Chapter 16.24
CRITICAL AQUIFER RECHARGE AREAS

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16.24.010 Coordination with public works department.

The director(s) shall consult with the public works department when administering this chapter. (Ord. 1070 § 2, 2004).

16.24.020 Designation and susceptibility rating.

A. The city of Bonney Lake Wellhead Protection and Monitoring Program Phase II, dated November 2000, identifies a one-year time-of-travel zone around all of the city’s wells. Outside that circle it identifies a five-year time-of-travel zone. Outside that it identifies a 10-year time-of-travel zone. The time-of-travel zones also appear in the city’s geographic information system. Maps thereof are available from the director(s). The city may update said maps as new scientific data become available without revising this code.

B. The city rates the one-year time-of-travel zones as having very high groundwater recharge (contamination) susceptibility, the five-year time-of-travel zones as having high susceptibility, and the 10-year time-of-travel zone as having moderate to low susceptibility.

C. The city hereby designates the one-year, five-year, and 10-year time-of-travel wellhead protection zones as critical aquifer recharge areas. This chapter’s requirements shall apply equally to all time-of-travel zones unless stated otherwise. (Ord. 1070 § 2, 2004).


In addition to the exemptions in BLMC 16.20.070, the following developments or materials shall be exempt from this chapter:

A. Construction of noncommercial structures, improvements, and additions of less than 2,500 square feet total site impervious surface area that do not increase risk from hazardous substances.

B. Development of parks, recreation facilities, or conservation areas that do not increase risk from hazardous substances.
C. Tree removal.

D. Hazardous materials in properly functioning and sealed units or containers.

E. Hazardous materials of less than 20 gallons or less than 200 pounds stored or used on premises.

F. Fuel oil in existing home heating systems.

G. Hazardous materials that may be used for treatment of the city's water supply.

H. Fueling of equipment that will not be traveling on city streets. (Ord. 1070 § 2, 2004).

**16.24.040 Hydrogeologic assessments – Level 1.**

In addition to the requirements of BLMC 16.20.090, critical area reports for critical aquifer recharge areas shall include a hydrogeologic assessment. Level 1 (simpler) hydrogeologic assessment shall contain at a minimum:

A. Available information regarding geology and hydrogeology of the site, including permeability of the unsaturated zone;

B. Groundwater depth, flow direction, and gradient based on available information;

C. Available data on wells and springs within 1,300 feet;

D. Location of other critical areas, including surface waters, within 1,300 feet; and

E. Best management practices proposed to be utilized. (Ord. 1070 § 2, 2004).

**16.24.050 Hydrogeologic assessments – Level 2.**

A. In addition to Level 1, a Level 2 hydrogeologic assessment shall be prepared for:

   1. Activities that divert, alter, or reduce the flow of surface or groundwaters, or otherwise reduce the recharging of the aquifer;

   2. The use of hazardous substances other than household chemicals used according to the directions specified on the packaging;

   3. Injection wells; and

   4. Any other activity determined by the director(s) likely to have an adverse impact on groundwater quality or quantity.

B. Level 2 hydrogeologic assessments shall contain at a minimum:

   1. Historic water quality data for the area to be affected by the proposed development;

   2. Groundwater monitoring plan;

   3. Potential effects on water quality and quantity of nearby wells and water bodies; and
4. Analysis of equipment or structures that could fail and regular inspection, repair, and replacement necessary to prevent failure. (Ord. 1070 § 2, 2004).

16.24.060 Substantive requirements.

In addition to the substantive requirements of BLMC 16.20.130, the substantive requirements contained in BLMC 16.24.060 through 16.24.100 shall apply to critical aquifer recharge areas.

A. Proposed developments shall not cause contaminants to enter the aquifer or significantly reduce the recharging of the aquifer, and shall comply with the water source protection requirements and recommendations of the U.S. Environmental Protection Agency, Washington State Department of Health, and county health department.

B. Above ground facilities for storing hazardous substances shall be designed to prevent accidental release, shall have a primary containment enclosing or underlying the tank, and shall have a secondary containment built into the tank structure or consisting of an external dike.

C. Vehicle repair and servicing shall be conducted over impermeable pads, within a covered structure capable of normal weather conditions. Chemicals shall be stored in a manner that protects them from weather and provides containment should leaks occur. Dry wells are prohibited.

D. Application of household pesticides, herbicides, and fertilizers shall not exceed times and rates specified on the packaging.

