

**DRINKING WATER PROTECTION OVERLAY ZONE (/DWP-RCP)  
RURAL COMPREHENSIVE PLAN**

**16.298 Drinking Water Protection Overlay Zone (/DWP-RCP).**

(1) General. The regulations that apply to property subject to this Drinking Water Protection (DWP) Overlay Zone are in addition to those of the underlying zoning districts and regulations of Lane Code. Where the regulations and permitted uses of an underlying zone conflict with those of this overlay zone, the more restrictive standards shall apply.

(2) Purpose. It is the purpose of this overlay zoning to promote the public health, safety, and general welfare of the residents of Lane County by minimizing public and private losses due to the contamination of drinking water sources. The specific goals of LC 16.298 are to:

(a) Protect surface and ground waters that provide drinking water to Lane County residents.

(b) Protect human life and health.

(c) Ensure that the public is provided with sustainable sources of safe potable water.

(d) Minimize expenditure of public money for pollution remediation projects.

(e) Minimize interruptions to business and commerce.

(3) Definitions. Unless specifically defined in LC 16.298(3), words or phrases used in LC 16.298 shall have the meanings provided in Lane Code 16.090.

Dense Non-Aqueous Phase Liquid (DNAPL). A dense non-aqueous phase liquid is an organic liquid that is denser than water and does not dissolve or mix easily in water (it is immiscible). In the presence of water it forms a separate phase from the water.

Development. For the purposes of LC 16.298, development shall mean the carrying out of any construction, reconstruction or alteration of a structure, installation of a new septic system or grading of land.

Hazardous Materials. Substances defined as such in any of the following:

(a) Hazardous waste as defined in ORS 466.005(7).

(b) Toxic substances as defined in ORS 465.003(9).

(c) Any substance defined as a hazardous substance pursuant to section 101(14) of the federal Comprehensive Environmental Response, Compensation and Liability Act, P.L. 96-510, as amended.

(d) Oil as defined in ORS 465.200(19).

(e) Any substance that meets the criteria established pursuant to ORS 465.400.

Ordinary High Water Level. The high water level is defined as that high level of a river, stream, lake or reservoir, which is attained during mean annual flood. It does not include levels attained during exceptional or catastrophic floods. It is often identifiable by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in character in the soil, destruction or absence of vegetation not adapted for life in saturated soils or the presence of flotsam and debris. In the absence of identifying physical characteristics, ordinary high water may be determined by step backwater analysis using a two-year frequency flood as determined by the US Army Corps of Engineers.

Primary Containment. A tank, pit, container or vessel of first containment of liquid or chemical.

Removal of Vegetation. The act of removing or fact of being removed by a person: i.e., to cut, thin or trim vegetation or to chemically treat vegetation which results in the loss of growth or health or the death of vegetation; to mechanically or manually disrupt or dislodge the root structure of vegetation resulting in loss of growth or health or causing the death of vegetation.

Secondary Containment. A second tank, catchment pit or vessel that limits and contains liquid or chemical leaking or leaching from a primary containment area; monitoring and recovery are required.

Time-of-Travel Zone. A mapped area that geographically delineates the amount of time it takes groundwater to flow within an aquifer to a given well.

(4) Designation of Drinking Water Source Areas. This Drinking Water Protection Overlay Zone is comprised of two separate regulatory elements, which contain different standards and requirements related to the protection of either surface water source areas or groundwater source areas. The location of the protected surface and groundwater source areas are generally depicted on the Official Drinking Water Protection Overlay Zone Map for Lane County and are further described below:

(a) Surface Water Source Protection Areas: Include the areas adjacent to rivers, streams, lakes or reservoirs that serve as a source of public drinking water, or which are tributaries to a source of public drinking water. These areas extend inland 200 feet, measured perpendicularly, from the ordinary high water level of the source of public drinking water and from any tributary to a source of public drinking water. The Official Drinking Water Protection Overlay Zone Map identifies the surface waters to which these protection areas apply but does not depict the precise location of the ordinary high water level. Where development or vegetation removal is proposed near a surface water protection area, Lane County may require that a site visit be conducted by staff to delineate and monument the location of the ordinary high water level and the boundary of the surface water protection area on a property by property basis.

(b) Groundwater Source Protection Areas: Include the surface and subsurface area surrounding any water well, spring, or well field supplying a public water system through which contaminants have a potential to move toward and reach that water well, spring, or well field. Groundwater source areas include two separate protection zones:

Zone A: Include areas located within a time-of-travel zones of less than two (<2) years.

Zone B: Include areas within a time of travel zone between 2 and 20 years.

The locations of Zone A and Zone B for each wellhead are shown on the Official Drinking Water Protection Overlay Zone Map for Lane County. Where the scale of the Official Drinking Water Protection Overlay Zone Map is insufficient to determine the precise boundary locations of Zone A or Zone B in relation to parcel boundaries, the digital ground water source protection area data contained in the Lane County Geographic Information System may be used in conjunction with the county maintained digital parcel data and considered an authoritative source.

(5) Request for Groundwater Source Protection Area Boundary Rezonings. A property owner may request that the boundaries of the mapped Groundwater Source Protection Areas (Zone A and/or Zone B) be modified if those boundaries are believed to be incorrectly mapped. Such modifications would constitute a rezoning of the property and shall;

(a) Be processed in accordance with Lane Code 16.252.

(b) Be accompanied by a letter and recertified source water assessment report from the Oregon Department of Human Services - Drinking Water

Program (DHS), which clearly indicates that the boundaries of the source water area in question have been modified and officially recertified by DHS under the Administrative Rules that apply to Oregon's EPA-approved Drinking Water Protection Program.

(6) Surface Water Protection Requirements. The following standards shall apply within Surface Water Protections Areas:

(a) New development is prohibited except for the following uses provided alteration and disturbances are kept to a minimum and native vegetation is used to replant disturbed areas after construction:

(i) Development that is appurtenant to the production, supply, distribution, treatment, or storage of water by a public water supplier.

(ii) Public roads, main-line utilities and trails.

(iii) Private roads and driveways necessary to access buildable portions of a parcel where no alternative location is feasible.

(iv) Culverts, ditches and other stormwater management improvements carried out as a component of Lane County's stormwater management program.

(v) Wells and irrigation pumps, which may be housed in structures no larger than 25 square feet.

(vi) Replacement of existing structures provided a replacement location outside of the Surface Water Protections Area does not exist on the lot or parcel and the replaced structure is set back as far away as possible from the drinking water source or tributary to the drinking water source based on a consideration of site characteristics, including but not limited to topography, road and property line setback. Applications for replacement of existing structures within Surface Water Protection Areas shall be reviewed as ministerial land use decisions.

(vii) Water dependent uses on publically owned land.

(viii) Development on public land carried out as part of an approved parks and open space plan.

(ix) Additions or alterations of existing lawfully established structures, including decks, stairs and landings attached to the structure, which do not cumulatively expand the footprint of the structure beyond 25% of its size on the date LC 16.298 becomes effective.

(x) Fish passage channels, culverts and other similar structural ecological enhancement improvements conducted by a watershed council or soil and water conservation district (SWCD), or conducted by a land trust or private land owner working in consultation with a watershed council or SWCD.

(b) Vegetation removal within Surface Water Protection Areas is prohibited except for the following uses and activities:

(i) Commercial forest practices regulated by the Oregon Forest Practices Act.

(ii) Removal of dead or diseased vegetation that poses a safety or health hazard, excluding removal of root wads, provided a certified arborist or licensed forester provides a statement to the Land Management Division documenting the need for such removals.

(iii) Removal of vegetation necessary for the maintenance or placement of permitted structural shoreline stabilization.

(iv) Normal and accepted farming practices other than buildings or structures occurring on land zoned for exclusive farm use.

(v) Ecological enhancement projects replanted with native vegetation and conducted by a watershed council or soil and water conservation district

(SWCD), or conducted by a land trust or private land owner working in consultation with a watershed council or SWCD.

(vi) Vegetation removal necessary to carry out development as permitted pursuant to LC 16.298(6)(a)

(vii) Maintenance of existing primary fuel breaks required by Lane Code. New fuel breaks are not permitted within Surface Water Protections Areas.

(viii) Right-of-way vegetation management conducted in conformance with LC 15.510.

(c) In addition to the development and vegetation removal standards of LC 16.298(6)(a) and (b), all new development within a Surface Water Protections Area shall also be subject to the Ground Water Protection requirements of LC 16.298(7)(a) and (b) for Zone A.

(d) Variances. For any existing lot or parcel that can be demonstrated to have been rendered not developable for a dwelling or for the primary use allowed in the base zone, by application of the LC 16.298(a) through (c), a variance to waive the applicable development restrictions may be applied for. Variances will be processed following the procedures outlined in LC 16.256(1)(a) and (b) and meeting the criteria of LC 16.256(2)(a) and (d) through (f) with additional findings of compliance addressing all of the following criteria:

(i) It can be demonstrated that the lot or parcel has been rendered undevelopable for a dwelling or for the primary use allowed in the base zone by the application of the LC 16.298(a) through (c). It shall be the burden of the property owner to demonstrate how application of LC 16.298(a) through (c) has rendered the lot or parcel undevelopable.

(ii) It can be demonstrated that the lot or parcel was lawfully created prior to the effective date of LC 16.298.

(iii) Approval of development under this provision must meet the following standards:

(aa) All development shall be located to the greatest degree possible outside of surface water protection areas.

(bb) The request shall be the minimum necessary to render the property developable.

(cc) Due to topography, parcel size or configuration, options for development outside of the surface water protection area are physically impossible.

(dd) The variance is not the result of a self-created hardship. After the effective date of LC 16.298, the reconfiguration of a lot or parcel as a result of a lot or property line adjustment, in whole or part within the setback area, shall be determined to be a self-created hardship by the creator and shall extend to subsequent property owners.

(ee) Vegetation disturbances shall be minimized and native vegetation shall be used to replant disturbed areas after construction.

(7) Ground Water Protection Requirements.

(a) Zone A Prohibited Uses. The following new uses shall be prohibited within Zone A of the DWP Overlay Zone:

(i) Storage, use, or production of hazardous materials, except as provided in LC 16.298 (7)(d).

(ii) Fueling facilities and automobile service stations, except as provided in LC 16.298 (7)(d).

(iii) Injection wells/dry wells/sumps except drywells for roof drainage.

(iv) Underground hazardous material storage facilities except those with spill, overfill, and corrosion protections in place.

(v) Disposal of hazardous materials.

(vi) Treatment of hazardous material, except remediation programs authorized by a government agency.

(vii) Disposal of septic sludge.

(viii) Automobile wrecking yards or activities, commercial or otherwise, that result in the accumulation of four or more non-operating vehicles.

(ix) Outside storage of eight or more nonfunctioning appliances.

(b) Any increases or alterations of non-conforming uses within Zone A as permitted under LC 16.251, must meet the requirements of LC 16.298(8). Non-conforming uses are uses otherwise prohibited by LC 16.298(7)(a)(i) that were in lawful existence on the date that LC 16.298 took effect.

(c) Zone B Requirements. New uses prohibited under LC 16.298(7)(a)(i) and LC 16.298(7)(a)(ii) may be conditionally permitted within Zone B provided the requirements of LC 16.298(8) are met. New uses identified in LC 16.298(7)(a)(iii) through (ix) are also prohibited within Zone B.

(d) Exemptions. The provisions of LC 16.298 do not exempt any material or use from requirements under the Oregon Fire Code. Except as otherwise provided by this section, the following activities and/or materials are exempt from LC 16.298(7):

(i) Use, storage and handling of specific hazardous materials that do not present a risk to the drinking water source, as determined and listed by the Planning Director. These materials may still need to be included on a Hazardous Material Inventory Statement as required by Fire Code. A Hazardous Material Exemption Request may be submitted to the Planning Director for hazardous materials that can be demonstrated to pose no threat to the drinking water source. These materials may be exempt from this regulation and added to the list of materials that do not pose a threat to the drinking water source. The demonstration of no threat is the responsibility of the applicant seeking the exemption and will be subject to a ministerial review by the Planning Director. The Planning Director shall notify and consult with the Department of Environmental Quality, the Oregon Department of Human Services - Drinking Water Program, the applicable water utility or water service supplier in the area and the Lane Pollution Prevention Coalition (P2C) prior to making a hazardous material exemption determination.

(ii) Hazardous materials offered for sale in their original containers of five (5) gallons or less. A Hazardous Material Exemption Request for original containers of greater than 5-gallons in size may be submitted to the Planning Director. These materials may be exempt from this regulation if an applicant can demonstrate that a larger size container does not pose a threat to the drinking water source. The Hazardous Material Exemption Request shall be reviewed by the Planning Director in the manner described in LC 16.298(7)(d)(i).

(iii) Hazardous materials in fuel tanks and fluid reservoirs attached to a private or commercial motor vehicle and used directly in the operation of that vehicle.

(iv) Hazardous materials in fuel tanks and fluid reservoirs attached to machinery, including but not limited to fuel, engine oil and coolant.

(v) Fuel oil used in existing heating systems.

(vi) Emergency use, storage and handling of hazardous materials by governmental organizations or non-governmental disaster relief organizations in the public interest.

(vii) Hazardous materials used and stored specifically for water treatment processes of public and private water systems

(viii) Hazardous materials contained in properly operating sealed units (transformers, refrigeration units, etc.) that are not opened as part of routine use.

(ix) Natural gas distribution lines.

(x) Any commonly used office supply, such as toner or cleaning supplies, where supplies are purchased off-site for use onsite.

(xi) Hazardous materials not already listed in this section used in association with Farm Practices as defined in ORS 30.930 in an Exclusive Farm Use Zone and Confined Animal Feeding Operations (CAFOs) as defined OAR 603-074-0010.

(xii) Pesticide use and storage specifically addressed by state preemption of local pesticide regulation under ORS 634.055 through 634.065.

(xiii) Hazardous material use in association with Forest activities conducted under the Forest Practices Act.

(xiv) Aggregate quantities equal to or less than 110 gallons of non-exempt hazardous materials, which are not dense non-aqueous phase liquids (DNAPLs).

(xv) Aggregate quantities greater than 110 gallons of non-exempt hazardous materials, for residential uses, rural home businesses or home occupations provided:

(aa) The hazardous materials are not dense non-aqueous phase liquids (DNAPLs).

(bb) The applicant submits a signed statement to Lane County asserting that all hazardous materials stored on site in excess of 110 gallons will be kept in a primary containment vessel and further protected within a secondary containment vessel and that the secondary containment vessel will be monitored regularly for leaks or other failures.

