

Section 4-1900

Limestone Overlay District

4-1901

Purpose and Intent. The County seeks to preserve and protect the unique geologic characteristics and the quality of the groundwater in its limestone area. A large area just east of the Catoclin Mountain range in the Rural Policy Area of Loudoun County is comprised of limestone and “Karst terrain” areas. The limestone geology of carbonate deposits in Karst terrain areas is dissolved over time by mildly acidic precipitation, creating fissures. The deposits are highly permeable, allowing surface water to pass through quickly to underlying aquifers and groundwater, and possibly to reappear elsewhere as springs. The terrain is also characterized by the presence of certain natural features, such as sinkholes and rock outcrops. Thus development on Karst terrain has a direct correlation to the potential for ground surface collapse and the susceptibility of groundwater and surface water pollution, and spring contamination, posing serious risks to public health, safety and welfare. The limestone cannot environmentally support land development activity without performance standards and monitoring. Therefore, the provisions of this Section 4-1900 are intended to regulate land use and development in areas underlain by limestone and in areas with Karst features and Karst terrain in such a manner as to:

- (A) Protect the health, safety and welfare of the public;
- (B) Protect groundwater and surface water resources from contamination; and
- (C) Reduce potential for property damage resulting from subsidence or other earth movement.

4-1902

Authority. Authority for these provisions includes:

- (A) Chapter 11, Title 15.2, Code of Virginia (Planning, Subdivision of Land and Zoning).
- (B) Soil and Water Conservation, Va. Code Sections Title 10.1, Chapter 5.
- (C) Environmental Quality law, Va. Code Title 10.1, Chapter 11.1.
- (D) Erosion and Sediment Control law, Va. Code Section 10.1-560 *et seq.*
- (E) Uniform Statewide Building Code and International Building Code Chapter 18.

4-1903

Applicability and Exemptions.

- (A) **Applicability – Land Area Included in the LOD.** This Section 4-1900 shall apply to all land included in the Limestone Overlay District (LOD), as shown on the official Limestone Overlay District Map (“LOD Map”), which, with all explanatory matter thereon, is hereby incorporated by reference. The LOD is established as an overlay district, meaning that this district is overlaid upon other districts and the land so encumbered may be used in a manner permitted in the underlying district only if and to the extent that such use is also permitted in the overlay district. Pursuant to Section 6-407, the Zoning Administrator is charged with making

necessary cartographic interpretations of the LOD Map with recommendation and referral from the County Soil Scientist.

- (B) **Applicability – Covered Activities.** This Section shall apply to all land development applications, including all Zoning Map Amendments, Special Exception applications and Commission Permit applications, as well as all land disturbing activities, including non-agricultural rural economy uses, new single-family development, preliminary subdivisions, family subdivisions, preliminary/record subdivisions, site plans, grading permits, construction plans and profiles, and zoning/building permits that involve land disturbing activities, that occur within the LOD.
- (C) **Exemptions.** The following land disturbing activities shall be allowed within the LOD, subject to the specific limits set forth below:
- (1) **Agricultural Operations.** This section shall not apply to agricultural, horticultural, or animal husbandry operations located in the LOD that are covered by, and conducted in conformance with, a Conservation Farm Management Plan, that includes best management practices, approved by the Loudoun County Soil and Water Conservation District or the U.S. Natural Resources and Conservation Service, and a Nutrient Management Plan approved by the Loudoun County Soil and Water Conservation District. Structures associated with agricultural operations are not exempt from these provisions. For purposes of this Section 4-1900, the term “structure” shall include, but not be limited to, all buildings, water/dam embankments, retaining walls, field/ tile drainage, road construction and cut or fill operations.
 - (2) **Forestry and Silviculture.** This section shall not apply to Forestry and Silviculture conducted in conformance with a Forest Management Plan that is prepared by the Virginia Department of Forestry, or a professional forester with, at a minimum, a Bachelor of Science degree from an accredited School of Forestry, in accord with requirements in the Facilities Standards Manual and approved by the County Urban Forester.
 - (3) **Gardens.** Gardens shall be exempt from the provisions of this Section 4-1900 provided that no cutting, filling, or berming is required to create such garden.
 - (4) **Existing Structures within LOD.** Except as provided herein expansion, alteration, or reconstruction of legally existing buildings, structures, and impervious surface areas existing on February 17, 2010 shall be exempt from the provisions of Section 4-1900, provided that such alteration does not increase the total footprint of a building or structure, or increase the total amount of impervious surface areas (exclusive of existing buildings and structures), as it existed on February 17, 2010, by more than twenty-five percent (25%) or 2,000 square feet, whichever is greater, and provided further that any such expansion does not

