

DIVISION 40.10.100 RESOURCE PROTECTION STANDARDS

SECTION 40.10.110 RESOURCE PROTECTION STANDARDS

- A. The protection of natural resources is achieved in three (3) ways. First, specific open space standards are proposed to protect each natural resource by insuring that some portion of the area remains undisturbed. Secondly, site capacity calculation (Article 5) is provided to regulate development of sites to that which is consistent with the level of protection. Lastly, specific use, protection, and mitigation standards are provided for each resource.
- B. Natural resources are protected by requiring the preservation of a minimum amount of the resource as open space. Such open space shall be part of the open space ratio in residential developments and part of the landscape surface ratio in nonresidential developments. Unless otherwise permitted in this Article or Table 40.10.210, the open space shall remain undisturbed. Resource protection levels are specified in Table 40.10.010 and must be met within any development. The development intensity may be modified by the site capacity calculations in Division 40.05.100. Natural resource definitions are described in Division 40.33.300 .

Table 40.10.010 RESOURCE PROTECTION LEVELS		
Natural Resource	Resource Protection Levels	
	CN, CR, ON, OR, BP, I, HI Districts	All Other Districts
Floodplain/floodway	1.00	1.00
Wetland (see Section 40.10.320)	1.00	1.00
Riparian buffer	1.00	1.00
Drainageways	0.00	0.40
Cockeysville Formation - WRPA	0.50	0.50
Cockeysville Formation Drainage Area - WRPA	0.50	0.50
Sinkhole	1.00	1.00
Wellhead - WRPA Class A	1.00	1.00
Wellhead - WRPA Class B & C	0.50	0.50
Recharge areas -WRPA	0.50	0.50
Slope or geologic sites - CNA	0.90	1.00
Steep slopes (< 25%)	1.00	1.00
Steep slopes (15-25%)	0.25	0.50
Rare species site - CNA	1.00	1.00
Forests, mature - CNA	0.70	0.85
Forests, mature	0.50	0.70
Forests, young - CNA	0.40	0.60
Forests, young	0.20	0.50
Other CNA	0.20	0.25
Historic	See Article 40.15	

(Amended September 22, 1998 by Ordinance 98-080; amended December 14, 1999 by Ordinance 99-075)

SECTION 40.10.110 RESOURCE PROTECTION STANDARDS

- A. The protection of natural resources is achieved in three (3) ways. First, specific open space standards are proposed to protect each natural resource by insuring that some portion of the area remains undisturbed. Secondly, site capacity calculation (Article 5) is provided to regulate

development of sites to that which is consistent with the level of protection. Lastly, specific use, protection, and mitigation standards are provided for each resource.

- B. Natural resources are protected by requiring the preservation of a minimum amount of the resource as open space. Such open space shall be part of the open space ratio in residential developments and part of the landscape surface ratio in nonresidential developments. Unless otherwise permitted in this Article or Table 40.10.210, the open space shall remain undisturbed. Resource protection levels are specified in Table 40.10.010 and must be met within any development. The development intensity may be modified by the site capacity calculations in Division 40.05.100. Natural resource definitions are described in Division 40.33.300 .

Table 40.10.010 RESOURCE PROTECTION LEVELS		
Natural Resource	Resource Protection Levels	
	CN, CR, ON, OR, BP, I, HI Districts	All Other Districts
Floodplain/floodway	1.00	1.00
Wetland (see Section 40.10.320)	1.00	1.00
Riparian buffer	1.00	1.00
Drainageways	0.00	0.40
Cockeysville Formation - WRPA	0.50	0.50
Cockeysville Formation Drainage Area - WRPA	0.50	0.50
Sinkhole	1.00	1.00
Wellhead - WRPA Class A	1.00	1.00
Wellhead - WRPA Class B & C	0.50	0.50
Recharge areas -WRPA	0.50	0.50
Slope or geologic sites - CNA	0.90	1.00
Steep slopes (< 25%)	1.00	1.00
Steep slopes (15-25%)	0.25	0.50
Rare species site - CNA	1.00	1.00
Forests, mature - CNA	0.70	0.85
Forests, mature	0.50	0.70
Forests, young - CNA	0.40	0.60
Forests, young	0.20	0.50
Other CNA	0.20	0.25
Historic	See Article 40.15	

(Amended September 22, 1998 by Ordinance 98-080; amended December 14, 1999 by Ordinance 99-075)

DIVISION 40.10.200 OPEN SPACE REGULATIONS

Table 40.10.010 provides the protection levels for natural resources measured in the site resource capacity calculation in Division 40.05.400. Section 40.10.210 indicates the uses for which open space may be used. This Article also contains additional performance standards and mitigation requirements.

SECTION 40.10.210 USES IN REQUIRED OPEN SPACE

Table 40.10.210 lists uses that may be permitted in open space when required elsewhere in this Chapter. The uses listed are narrower subsets of the use categories listed in Table 40.03.110. In so doing, a closer match of the permitted uses to the resources' tolerance is provided. Any use not listed shall be considered prohibited.

