vents, stem opening, or tailpiece of the discharge pipe are clear indications that a valve should be immediately replaced. When seat leakage occurs, solids collect around the disk seat and valve body cavity and act as an efficient adhesive. The valve tested from the Massachusetts high school had leaked for so long that the solids themselves sealed the leak and the valve disk, and consequently, the fate of the cafeteria.

As Mr. Mooney explains in his report, a properly functioning temperature-pressure relief valve could have prevented the damage from the exploding water heater. The explosive force resulting from rupture of a water heater is caused by overheated water flashing into steam when the pressurized water is released. The steam expands and occupies a space of more than 1,600 times the volume of the water. The expansion of steam has great power and causes extensive structural damage when restrained in a small area.

In addition to a spring for pressure operation, a temperature-pressure relief valve is equipped with a special thermal probe designed to open the valve at a temperature below the boiling point of water at atmospheric pressure. Once open, the cooler make-up supply water enters the tank to keep the water temperature below 212° F to prevent the explosive effects of a vessel rupture.

Temperature-pressure relief valves have special nameplate markings with dual setting and capacity rating values. The set pressure is stated and corresponds to the capacity rating certified by the National Board of Boiler and Pressure Vessel Inspectors in accordance with the ASME Boiler and Pressure Vessel Code. The set temperature rating, usually 210° F, corresponds to the BTU flow rating determined in accordance with ANSI Z21.22, Relief Valves and Automatic Gas Shut-off Devices for Hot Water Supply Systems.

The rating determined by the national board is a measure of the valve's capacity when subjected to a static inlet pressure of 110 percent of the valve's set pressure (commonly 125 to 150 psig). In comparison, the temperature rating is a measure of the capacity when the valve is opened by its thermal probe when exposed to 15 psi of steam at the valve inlet. The capacity set by the national board is used to size the relief valve to prevent pressure from rising beyond 110 percent of the water heater's maximum allowable working pressure. The temperature rating is used to size the relief valve to prevent the water temperature from rising above 212° F (the boiling point of water at atmospheric pressure), assuming the supply water to the heater is properly installed and operating.

To determine if the valve will work, it has been recommended that the valve be opened periodically using the valve's lift lever. This test will only demonstrate that the valve is not stuck shut. Precautions must be taken, however, to ensure that the discharge piping will direct the water to a safe location, and that the valve will close and remain leak-tight. As an alternative, users are encouraged to periodically replace these valves, which are relatively inexpensive when compared to the cost of loss of life, injuries, and equipment damage that result from failed pressure-relieving devices. ■

Notice of Final Appeal Decision



Building Code Structures Board

Subject: Major One- and Two-Family Dwelling Code Interpretation (OTFDC)

Reference: ORS 455.475 - Appeal DC 00-01

Code section: OTFDC Section 111.1, Item 1.14

Question:

Are permits and inspections required for the installation of brick veneer replacing other types of siding such as wood, masonite, or vinyl on an existing single-family residence?

Answer:

Yes. On October 4, 2000, the Building Codes Structures Board determined that a permit and inspections are required for installation of brick veneer in place of lighter-weight materials such as wood siding on an existing single-family residence.

The Board determined that the installation of brick veneer in place of such lightweight materials as wood siding should not be included in the list of items exempt from permit in OTFDC Section 111.1. This decision was based on the following findings:

1. Replacement of siding with **like** materials is exempt from permit.
2. Replacement of wood siding with brick veneer constitutes a significant increase in the weight of the siding material.

3. The 600 percent-increase in weight of the siding material has the potential to adversely impact the structural integrity of the building.
4. The method of installation of the two types of materials is significantly different.
5. OTFDC Table 403.1.1, Minimum Width of Concrete or Masonry Footings, recognizes the difference in loading between conventional wood frame construction with wood siding and construction that includes 4-inch brick veneer over wood frame.
6. The appeal was properly filed in accordance with ORS 455.475 and OAR 918-001-0130.
7. The appeal of a OTFDC interpretation is under the purview of the structural program chief.

This decision is consistent with the requirement of ORS 455.310 that states: *"In making the list of exempt items, the director shall further define the items on the list contained in this subsection so that no item which adversely affects the structural integrity of the dwelling shall be on the list."* A complete record of the board appeal hearing and decision is in the minutes of the October 4, 2000, Building Codes Structures Board meeting posted on BCD's Web site, www.oregonbcd.org. ■

Lead paint reporting requirements



All contractors should be aware of a new federal rule that went into effect June 1, 1999. Known as "Section 406," it is a requirement by EPA that every "renovator" give consumers notice of possible lead-based paint hazards before work begins. A renovator is anyone who disturbs more than two square feet, interior, or 20 square feet, exterior, of paint (not just lead-based paint) in or on pre-1978 housing, including window replacements. This applies to painters, carpenters, remodelers, electricians, plumbers, maintenance staff, landlords, property managers, etc. The notice is a special HUD/EPA pamphlet. There are also documentation and

record-keeping requirements. Not all contractors who do work on lead paint in Oregon need to be licensed by the Health Division as lead-abatement contractors, but all contractors are subject to Section 406.

Guidance and required owner/occupant EPA (Environmental Protection Agency) pamphlets and acknowledgment forms for contractors are available on line at <http://www.hud.gov/lea/leapame.pdf>, the HUD Web site, or <http://www.epa.gov/lead/leadrenf.htm>, the EPA Web site. Free materials can be obtained by calling (800) 424-LEAD (5323). ■

Board reappointment



John W. "Bill" Eames III was reappointed to the Manufactured Structures and Parks Advisory Board effective July 1, 2000, for a four-year term. Mr. Eames occupies the accessory structures manufacturer/sales position. ■

Correction

The November/December 2000 issue of CodeLink incorrectly showed the violation by Frank W. Wagner dba Wagner Electric as no supervising, journeyman, or limited residential license. The violation was allowing an unlicensed individual to make an electrical installation. ■

Board meeting dates

Sun	Mon
1	2
8	9

ELECTRICAL & ELEVATOR BOARD _____

Meets at 9:30 a.m. on the fourth Thursday of each month:

- January 25
- February 22

BUILDING CODES STRUCTURES BOARD _____

Meets at 9 a.m. on the first Wednesday of each month:

- February 7
- March 7

MANUFACTURED STRUCTURES & PARKS ADVISORY BOARD _____

Meets at 9:30 a.m. on the second Thursday of each quarter:

- January 11

STATE PLUMBING BOARD _____

Meets at 9 a.m. on the third Friday of every other month:

- February 16

BOARD OF BOILER RULES _____

Meets at 9:30 a.m. on the first Tuesday of each quarter:

- March 6

MEETINGS ARE HELD IN THE SALEM BCD CONFERENCE ROOM AT 1535 EDGEWATER ST. NW.

TRI-COUNTY BUILDING INDUSTRY SERVICE BOARD

Meets at 9:30 a.m. on the second Wednesday of each month:

- January 10
- February 14

THE TRI-COUNTY BOARD MEETS AT 123 NE 3rd AVE. PORTLAND.



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BCD Web site



BCD has a new “user-friendly” Web site. The address is: www.oregonbcd.org/

The old address also works. ■

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