encroach into a Karst/Sensitive Environmental Feature Setback. If the existing building, structure, or impervious surface is located within a Karst/Sensitive Environmental Feature Setback, then such expansion shall not get closer to the Karst/Sensitive Environmental Feature than the closest point of the existing structure, as it existed on February 17, 2010. However, if expansion away from a Karst/Sensitive Environmental Feature is not feasible, then such expansion may get closer to the Karst/Sensitive Environmental Feature if such expansion conforms to the provisions of Section 4-1906(A)(2)(a). Expansion or alteration of legally existing buildings, structures or impervious surfaces pursuant to this section shall require locational clearance approved by the County Department of Building and Development, as set forth in Section 4-1904(A)(2). Reconstruction of a structure pursuant to this section, in the exact location it occupied on February 17, 2010 shall not require a locational clearance.

- (5) **Paving of Existing Driveways.** The paving of driveways existing on February 17, 2010 shall be exempt from the requirements of this Section 4-1900 except that any proposed paving shall require locational clearance approved by the Department of Building and Development, as set forth in Section 4-1904(A)(2).
- (6) **Structures or Land Disturbance of 720 Square Feet or Less.** Any land disturbing activities or structures involving the disturbance of 720 square feet or less of land shall be exempt from the provisions of this Section 4-1900, except:
 - (a) No such disturbance shall be permitted within 20 feet of a Karst/Sensitive Environmental Feature; and
 - (b) No structures, even if 720 square feet or less, shall be permitted within the Karst/Sensitive Environmental Feature Setback; and
 - (c) This exemption shall not apply to swimming pools, principal dwellings, accessory dwellings, or to structures or land disturbing activities whose purpose is to change water flow: and
 - (d) This exemption shall not apply to wells, except in cases involving the replacement of a dry well serving an existing inhabited structure.

4-1904 Review Procedures.

(A) Administrative Applications

- (1) All land disturbing activities, including non-agricultural rural economy uses, new single-family development, preliminary subdivisions, family subdivisions, preliminary/record

subdivisions, site plans, grading permits, and construction plans and profiles in the LOD shall be governed by procedures in Chapter 8 of the Facilities Standards Manual (FSM). In addition, each such application shall include proposed roads, lot lines, buildings, wells, drainfield locations and limits of clearing and grading and other land disturbing activities.

- (2) All zoning/building permits within the LOD shall require that an applicant obtain a locational clearance from the County Department of Building and Development. The applicant shall submit a map, plan, or plat showing the location and extent of land disturbing activities and mitigation measures, and shall include the proposed building sites, paved areas, drainfields, well locations, and other uses.