**Table 40.10.210
USES IN REQUIRED OPEN SPACE****

Y = Permitted N = Prohibited L = Limited Use S = Special Use I = Environmental Impact Assessment Report (See Section 40.10.410)

Use	Natural Resource Area Open Space***	Community Area Open Space***	Floodway	Floodplain	Wetland	Riparian Buffer Zone		Drainage-ways	Cockeysville Formation	Sink-hole	Wellhead/Recharge Areas	Steep Slopes	Forests	Historic
						1	2							
Agricultural														
Apiaries	I	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Clearing	L	L	L	N	N	N	N	L	L	N	L	I	N	L
Game farms/fish hatcheries	I	Y	I	I	I	N	I	I	N	N	N	N	N	N
Field crops	I	Y	N	Y	N	N	N	Y	Y	N	Y	N	N	Y
Orchards	I	Y	N	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y
Pasture	I	Y	Y	Y	N	N	Y	N	Y	N	N	Y	N	Y
Stables	N	Y	N	N	N	N	N	N	Y	N	N	N	I	Y
Nursery	N	Y	N	L	N	N	L	Y	Y	N	Y	Y	N	Y
Recreation and Amusement: Outdoor Recreation														
Ball fields	N	Y	N	Y	N	N	N	Y	Y	N	Y	N	N	N
Day camps	N	L	N	L	N	N	L	Y	Y	N	L	N	L	L

Fishing areas	N	N	Y	Y	Y	Y	Y	Y	L	L	L	L	L	L
Hunting areas	N	N	L	L	L	L	L	L	L	L	L	L	L	L
Golf course/driving ranges	N	N	N	L	L	N	L	Y	Y	L	Y	L	L	Y
Natural area	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Nature center	N	Y	N	N	N	N	N	Y	Y	N	Y	Y	Y	Y
Picnic area/playground	N	Y	N	L	N	N	L	Y	Y	N	Y	Y	Y	Y
Pools/courts	N	Y	N	L	N	N	N	Y	Y	N	Y	N	N	Y
Shooting and archery ranges	N	N	L	L	N	N	L	L	L	L	L	N	N	N
Trails	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Water dependent use	N	N	L	L	L	L	L	Y	N	N	N	N	N	N
Utilities, Community/Region														
Public roads, bridges and appurtenances	I	N	I	I	N	I	I	Y	Y	N	L	L	L	N
Private roads	I	N	I	I	N	I	I	Y	Y	N	L	L	L	N
Parking lots	I	L	N	N	N	N	N	L	L	N	L	N	N	L
Essential access	I	I	I	I	I	I	I	L	L	N	S	S	L	N
Sewer/water/utilities	Y	Y	L	L	L	L	L	Y	Y	N	S	S	L	Y

Land application of treated effluent	I	N	N	N	I	N	Y	N	N	N	I	N	Y	Y
Sewage & water treatment plants/pumping stations/dams and flood control structures	N	N	I	I	N	I	I	N	N	N	N	N	N	N
Stormwater management practices	Y	Y	N	I	N	N	Y	Y	I	N	I	N	Y	Y
Remedial or other activities mandated by State or Federal law	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Temporary Uses														
Public interest Event	N	Y	N	N	N	N	N	Y	Y	N	Y	N	N	Y
Special event	N	Y	N	N	N	N	N	Y	Y	N	Y	N	N	Y
<p>* Subdivisions less than fifty (50) acres will utilize the community area open space criteria. ** For resource standards for limited uses, refer to Division 40.10.300 and Division 40.10.400. *** Permitted uses for natural resource area open space and community area open space not containing any specific natural resources. If the protection standards differ, between natural resource area open space and/or community area open space and specific resource categories, the stricter of the two (2) will govern.</p>														

(Amended September 22, 1998 by Ordinance 98-080; amended July 8, 2003 by Ordinance 03-045; amended September 26, 2006 by Ordinance 06-060; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.310 FLOODPLAINS AND FLOODWAYS

- A. **FEMA Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS).** In New Castle County (community number 10585), the areas identified by the Federal Emergency Management Agency's (FEMA) as being subject to periodic inundation by the one hundred (100) year storm event, including the floodway, flood fringe and areas for which no base flood elevations are available, dated October 6, 2000 or as later amended in digital file or paper map form. For land development plans that exceed five (5) acres in size or propose to create fifty (50) or more lots on parcels within or adjacent to a floodplain where base flood elevations are not available, the applicant must provide a hydrologic and hydraulic analysis pursuant to FEMA standards to establish the base flood elevations.
- B. All land disturbing (excavation or filing) activity, building construction, or development in a FEMA delineated or nondelineated floodplain shall comply with Division 40.10.300 and be

performed pursuant to authorization from the Department in the form of an approved floodplain permit as set forth in Appendix 1 of this Chapter.