(8) Hazardous Material Special Use Permit - Director Review. Increases or alterations of non-conforming uses pursuant to LC 16.298(7)(b) and new uses pursuant to 16.298(7)(c) may be conditionally permitted provided a land use application is submitted pursuant to LC 14.050, processed according to LC 14.100, and approved by the Planning Director upon determination that the criteria of 16.298(8)(a)(i) through (viii) are met. The Planning Director shall condition any such approvals to ensure that the hazardous material management strategies identified LC 16.289(9) are carried out. Prior to issuing a hazardous material special use permit decision the Planning director shall notify and consult with the Department of Environmental Quality, the Oregon Department of Human Services - Drinking Water Program and the applicable water utility or water service supplier in the area.

(a) A hazardous material special use permit application must contain:

(i) A hazardous material inventory statement and, upon request from the Planning Director, a Material Safety Data Sheet (MSDS) for any hazardous materials to be used, stored or produced on site. Hazardous material weights shall be converted to volume measurement for purposes of determining amounts - 10 pounds shall be considered equal to 1 gallon.

(ii) A detailed description of the activities conducted at the facility that involve the storage, handling, treatment, use or production of hazardous materials.

(iii) A description of the primary and secondary containment devices proposed.

(iv) Spill reporting procedures, including a list of affected agencies and affected public water system(s) to be contacted in the event of a spill with current contact information for each agency.

(v) A description of procedures for inspection and maintenance of containment devices and emergency equipment; and

(vi) A description of procedures for disposition of unused hazardous materials or hazardous material waste products including the type of transport and proposed route.

(vii) A list of the chemicals to be monitored through the analysis of groundwater samples and a monitoring schedule if ground water monitoring is anticipated to be required under state or local government water quality permit, cleanup agreements, or other requirements.

(viii) The location of all operating, unused and abandoned wells on the property with documentation that all abandoned wells have been properly capped or sealed.

(b) Hazardous material special use permits shall expire five years after the date of issuance but may be renewed indefinitely. Renewal applications shall include updated information required pursuant to LC 16.298(8)(a)(i) through (viii).

(9) Hazardous Material Management Standards. Uses permitted pursuant to LC 16.298(8) shall meet the following standards:

(a) Storage, handling, treatment, use, production or otherwise keeping on premises hazardous materials shall be in compliance with containment and safety standards set by the Oregon Fire Code.

(b) All hazardous materials that pose a risk to a surface or ground water source shall be stored in areas with approved secondary containment in place (Oregon Fire Code Section 2704.2).

(c) Requirements found in the Oregon Fire Code Section 2704.2.2.5 for a monitoring program to detect hazardous materials in the secondary containment system shall be met for all amounts of non-exempt hazardous materials that pose a risk to a surface or ground water source.

(d) All spill reporting procedures and contact information described in LC 16.298(8)(iv) shall be updated annually and kept on premises.

(10) Agency Review. Decisions made by Lane County under LC 16.298 do not supersede the authority of the state or federal agencies which may regulate or have an interest in the activity in question. It is the responsibility of the landowner to ensure that any other necessary state or federal permits or clearances are obtained.

(11) Warning and Disclaimer of Liability. The degree of drinking water protection required by LC 16.298 is based on scientific and engineering considerations. These considerations include drinking water source area assessments certified by Oregon Department of Human Services, under the Oregon Administrative Rules that apply to Oregon's EPA-approved Drinking Water Protection Program, which inherently carry associated uncertainties. Any conclusions based on the exact boundaries of the surface or groundwater source areas shall therefore be considered estimates. Under no conditions should LC 16.298 be construed to guarantee the purity of the surface or ground waters or guarantee the prevention of contamination. Therefore, LC 16.298 shall not create liability on the part of the Lane County, or any Lane County personnel, for any

contamination that may result from reliance on LC 16.298 or any administrative decision made under LC 16.298.



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**16.298 Drinking Water Protection Overlay Zone (/DWP-RCP).**

(1) **General.** The regulations that apply to property subject to this Drinking Water Protection (DWP) Overlay Zone are in addition to those of the underlying zoning districts and regulations of Lane Code. Where the regulations and permitted uses of an underlying zone conflict with those of this overlay zone, the more restrictive standards shall apply.

(2) **Purpose.** It is the purpose of this overlay zoning to promote the public health, safety, and general welfare of the residents of Lane County by minimizing public and private losses due to the contamination of drinking water sources. The specific goals of LC 16.298 are to:

- (a) Protect surface and ground waters that provide drinking water to Lane County residents.
- (b) Protect human life and health.
- (c) Ensure that the public is provided with sustainable sources of safe potable water.
- (d) Minimize expenditure of public money for pollution remediation projects.
- (e) Minimize interruptions to business and commerce.

(3) **Definitions.** Unless specifically defined in LC 16.298(3), words or phrases used in LC 16.298 shall have the meanings provided in Lane Code 16.090.

**Dense Non-Aqueous Phase Liquid (DNAPL).** A dense non-aqueous phase liquid is an organic liquid that is denser than water and does not dissolve or mix easily in water (it is immiscible). In the presence of water it forms a separate phase from the water.

**Development.** For the purposes of LC 16.298, development shall mean the carrying out of any construction, reconstruction or alteration of a structure, installation of a new septic system or grading of land.

**Hazardous Materials.** Substances defined as such in any of the following:

- (a) Hazardous waste as defined in ORS 466.005(7).
- (b) Toxic substances as defined in ORS 465.003(9).
- (c) Any substance defined as a hazardous substance pursuant to section 101(14) of the federal Comprehensive Environmental Response, Compensation and Liability Act, P.L. 96-510, as amended.
- (d) Oil as defined in ORS 465.200(19).
- (e) Any substance that meets the criteria established pursuant to ORS 465.400.

**Ordinary High Water Level.** The high water level is defined as that high level of a river, stream, lake or reservoir, which is attained during mean annual flood. It does not include levels attained during exceptional or catastrophic floods. It is often identifiable by physical characteristics such as a clear natural line impressed on the bank, shelving, changes in character in the soil, destruction or absence of vegetation not adapted for life in saturated soils or the presence of flotsam and debris. In the absence of identifying physical characteristics, ordinary high water may be determined by step backwater analysis using a two-year frequency flood as determined by the US Army Corps of Engineers.

**Primary Containment.** A tank, pit, container or vessel of first containment of liquid or chemical.

**Removal of Vegetation.** The act of removing or fact of being removed by a person: i.e., to cut, thin or trim vegetation or to chemically treat vegetation which results in the loss of growth or health or the death of vegetation; to mechanically or manually disrupt or dislodge the root structure of vegetation resulting in loss of growth or health or causing the death of vegetation.

**Secondary Containment.** A second tank, catchment pit or vessel that limits and contains liquid or chemical leaking or leaching from a primary containment area; monitoring and recovery are required.

**Time-of-Travel Zone.** A mapped area that geographically delineates the amount of time it takes groundwater to flow within an aquifer to a given well.

(4) **Designation of Drinking Water Source Areas.** This Drinking Water Protection Overlay Zone is comprised of two separate regulatory elements, which contain different standards and requirements related to the protection of either surface water source areas or groundwater source areas. The location of the protected surface and groundwater source areas are generally depicted on the Official Drinking Water Protection Overlay Zone Map for Lane County and are further described below:

(a) **Surface Water Source Protection Areas:** Include the areas adjacent to rivers, streams, lakes or reservoirs that serve as a source of public drinking water, or which are tributaries to a source of public drinking water. These areas extend inland 200 feet, measured perpendicularly, from the ordinary high water level of the source of public drinking water and from any tributary to a source of public drinking water. The Official Drinking Water Protection Overlay Zone Map identifies the surface waters to which these protection areas apply but does not depict the precise location of the ordinary high water level. Where development or vegetation removal is proposed near a surface water protection area, Lane County may require that a site visit be conducted by staff to delineate and monument the location of the ordinary high water level and the boundary of the surface water protection area on a property by property basis.

(b) **Groundwater Source Protection Areas:** Include the surface and subsurface area surrounding any water well, spring, or well field supplying a public water system through which contaminants have a potential to move toward and reach that water well, spring, or well field. Groundwater source areas include two separate protection zones:

**Zone A:** Include areas located within a time-of-travel zones of less than two (<2) years.

**Zone B:** Include areas within a time of travel zone between 2 and 20 years.

The locations of Zone A and Zone B for each wellhead are shown on the Official Drinking Water Protection Overlay Zone Map for Lane County. Where the scale of the Official Drinking Water Protection Overlay Zone Map is insufficient to determine the precise boundary locations of Zone A or Zone B in relation to parcel boundaries, the digital ground water source protection area data contained in the Lane County Geographic Information System may be used in conjunction with the county maintained digital parcel data and considered an authoritative source.

(5) **Request for Groundwater Source Protection Area Boundary Rezonings.** A property owner may request that the boundaries of the mapped

Groundwater Source Protection Areas (Zone A and/or Zone B) be modified if those boundaries are believed to be incorrectly mapped. Such modifications would constitute a rezoning of the property and shall;

- (a) Be processed in accordance with Lane Code 16.252.
- (b) Be accompanied by a letter and recertified source water assessment report from the Oregon Department of Human Services - Drinking Water Program (DHS), which clearly indicates that the boundaries of the source water area in question have been modified and officially recertified by DHS under the Administrative Rules that apply to Oregon's EPA-approved Drinking Water Protection Program.

(6) Surface Water Protection Requirements. The following standards shall apply within Surface Water Protections Areas:

(a) New development is prohibited except for the following uses provided alteration and disturbances are kept to a minimum and native vegetation is used to replant disturbed areas after construction:

(i) Development that is appurtenant to the production, supply, distribution, treatment, or storage of water by a public water supplier.

(ii) Public roads, main-line utilities and trails.

(iii) Private roads and driveways necessary to access buildable portions of a parcel where no alternative location is feasible.

(iv) Culverts, ditches and other stormwater management improvements carried out as a component of Lane County's stormwater management program.

(v) Wells and irrigation pumps, which may be housed in structures no larger than 25 square feet.

(vi) Replacement of existing structures provided a replacement location outside of the Surface Water Protections Area does not exist on the lot or parcel and the replaced structure is set back as far away as possible from the drinking water source or tributary to the drinking water source based on a consideration of site characteristics, including but not limited to topography, road and property line setback. Applications for replacement of existing structures within Surface Water Protection Areas shall be reviewed as ministerial land use decisions.

(vii) Water dependent uses on publically owned land.

(viii) Development on public land carried out as part of an approved parks and open space plan.

(ix) Additions or alterations of existing lawfully established structures, including decks, stairs and landings attached to the structure, which do not cumulatively expand the footprint of the structure beyond 25% of its size on the date LC 16.298 becomes effective.

(x) Fish passage channels, culverts and other similar structural ecological enhancement improvements conducted by a watershed council or soil and water conservation district (SWCD), or conducted by a land trust or private land owner working in consultation with a watershed council or SWCD.

(b) Vegetation removal within Surface Water Protection Areas is prohibited except for the following uses and activities:

(i) Commercial forest practices regulated by the Oregon Forest Practices Act.

(ii) Removal of dead or diseased vegetation that poses a safety or health hazard, excluding removal of root wads, provided a certified arborist or licensed forester provides a statement to the Land Management Division documenting the need for such removals.

(iii) Removal of vegetation necessary for the maintenance or placement of permitted structural shoreline stabilization.

(iv) Normal and accepted farming practices other than buildings or structures occurring on land zoned for exclusive farm use.

(v) Ecological enhancement projects replanted with native vegetation and conducted by a watershed council or soil and water conservation district (SWCD), or conducted by a land trust or private land owner working in consultation with a watershed council or SWCD.

(vi) Vegetation removal necessary to carry out development as permitted pursuant to LC 16.298(6)(a)

(vii) Maintenance of existing primary fuel breaks required by Lane Code. New fuel breaks are not permitted within Surface Water Protections Areas.

(viii) Right-of-way vegetation management conducted in conformance with LC 15.510.

(c) In addition to the development and vegetation removal standards of LC 16.298(6)(a) and (b), all new development within a Surface Water Protections Area shall also be subject to the Ground Water Protection requirements of LC 16.298(7)(a) and (b) for Zone A.

(d) Variances. For any existing lot or parcel that can be demonstrated to have been rendered not developable for a dwelling or for the primary use allowed in the base zone, by application of the LC 16.298(a) through (c), a variance to waive the applicable development restrictions may be applied for. Variances will be processed following the procedures outlined in LC 16.256(1)(a) and (h) and meeting the criteria of LC 16.256(2)(a) and (d) through (f) with additional findings of compliance addressing all of the following criteria:

(i) It can be demonstrated that the lot or parcel has been rendered undevelopable for a dwelling or for the primary use allowed in the base zone by the application of the LC 16.298(a) through (c). It shall be the burden of the property owner to demonstrate how application of LC 16.298(a) through (c) has rendered the lot or parcel undevelopable.

(ii) It can be demonstrated that the lot or parcel was lawfully created prior to the effective date of LC 16.298.

(iii) Approval of development under this provision must meet the following standards:

(aa) All development shall be located to the greatest degree possible outside of surface water protection areas.

(bb) The request shall be the minimum necessary to render the property developable.

(cc) Due to topography, parcel size or configuration, options for development outside of the surface water protection area are physically impossible.

(dd) The variance is not the result of a self-created hardship. After the effective date of LC 16.298, the reconfiguration of a lot or parcel as a result of a lot or property line adjustment, in whole or part within the setback

area, shall be determined to be a self-created hardship by the creator and shall extend to subsequent property owners.

(ee) Vegetation disturbances shall be minimized and native vegetation shall be used to replant disturbed areas after construction.

**(7) Ground Water Protection Requirements.**

**(a) Zone A Prohibited Uses.** The following new uses shall be prohibited within Zone A of the DWP Overlay Zone:

(i) Storage, use, or production of hazardous materials, except as provided in LC 16.298 (7)(d).

(ii) Fueling facilities and automobile service stations, except as provided in LC 16.298 (7)(d).

(iii) Injection wells/dry wells/sumps except drywells for roof drainage.

(iv) Underground hazardous material storage facilities except those with spill, overfill, and corrosion protections in place.

(v) Disposal of hazardous materials.

(vi) Treatment of hazardous material, except remediation programs authorized by a government agency.

(vii) Disposal of septic sludge.

(viii) Automobile wrecking yards or activities, commercial or otherwise, that result in the accumulation of four or more non-operating vehicles.