(B) **Legislative Applications.** All applications for Zoning Map Amendments, Special Exceptions and Commission Permits shall be required to submit, in addition to the material required under the provisions of Article 6 of this Ordinance for each respective application type, the following material:

- (1) Existing Conditions Map, prepared at a scale of 1 inch = 200 feet and including planimetric detail with, at a minimum, five foot contour intervals. This map shall include the location of existing wells, drainfields, fill sites, faults (as shown on United States Geologic Survey Maps), and Karst/Sensitive Environmental Features within 100 feet of the property boundary. For purposes of identifying fill sites on the Existing Conditions Map, the applicant shall include areas of fill identified on the County's G.I.S. database, identified in the Preliminary Soils Report and/or identified in a Geophysical or Geotechnical Study.
- (2) Concept Plan of proposed development including proposed roads, lot lines, buildings, wells, drainfield locations, Karst/Sensitive Environmental Features, Karst/Sensitive Environmental Feature Setbacks, and other areas of non-disturbance.
- (3) Preliminary Soils Review in accordance with Chapter 6 of the FSM.

4-1905

Establishment of Karst/Sensitive Environmental Features

(A) **Karst/Sensitive Environmental Features Associated with Limestone Bedrock.** For all land development applications and land disturbing activities, as specified in Section 4-1903(B), involving properties subject to LOD, as identified on the LOD Map, the applicant shall submit a Geophysical Study, pursuant to the requirements of Chapter 6 of the FSM. The Geophysical Study shall identify the following Karst/Sensitive Environmental Features associated with limestone bedrock:

- (1) Sinkholes, Swallets, or Closed depressions;

- (2) Rock Outcrops;
- (3) Underground Solution Channels within 45 feet of the surface;
- (4) Cave Openings;
- (5) Springs; and
- (6) Perennial Sinking Streams;

A Geotechnical Report shall also be required to verify any of the above conditions whenever recommended by the Geophysical Study.

(B) **Karst/Sensitive Environmental Feature Setback.** For each Karst/Sensitive Environmental Feature within the LOD including, without limitation, those identified in any required Geophysical Study, or any Preliminary Soils Review as required by the Facilities Standards Manual, a setback shall be established from the outermost edge of each such feature. All such features must be identified on the land development application and must have a minimum setback of fifty (50) feet, except for the following:

- (1) One hundred (100) feet minimum from the rim of any Sinkhole, Swallet or Closed Depression; and
- (2) One hundred (100) feet minimum from any Cave Opening.
- (3) Springs. Land disturbing activities, development, and impervious surface coverage are prohibited within 1) one hundred (100) feet from a spring, measured from the first emergence of the spring or 2) two hundred (200) feet when the first emergence of the spring is on a slope greater than 15% and is downslope from the land disturbing activities, development or impervious surface coverage.
- (4) Perennial Sinking Streams. One hundred (100) feet minimum setback from any perennial sinking stream, as measured along the slope of the ground from the channel scar.
- (5) The setback from rock outcrops for wells shall be ten (10) feet

The setback shall be reduced, by up to 50%, based on the conclusions of the Geophysical Study, if the Geophysical Study concludes that the risks of collapse and groundwater contamination are non-existent or insignificant for the proposed location and use. However, no such reduction shall be approved for any perennial sinking stream, nor for any spring, nor for any sinkhole, swallet, closed depression, or cave opening that receives either a perennial or intermittent sinking stream. In addition, no such reduction shall be allowed in the required setback from rock outcrops for wells.

(A) Uses and Activities within Karst/Sensitive Environmental Feature Setback.