E. Surface percolation or injection of reclaimed water shall conform to adopted water or sewer comprehensive plans, RCW 90.46.010(10), 90.46.042, and 90.46.080(1).

F. Infiltration of stormwater consistent with Volume V, Section 3.3 of the 2001 Stormwater Management Manual for Western Washington shall be incorporated to the maximum extent possible to recharge the aquifer.

G. Floor drains shall not drain to the stormwater system and shall conform to the Uniform Plumbing Code (UPC) Section 303.

H. Roof venting carrying contaminants shall be pretreated as described in the UPC Section 304(b).

I. Nonresidential vehicle washing shall be either self-contained or pretreated then discharged to the city’s sanitary sewer system, with city permission. This use shall meet UPC Sections 708 and 711 requirements.

J. Where appropriate, activities shall utilize integrated pest management practices for pest control and best management practices for fertilizing as described by the Washington State University/Pierce County Cooperative Extension.

K. For new uses served by on-site septic systems, nitrate levels at the down-gradient property line shall not exceed 2.5 mg/L.

L. The city may require emergency measures as necessary to protect aquifer water quantity or quality.
M. The uses listed below shall be conditioned as necessary to protect critical aquifer recharge areas in accordance with the applicable state and federal regulations.

### Statutes, Regulations, and Guidance Regarding Groundwater-Impacting Activities

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(Ord. 1070 § 2, 2004).

16.24.070 Uses prohibited from critical aquifer recharge areas.

The following activities and uses are prohibited in critical aquifer recharge areas (based on “Guidance Document for the Establishment of Critical Aquifer Recharge Area Ordinances,” by WDOE, Publication #97-30):

A. Landfills and solid waste transfer stations, including landfills for hazardous waste, municipal solid waste, special waste, wood waste, and inert and demolition waste;

B. Underground injection wells: Class I, III, and IV wells and subclasses 5F01, 5D03, 5F04, 5W09, 5W10, 5W11, 5W31, 5X13, 5X14, 5X15, 5W20, 5X28, and 5N24 of Class V wells;

C. Mining of metals, hard rock, sand, and gravel;

D. Wood treatment facilities that allow any portion of the treatment process to occur over permeable surfaces;

E. Creosote or asphalt manufacturing;

F. Storage, processing, or disposal of hazardous, chemical, or radioactive substances;

G. Electroplating;

H. Class 1A or 1B flammable liquids manufacturing as defined by the Uniform Fire Code;

I. Conversion of heating systems to fuel oil;

J. New petroleum product pipelines;

K. Activities that would significantly reduce the recharge to aquifers currently or potentially used for potable water; and

L. Activities that would significantly reduce base flow to a regulated stream. (Ord. 1070 § 2, 2004).

16.24.080 Substantive requirements for existing underground storage tanks.

A. Existing underground facilities for storing hazardous substances shall prevent releases and shall be upgraded to meet the requirements for a new underground storage facility if they leak a product.

B. Existing underground storage facilities in a one-year time-of-travel zone which store regulated substances shall comply with this title’s requirements for the construction and monitoring of new underground storage facilities by July 1, 2004.
C. Owners of existing underground storage facilities which store regulated substances in a five-year or 10-year time-of-travel zone shall implement a monitoring system by July 1, 2004. The system shall be designed to detect unauthorized releases within 72 hours. The director(s) shall specify the details of the monitoring system. Whenever possible, monitoring other than groundwater monitoring shall be performed at least weekly. The director(s) shall require the closure of the any underground storage facility which is not monitored per this subsection. The monitoring system shall be designed to determine containment ability and detect unauthorized releases by:

1. Visual monitoring;
2. Tank tightness testing and inventory reconciliation controls;
3. Testing or monitoring for vapors in the surrounding soil;
4. Monitoring for releases collecting in a secondary or interception barrier provided the nearby soil and backfill are first tested for presence of the regulated substance or interfering constituents;
5. Automatic monitoring of product level and automatic inventory reconciliation;
6. Groundwater monitoring; and/or
7. Other methods approved by the department. (Ord. 1070 § 2, 2004).

16.24.090 Substantive requirements for new underground storage tanks.

A. New underground storage facilities used for the storage of regulated substances shall have primary and secondary levels of containment.

B. Primary containers shall be product-tight and shall be installed in accordance with applicable sections of Article 79 of the Uniform Fire Code.