(ix) Outside storage of eight or more nonfunctioning appliances.

(b) Any increases or alterations of non-conforming uses within Zone A as permitted under LC 16.251, must meet the requirements of LC 16.298(8). Non-conforming uses are uses otherwise prohibited by LC 16.298(7)(a)(i) that were in lawful existence on the date that LC 16.298 took effect.

(c) **Zone B Requirements.** New uses prohibited under LC 16.298(7)(a)(i) and LC 16.298(7)(a)(ii) may be conditionally permitted within Zone B provided the requirements of LC 16.298(8) are met. New uses identified in LC 16.298(7)(a)(iii) through (ix) are also prohibited within Zone B.

(d) **Exemptions.** The provisions of LC 16.298 do not exempt any material or use from requirements under the Oregon Fire Code. Except as otherwise provided by this section, the following activities and/or materials are exempt from LC 16.298(7):

(i) Use, storage and handling of specific hazardous materials that do not present a risk to the drinking water source, as determined and listed by the Planning Director. These materials may still need to be included on a Hazardous Material Inventory Statement as required by Fire Code. A Hazardous Material Exemption Request may be submitted to the Planning Director for hazardous materials that can be demonstrated to pose no threat to the drinking water source. These materials may be exempt from this regulation and added to the list of materials that do not pose a threat to the drinking water source. The demonstration of no threat is the responsibility of the applicant seeking the exemption and will be subject to a ministerial review by the Planning Director. The Planning Director shall notify and consult with the Department of Environmental Quality, the Oregon Department of Human Services - Drinking Water Program, the applicable water utility or water service supplier in the area and the Lane Pollution

Prevention Coalition (P2C) prior to making a hazardous material exemption determination.

(ii) Hazardous materials offered for sale in their original containers of five (5) gallons or less. A Hazardous Material Exemption Request for original containers of greater than 5-gallons in size may be submitted to the Planning Director. These materials may be exempt from this regulation if an applicant can demonstrate that a larger size container does not pose a threat to the drinking water source. The Hazardous Material Exemption Request shall be reviewed by the Planning Director in the manner described in LC 16.298(7)(d)(i).

(iii) Hazardous materials in fuel tanks and fluid reservoirs attached to a private or commercial motor vehicle and used directly in the operation of that vehicle.

(iv) Hazardous materials in fuel tanks and fluid reservoirs attached to machinery, including but not limited to fuel, engine oil and coolant.

(v) Fuel oil used in existing heating systems.

(vi) Emergency use, storage and handling of hazardous materials by governmental organizations or non-governmental disaster relief organizations in the public interest.

(vii) Hazardous materials used and stored specifically for water treatment processes of public and private water systems

(viii) Hazardous materials contained in properly operating sealed units (transformers, refrigeration units, etc.) that are not opened as part of routine use.

(ix) Natural gas distribution lines.

(x) Any commonly used office supply, such as toner or cleaning supplies, where supplies are purchased off-site for use onsite.

(xi) Hazardous materials not already listed in this section used in association with Farm Practices as defined in ORS 30.930 in an Exclusive Farm Use Zone and Confined Animal Feeding Operations (CAFOs) as defined OAR 603-074-0010.

(xii) Pesticide use and storage specifically addressed by state preemption of local pesticide regulation under ORS 634.055 through 634.065.

(xiii) Hazardous material use in association with Forest activities conducted under the Forest Practices Act.

(xiv) Aggregate quantities equal to or less than 110 gallons of non-exempt hazardous materials, which are not dense non-aqueous phase liquids (DNAPLs).

(xv) Aggregate quantities greater than 110 gallons of non-exempt hazardous materials, for residential uses, rural home businesses or home occupations provided:

(aa) The hazardous materials are not dense non-aqueous phase liquids (DNAPLs).

(bb) The applicant submits a signed statement to Lane County asserting that all hazardous materials stored on site in excess of 110 gallons will be kept in a primary containment vessel and further protected within a secondary containment vessel and that the secondary containment vessel will be monitored regularly for leaks or other failures.

(8) **Hazardous Material Special Use Permit – Director Review.** Increases or alterations of non-conforming uses pursuant to LC 16.298(7)(b) and new uses pursuant to 16.298(7)(c) may be conditionally permitted provided a land use application is submitted pursuant to LC 14.050, processed according to LC 14.100, and approved by the Planning Director upon determination that the criteria of 16.298(8)(a)(i) through (viii) are met. The Planning Director shall condition any such approvals to ensure that the hazardous material management strategies identified LC 16.289(9) are carried out. Prior to issuing a hazardous material special use permit decision the Planning director shall notify and consult with the Department of Environmental Quality, the Oregon Department of Human Services - Drinking Water Program and the applicable water utility or water service supplier in the area.

(a) A hazardous material special use permit application must contain:

(i) A hazardous material inventory statement and, upon request from the Planning Director, a Material Safety Data Sheet (MSDS) for any hazardous materials to be used, stored or produced on site. Hazardous material weights shall be converted to volume measurement for purposes of determining amounts - 10 pounds shall be considered equal to 1 gallon.

(ii) A detailed description of the activities conducted at the facility that involve the storage, handling, treatment, use or production of hazardous materials.

(iii) A description of the primary and secondary containment devices proposed.

(iv) Spill reporting procedures, including a list of affected agencies and affected public water system(s) to be contacted in the event of a spill with current contact information for each agency.

(v) A description of procedures for inspection and maintenance of containment devices and emergency equipment; and

(vi) A description of procedures for disposition of unused hazardous materials or hazardous material waste products including the type of transport and proposed route.

(vii) A list of the chemicals to be monitored through the analysis of groundwater samples and a monitoring schedule if ground water monitoring is anticipated to be required under state or local government water quality permit, cleanup agreements, or other requirements.

(viii) The location of all operating, unused and abandoned wells on the property with documentation that all abandoned wells have been properly capped or sealed.

(b) Hazardous material special use permits shall expire five years after the date of issuance but may be renewed indefinitely. Renewal applications shall include updated information required pursuant to LC 16.298(8)(a)(i) through (viii).

(9) **Hazardous Material Management Standards.** Uses permitted pursuant to LC 16.298(8) shall meet the following standards:

(a) Storage, handling, treatment, use, production or otherwise keeping on premises hazardous materials shall be in compliance with containment and safety standards set by the Oregon Fire Code.

At left margin indicates changes  
Bold indicates material being added  
~~Strikethrough~~ indicates material being deleted  
16.298

LEGISLATIVE  
FORMAT

Lane Code

16.298

(b) All hazardous materials that pose a risk to a surface or ground water source shall be stored in areas with approved secondary containment in place (Oregon Fire Code Section 2704.2).

(c) Requirements found in the Oregon Fire Code Section 2704.2.2.5 for a monitoring program to detect hazardous materials in the secondary containment system shall be met for all amounts of non-exempt hazardous materials that pose a risk to a surface or ground water source.

(d) All spill reporting procedures and contact information described in LC 16.298(8)(iv) shall be updated annually and kept on premises.

(10) Agency Review. Decisions made by Lane County under LC 16.298 do not supersede the authority of the state or federal agencies which may regulate or have an interest in the activity in question. It is the responsibility of the landowner to ensure that any other necessary state or federal permits or clearances are obtained.

(11) Warning and Disclaimer of Liability. The degree of drinking water protection required by LC 16.298 is based on scientific and engineering considerations. These considerations include drinking water source area assessments certified by Oregon Department of Human Services, under the Oregon Administrative Rules that apply to Oregon's EPA-approved Drinking Water Protection Program, which inherently carry associated uncertainties. Any conclusions based on the exact boundaries of the surface or groundwater source areas shall therefore be considered estimates. Under no conditions should LC 16.298 be construed to guarantee the purity of the surface or ground waters or guarantee the prevention of contamination. Therefore, LC 16.298 shall not create liability on the part of the Lane County, or any Lane County personnel, for any contamination that may result from reliance on LC 16.298 or any administrative decision made under LC 16.298.



IN THE BOARD OF COUNTY COMMISSIONERS, LANE COUNTY, OREGON

ORDINANCE NO. PA 1276

IN THE MATTER OF AMENDING THE LANE COUNTY RURAL COMPREHENSIVE PLAN (RCP) BY REVISING GOAL-2, POLICY 25, TO ESTABLISH PROVISIONS FOR A DRINKING WATER PROTECTION OVERLAY ZONE; BY ADOPTING AN OFFICIAL DRINKING WATER PROTECTION OVERLAY ZONE MAP; BY APPLYING THE OVERLAY ZONE TO PROPERTIES WITHIN IDENTIFIED GROUNDWATER AND SURFACE WATER PROTECTION AREAS AND ADOPTING SAVINGS AND SEVERABILITY CLAUSES.

---

**WHEREAS**, the Board of County Commissioners of Lane County, through enactment of Ordinance PA 883, has adopted the Lane County General Plan Policies which is a component of the Lane County Rural Comprehensive Plan; and

**WHEREAS**, the Board of County Commissioners of Lane County, through enactment of Ordinance PA 884, has adopted Land Use Designations and Zoning for lands within the Jurisdiction of the of the Lane County Rural Comprehensive Plan; and

**WHEREAS**, Lane Code 12.050 and 16.400 set forth procedures for amendments of the Rural Comprehensive Plan and Lane Code 16.252 sets forth procedures for rezoning lands within the jurisdiction of the Rural Comp Plan; and

**WHEREAS**, abundant and pure sources of high quality drinking water are critically important to the livability of Lane County residents; and

**WHEREAS**, it is necessary to amend the Rural Comprehensive Plan and apply an overlay zone to provide for the enhanced protection of surface and ground waters, which are sources of public drinking water; and

**WHEREAS**, the proposal was reviewed at a joint public hearing with the Lane County Planning Commission and the Lane County Board of Commissioners on October 26, 2010; and

**WHEREAS**, evidence exists in the record indicting that the proposal meets the requirements of Lane Code Chapters 12 and 16, and the requirements of applicable state and local law; and

**WHEREAS**, the Board of County Commissioners has conducted a public hearing and is now ready to take action;

**NOW, THEREFORE**, the Board of County Commissioners of Lane County ordains as follows:

Section 1, The Lane County General Plan Policies, Goal 2 (Policy 25) adopted by Ordinance No. PA 883 and amended thereafter is further amended by revising Goal 2 General Plan Policy 25 to add provisions for a Drinking Water Protection Overlay Zone as set forth in Exhibit "A".

Section 2, An Official Drinking Water Protection Overlay Zone Map is established and adopted as depicted in Exhibit "B".

Section 3, The Drinking Water Protection Overlay Zone is applied to properties within identified ground and surface water protection areas as shown on the Official Drinking Water Protection Overlay Zone Map and as described in Lane Code 16.298(4).

**FURTHER**, although not part of this Ordinance, the Board of County Commissioners adopts findings in support of this action as set forth in Exhibit C to this Ordinance and also as outlined in the staff memo dated September 14, 2010 and in Attachments 5, 6 and 7 to that memo.

The prior policies, plan and zone diagram designations repealed or changed by this Ordinance remain in full force and effect to authorize prosecution of persons in violation of thereof prior to the effective date of this Ordinance.

If any section, subsection, sentence, clause phrase or portion of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such section shall be deemed a separate, distinct and independent provision, and such holding shall not effect the validity of the remaining portions thereof.

**ENACTED** this \_\_\_\_\_ day of \_\_\_\_\_, 2010.

\_\_\_\_\_  
Bill Fleenor, Chair  
Lane County Board of County Commissioners

APPROVED AS TO FORM

Date \_\_\_\_\_ Lane County

\_\_\_\_\_  
*OFFICE OF LEGAL COUNSEL*

All cluster subdivisions must be within an existing Rural Fire Protection District.

No other identifiable substantial increase of a public service shall be necessitated by the approval of a cluster subdivision.

24. Outside of designated 'Community' areas, all changes to Plan Diagram designations shall be evaluated through the County's Plan Amendment procedure (LC 16.400) and approval based upon fulfillment of criteria therein.
25. Each of the land use designations applied to the Plan Diagram shall be implemented by one or more zoning districts, as follows:

<u>Plan Designation</u>	<u>Zone Classification</u>	<u>Abbrev.</u>
Forest Land	Nonimpacted Forest Lands	F-1, RCP
Forest Land	Impacted Forest Lands	F-2, RCP
Agricultural Land	Exclusive Farm Use	E-RCP
Natural Resource	Natural Resource	NR-RCP
Marginal Land	Marginal Lands	ML-RCP
Park and Recreation	Park and Recreation	PR-RCP
Rural Park and Recreation	Rural Park and Recreation	RPR, RCP
Notwithstanding the plan diagram, areas designated by the plan diagram as Park and Recreation, that are located outside of communities and inside developed and committed exception areas, are now designated as Rural Park and Recreation.		
Natural Resource	Quarry & Mining Operations Combining	/QM-RCP
Natural Resource	Sand, Gravel and Rock Products	SG-RCP
Natural Resource	Sand, Gravel & Rock Prod. Processing	/CP-RCP
Public Facility, Community	Public Facility	PF-RCP
Rural Public Facility	Rural Public Facility	RPF, RCP
Notwithstanding the plan diagram, areas designated by the plan diagram as Public Facility, that are located outside of communities and inside developed and committed exception areas, are now designated as Rural Public Facility.		
Commercial, Community	Limited Commercial	C-1, RCP
Commercial, Community	Neighborhood Commercial	C-2, RCP
Commercial, Community	Commercial	C-3, RCP
Rural Commercial	Rural Commercial	RC, RCP
Notwithstanding the plan diagram, areas designated by the plan diagram as Commercial, that are located outside of communities and inside developed and committed exception areas, are now designated as Rural Commercial.		
Industrial, Community	Limited Commercial	M-1, RCP
Industrial, Community	Light Commercial	M-2, RCP
Industrial, Community	Heavy Industrial	M-3, RCP
Rural Industrial	Rural Industrial	RI, RCP
Notwithstanding the plan diagram, areas designated by the plan diagram as Industrial, that are located outside of communities and inside developed and committed exception areas, are now designated as Rural Industrial.		
Rural, Community	Suburban Residential	RA, RCP
Rural, Community	Garden Apartment Residential	RG, RCP
Rural, Community	Rural Residential	RR, RCP

Rural Residential	Rural Residential	RR, RCP
Notwithstanding the plan diagram, areas designated by the plan diagram as Rural, that are located outside of communities and inside developed and committed exception areas, are now designated as Rural Residential.		
Destination Resort	Destination Resort	DR, RCP
Historic Structure/Site	Historic Struc. or Sites Combining	/H-RCP
Natural Estuary	Natural Estuary	/NE-RCP
Conservation Estuary	Conservation Estuary	/CE-RCP
Development Estuary	Development Estuary	/DE-RCP
Sign. Natural Shorelands	Significant Nat. Shorelands Comb.	/SN-RCP
Prime Wildlife	Prime Wildlife Shorelands Comb.	/FW-RCP
Natural Resources Consrv.	Natural Resources Conservation Comb.	/NRC-RCP
Residential Development	Res. Devel. Shorelands Combining	/RD-RCP
Shorelands Mixed Develop	Shorelands Mixed Devel. Combining	/MD-RCP
Dredge Material/Mitigation	Dredge Mat./Mitigation Site Comb.	/DMS-RCP
Beaches & Dunes	Beaches and Dunes Combining	/BD-RCP
	Floodplain Combing	/FP-RCP
	Commercial Airport Safety District	/CAS-RCP
	Airport Safety District	/AS-RCP
Airport	Airport Operations	AO-RCP
	Private Use Airport Overlay	/PUAO-RCP
Nonresource	Rural Residential	RR-RCP
Public Facility	Inmate Work Camp	IWC-RCP
	<u>Drinking Water Protection Overlay</u>	<u>/DWP</u>

**\*NOTE:** The "Community" Plan Designation is implemented by various zoning districts as indicated, zones which also implement specific Plan designations other than "Community". A suffix "/C" shall be used in combination with these zoning abbreviations to denote the zoning inside unincorporated community plans adopted to comply with OAR 660 Division 22, the UC Rule: RR, RC, RI, RPF, and RPR.