- (1) Land disturbing activities, development, and impervious surface coverage are prohibited within Karst/Sensitive Environmental Feature Setbacks except for the following:
 - (a) Fences that do not obstruct surface water flow;
 - (b) Trails and other passive recreation facilities, excluding buildings, for pedestrian, bike or other non-motorized use, provided that such facility is designed with permeable materials and is located a minimum of 25 feet from the edge of each Karst/Sensitive Environmental Feature; and
 - (c) Restoration and vegetation.
- (2) Residential structures shall be located outside Karst/Sensitive Environmental Feature Setbacks (as set forth in Section 4-1905(B) or as may be reduced pursuant to the provisions of that section), except as follows:
 - (a) On any lot existing on February 17, 2010, where there is no feasible development site available outside of the Karst/Sensitive Environmental Feature Setback, a principal residential structure, and/or a drainfield for such principal residential structure, if otherwise permitted under this ordinance, may be permitted if, prior to the issuance of a zoning permit, the owner shall provide, or comply with, as applicable, the following:
 - (i) Provide a Geophysical Study for the proposed structure and/or drainfield, ;
 - (ii) Comply with any recommendations of the Geophysical Study; and
 - (iii) Such structure and/or drainfield, shall be sited on the lot so as to be located as far from the Karst/Sensitive Environmental Feature as is feasible.
 - (iv) Development on such lot shall not be allowed if the Geophysical Study shows subsidence poses a serious risk to public health or safety or to the safety of residents or users of the proposed development unless the design of the proposed development is certified, both structurally and geotechnically, by a professional engineer.

- (b) No structures for uses other than a principal residential structure permitted under subsection (a), above (i.e. no accessory structures) shall be permitted to locate within the Karst/Sensitive Environmental Feature Setback.
- (B) **Uses and Activities in the Limestone Overlay District, Outside Karst/Sensitive Environmental Feature Setback.** Except as provided in Section 4-1906(E) all uses and structures permitted by right in the underlying zoning district are permitted within the Limestone Overlay District outside of the Karst/Sensitive Environmental Feature Setback, subject to standards and mitigation measures required pursuant to this section of the Zoning Ordinance.
- (C) **Special Exception Uses.** Except as provided in Section 4-1906(E), all uses and structures permitted by special exception in the underlying zoning district may be permitted subject to the procedures and criteria stated in Section 6-1300, “Special Exception” of the Zoning Ordinance, Section 4-1904(B), above, and to conditions identified in such special exception and to any mitigation measures required according to Section 4-1908, below.
- (D) **Creation of New Lots.** Prior to approval of any building lot created after February 17, 2010 it shall be demonstrated that there is a sufficient area (to include sewage disposal and well sites, where applicable, unless an approved sewage disposal site exists which is subject to Section 1066.17 of the Loudoun County Codified Ordinances and/or an approved well site exists which is subject to Section 1040.19 of the Loudoun County Codified Ordinances) outside of the Karst/Sensitive Environmental Feature Setbacks, identified in Section 4-1905(B), for the intended use.
- (E) **Prohibition of Specific Pollution Sources.** The following uses shall be prohibited within the LOD:
- (1) Facilities or uses that generate or manufacture hazardous substances;
 - (2) Storage of hazardous substances in an aggregate amount greater than 55 gallons (or the dry weight equivalent) on site at any one time, excluding heating oil or gasoline within above ground storage tanks;
 - (3) Automobile Service Stations;
 - (4) Gas Pumps accessory to Convenience Food Store;
 - (5) Motor Vehicle service and repair;
 - (6) Underground Storage Tanks, except for propane tanks and water cisterns shown on an approved Geophysical Study;
 - (7) Landfills and waste sites.

Development Standards for the LOD. Unless otherwise exempt by Section 4-1903(C) above, all uses permitted by right or special exception and all land disturbing activities in the LOD shall adhere to the following development standards:

- (A) **Structures in Potential Subsidence Areas.** No structure shall be built in an area where a Geophysical Study indicates that potential subsidence may occur that would cause property damage, physical injury or harm to the public or future residents unless there are no alternative locations within a given lot of record, and a subsequent Geotechnical Report indicates that such potential harm can be mitigated. In such cases the structures must be constructed in accord with the mitigation techniques recommended by the Geotechnical Report.
- (B) **Site Grading.** A grading permit is required for all land disturbing activities. Site grading, including any fill or berm placement, shall maintain natural drainage patterns. Berms and filling operations shall require a Geophysical Study.

If no other alternative exists than to impact natural drainage patterns, then drainage shall be designed to avoid damage to Karst/Sensitive Environmental Features as identified in the required Geophysical Study, and in any subsequently required Geotechnical Report, by mimicking pre-development volumes.