C. Secondary containers shall be designed to withstand contact with released hazardous substance long enough to allow detection and removal of the unauthorized release.

D. If a secondary container comes into contact with a hazardous substance, it shall be replaced if necessary to guarantee continued compliance with subsection C of this section.

E. The secondary container shall be able to contain 100 percent of the volume of the primary container. If the secondary container serves multiple primary containers, the secondary container shall shall be able to contain 150 percent of the volume of the largest primary container or 10 percent of the aggregate volume of all primary containers, whichever is greater.

F. If the secondary container is open to rainfall, it shall be able to contain the volume of precipitation which could enter the secondary container during a 24-hour, 100-year storm in addition to the volume of hazardous substance storage required in subsection E of this section.

G. The volumetric requirements for the pore space of a granular material placed in the secondary container as backfill for the primary container shall be equal to or greater than that required in subsection E of this section. The available pore space in the secondary container backfill shall be
determined using appropriate engineering methods and safety factors and shall consider the specific retention and specific yield of the backfill material, the location of the primary container within the secondary container, and the proposed method of operation for the secondary container.

H. The secondary container shall be equipped with a collection system to accumulate, store, and permit removal of any precipitation, subsurface infiltration, or hazardous substance released from the primary container.

I. Laminations or coatings of the primary container shall not obviate the requirement for a secondary container.

J. Primary containers and double-walled underground storage tanks subject to flotation shall be weighted or anchored using methods specified by the manufacturer or, if none exist, best engineering judgment.

K. New primary containers and double-walled underground storage tanks shall conform to the following.

1. Cathodically protected steel underground storage tanks, steel underground storage tanks clad with glass fiber reinforced plastic, and glass fiber plastic underground storage tanks shall be designed to standards developed by a nationally recognized independent testing organization or be listed by the testing organization.

2. Underground storage tanks shall be tested by the manufacturer or an independent testing organization for durability and chemical compatibility with the regulated substances to be stored using recognized engineering practices.

3. Except for steel underground storage tanks, a wear plate (striker plate) shall be centered under all accessible openings of the underground storage tank. The plate shall be constructed of steel or, if the steel is not compatible with the regulated substance stored, a material resistant to the stored regulated substance. The width of the plate shall be at least nine inches wide and have an area of one square foot or be equal to the area of the accessible opening or guide tube, whichever is larger. The thickness of the steel plate shall be at least 0.053 inch (1.35 mm), and those constructed of other materials (as required) shall be of sufficient thickness to provide equivalent protection. The plate shall be rolled to the contours of underground storage tank and bonded or seam welded in place.

4. Single-walled primary containers of steel and the outer surface of double-walled underground storage tanks constructed of steel which are not clad with glass fiber reinforced plastic shall be protected by a properly installed, maintained, and monitored cathodic protection system with a certification listing by a nationally recognized independent testing organization or certification by a registered corrosion engineer or a National Association of Corrosion Engineers (NACE) accredited corrosion specialist taking into account the corrosion history of the area.

Underground storage tanks with listed corrosion resistant materials, nonmetallic glass fiber reinforced plastic coatings, composites, or equivalent systems shall be tested immediately prior to installation. The protection system shall be inspected under the direction of a registered corrosion engineer or NACE corrosion specialist at the frequency specified in the certification or
in accordance with the schedule prescribed by the system designer, but not less than annually. Underground storage tanks in a vault and not backfilled are exempted from this subsection.

5. Primary containers and double-walled underground storage tanks shall be installed according to the manufacturer’s written recommendations or, if no written recommendations exist, best engineering practice.

6. Underground storage tanks shall be tested before being put into service in accordance with the applicable sections of the code under which they were built. The ASME code stamp or listing mark of Underwriters Laboratories, Incorporated (UL), or any other nationally recognized independent testing organization, shall be evidence of compliance with this requirement.

7. Before being covered, enclosed, or placed in use, all underground storage tanks and piping shall be tested for tightness hydrostatically or with air pressure at not less than three pounds per square inch and not more than five pounds per square inch. Pressure piping shall be hydrostatically tested to 150 percent of the maximum anticipated pressure of the system, or pneumatically tested to 110 percent of the maximum anticipated pressure of the system, but not less than five pounds per square inch gauge at the highest point of the system. This test shall be maintained for a sufficient time to complete visual inspection of all joints and connections, but for at least 10 minutes. In lieu of the above, a test using accepted engineering practices shall be used. Double-walled underground storage tanks are exempt from the requirements of this section; provided, that the annular space is monitored using either pressure or vacuum testing.