26. Exceptions to resource goals shall be required for transmission line right-of-ways when in excess of fifty (50) feet.
27. Conformity Determinations. Lane County will annually initiate and process applications to correct identified plan or zoning designations in the RCP Official Plan and Zoning Plots resulting from the Official Plan or Zoning Plots not recognizing lawfully existing (in terms of the zoning) uses or from inconsistencies between the Official Plan and Zoning Plots. Changes to correct nonconformities shall comply with the procedures and requirements of Lane Code Chapter 12 (Comprehensive Plan), Chapter 14 (Application Review and Appeal Procedures), and Chapter 16 (Land Use & Development Code), except as provided for in 27 c. and d., below.
  - a. Circumstances qualifying for consideration by the Board of Commissioners under the Conformity Determinations Policy may include one or more of the following:
    - i. Lawful, structural development existing prior to September 12, 1984 and use of the structure(s) at the time qualified as an allowable use in a developed & committed zone designation other than that designated for the land on an Official Plan or Zoning Plot.

This map illustrates the layout of Douglas County, Oregon, and its proximity to neighboring counties: Lincoln County to the north, Benton County to the northeast, and Douglas County to the south. The county's major transportation routes are clearly marked, including Highway 101 running along the western border, Highway 126 running east-west through the center, and Highway 38 running north-south in the eastern part of the county. Key urban centers and towns are labeled, such as Florence, Mapleton, Veneta, Eugene, Junction City, and Cottage Grove. The map also depicts several lakes, including Triangle Lake, Blachly, Cheshire, Alvadore, and Cottage Grove Lake. Other notable features include the Fern Ridge Reservoir and various smaller roads and landmarks like the Douglas County Courthouse and the Douglas County Jail. The map is a detailed representation of the county's geography and infrastructure.

Response	Percentage
Yes	55%
No	45%

# ction Overlay Zone Map (Draft)

Attachment 4



10 20 Miles

The information on this map was derived from digital databases on the Lane County regional geographic system. Care was taken in the creation of this map, but is provided "as is". Lane County cannot accept any responsibility for errors, omissions, or positional accuracy in the digital data or the underlying records. Current plan designation, zoning, etc., for the specific parcels should be confirmed with the appropriate agency. There are no warranties, expressed or implied, accompanying this product. However, notification of any errors will be appreciated.



IN THE BOARD OF COUNTY COMMISSIONERS, LANE COUNTY, OREGON

ORDINANCE NO. PA 1276

IN THE MATTER OF AMENDING THE LANE COUNTY RURAL COMPREHENSIVE PLAN (RCP) BY REVISING GOAL-2, POLICY 25, TO ESTABLISH PROVISIONS FOR A DRINKING WATER PROTECTION OVERLAY ZONE; BY ADOPTING AN OFFICIAL DRINKING WATER PROTECTION OVERLAY ZONE MAP; BY APPLYING THE OVERLAY ZONE TO PROPERTIES WITHIN IDENTIFIED GROUNDWATER AND SURFACE WATER PROTECTION AREAS AND ADOPTING SAVINGS AND SEVERABILITY CLAUSES.

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**WHEREAS**, the proposal was reviewed at a joint public hearing with the Lane County Planning Commission and the Lane County Board of Commissioners on October 26, 2010; and

**WHEREAS**, evidence exists in the record indicting that the proposal meets the requirements of Lane Code Chapters 12 and 16, and the requirements of applicable state and local law; and

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**NOW, THEREFORE**, the Board of County Commissioners of Lane County ordains as follows:

Section 1, The Lane County General Plan Policies, Goal 2 (Policy 25) adopted by Ordinance No. PA 883 and amended thereafter is further amended by revising Goal 2 General Plan Policy 25 to add provisions for a Drinking Water Protection Overlay Zone as set forth in Exhibit "A".

# Summary of Oregon Source Water Assessment Methodology

## Background

The 1996 Federal Safe Drinking Water Act amendments provide the means to protect drinking water at its source. In developing the amendments, Congress recognized that the need to go beyond traditional emphasis on treatment to address new challenges to provide clean drinking water. The act's amendments mandated that states conduct "source water assessments" for all public water systems. These assessments include delineating contribution zones or source areas for all groundwater and surface water-supplied public water systems and identifying potential sources of contamination for drinking water in each state. Source water assessments are required for all systems with at least 15 hookups or that serve more than 25 people year-round.

To meet the federal requirements, the Oregon Department of Human Services and Oregon Department of Environmental Quality formed a partnership to complete source water assessments for public water systems in Oregon. The two agencies formed a citizen's advisory committee which included nine public water system managers and 11 stakeholder representatives. The advisory committee worked for more than a year (1998-99) to develop the "Source Water Assessment Plan" document to describe the approach for Oregon's work, as well as a template (see DEQ website) for individual source water assessment reports that are required for every public water. The U.S. Environmental Protection Agency provided guidelines but encouraged states to develop their own unique approach for meeting the requirements.

EPA approved Oregon's plan in June 1999. The active list in Oregon as of 1999 included 2,656 public water systems. Of those, 1,171 met the federal definition of a public water system, requiring a full assessment and report. Smaller systems received a limited assessment and streamlined report. *All required source water assessments in Oregon are now completed.*

A source water assessment report was prepared and provided to each of the federal-regulated public water systems. Each report includes a large-scale map that identifies the geographic area that supplies the public water system. These source water areas were mapped for the surface water intakes by DEQ and the groundwater wells

by DHS. DEQ then identified potential sources of contamination within those areas and the agencies prepared a written report for each system. Communities now have both a detailed map of where their water comes from and the potential contaminant sources (natural and manmade) that may affect their water quality. The assessments identify potential sources of contamination from both non-point and point sources.

The basic components of a source water assessment include delineation, inventory of potential contaminant sources, and a susceptibility analysis. More information on each of these components is listed below.

## Delineation:

The source water assessment process began with a "delineation" of the source areas for groundwater wells and surface water intakes. This was done by identifying the surface area that directly overlies that portion of the aquifer that supplies the well, wellfield or springs used for drinking water purposes. In the Oregon procedures, the upgradient extent of the capture zone extended to a specific time-of-travel (TOT) for groundwater through the aquifer. For systems with populations of more than 500, the TOT is 10 years. For systems serving less than 500, the TOT is 15 years because the method of delineation is much less precise.

Within each delineated area, subzones are delineated at two- and five-year TOTs. The goal of the subzones is to provide communities with better data from which to build protection strategies. The area within the two-year time-of-travel represents the "hot zone" for the area: potential contaminant sources within this area will probably present higher risks because of their proximity to the well. The two-year TOT also provides the outer limit from which microbial sources are likely to affect the well.

Individual water systems received a topographic map with the delineation shown as a function of the time-of-travel in each source water assessment report. As part of the delineation effort, all wells were precisely located with a Geographic Positioning System. The state also consulted with U.S. Geological Survey experts in developing the conceptual model and estimating parameters used in the modeling effort for systems that were more geologically complex.



State of Oregon  
Department of  
Environmental  
Quality

Water Quality  
Drinking Water  
Protection Program  
811 SW 6<sup>th</sup> Avenue  
Portland, OR 97204  
Phone: (503) 229-5664  
(800) 452-4011  
Fax: (503) 229-5850  
Contact: Julie Harvey  
harvey.julie@deq.state.or.us  
[www.oregon.gov/DEQ/](http://www.oregon.gov/DEQ/)



For surface water systems, the drinking water source area delineation process was performed by using the fifth-field hydrologic unit (watershed) boundaries. All intakes were precisely located with Geographic Positioning System. The surface water delineation includes the entire watershed area upstream of the intake structure.

After delineating the entire watershed, sensitive areas within the watershed were identified. These included land adjacent to the stream, high erosional areas and other natural factors that increase the risk of contamination of the surface water. The result is an identification of a subset of the entire watershed. The sensitive areas are those where potential contamination sources or land-use activities, if present, have a greater potential to affect the water supply. This is analogous to the time-of-travel zones for groundwater systems.

### Inventory

Another purpose of the source water assessment was to identify land uses and activities that present potential risks to public water systems in each state; this is referred to as the "inventory." The statewide advisory committee determined what to inventory and how to inventory in 1998-99. The list of all land uses and activities inventoried is available on DEQ's website. Inventories are valuable tools for local communities in that they provide:

- Information on locations of potential contaminant sources, especially those that present the greatest risks to the water supply
- An effective means of educating the public about potential problems
- Valuable awareness to those that own or operate facilities and conduct land-use activities in the drinking water source area
- A reliable basis for developing a local protection plan to reduce the risks to the water supply.

Inventories are focused primarily on potential sources of contaminants regulated under the federal Safe Drinking Water Act. This includes contaminants with a maximum contaminant level, contaminants regulated under the Surface Water Treatment Rule, and the microorganism *Cryptosporidium*. Based on the type of facility and the nature of potential contaminants they use, these sources represent a lower-, moderate-, or higher-relative risk to the water system. The inventory was designed to identify several categories of potential sources of contaminants including micro-organisms (i.e., viruses, *Giardia lamblia*, *Cryptosporidium*, and fecal bacteria);

inorganic compounds (i.e., nitrates and metals); organic compounds (i.e., solvents, petroleum compounds and pesticides) and turbidity/sediments.

Contaminants can reach a water body (groundwater, rivers, lakes) from activities occurring on the land surface or below it. Contaminant releases to water bodies can also occur on an area-wide basis or from a single point source. In completing the inventories, potential sources of contaminants were identified through a variety of methods and resources. DEQ used readily available information including review of nine databases at DEQ, EPA and other agencies with currently listed sites, interviews with the public water system operator, and field observation as a final step in the process.

When identifying potential risks to a public water supply, "worst-case" assumptions were made. Under today's regulatory standards and environmental awareness, the majority of the identified activities and land uses employ "best management practices" in handling contaminants or preventing water quality degradation from their operations. It is important to note that while the assessments list all POTENTIAL risks, many of them do not present actual risks to the water system. Environmental contamination is not likely to occur when contaminants are handled and used properly, or when best management practices are employed. Day-to-day operating practices and environmental awareness varies greatly from one facility or land-use activity to another. Due to time constraints, in-depth analysis or research was not completed to assess each specific source's compliance status with local, state and/or federal laws.

The state also made assumptions about what potential contamination sources are included in the various types of land uses. For example, it is assumed that rural residences associated with farming operations have specific potential contamination sources such as fuel storage, chemical storage and mixing areas, and machinery repair shops. Any errors in these assumptions can be easily corrected as the community moves beyond the assessment. Prior to moving forward in the development of a protection plan, it is recommended that an enhanced inventory be conducted to look at site-specific practices. The potential sources listed in the assessment that are actually lower risks can be removed from the list during the next step in the process.

### Susceptibility

One of the most important aspects of the source water assessment process is determining the susceptibility of each system to contamination. Susceptibility is defined as the potential for contamination in the source area to reach the intake

on the surface water body or the well(s) being used by a public water system for drinking water purposes. Whether or not a particular drinking water source becomes contaminated depends on three major factors: 1) occurrence of a facility or land use that releases contamination, 2) location of the release, and 3) hydrologic and/or soil characteristics in the source area that allow transport of the contaminants to the surface water body.

In conducting a susceptibility analysis for each public water system, the state uses information from the delineation (the most sensitive areas) and the inventory. The results of the inventory are more meaningful when proximity to the well or intake is considered, along with the associated risk rating of the source, and whether it is located within a sensitive area. In general, land uses closest to the intake/well and those with the highest risk rating pose the greatest threat to a drinking water supply. The presence and locations of potential contamination sources within sensitive areas will determine where the water system has the highest susceptibility to contamination. The susceptibility analysis cannot predict when or if contamination will actually occur but recognizes conditions that are highly favorable for contamination to occur. If a contaminant release to soils or water should occur in a sensitive area, it is very likely that contamination of the water body would occur if remedial actions are not taken.

When several high- or moderate-risk sources are located within sensitive areas, a public water system may also be said to have a high overall susceptibility to contamination. If a public water system's drinking water source is determined to be of high susceptibility, it is recommended that the system identify those condition(s) that lead to the high susceptibility and take steps to protect the resource (such as reducing soil erosion or working directly with facility operators to implement sound management practices). Water systems with a low susceptibility should consider

all identified factors that could lead to higher susceptibility in the future and prepare a strategy to protect the resource for the future. The product of the susceptibility analysis is an overlay of the results of the inventory with the map of the sensitive areas. *The susceptibility analysis provides the water system with information on where the greatest risk occurs and where to focus resources for protection.*

#### **For more information**

To obtain a copy of the source water assessment report for your water system:

- Contact your public water system owner/operator to review the full report or get a copy. Information for public water systems including a contact person is available at the Department of Human Services (DHS) Drinking Water Program (DWP) website (see "Data Online").
- DEQ and DHS also have copies of source water assessment reports. For groundwater system reports, contact Nancy Viera, DHS, at (541) 726-2587, ext. 25 or by e-mail. For surface water systems, contact Julie Harvey, DEQ, Portland, at (503) 229-5664 or toll-free in Oregon at 1-800-452-4011, ext. 5664, or by e-mail.
- In addition, summaries of completed source water assessments for water systems that get their water from a surface water intake are on DEQ's website at: <http://www.deq.state.or.us/wq/dwp/swrpts.asp>.