- (C) **Surface Water Run-Off.**
- (1) Non-point source pollution load of surface runoff from land disturbing activity, that is naturally conveyed to a Sinkhole, Swallet, Closed Depression, or Cave Opening shall meet the stormwater quantity and quality standards specified in Chapter 5 of the Facilities Standards Manual. In addition, the runoff shall travel over vegetative filters or other filtration measures, as established in the Virginia Stormwater Management Handbook, prior to entering such features.
 - (2) Surface water runoff shall not be redirected or concentrated to enter a Sinkhole, Swallet, Closed Depression or Cave Opening.
 - (3) Post-development flow to a Sinkhole, Swallet, Closed Depression, or Cave Opening that receives a Sinking Stream shall be the same as pre-development flow.
- (D) **Limits of Disturbance and Revegetation.** Disturbed areas shall be limited to what is necessary to locate the use, and any disturbed areas that are not covered by paving, stone, or other solid materials shall be revegetated.
- (E) **Wells.** Wells shall be installed in accordance with the provisions of Chapter 1040 of the Loudoun County Codified Ordinance, the Virginia Department of Health Private Well Regulations and the Virginia

Department of Health Waterworks Regulations and Chapter 6 of the Facilities Standards Manual, relating to “Subdivisions with Communal Water Systems”. Communal Water Supply Systems shall be required for all subdivisions of fifteen (15) or more lots approved after [action date], except for subdivisions in which each lot of the subdivision contains ten (10) or more acres of land.

- (F) **On-Site Sewage Disposal Systems.** On-site sewage disposal systems, as defined in the Land Subdivision Development Ordinance, are allowed in the LOD for individual lots and subdivisions with fewer than fifteen (15) lots, and for subdivisions in which each lot of the subdivision contains ten (10) or more acres of land. Sewage disposal systems shall be subject to the review processes and requirements in the LSDO (Section 1245.10) and shall comply with requirements of the Virginia Department of Health – Division of Sewage and Water Services, and the Loudoun County Health Department.

- (G) **Communal Wastewater Systems.** Proposed subdivisions containing fifteen (15) or more lots shall be served by communal wastewater systems, unless the applicant demonstrates to the County that other types of systems are available that will achieve and maintain the same or superior treatment results. Additionally, subdivisions in which each lot of the subdivision contains ten (10) or more acres of land shall be exempt from this requirement. The County shall allow communal wastewater systems in the LOD subject to the following standards:
 - (1) Where sufficient area exists on the portion of the property outside of the Karst/Sensitive Environmental Feature Setback to accommodate a proposed communal wastewater disposal system, then such system shall be located outside of the Karst/Sensitive Environmental Feature Setback; or
 - (2) Where insufficient buildable land area exists outside of the Karst/Sensitive Environmental Feature Setback as much of the proposed communal wastewater disposal system shall be sited outside the Karst/Sensitive Environmental Feature Setback as possible and the applicant shall demonstrate through a Geophysical Report and Detailed Soils Site Investigation Report acceptable to the County that the communal wastewater disposal system will prevent a change in the levels of pre-development runoff within the Karst/Sensitive Environmental Setback area, enhance filtration, and will not have an adverse environmental impact on underlying aquifers and groundwater. In addition, the applicant shall provide a plan for regular operation and maintenance.
 - (3) All Communal Wastewater Systems shall be capable of producing secondary effluent, or better, as identified in the Sewage Handling and Disposal Regulations of Virginia.