8. Underground storage tanks shall be equipped with a spill catchment basin which surrounds the fill pipe and prevents the inflow of the hazardous substance into the subsurface environment. Underground storage tanks shall also be equipped with either a level sensing device that continuously monitors and indicates the liquid level in the underground storage tank; an audible/visual alarm system triggered by a liquid level sensor to alert the operator of an impending overfill condition; or an automatic shut-off device that stops the flow of product being delivered to the underground storage tank when the underground storage tank is full.

L. Secondary containers including leak interception and detection systems shall conform to the following:

1. The secondary container shall, at a minimum, encompass the area within the system of vertical planes surrounding the exterior of the primary containment unit. If backfill is placed between the primary and secondary containment, then an evaluation shall be made of the maximum lateral spread of a point leak from the primary containment over the vertical distance between the primary and secondary containment. The secondary containment shall extend an additional distance beyond the vertical planes described above equal to the radius of lateral spread plus one foot.

2. The secondary container must be capable of precluding the inflow of the highest groundwater anticipated during the life of the underground storage tank into the space between the primary and secondary containers.
3. If the space between the primary and secondary containers is backfilled, the backfill material shall not preclude the vertical movement of leakage from any part of the primary container.

4. The secondary container and any backfill material between the primary and secondary containers shall be designed and constructed to promote gravity drainage of a leak of regulated substances from any part of the primary container to the monitoring location(s).

5. Two or more primary containers shall not utilize the same secondary container if the primary containers store materials that in combination may cause a fire or explosion; or the production of a flammable, toxic, or poisonous gas; or the deterioration of a primary or secondary container.

6. Drainage of liquid from within a secondary container shall be controlled in a manner approved by the director(s) so as to prevent regulated materials from being discharged. The liquid shall be analyzed to determine the presence of any of the regulated substance(s) stored in the primary container prior to initial removal and monthly thereafter for any continuous discharge (removal) to determine the appropriate method for final disposal. The liquid shall be sampled and analyzed immediately upon an indication of an unauthorized release from the primary container.

7. For primary containers installed completely beneath the ground surface, the original excavation for the secondary container shall have a watertight cover which extends at least one foot beyond each boundary of the original excavation. This cover shall be asphalt, reinforced concrete, or equivalent material which is sloped to drainways leading away from the excavation. Access openings shall be constructed as watertight as practical. Double-walled underground storage tanks and open vaults are exempt from the requirements of this subsection.

8. The location of underground storage tanks and piping systems shall be indicated on as-built drawings with copies submitted to the director(s).

9. The floor of the secondary container shall be constructed on a firm base and, if necessary for monitoring, shall be sloped to a collection sump. One or more access casings shall be installed in the sump and sized to allow removal of collected liquid. The access casing shall extend to the ground surface, be perforated in the region of the sump, and covered with a locked waterproof cap. If this access casing is within a secured facility, the requirements for a locked cap may be waived by the director(s). The casing shall be thick enough to withstand all anticipated stresses with appropriate engineering safety factors and constructed of materials that will not be structurally weakened by the stored hazardous substance and will not donate, capture, or mask constituents for which analyses will be made.

10. Secondary containment utilizing membrane liners shall conform to the following:

   a. The membrane liner shall have a permeability factor of 0.25 ounces per square foot per 24 hours or less. Such permeability shall constitute the maximum rate of transport over time of the hazardous substance proposed for storage. Permeability shall be evaluated according to accepted engineering practices for materials testing.

   b. The membrane liner shall be certified using accepted engineering practices as being in conformance with the following:
i. The volume swell after a 24-hour period of immersion in the stored hazardous substance shall not exceed three percent of the original liner membrane material thickness.

ii. The maximum change in elongation of the liner membrane material at break after 24 hours of immersion in the stored hazardous substance shall not exceed two percent of the original elongation.

iii. The liner membrane material hardness (brittleness) after 24 hours of immersion in the regulated substance shall be within five percent of the original hardness.

iv. For a containment test, the rate of transport through the liner membrane material of the regulated substance after a period of 24 hours shall not exceed six percent by weight of the regulated substance being tested. The liquid height for the test shall be no greater than that expected in actual site conditions.