Additional information on drinking water protection can be found at:

<http://www.deq.state.or.us/wq/dwp/dwp.htm>

#### **Alternative formats**

Alternative formats (Braille, large type) of this document can be made available. Contact DEQ's Office of Communications & Outreach, Portland, at (503) 229-5696, or call toll-free in Oregon at 1-800-452-4011, ext. 5696. People with hearing impairments may call 711.



# Memorandum

20 August 2010

<b>To</b>	<b>Lane County Planning Commission &amp; Board of Commissioners</b>
<b>From</b>	<b>Floodplain Ordinance Review Technical Advisory Committee</b>
<b>SUBJECT</b>	<b>TECHNICAL AND POLICY RATIONAL FOR PROPOSED AMENDMENTS TO THE LANE COUNTY FLOODPLAIN ORDINANCE'</b>

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## INTRODUCTION

The purpose of this memorandum is to provide the technical rationale for the proposed amendments to the Lane County's Floodplain regulations. The purpose of the Lane County Floodplain Combining Zones is to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas.<sup>2</sup> The proposed amendments are all consistent with the stated purpose and will better support the intent of the ordinance.

Lane Code Chapter 10.271 is the floodplain regulations applicable within the urban growth boundary areas of Lane County's small cities. Lane Code Chapter 16.244 is applicable outside of an urban growth boundary and governed by the Rural Comprehensive Plan. The amendments discussed throughout this memorandum are identical for both LC 16.244 and LC 10.271. Therefore, for the sake simplicity, future references to the proposed amendments will only cite applicable sections within LC16.244.

The Lane County Floodplain Combining Zone does not address water quality or public health; rather its intent is to protect property from flood damage and limit the impact of development on flood levels. The Lane Code includes a Floodplain Combining Zone, which requires development within a floodplain or flood hazard area to use designs and materials to minimize flood damage.<sup>3</sup> The Code includes specific regulations for development within a floodway and the process for acquiring a variance. The ordinance, as well as the proposed amendments, apply to all identified areas of flood hazard within Lane County, and overlay the regulations of the underlying zone.

## TAC Mission and Charge

In late 2009, The Lane County Board of Commissioners appointed a Technical Advisory Committee (TAC) to assist the Lane Management Division (LMD) staff in drafting proposed

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<sup>1</sup> Floodplain Combining Zone (/FP-RCP) Rural Comprehensive Plan, Lane Code, 16.244, p. 1

<sup>2</sup> Development in the Special hazard Area, Lane County Public Works Department, August 2009, Land Management Division, P.

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<sup>3</sup> The Federal Insurance Administration (FIA) determined flood hazard areas for unincorporated Lane County.

revisions to the existing floodplain ordinance and preparing a new drinking water protection overlay ordinance. The objective of the TAC was to help LMD construct ordinances that would protect water quality, promote human health and safety and protect property, while providing reasonable limitations and exceptions to the code where necessary to protect private property rights. In its deliberations, the TAC reviewed various practices in other jurisdictions, model ordinances prepared by the Oregon Department of Environmental Quality and other agencies, a recent study by the University of Oregon and other technical and scientific sources from agencies, a threat identification document prepared by LMD, and the relevant literature. References are cited in the documents prepared by the TAC. The Land Management Division is responsible for the final language that is presented to the Board of Commissioners. The TAC is not a stakeholder committee and the recommendations are not intended to reflect the views of stakeholders.

The members of TAC are:

Member	Affiliation
Amy Chinitz	Springfield Utility Board (SUB)
Jacqueline Fern	Oregon Department of Environmental Quality (DEQ)
Denise Kalakay	Lane Council of Governments (LCOG)
Joe Moll	McKenzie River Trust
Karl Morgenstern	Eugene Water and Electric Board (EWEB)
Bob Parker	University of Oregon Community Service Center
Larry Six	McKenzie Watershed Council
Eve Montanaro	Middle Fork Willamette Watershed Council

Membership on the TAC does not necessarily imply formal endorsement of the proposed ordinances by the agencies and organizations represented, although the objectives of the ordinances are consistent with the mission and goals

## BACKGROUND

### Floodplains as Valued Community Assets

The value of floodplains lies in the functions that they perform within the floodplain environment. Floodplain natural resources include the soils, nutrients, water quality and quantity, and diverse species of plants and animals that exist in the areas between the water's edge and the higher ground adjoining flood-prone areas. These can be considered as natural "infrastructure."<sup>4</sup> Flooding is extremely important to the maintenance of floodplain ecosystems, and may be the primary reason for their biological richness. Floodwaters carry nutrient-rich sediments and trigger chemical processes that cause beneficial changes in the soil, which contribute to a fertile environment for vegetation.<sup>5</sup>

<sup>4</sup> Protecting Floodplain Resources: A guidebook for Communities, Federal Interagency Floodplain Management Task Force, June 1996, FEMA, P. 5

<sup>5</sup> Ibid, p. 7

Floodplains provide a wide variety of ecosystem services to humans and the quality of these services depend on the degree and quality to which the ecosystem is functioning.<sup>6</sup> When streams and wetlands are in their natural state, they absorb significant amounts of rainwater, snowmelt, and runoff before flooding occurs.<sup>7</sup> The upper reaches of a stream are important for reducing the intensity and frequency of floods; helping to protect property values of residents located near or on the floodplain.<sup>8</sup>

### **The National Flood Insurance Program (NFIP)**

As part of the County's involvement in the National Flood Insurance Program's Community Rating System (CRS), the County is evaluating its current floodplain ordinances to determine if changes to the rules are needed to help promote life safety and prevent property damage. The National Flood Insurance Program (NFIP) was created by Congress in 1968 to provide federally backed flood insurance coverage, because flood insurance was generally unavailable from private insurance companies. The NFIP is also intended to reduce future flood losses by identifying floodprone areas and ensuring that new development in these areas is adequately protected from flood damage.

To participate in the National Flood Insurance Program (NFIP), a community must adopt and enforce a floodplain management ordinance that regulates development in the community's floodplain.<sup>9</sup> The management of the NFIP in a community consists of a partnership between the Federal government and the local community.<sup>10</sup> NFIP's Community Rating System (CRS) recognizes community floodplain management efforts that go beyond the minimal requirements of the NFIP by reducing flood insurance premiums for the community's property owners. Through their floodplain management ordinances, communities adopt the NFIP design performance standards for new and substantially improved buildings located in floodprone areas identified on the Federal Insurance Administration's Flood Insurance Rate Maps (FIRMs).<sup>11</sup> As a participant in the NFIP, Lane County adopted and enforces floodplain management ordinances aimed at reducing the likelihood of future flood damage to new construction within Special Flood Hazard Areas (SFHA).<sup>12</sup>

The CRS recognizes 18 floodplain management activities divided into four categories which include flood preparedness series, flood damage reduction, public information, mapping and regulations.<sup>13</sup> In turn, communities are rewarded for their efforts through reduced flood insurance premiums for the citizens of that community.<sup>14</sup> On March 3, 2008, LMD submitted a

<sup>6</sup> "Where Rivers are Born: The scientific imperative for defending small streams and wetlands." American Rivers and Sierra Club, September 2003, p. 5

<sup>7</sup> Ibid, p. 10

<sup>8</sup> "Where Rivers are Born: The scientific imperative for defending small streams and wetlands." American Rivers and Sierra Club, September 2003, p. 6

<sup>9</sup> NFIP Guidebook, Floodplain Management, Produced by FEMA Region 10, 4<sup>th</sup> Edition, October 2002. P. 15

<sup>10</sup> Ibid, p. 21

<sup>11</sup> "Non-residential floodproofing for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program, FEMA Technical Bulletin 3-93, p. 15

<sup>12</sup> Ibid, p. 21

<sup>13</sup> Ibid, p. 23

<sup>14</sup> Ibid, p. 43

CRS application and accompanying documentation to FEMA for formal review. After a lengthy application review and verification process, Lane County received official notification of admission into the CRS on July 2, 2009.<sup>15</sup>

### **Pending Litigation**

The Audubon Society of Portland, Northwest Environmental Defense Center and other environmental groups sued FEMA in 2009 over its issuance of flood insurance in Oregon. The suit said the agency encourages floodplain development by providing coverage without considering the effect on fish listed under the Endangered Species Act. As a result, FEMA is required to seek review and comment on its Oregon flood insurance program from federal fisheries biologists with the National Oceanic and Atmospheric Administration. The settlement could have a strong impact on decreasing the ease at which developments located near and on floodplains can occur.<sup>16</sup>

The TAC cannot predict exactly how this will affect national regulations on floodplain development, but we believe that this lawsuit is indicative of broader coordination issues related to the NFIP. Adoption of the proposed amendments to the County floodplain ordinance will move Lane County in the right direction in the case of a probable federal mandate.

### **Lane County Flooding**

In the aftermath of the Willamette Valley Flood of 1996, residents of Lane County now realize that flooding poses a serious risk to human and ecosystem health and that by engaging in smart land use practices, determinate floods can be either avoided or the damage to property mitigated. In the 1996 floods, the combination of record-breaking rain, warm temperatures, and a deep snowpack led to severe flooding throughout northern sections of the state.<sup>17</sup> Severity of the flood can be attributed to a significant increase in development along the river systems as well as significant increase in logging in the local watersheds, which increases runoff as well as debris jams in the river systems.<sup>18</sup>

Approximately 200 square miles of land falls within the regulated floodplain in Lane County and more than 11,000 individual parcels are partially or entirely located within the floodplain. Statewide, Lane County has more river miles of floodplain than any other county and ongoing development along these rivers continues to displace natural areas that have historically functioned to store and transport flood waters.<sup>19</sup>

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<sup>15</sup> Additional information on the Lane County floodplain management program and CRS is provided in a memorandum from Lane County Land Management/Public Works Staff to the Lane County Planning Commission dated Jun 2 21, 2010. [http://www.lanecounty.org/departments/pw/lmd/landuse/documents/flood\\_dwp/july%206%20lcpc/lcpc\\_memo\\_7\\_6\\_10.pdf](http://www.lanecounty.org/departments/pw/lmd/landuse/documents/flood_dwp/july%206%20lcpc/lcpc_memo_7_6_10.pdf)

<sup>16</sup> Learn, Scott, "FEMA lawsuit settlement could make building in Oregon floodplains tougher, July 14, 2010. [www.oregonlive.com/environment/index.ssf/2010/07/fema\\_lawsuit\\_settlement\\_could.html](http://www.oregonlive.com/environment/index.ssf/2010/07/fema_lawsuit_settlement_could.html)

<sup>17</sup> Global Change Master Directory, NASA, [http://gcmd.nasa.gov/records/GCMD\\_OREG\\_CLIM\\_FLOOD\\_96.html](http://gcmd.nasa.gov/records/GCMD_OREG_CLIM_FLOOD_96.html)

<sup>18</sup> The Willamette Valley Flood of 1996, The University of Oregon Electronic Universe Project, <http://zebu.uoregon.edu/1996/es202/flood.html>

<sup>19</sup> Amber Fossen, Public Information Officer, Lane County Government, <http://www.lanecounty.org>

Recently, the U.S. Army Corp of Engineers has been investing significant resources into dam repairs and improvements. The U.S. Army Corps of Engineers officials announced this summer that they will repair aging spillway gates on the Middle Fork Willamette River dams at Fall Creek, Lookout Point, Hills Creek and Dexter dams. The estimated cost for the repair work to the spillway gates on all the Willamette dams is about \$35 million. Repairs were prompted after the Corps had to perform emergency repairs to the Foster and Big Cliff dams on the Santiam River in 2008 and 2009.<sup>20</sup> The TAC recommends limiting development and restoring natural ecosystem functions.

## **SUMMARY OF CPW RESEARCH**

In 2009, the Eugene Water and Electric Board (EWEB) and the University of Oregon's Community Planning Workshop (CPW) conducted an analysis of development activity in the floodplain of the McKenzie River Basin and how the Lane County Development Code influenced development in the floodplain. The intent was to evaluate development patterns and trends in the floodway and 100-year floodplain in the McKenzie watershed and assess the potential impacts from development in these areas. The study area for a series of case studies conducted by CPW consisted of the following lands in the McKenzie River Watershed: lands upriver from the Hayden Bridge intake that are outside of the Eugene-Springfield Metropolitan Urban Growth Boundary (UGB) and are zoned F-2 (Impacted Forest Lands Zone).<sup>21</sup> The study area included nearly 32,000 acres in about 4,550 tax lots.

Following are key findings from the EWEB/CPW project:

- Development in floodplains poses risks to water quality because development including dwellings, septic tanks, and drainage fields, if located within the floodplain, may impact water quality by leaking untreated sewage, household chemicals, or hazardous materials into the waterway. During a flood event, entire structures and septic systems may be washed into the waterway, negatively impacting water quality and leading to further property damage. Additionally, revetments and other bank stabilizing structures can cause increased velocity, turbidity, and water levels, especially during a flood event, which increases risk to human life, property, and water quality.
- Based on analysis of the Lane County permit database, taxlots with structures within the floodplain have a significantly higher number of permits associated with them than those outside the floodplain. Structures outside the floodplain average about 3 permits, while those in the floodplain or floodway averaged more than five. Once a structure in the floodplain gains approval it can lead to multiple permit applications for development, such as additions, improvements, revetments, and erosion control measures. In addition, accessory structures are not as highly regulated as dwellings.
- CPW identified several instances where Lane County approved a dwelling in the floodplain or floodway that subsequently resulted in property owners applying for

<sup>20</sup> Palmer, Susan, June 3, 2010, The Register Guard, <http://www.registerguard.com/csp/cms/sites/web/news/cityregion>

<sup>21</sup> McKenzie River Basin Risk Atlas, Community Planning Workshop, August 2009, P. 4

emergency permits for revetments from the Division of State Lands to protect their structure due to bank erosion. In one instance, Lane County approved a dwelling outside the floodplain in a known meander zone. The riverbank eroded and destroyed the dwelling within two years of the approval.