- (H) **Golf Course Use.** Any golf course use within the LOD shall adhere to a Water Management Plan approved by the County Department of Building and Development and a nutrient management plan approved by the Loudoun County Soil and Water Conservation District and the County Department of Building and Development.
- (I) **Stormwater Management Facilities and Best Management Practice Facilities (BMPs).**
 - (1) Stormwater management ponds and BMP facilities shall not be located within Karst/Sensitive Environmental Feature Setbacks.
 - (2) Stormwater management ponds, and BMPs constructed within the LOD shall require a Geophysical Study, and all stormwater management ponds, sediment traps, and sediment basins shall be lined with impervious materials to prevent groundwater pollution, in accordance with Chapter 5 of the Facilities Standards Manual
- (J) **Irrigation Systems.** Irrigation systems shall be prohibited unless the water for such system is supplied from a source that is not dependent on groundwater, such as, but not limited to, cisterns and stormwater management ponds. Communal water systems that obtain water through communal wells are not an acceptable source for irrigation systems.
- (K) **Explosives and Blasting.** Blasting within LOD shall require conformance to Section 6.157 of the FSM
- (L) **Notice to Property Owners.** Notes containing the following or similar language shall be placed in all deeds of conveyance, and on all record subdivision plats and site plans for land in the LOD:
 - (1) “In addition to the requirements of the underlying zoning district this property is also subject to the restrictions, standards and criteria of the Limestone Overlay Zoning District. Please contact the County Zoning Office for more information.”
 - (2) “Maintenance of sewage disposal systems must be done in accordance with all State and County requirements in order to help prevent potential groundwater contamination.”

4-1908

Mitigation Measures for the LOD. In addition to compliance with the development standards in Section 4-1907, land disturbing activities shall employ measures necessary to mitigate any potential adverse impacts to the County’s subsurface water resources or Karst/Sensitive Environmental Features associated with limestone bedrock, as identified in the required Geophysical Study as set forth in Section 4-1905(A), and any subsequently required Geotechnical Report, or in any other study required by the Zoning Ordinance, Land Subdivision Development Ordinance or Facilities Standards Manual.

- (A) **General.** Mitigation measures shall be directly related to proposed land disturbing activities and its potential adverse impact on the County’s water

resources or Karst/Sensitive Environmental Features associated with limestone bedrock identified on the subject property

- (B) **Mitigation Measures.** If mitigation measures are recommended by a study required by the Zoning Ordinance, Land Subdivision and Development Ordinance or Facilities Standards Manual, in order to protect against ground surface collapse, surface or groundwater pollution, and/or spring contamination, the County shall require such measures to mitigate the identified adverse impacts. Such measures may include, but shall not be limited to, the following list. This provision shall not be construed to limit the County's ability to impose mitigating conditions in its review of special exception applications, nor its ability to accept mitigating proffers in its review of zoning map amendment applications:
- (1) **Ineligibility for Density Increases.** The applicant may not be eligible for density increases otherwise permitted under the clustering provisions of this Ordinance.
 - (2) **Use of a Cluster Subdivision.** Where not otherwise required by this Ordinance, the County may require cluster development.
 - (3) **Landscaping and Reductions in Impervious Surface Coverage.** The County may require:
 - (a) Reductions in the maximum impervious surface coverage allowed;
 - (b) Reductions in the area devoted to landscaped lawns, and;
 - (c) Use of xeriscape (i.e., use of native plant materials and landscape materials that have lower water and nutrient requirements).
 - (4) **Storage Tank Testing and Containment.** The County may require leak testing and secondary containment for above ground storage tanks other than propane or water tanks.
 - (5) **Conservation of Indigenous Vegetation.** The County may require retention of indigenous vegetation to the maximum extent feasible, and in accordance with Tree Conservation Standards in Chapter 7 of the Facilities Standards Manual.
 - (6) **Groundwater Protection.** The County may require the applicant to establish a regular system of groundwater monitoring by a qualified professional for the proposed development and such other measures as may be recommended by other County Ordinances.
 - (7) **Prohibition of Additional Specific Pollution Sources.** The County may prohibit specific pollution sources, as defined in Chapter 5 of the Facilities Standards Manual as "stormwater hotspots", and other uses and activities with high risk of releasing