v. The rate of solubility of the liner membrane material in the regulated substance for a period of 24 hours shall not exceed one-tenth of one percent by weight of the section of liner being tested.

vi. The liner seam strength shall be equal to the tensile strength of the parent material when tested in accordance with accepted engineering practices for materials tested.

vii. The liner shall be installed under the supervision of a representative of the membrane liner fabricator or a contractor certified by such fabricator.

viii. The excavation base and walls for the synthetic liner shall be prepared to the liner fabricator’s specifications and shall be firm, smooth, and free of any sharp objects or protrusions.

ix. The design of double-walled underground storage tanks shall allow for monitoring of the annular space.

x. “Sticking” the annular space of a double-walled underground storage tank as a monitoring method shall not be allowed unless a strike plate or other approved devices used to protect the underground storage tank are located directly under the monitoring opening.

xi. The double-walled underground storage tank shall be so designed and installed that any loss of hazardous substance from the primary container will drain to a specific location within the annular space, as required, to be detected by a monitoring device or method.

xii. Any special accessories, fitting, coating, or lining not inherent within the initial design of the primary container or double-walled underground storage tank shall be approved by a nationally recognized, independent testing organization or a demonstration of integrity with the primary container or double-walled underground storage tank shall be required.
M. The owners of new underground storage facilities shall implement a monitoring program that is approved by the director(s). The monitoring shall be visual unless the director(s) determines this to be unfeasible. Monitoring programs shall specify, when applicable:

1. Frequency of monitoring;
2. Methods and equipment to be used;
3. Location(s) where the monitoring will be performed; and
4. Name(s) or title(s) of the person(s) responsible for monitoring and/or maintaining the equipment, and the reporting format.

N. The permit applicant shall develop a response plan which demonstrates to the satisfaction of the director(s) that any unauthorized release will be removed from the secondary container within the shortest possible time and no longer than the time consistent with the ability of the secondary container to contain the regulated substance. The response plan shall include:

1. A description of the proposed methods and equipment to be used for removing the hazardous substance, including the location and availability of the required equipment, if not permanently on-site, and an equipment maintenance schedule for the equipment located on-site.
2. The name(s) or title(s) of the person(s) responsible for authorizing the work to be performed.
(Ord. 1070 § 2, 2004).

16.24.100 Reporting of unauthorized releases.

A. This subsection shall apply if the storage facility was installed in compliance with this chapter (not pre-existing), and the unauthorized release was caught by the secondary container, and the leak detection monitoring system in the space between the primary and secondary containers can be reactivated within eight hours.

1. The operator shall record the release on the monitoring reports.

2. The operator shall report the release to the director(s) within five days. The report shall include:
   a. Type, quantities, and concentration of hazardous substances released;
   b. Method of cleanup;
   c. Method and location of disposal of the released hazardous substances;
   d. Method of future leak prevention or repair. If this involves a change in operation, monitoring or management, then a new permit shall be applied for; and
   e. If the primary container is to continue to be used, a description of how the monitoring system between the primary and secondary container has been reactivated.

3. The director(s) shall review the unauthorized release report, shall review the permit, and may inspect the underground storage facility.
4. The director(s) shall either find that containment and monitoring requirements can continue to be achieved or revoke the permit, understanding that deterioration of the secondary container is likely when the secondary container has lost integrity due to contact with the stored hazardous substances, or the mechanical or chemical clean-up of the released hazardous substance has damaged the secondary container.

B. This subsection shall apply to all other unauthorized releases.

1. The operator shall notify the director(s) within 24 hours after the release has been, or should have been, detected under the monitoring program.

2. Within five working days of detecting the release, the operator or permittee shall submit to the director(s) a report including:

   a. Type, quantity, and concentration of regulated substances released;

   b. As far as is known, the extent of soil, groundwater, or surface water contamination;

   c. Method and approximate cost of cleanup to date, and proposed cleanup actions;

   d. Method and location of disposal of the released regulated substance and any contaminated soils or groundwater or surface water; and

   e. Proposed method of repair or replacement of the primary and secondary containers.

3. Until cleanup is complete, the operator shall submit at least monthly reports to the director(s) including the above information. (Ord. 1070 § 2, 2004).

The Bonney Lake Municipal Code is current through Ordinance 1474, passed December 10, 2013.

Disclaimer: The City Clerk's Office has the official version of the Bonney Lake Municipal Code. Users should contact the City Clerk's Office for ordinances passed subsequent to the ordinance cited above.