- One case demonstrated the ability of the code to restrict development in the floodplain. In this case, an application to build a dwelling on a 13-acre property in the floodplain was denied. The staff report recommended denial due to the potential for increased base flood elevation from the proposed development.
- Another case illustrated the inability of the code to restrict development in the floodplain. In this instance, the original owner of an 18.75-acre property proposed a dwelling away from the river after meeting with ODFW. However, a new owner built close to the river, then received approval to fill 900 cubic yards along 500 feet of shoreline to stabilize the bank. This case has implications for floodplain development and riparian modification code applications.
- The Lane County Floodplain Combining Zone does not address water quality or public health; rather its intent is to protect property from flood damage and limit the impact of development on flood levels.
- Floodplain regulations restrict buildings to at least 1 foot above the base flood elevation, but septic systems are not covered by the code. Flooding of septic systems can result in damage to the systems, or contamination of surface or ground water by washing untreated effluent out of the tanks.

## **RATIONALE FOR KEY AMENDMENTS TO THE FLOODPLAIN ORDINANCE**

This section provides technical rationale for some of the key amendments to the floodplain ordinance. We focus our review on the major elements of the proposed amendments. For each element we (1) present the current ordinance language, (2) the proposed language of the amendment, (3) an explanation of the proposed amendment, and (4) the technical rationale for the amendment.

### **Proposed Amendment: new definition of “substantial improvement”**

**Current Ordinance:** LC 16.244(3) Any repair, reconstruction or improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure either (a) before the improvement or repair is started, or (b) if the structure has been damaged, and is being restored, before the damage occurred. The term does not, however, include alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.

**Proposed Language:** Any combination of repairs, reconstruction, alteration or improvements to a structure, during any five (5) year period, in which the cumulative cost equals or exceeds



twenty-five (25) percent of the “market value” as defined herein of the existing structure before “the start of construction” of the improvement. This term also includes structures which have incurred “substantial damage,” regardless of the actual repair work performed.

**Explanation:** LC 16.244- (3) – The revised substantial improvement definition is intended to limit/discourage incremental development in the floodplain. Under the current definition, “substantial improvement” is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences, whether or not that alteration affects the external dimensions of the structure. Currently, work done that increases the value of a structure over 50% is considered a substantial improvement.<sup>22</sup> The new ordinance would limit substantial improvement to a 25% improvement of the overall structure. In addition, the new language would remove the phrase, “The term (substantial improvement) does not, however, include alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.”

**Rationale:** Any substantially improved structure must be brought into compliance with the NFIP requirements for new construction; in other words, it must be elevated (or flood proofed if it is a non-residential structure) to the flood protection elevation. When a structure is substantially improved, it is considered a new “post-FIRM” structure, and actuarial flood insurance rates would apply based on the lowest floor elevation of the structure.<sup>23</sup> The definition, as revised, ensures that major improvements are consistent with the intent of the ordinance and are treated similarly to new construction.

With respect to limiting the cumulative cost to 25% rather than 50%, a 50% improvement is a very substantial improvement; especially on a multimillion dollar home. Because the long-term goal of the ordinance is to eventually bring all properties up to standard; a 25% limit on substantial improvement is a more reasonable threshold that avoids improvements that will limit private investment in hazardous areas. Moreover, a 25% limit on substantial improvement better fits the definition of ‘improvement’ as opposed to ‘rebuilding’ and will also ultimately aid homeowners in reducing risk of flood damage to their properties.

#### **Proposed Amendment: Siting of critical facilities restrictions in the floodplain**

**Current Ordinance:** Critical facilities are not referenced in the existing Lane County Flood Plain ordinance.

**Proposed Language:** LC 16.244(9)(c) - Construction of new critical facilities shall be prohibited within the 500 year floodplain. Substantial improvements of critical facilities may be permissible but improved facilities must be elevated on fill at least one foot above the elevation of the 500-year flood. Access routes above the 500-year flood level must be provided for substantially improved critical facilities.

<sup>22</sup> Development in the Special hazard Area, Lane County Public Works Department, August 2009, Land Management Division, P. 2

<sup>23</sup> Protecting Floodplain Resources: A guidebook for Communities, Federal Interagency Floodplain Management Task Force, June 1996, FEMA, p. 33

According to LC 16.244, a critical facility is one that is:

“Critical for the health and welfare of the population and is especially important following a hazard event. Examples include hospitals, nursing homes police stations, fire stations, and public and private utility facilities that are vital to maintaining or restoring normal services to flooded areas...Critical facilities also include those facilities that if damaged or inundated during a flood event have the potential to create further detrimental risks to the health of the population and the environment. These include all landfills, dumps, waste treatment facilities and also any industrial facilities that produce, use or store hazardous materials.”<sup>24</sup>

**Explanation:** The significant proposed change is that critical facilities must be sited outside the 500 year floodplain.

**Rationale:** The rationale for this proposed amendment is straightforward: facilities that provide key public services should not be built in areas where they will be damaged or rendered inoperable during flood events. Not only does this provision ensure that such facilities will not be impacted during flood events, it ensures that investments in critical facilities will not be compromised by flood damage. Moreover, the federal government sets a higher standard: under Executive Order 11988, Floodplain Management, Federal agencies funding and/or permitting critical facilities are required to avoid the 0.2% (500-year) floodplain or protect the facilities to the 0.2% chance flood level.<sup>25</sup>

**Proposed Amendment: Create additional restrictions on development in the floodway**

**Current Ordinance:** For the purposes of LC 16.244, development is defined in LC 16.090, and shall include dredging, paving, and drilling operations and the storage of equipment and materials.

**Proposed Language:** For the purposes of LC 16.244, development means any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials located within the area of special flood hazard. Development does not include:

- A. Signs, markers, aids, etc. placed by a public agency to serve the public
- B. Driveways, parking lots, or other open space use areas where no alteration of topography occurs;
- C. Minor repairs or improvements to existing structures provided that the alterations do not increase the size or intensity of use, and do not constitute repair of substantial damage, or substantial improvement as defined in this ordinance;
- D. Customary dredging associated with routine channel maintenance consistent with State or Federal laws and permits;

<sup>24</sup> Floodplain Combining Zone (/FP-RCP) Rural Comprehensive Plan, Lane Code, 16.244, p. 4

<sup>25</sup> [http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/critical\\_facility.shtml](http://www.fema.gov/plan/prevent/floodplain/nfipkeywords/critical_facility.shtml)

E. Replacement of utility facilities necessary to serve established and permitted uses.

LC 16.244(9)(d)(i) - Development within the floodway is prohibited for most uses unless this standard would deny any reasonable use of the property. In addition, applications for development outside of the regulated floodway shall be reviewed as ministerial land use applications. Applications for development within the regulated floodway shall be filed with the Department pursuant to LC 14.050.

**Explanation:** The Planning Director must approve all proposed developments within a flood hazard area. Floodway development is prohibited unless a registered professional engineer certifies that the development will not increase flood levels during a base flood (16.244(8)(d)(v)(aa)).<sup>26</sup>

**Rationale:** The primary rationale for this provision is to preclude development in the floodway—the channel of water conveyance during flood events—that would impair the conveyance of floodwaters.

In general, development and urbanization in a floodplain permanently impair the functioning of riparian areas.<sup>27</sup> The 2009 CPW study concluded that development in floodplains poses risks to water quality because development including dwellings, septic tanks, and drainage fields, if located within the floodplain, may impact water quality by leaking untreated sewage, household chemicals, or hazardous materials into the waterway. During a flood event, entire structures and septic systems may be washed into the waterway, negatively impacting water quality and leading to further property damage. Additionally, revetments and other bank stabilizing structures can cause increased velocity, turbidity, and water levels, especially during a flood event, which increases risk to human life, property, and water quality.

Based on analysis of the Lane County permit database, CPW found that tax lots with structures within the floodplain have a significantly higher number of additional permits associated with them than those outside the floodplain. Structures outside the floodplain average about three permits, while those in the floodplain or floodway averaged more than five. Once a structure in the floodplain gains approval it can lead to multiple permit applications for development, such as additions, improvements, revetments, and erosion control measures. In addition, accessory structures are not as highly regulated as dwellings.<sup>28</sup> The CPW study identified 70 structures within the floodway in the McKenzie River basin study area.<sup>29</sup>

One case demonstrated the ability of the current code to restrict development in the floodplain. In this case, an application to build a dwelling on a 13-acre property in the floodplain

<sup>26</sup> EWEB Source Water Protection Project: Best Management Practices and Model Ordinance Review, Community Planning Workshop, June 2009, p. 9

<sup>27</sup> Riparian Areas: Functions and Strategies for Management, National Academy Press, 2002, p. 12

<sup>28</sup> EWEB Source Water protection Project Land Use Decision Analysis, Final Report, Community Planning Workshop, September 2009, p. 32

<sup>29</sup> McKenzie River Basin Risk Atlas, Community Planning Workshop, August 2009, P. 18

was denied. The staff report recommended denial due to the potential for increased base flood elevation from the proposed development.<sup>30</sup>

In terms of regulating development for ensuring riparian protection, Northeast Ohio is working to establish strict regulations for development in floodplain areas. The Northeast Ohio Regional Storm Water Ordinance, "Controlling Riparian Setbacks and Wetlands Setbacks" has begun the process of community natural resources protection. This model ordinance, which is currently being review by local communities, includes the establishment of naturally vegetated riparian setbacks for all streams, including headwater streams (drainage areas less than ¼ square mile with a defined bed and bank) and all wetlands, including isolated wetlands that are not found within or abutting the riparian setback.<sup>31</sup>

In the Northwest, King County Washington developed a comprehensive floodplain management program in 2006.<sup>32</sup> In the face of repetitive flood losses and lawsuits related to the biological impacts of development in the special flood hazard zone, the County adopted the Flood Hazard Management Plan which presents a 10-year action plan to mitigate the impacts of flooding in King County. The County also has a highly restrictive floodplain ordinance. Similar to the proposed amendment to the Lane County Code, King County Code Title 21A.24.260 prohibits new residential development in areas within the mapped FEMA floodway. Moreover, the King County Code places significant restrictions on "substantial improvements" to existing development within floodways.

In fact, the State of Washington prohibits residential development in floodways by statute:

"Washington's floodplain management law at Chapter 86.16 RCW exceeds the minimum National Flood Insurance Program standards by prohibiting new residences or substantial improvements of existing residences in the State's floodways."<sup>33</sup>

Moreover, this provision has been upheld in several court cases that challenged various aspects of the prohibition.<sup>34</sup>

### **Proposed Amendment: Restrictions on land divisions**

**Current Ordinance:** LC 16.244(9) Land divisions must be consistent with shoreland values as identified in the Coastal Resources Management Plan, not adversely impact water quality, and not increase hazard to life or property. (b) For lands outside urban or urbanizable areas or lands developed or committed to development, the above criterion, plus the following:(i) There is a need which cannot adequately be accommodated on non-shoreland locations. (ii) There is a lack of suitable shoreland locations within urban or urbanizable areas or within areas developed or committed to development.

<sup>30</sup> EWEB Source Water protection Project: Land Use Decision Analysis, Final Report, Community Planning Workshop, September 2009

<sup>31</sup> Northeast Ohio Regional Storm Water Ordinance, [http://www.norack.org/storm\\_water.html](http://www.norack.org/storm_water.html).

<sup>32</sup> <http://www.kingcounty.gov/environment/waterandland/flooding.aspx>

<sup>33</sup> <http://www.ecy.wa.gov/programs/sea/floods/archive-news/news-arc11.html>

<sup>34</sup> Ibid.

**Proposed Language:** LC 16.244(9)(d)(vi) - Land divisions are prohibited unless a development site is identified outside of the floodway. "Land divisions for residential purposes are prohibited if the resulting lots or parcels do not have a demonstrable developable area located outside of the Floodway that is of sufficient size to accommodate a dwelling, septic system, and parking area."

**Explanation:** The proposed amendment will restrict creation of new taxlots that do not have buildable areas outside the floodway. In short, this amendment will prohibit land divisions that would result in sites where the only buildable area is in the floodway

**Rationale:** This amendment would prevent land divisions that require development in the floodway thereby preventing potential loss of property from flood damage and avoiding unsafe conditions for property owners. It complements the previous provision that prohibits most development in the floodway.

The County has allowed such development in the past. Since 2000 the county approved eight permits for development in the floodway within the McKenzie River Basin study area.\*

**Proposed Amendment: Required Septic System Setbacks from the Flood Hazard Area (SFHAs)**

**Current Ordinance:** LC 16.244(9)(e) Individual sewerage facilities shall be located to avoid impairment to them or contamination from them during flooding.

**Proposed Language:** LC 16.244(9)(e) Whenever feasible, all new and replacement septic systems (including drainfields) must be setback a minimum of 25 feet from the SFHA. Where a suitable septic location outside of the SFHA does not exist, new and replacement systems must be designed to minimize or eliminate infiltration of flood waters into the system and be situated as far away as practicable from the flood source.

**Explanation:** This amendment requires that septic systems be setback from the floodplain where feasible or fitted with appropriate backflow devices.

**Rationale:** The primary rationale for this amendment is to keep septic systems out of the flood hazard area where they may be damaged during a flood event or release untreated sewage into the waterway.

Through case study analysis, CPW found that Floodplain regulations restrict buildings to at least 1 foot above the base flood elevation, but septic systems are not covered by the code.\* The McKenzie River basin, upriver from the Hayden Bridge intake facility, has approximately 4,000 septic systems and eight larger community septic systems. According to the Environmental Protection Agency (EPA), up to a quarter of septic systems fail within their lifetime, meaning

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<sup>35</sup> Ibid, p. 24

<sup>36</sup> Ibid, p. 33

that the contents of the septic tanks are released into the surrounding soils which may leach into nearby water bodies.

The Oregon Department of Environmental Quality (DEQ) establishes the standards for siting of septic systems. DEQ has explicit standards for the distance between septic systems and residential wells.<sup>37</sup> However, the Lane County Development Code only addresses septic systems on the tax lot level, which omits proximity of a landowner's septic system from a neighbor's well or vice versa. In addition, cumulative impacts of high septic system densities are not addressed. In addition, under the Lane County code, existing floodplain regulations only restrict development that affects drainage above ground by mandating that the ground floor must be at least 1 foot above the base flood elevation. Since septic systems occur below ground, they are not regulated by the floodplain requirement, which creates substantial risk of contaminants entering the river.<sup>38</sup>

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<sup>37</sup> EWEB Source Water protection Project: Land Use Decision Analysis, Final Report, Community Planning Workshop, September 2009, p. 34

<sup>38</sup> EWEB Source Water protection Project: Land Use Decision Analysis, Final Report, Community Planning Workshop, September 2009, p. 33

28 September 2010

<b>To</b> <b>From</b> <b>SUBJECT</b>	<b>Lane County Planning Commission and Board of Commissioners</b> <b>Technical Advisory Committee</b> <b>FINDINGS OF FACT AND RATIONALE FOR THE PROPOSED DRINKING WATER PROTECTION ORDINANCE</b>
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## INTRODUCTION

The purpose of this memo is to provide findings of fact for the proposed *Lane County Drinking Water Protection Overlay Zone* (Lane Code 16.298/DWP-RCP). The purpose of this overlay zone is to promote the public health, safety, and general welfare of the residents of Lane County by minimizing public and private losses due to contamination of drinking water sources. Specifically, the goals of the proposed ordinance are to protect surface and ground waters that provide sustainable sources of safe potable drinking water to Lane County residents, protect human life and health, minimize expenditure of public money for pollution remediation projects, and minimize interruptions to business and commerce. The newly defined overlay zone will serve to better protect Lane County's sources of public drinking water.

## Technical Advisory Committee Mission and Charge

In late 2009, the Lane County Board of Commissioners appointed a Technical Advisory Committee (TAC) to assist the Lane Management Division (LMD) staff in drafting proposed revisions to the existing floodplain ordinance and preparing a new drinking water protection overlay zone. The objective of the TAC was to help LMD construct ordinances that would protect water quality, promote human health and safety and protect property, while providing reasonable limitations and exceptions to the code where necessary to protect private property rights.

In its deliberations, the TAC reviewed various practices in other jurisdictions, model ordinances prepared by the Oregon Department of Environmental Quality and other agencies, a recent study by the University of Oregon and other technical and scientific sources from agencies, a threat identification document prepared by LMD, and the relevant literature. References are cited in the documents prepared by the TAC. The Land Management Division is responsible for the final language that is presented to the Board of Commissioners. The TAC is not a stakeholder committee and the recommendations are not intended to reflect the views of stakeholders.

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Membership on the TAC does not necessarily imply formal endorsement of the proposed ordinances by the agencies and organizations represented, although the objectives of the ordinances are consistent with the mission and goals of these organizations. Nor do the recommendations herein comprehensively reflect the views of all individual TAC members.

## BACKGROUND

Sixty-seven community water systems provide the primary sources of drinking water for approximately 83% of the population in Lane County (ODHS, 2010). All of these community water systems have delineated drinking water source areas and have assessed the various pollution threats to water quality in these areas as required under the Clean Water Act (<http://www.deq.state.or.us/wq/dwp/swrpts.asp>). According to the U.S. Environmental Protection Agency, the leading cause of source water degradation is from nonpoint sources of pollution (NPS), which includes runoff from lawns, farms, forests, highways, and urban areas, as well as leachate from septic systems and landfills (U.S. EPA, 1998). Public water providers and community leaders in Lane County have been working to better understand and address the various threats to water quality in drinking water source areas with varying success. The following are examples of these efforts:

- **Dune City:** most Dunes City residents draw their drinking water from Siltcoos or Woahink Lakes. For years, Dunes city has been proactive in protecting their drinking water supply through a combination of regulatory and educational mechanisms. Dunes city prohibits detergents with phosphorous (Ordinance 190) and requires residents to have their septic systems periodically inspected to help reduce the risk to their water supply (Ordinance 173). Dunes City also has an erosion control ordinance (Ordinance 193) that requires site plans and erosion control for certain disturbances of soil (based upon size of disturbance and slope). Dunes City staff and volunteers are also long-term partners in ongoing project work to monitor and address blue-green algae issues.
- **Florence:** awarded an EPA grant to fund the Siuslaw Estuary Partnership project to better assess and protect natural resources including drinking water quality in their federally designated sole source aquifer.
- **Heceta Water District** is a partner in multiple drinking water protection grants including the Siuslaw Estuary Partnership project and a DHS grant to assess harmful algae blooms in mid-coast lakes. The water district also voluntarily tests for pharmaceuticals in their source water.



- Veneta: completed a drinking water protection plan in 2000. One of the goals in the plan is to "Form an Intergovernmental Agreement with Lane County". The goal is formed around the idea that collaboration with the County is important because "activities and actions within Lane County purview may adversely affect Veneta's groundwater quality".
- Springfield: developed a drinking water protection plan that was adopted in May 1999. Following the goals outlined in its plan, Springfield developed a drinking water protection overlay zone, which sets standards, prohibitions, and restrictions for the use of hazardous materials within those portions of Springfield's groundwater source area that fall within the urban growth boundary. Springfield was also awarded a Dept. of Human Services grant in 2009 to coordinate with Veneta and Adair Village in implementing county-wide source water protection activities including public education and integration of drinking water protection with land use planning.
- Junction City and Coburg developed drinking water protection plans in 1997 and 1996, respectively, and are highly proactive in educating community members and reducing high-level risks to their city wells. Both municipalities are actively engaged in implementing strategies documented in the Southern Willamette Valley Groundwater Management Area Action Plan to reduce regional nitrate contamination.

The largest public water system in Lane County is the Eugene Water and Electric Board (WEB) serving nearly 200,000 people. WEB's Drinking Water Source Protection Program has made a significant investment over the last nine years to collect baseline information with the U.S. Geological Survey (USGS) and other partners about water quality threats and impacts from forestry, agriculture, urban pollution, development, roadside vegetation management, operation of reservoirs and hydroelectric facilities, commercial and industrial pollution and hazardous material spills or releases (WEB, 2000; WEB, 2001a; WEB, 2001b; WEB, 2005a; WEB, 2005b; WEB, 2005c; WEB, 2005d; WEB 2005e; WEB 2005f; WEB, 2005g; WEB, 2006a; WEB, 2006b; WEB, 2007; WEB, 2009; USGS, 2009; Kraus, et. al., 2010; U of O CPW, 2009b; U of O CPW, 2009d; also see [www.web.org](http://www.web.org) and [www.mckenziewaterquality.org](http://www.mckenziewaterquality.org)). This information is being used to develop watershed models that will be used to help understand trends and predict future water quality based on changes in land use and the climate.

Recent studies by WEB have focused on assessing the water quality impacts from septic system clusters areas (i.e., higher density areas) in close proximity to the river or tributaries on gravelly or highly permeable soils (WEB, 2006a; WEB, 2009). WEB also engaged students at the University of Oregon Community Planning Workshop (CPW) to evaluate Lane County Development Code and determine what parts of the code were detrimental to source protection and what parts were beneficial. The CPW also assessed how the beneficial development code was implemented and enforced (CPW, 2009c). Based on these studies it appears increased development along the river poses a threat to Eugene's sole source of drinking water in the following ways (WEB, 2009; CPW, 2009b; CPW, 2009c; CPW, 2009d):

- Septic systems, especially those in higher densities or clusters, and/or located near the river in soils that are excessively permeable, pose a threat due to reduced treatment of domestic wastewater and short travel time to the river. Water quality monitoring from samples collected downstream of septic system cluster areas indicated an increase in bacteria and nutrient concentrations in shallow groundwater and the McKenzie River when compared to upgradient or upstream samples (EWEB, 2009).
- Development removes riparian vegetation that can buffer impacts from runoff of pesticides, paint, wood treatment chemicals, fertilizer or other household chemicals during rainstorms. Riparian areas also provide critical habitat and shade the river to reduce water temperatures.
- Development in the floodplain poses a threat due to the potential inundation of homes, garages, sheds and businesses that store pesticides, paints, solvents, petroleum products, sewage (from septic tanks and drainfields), gasoline, oil, grease and other petroleum products during periodic floods.
- Development in areas where the river is actively meandering can potentially wash away structures, septic systems, drums, tanks, or other containers that store chemicals. In addition, landowners in meander areas often resort to using revetment to harden river banks to protect homes and other structures that are threatened. This leads to a straightening of the river, with higher water velocities and potential for downstream impacts.
- Lane County Code and permitting practices allow development in the riparian area, floodplain, floodway and/or meander zones that not only increases the threat to drinking water, structures and human safety, but increases County staff time and costs of government resources once the structures are built in these critical areas.

This data and information was presented to the Lane County Board of County Commissioners on June 2, 2009 and August 25, 2009. Because the CPW study focused on Lane Code and development patterns associated with that code the Commissioners directed staff to work on updating and expanding the existing floodplain management ordinance and a drinking water source protection overlay zone throughout Lane County. These ordinances are designed to better protect human health and safety and to safeguard community drinking water quality.

Protecting the water quality of Lane County community drinking water source areas (which include surface water and groundwater areas) is a crucial part of ensuring safe and clean drinking water for the vast majority of residents in Lane County both now and into the future. The terms "surface water" and "groundwater" refer to the same water, they merely clarify the location of the water at a particular point in time (Leopold, 1997).

Drinking water source protection overlay zone ordinances are used throughout the country as one of many different tools being employed to protect valuable community drinking water source areas. The main purpose of overlay protection zones is to restrict or prohibit activities like development, hazardous material use and storage and other disturbances that would directly threaten the long-term water quality and health of the people that rely on the drinking

water source. By adopting a proactive ordinance, Lane County can better minimize expenditure of public money for pollution remediation projects by simply avoiding contamination in the first place (TPL, 2004).

The purpose of this memorandum is to provide the factual and scientific basis for the main elements of the proposed *Lane County Drinking Water Protection Overlay Zone* (Lane Code 16.298/DWP-RCP), which includes:

- Extent of drinking water protection buffer zones;
- Activities prohibited in protection buffer zones; and
- Groundwater protection zone delineation.

## SUMMARY OF RESEARCH

### *The Economics of Source Protection*

There are a number of purely financial reasons that exist for creating an overlay protection zone to help safeguard a community's drinking water source and reduce the likelihood that contamination will occur. Specific economic benefits include reduced costs for raw water treatment chemicals such as flocculent and chlorine, reduced water demand for backwashing, long-term economic viability of community, and reduced risk of contamination clean-up (TPL, 2004; NEIWPCC, 2000).

The true value of clean water is hard to measure. The cost of drinking water is currently set by the cost of treatment and distribution to the customer, which makes water an extremely inexpensive commodity. However, the majority of people are willing to buy bottled water at a price of up to 1,000 times the cost of safe tap water (AWWA, 2005). The Harvard Law School developed a methodology to quantify the value of improvement in water quality. They found that a 1% improvement in water quality was worth \$22.40 per household (Magat, et. al., 2000). This type of valuation can also be used when assessing the worth of preventing water quality degradation.

Another way to assess the economics of source protection is to look at the cost of additional treatment should a water system become contaminated. Regardless of the type of water treatment technology used by a community water provider, the protection of public health and raw water quality requires the protection of the source water. Simply put, contamination isn't allowed to find its way into the public water supply in the first place, then society wouldn't have to pay the high price that goes with removing it (NEIWPCC, 2000). Without source protection, raw water may degrade over time to the point where it is necessary to upgrade existing treatment technology at high capital costs. A few examples include:

- A lower bound on the economic benefits provided by watershed protection of the City of New York's water supply watersheds in the Catskill Mountains can be inferred from the estimated costs of \$5 to \$8 billion in capital investment and \$300 million annual operating and maintenance costs that would be needed for drinking water filtration facilities to replace the natural filtration of the City's water supply. To preserve these

services, the City of New York is investing \$1.5 billion in the Catskill Mountain watershed for stream setbacks, stream fencing, and a range of best management practices to preserve the natural water filtration services of the riparian landscape (NRC, 2000; CRWPI, 2006).

- The 1996 flood had a significant effect on the quality and quantity of Salem's water supply as the North Santiam River had extremely high turbidity and sediment loads. The city's slow sand treatment system was quickly overwhelmed with sediment, forcing the city to drill emergency wells, purchase groundwater from neighboring communities and construct an emergency pre-treatment system at a cost of \$2,410,000 (TPL, 2004; NEIWPCC, 2000). Logging clear cuts and unmanaged roads that gave way to slides and erosion were cited as one of the main reasons for the high sediment load, as well as the proximity of urban and residential development, including a highway that parallels the city's source of drinking water (U.S. GAO, 1998).
- Between 1996 and 1998 the City of Wilmington, North Carolina spent \$36 million to add ozonation and expand its treatment facility, in part as a result of an increase in industrial and agricultural runoff in their watershed (TPL, 2004).
- In 2000, Danville, Illinois invested \$5 million in a nitrate removal facility to deal with spikes in nitrogen resulting from agricultural runoff (TPL, 2004).
- In 2001, Decatur, Illinois, invested \$8.5 million in a new nitrate removal facility, also to deal with agricultural runoff (TPL, 2004).

The following table depicts the savings to communities that can be realized by investing in source water protection versus cleaning up the contamination after the fact. EPA estimates that on average, clean-up is 27 times more expensive than prevention and can be up to 200 times more expensive (U.S. EPA, 1996).

Community	Contamination Cost	Source Water Protection Cost	Overall Ratio of Contamination Cost to Source Water Protection Cost
Gilbert, IA	\$547,323	\$2,744	200:1
Norway, ME	\$545,904	\$101,014	5:1
Turnwater, WA	\$570,813	\$22,073	26:1
Gettysburg, PA	\$4,015,351	\$22,579	178:1
Dartmouth, MA	\$1,176,646	\$99,052	12:1
Middletown, OH	\$491,823	\$22,761	22:1

Another reason to pursue protection of community water systems is that some contaminants cannot be treated using known treatment technology, so even if society decided to just invest in treatment of contaminated water as opposed to preventing contamination, it would not be effective in protecting human health over time. A number of studies have shown that conventional treatment systems do little to remove contaminants such as pharmaceuticals, plasticizers, pesticides, steroids, flame retardants and detergents and even advanced treatment systems may not be effective in removing these compounds (Stackelberg, et. al, 2004;

Stackelberg, et. al., 2007; TPL, 2004; NEIWPCC, 2000; Lubick, 2008; USGS, 2008). In fact, pesticides were detected at low levels in over 60% of the finished water samples (i.e., after treatment) from community water systems in the Clackamas River basin (USGS, 2008). With more than 100,000 synthetic chemicals manufactured and used in domestic, industrial and agricultural applications it may not be possible to rely on simply treating the problem even if a community choose to go that route (Jorgensen, 2004).

To add to the complexity of addressing potential contaminants in a drinking water source area, scientists are starting to find that there can be synergistic toxicity effects when a number of organic compounds are present even at low concentrations. The U.S. Geological Survey (USGS) has conducted a number of studies across the country, including the Willamette Valley and Clackamas River Basin, that have found the majority of the water samples with detections from urban, agricultural and mixed-use streams contained two or more pesticides (Gilliom, 2007; USGS, 1996; USGS 1997; USGS, 1998a; USGS, 1998b; USGS, 2001; USGS, 2008; Laetz, et. al., 2009). The toxicological effects of these mixtures on aquatic organisms and humans are largely unknown. However, it is fairly clear that single-chemical risk evaluations are likely to underestimate the impacts of pesticide mixtures on salmon and other organisms (Laetz, et. al., 2009).

As already indicated, it is more cost effective to avoid the need for expensive technology for water treatment that may not be effective against a number of organic contaminants by protecting the quality of raw water (NEIWPCC, 2000). Another benefit that is usually not considered (in fact is often cited as a reason not to pursue source protection) is the potential for increased property values resulting from land use controls within a source protection area (NEIWPCC, 2000).

There are also a number of proven social, environmental and public health benefits associated with adopting a proactive drinking water ordinance. The following are benefits of proactive drinking water protection to the community (TPL, 2004; NEIWPCC, 2000):

- Increased reliability and safety of the water source ensures consumer confidence
- Supports community values, e.g. good stewardship of resources; healthy environment
- Greater flexibility to adapt to changes/future water needs
- Reduced treatment chemicals = reduced health risks associated with disinfection by-products; less worker exposure to chemicals
- Improved water quality = reduced health risks
- No drinking water standards exist for many emerging contaminants, including pharmaceuticals and personal care products. These compounds have been detected in streams and groundwater nationwide (Kolpin, et. al., 2002; Barnes, et. al., 2008); pollution prevention provides added protection from health risks (and other environmental risks) associated with these contaminants; each year approximately 50 new drugs appear on the U.S. market

- Even state-of-the-art treatment plants cannot remove all contaminants; a USGS study showed that many drinking contaminants can pass through high-level treatment (albeit at low concentrations) (Blomquist, 2001)
- Improved aquatic habitat and in-stream flows; protecting other beneficial uses including swimming, fishing, shellfish harvesting, livestock watering, wildlife benefits, irrigation.
- Fewer chemicals/contaminants = higher quality effluent to receiving water bodies
- Greater forest cover = lower treatment costs; in a 2002 study of 27 water systems by AWWA and TPL it was found that for every 10% increase in forest cover in drinking water source areas, there was a 20% reduction in treatment and chemical costs (TPL/AWWA 2002 study).
- "Approximately 50-55 percent of the variation in treatment costs can be explained by the percent of forest cover in the source area." (TPL/AWWA 2002 study)
- Trust for Public Land reports that a 1997 study by Dept. of Agricultural Economics at Texas A&M University of 12 water providers and 3 years worth of data found the following:
  - *"Suppliers in source areas with chemical contaminants paid \$25 more per million gallons to treat their water than suppliers in source areas where no chemical contaminants were detected."*
  - *"For every four percent increase in raw water turbidity there is a one percent increase in treatment costs. Increased turbidity, which indicates the presence of sediment, algae and other microorganisms in the water, is a direct result of increased development, poor forestry practices, mining or intensive farming in the watershed."*

Without proper proactive drinking water protection, costly contamination can occur, as depicted by examples both in Oregon and throughout the country. Contamination of two drinking water wells in a small community in Marion County, Oregon resulted in costs exceeding \$500,000 (ODEQ, 2010a). In the two-year interim between discovery of the problem and the installation of a treatment unit, residents had to use bottled water for drinking and cooking purposes. In contrast, the cost to develop a Drinking Water Protection Plan for a small community would be well under \$10,000 (ODEQ, 2010a).

In Milwaukee, Wisconsin, cryptosporidium in groundwater has cost the region \$89 million thus far. Furthermore, in Moses Lake, Washington, trichloroethylene in groundwater cost the region \$1.8 million to date on blending water and educating the public (Ainsworth and Jehn, 1996).

When water quality causes illness or even just an unusual taste, odor, or smell, the public quickly loses confidence in the safety of its supply. Loss of public trust costs both the supplier and the consumer and often leads to broader economic impacts (TPL, 2004).

Trust for Public Land states that "land use regulation and protection are crucial tactics for ensuring high quality drinking water in the region, but are often compromised for the short-term economic pay off of development. Land use decisions are often based on short-term (1-5 years) revenues and expense projections for local governments. The impacts of development

on water quality and treatment costs are realized over the long run (5-10 years)" (TPL, 2004). In addition, once development occurs it is a permanent fixture on the landscape, unlike other land use activities such as agriculture and forestry (NRC, 2002).

In community drinking water source areas the cumulative impact of development in critical areas like along rivers and tributaries and in floodways can potentially have a long term negative economic impact on communities and property values, especially if the natural resources that attracted people in the first place are significantly altered or degraded (CWRPI, 2006). A 1997 survey conducted by Duke University revealed that randomly selected residents in Colorado and North Carolina were willing to pay significantly more for a residential property located on land with 'good' drinking water as opposed to 'poor' drinking water (TPL, 2004).

The effect of setback regulations on property values is uncertain. Setback regulations could create a development effect that either increases or decreases home and lot prices. While both river views and forest views are consistently shown to increase property values, Mooney and Eisgruber estimated the effect of Oregon's voluntary riparian buffer rules, requiring a 50 foot *forested buffer* - not just a setback - reduced property values approximately 3%, attributed primarily to the loss of river view. Setback regulations could also be expected to contribute positive amenity value from the preservation of scenic views and water quality protection, as seen in water clarity, in waterfront properties (Mooney and Eisgruber, 2001; CWRPI, 2006).

## **RATIONALE FOR KEY AMENDMENTS TO THE DRINKING WATER OVERLAY ZONE**

The target of this ordinance is those areas that are the sources for community water systems as delineated by the Oregon DEQ as required under the federal Safe Drinking Water Act as delineated by Oregon DEQ and Department of Human Services (<http://www.deq.state.or.us/wq/dwp/swrpts.asp>).

### **Proposed Ordinance: Extent of Surface Water Protection Overlay Zone**

**Proposed Language:** LC 16.298 4 Designation of Drinking Water Source Areas. This Drinking Water Protection Overlay Zone is comprised of two separate regulatory elements, which contain different standards and requirements related to the protection of either surface water source areas or groundwater source areas. The locations of the protected surface and groundwater source areas are generally depicted on the proposed Drinking Water Protection Overlay Zone Map for Lane County and are further described below:

(a) Surface Water Source Protection Areas: Include the areas adjacent to rivers, streams, lakes or reservoirs that serve as a source of public drinking water, or which are tributaries to a source of public drinking water. These areas extend inland 200 feet, measured perpendicularly, from the ordinary high water level of the source of public drinking water and from any tributary to a source of public drinking water. The Official Drinking Water Protection Overlay Zone Map

identifies the surface waters to which these protection areas apply but does not depict the precise location of the ordinary high water level. Where development or vegetation removal is proposed near a surface water protection area, Lane County may require that a site visit be conducted by staff to delineate and monument the location of the ordinary high water level and the boundary of the surface water protection area on a property by property basis.

**Explanation:** As noted in LC 16.298 4(a), Surface Water Source Protection Areas extend inland 200 feet, measured perpendicularly, from the ordinary high water level of the source of public drinking water including tributaries (see map at: <http://apps.lanecounty.org/LaneCountyPlanMaps/> ).

Riparian buffer zones are land adjacent to waterbodies that have a significant role in controlling pollution and other impacts on water quality (NRC, 2000; NRC, 2002; CRWPI, 2006). The purpose of this 200 foot buffer is to prevent or minimize land use activities that may have a cumulative adverse impact on water quality over time in areas close to sources of public drinking water and provide increased treatment of overland runoff from nearby areas. According to the National Research Council (NRC), "Only if a setback is subject to management or natural preservation can it be considered a "buffer" that reliably insulates ecosystems and resources from nonpoint source pollution" (NRC, 2000). Lane Code 16.298 is designed effectively restrict activities that would impact the natural preservation within the 200 foot overlay zone to maximize the effectiveness of this area for treatment of nonpoint source pollution.

**Rationale:** Across the United States the majority of riparian forests have been converted to other land uses or have been replaced by development (NRC, 2002). This trend holds true for Lane County, where increased development of homes in floodways and within 100 feet of the river significantly impacts riparian forest (U of O CPW, 2009b; U of O CPW, 2009c). "Future structural development on floodplains should be placed as far from streams, rivers, lakes and other waterbodies as possible to help reduce its impact on riparian areas. Structural developments typically have significant and persistent effects on the size, character, and functions of many riparian areas. Thus, preventing unnecessary structural development in near-stream areas should be a high priority at local, regional, and national levels" (NRC, 2002). Lane Code 16.298 4(a) establishes that a buffer of 200 feet from the river or tributary stream is a reasonable setback distance for structural development to protect riparian forests in community drinking water source areas.

Because there are already substantial zoning ordinances already in place, the most effective way to protect riparian buffers is through an amendment that adds to the existing riparian overlay buffer zone (Wenger and Fowler, 2000). By increasing the buffer width, Lane County will decrease the extent of risk to drinking water posed by development adjacent to rivers, lakes and tributaries of source areas. Buffers can play a key role in the protection of drinking water sources. Riparian buffers are highly effective in removing a variety of pollutants from overland and shallow subsurface flow, as well as serving as stream flow regulators and bank and riverbed stabilizers; thus helping to improve water quality of a stream (ELI, 2008; Oregon,



2000; NRC, 2002; CRWPI, 2006; NRC 2002). A review of literature supports the need for riparian buffers, but recommendations provide a large range of buffer widths (NRC 2000; NRC 2002; May, 2003; USDA, 2003; Mayer, et. al., 2006; Palone and Todd, 1998) depending on:

- The value of the resource that riparian buffers are protecting (recreation, drinking water supply, habitat);
- The desired function of the riparian area (i.e., habitat improvement, pollution removal, flood control, bank stabilization, etc.);
- The magnitude and intensity of the adjacent land use (agriculture, development, timber harvest, roads, etc.);
- The characteristics of the riparian area and watershed such as steepness or slope of the adjacent upland area, climate and soil type.

The scientific literature suggests that common non-point source pollutants (i.e. nutrients, metals, pathogens) require a natural vegetated buffer of between 100-300 ft to attenuate those pollutants associated with land use development (NRC, 2000; CRWPI, 2006). Application of buffers to first and second order streams, as well as larger tributaries, has been shown to be essential to overall watershed water quality; thus buffer protection is extended to all perennial tributaries (NRC, 2002; CRWPI, 2006; Palone and Todd, 1998). Given varying natural buffer conditions, such as slope, soil type or land cover as well as the nature of the proposed land use, the buffer distances necessary to protect drinking water supplies may vary. The following is a summary of some examples of riparian setbacks adopted by other communities, counties and states.

- Three hundred feet is suggested as a buffer distance along the shoreline of a surface water drinking water supply as distance that would attenuate most common non-point source pollutants. A secondary buffer extending from 300 to 400 feet from the water supply's shoreline limits certain higher risk land uses (NHDES, 2008).
- In Washington State, the Legislature determined that "Shorelands" or "shoreland areas" means those lands extending landward for two hundred feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward two hundred feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters for the purposes of designating critical areas for protection under the shoreline management act (WA, 2010).
- The United States Department of Agriculture (USDA) Forest Service handbook for establishing and maintaining riparian forest buffers in the Chesapeake Bay watershed, recommends the following minimum width ranges based on specific functions (Palone and Todd, 1998; CRWPI, 2006):
  - Bank stabilization and aquatic food web processes - 10ft to 40ft.
  - Water temperature stabilization - 10ft to 60ft.
  - Nitrogen removal - 30ft to 140ft.
  - Sediment removal - 50ft to 160ft.
  - Flood mitigation - 65ft to 225ft.
  - Wildlife habitat - 45ft to 255ft.

- In the Cuyahoga Valley National Park, the National Park Service has recommended that riparian setbacks range from 50ft to 120 ft depending on drainage area, plus an additional 2 ft for each 1% increase in slope (CVNP, 2002; CRWPI, 2006).
- The City of Everett, Washington conducted a review of riparian literature and, as applied to the riparian function requirements of their community, came up with the following buffer width recommendations (Everett, 2003; CRWPI, 2006):
  - Sediment Retention and Filtration – 100ft to 300 ft.
  - Bank Stability - 100ft to 125 ft.
  - Small Woody Debris - 250 ft.
  - Shade/Water Temperature – 35ft to 250ft.
  - Water Quality – 13ft to 600ft.
  - Wildlife Habitat – 30ft to 1000ft.
- The City of Renton, Washington conducted a similar review of riparian literature to provide the scientific support for their riparian buffer ordinance, and reported the following recommended minimum buffer widths for their community (Renton, 2003; CRWPI, 2006):
  - Pollutant Trapping – 50ft to 100 ft
  - Sediment Trapping – 50ft to 200 ft.
  - Provide Particulate Nutrients to Stream (detritus) – 50ft to 100 ft.
  - Microclimate Control – 100ft to 525 ft.
  - Shade and Temperature Control - 50ft to 250ft.
  - Human Disturbance Control – 25ft to 50ft.
  - Bank Stability- 40ft to 70ft.
- Massachusetts passed the Watershed Protection Act that designates two areas for protection in different ways.
  - Within 400 feet of the reservoirs and 200 feet of tributaries and surface waters (the "Primary Protection Zone"), any alteration is prohibited. "Alteration" includes a variety of activities, such as construction, excavation, grading, paving, and dumping. Generation, storage, disposal or discharge of pollutants is also prohibited in the Primary Zone.
  - Between 200 and 400 feet of tributaries and surface waters, and on land within flood plains, over some aquifers, and within bordering vegetated wetlands (the "Secondary Protection Zone"), certain activities are specifically prohibited. These include storage, disposal or use of toxic, hazardous, and certain other materials; alteration of bordering vegetated wetlands; more dense development; and other activities (MDCR, 2010; NRC, 2000).
- The EPA recommends a minimum width of at least 100 feet to provide adequate stream protection (U.S. EPA, 2005; Broadmeadow and Nisbet, 2004).
- The Oregon DEQ indicates in the "Model Ordinance: Protecting Surface Water Sources of Drinking Water" that a larger width of 200 feet would be most appropriate for protecting streams, rivers, and reservoirs that supply public drinking water (<http://www.deq.state.or.us/wq/pubs/factsheets/drinkingwater/DWPOrdinanceOverlay.pdf>).