- C. All land disturbing activity (excavation or filling), building construction, or development conducted under the authorization of an approved floodplain permit shall comply with this Division and with the specifications and conditions contained in the permit.
- D. Nondelineated floodplains are only subject to the provisions of Sections 40.10.311, 40.10.312, 40.10.314, 40.10.316 and 40.10.317.
- E. Areas where unauthorized land disturbance, building construction, filling activities, or development have occurred and are determined to be in violation of this Article shall be restored to their pre-violation grade and vegetative cover. All work to address a violation of this Article must be done pursuant to an approved floodplain permit.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended September 26, 2006 by Ordinance 06-060; amended November 10, 2009 by Ordinance 09-068)

SECTION 40.10.311 NONCONFORMING STRUCTURES AND USES IN FLOODPLAIN

The following shall regulate nonconforming structures and uses of land within the floodplain:

- A. The reconstruction or substantial repair of a nonconforming structure in a floodplain must be authorized and approved by the Department pursuant to the standards specified in Sections 40.10.313, 40.10.314, 40.10.316 and 40.10.317 of this Article.
- B. Any existing nonconforming building, structure, or use which is proposed to be expanded or enlarged in the Zone AE flood fringe, Zone A floodplain or nondelineated floodplain may be permitted, provided that such expansion or enlargement does not result in an increase to the building or structure footprint (foundation) and has received approval from the Department. The Department's approval shall be conditioned upon the applicant addressing to the satisfaction of the Department Sections 40.10.314, 40.10.316, and 40.10.317 of this Article in a floodplain permit application.
- C. **Storage, Material, and Equipment.**
 - 1. The storage or processing of materials within the floodplain that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life, is prohibited.
 - 2. Storage of other material or equipment may be allowed if not subject to major damage by floods, if firmly anchored to prevent flotation, or if readily removable from the area within the time available after a flood warning.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended September 26, 2006 by Ordinance 06-060)

SECTION 40.10.312 FLOODPLAIN BOUNDARY INTERPRETATION

The methodologies listed below shall be used to delineate the limits of floodplains. If the result of any of the methodologies described below is a delineation that is different from that shown on the FEMA panel and has a real and material effect on the plan as determined by the Department, then a LOMR or LOMA must be submitted to and approved by FEMA before recordation of a subdivision/land development plan, approval of any site construction plans or issuance of a building permit. Where the boundary of the floodplain is disputed, the burden of proof shall rest with the applicant. All new land development and/or subdivision applications for either fifty (50) new lots or five (5) acres of development, whichever is

the lesser, shall incorporate base flood elevation data according to the FEMA National Flood Insurance Program (NFIP) Regulations (44 CFR Part 60.3(b)).

- A. **FEMA mapped floodplains.** Those areas within the limits of the Zone A floodplain and Zone AE floodway and flood fringe as depicted on the Federal Emergency Management Agency's National Flood Insurance Rate Maps (FIRM) for unincorporated New Castle County.
 1. **Floodplain (Zone A - no flood elevations provided).** Scale the delineation from the appropriate FIRM panel and superimpose it on a topographic map with a compatible datum. The extent to which the delineations differ as determined by the Department may result in a LOMC (Letter of Map Change) application to FEMA to certify the limit of the floodplain; however, the delineation from the FIRM map and FIS governs unless amended by FEMA.
 2. **Flood fringe (Zone AE - flood elevations included on the FEMA panel).** Scale the delineation from the appropriate FIRM panel and Flood Insurance Study (FIS) and superimpose it on a topographic map with a compatible datum. Next, transfer the base flood elevations from the appropriate FIRM panel onto a topographic map with a compatible datum. The extent to which the delineations differ as determined by the Department may result in a LOMC application to FEMA to certify the limit of the floodplain; however, the delineation from the FIRM map and FIS governs unless amended by FEMA.
 3. **Floodway (Zone AE).** The limit of the floodway shall be scaled from the appropriate FIRM panel using a street or mapped roadway as a reference point.
- B. **Nondelineated floodplain (see Division 40.33.300 for definition).** The subdivision or development of land within and adjacent to a nondelineated floodplain shall include the submission of a flood study from the applicant to establish the limits of flooding from the one hundred (100) year storm event using one of the following methodologies as designated by the Department.
 1. Where the specific one hundred (100) year elevation cannot be determined using the sources established in this Subsection, the applicant for the proposed development shall submit his or her suggested determination of this elevation in accordance with accepted hydrologic and hydraulic engineering techniques. Hydrologic and hydraulic analysis shall be performed only by a professional engineer with a background in hydraulics and hydrology, who shall certify to the Department that the technical methods used correctly reflect currently accepted technical concepts. The applicant shall submit studies, analyses, computations, etc. in sufficient detail to allow a thorough technical review. The studies shall designate the one hundred (100) year flood elevations established by the County based on existing applicable codes. It is the applicant's responsibility to incorporate or refute the findings of any flood study previously accepted by the County into an updated submission.
 2. *U.S. Department of Agriculture, Soil Survey Manual for New Castle County (1970)* or as later amended. Soils considered to be evidence of a nondelineated floodplain are those designated as flood hazard soils (including tidal flooding) or high water table soils on table 7 (estimated degree and kinds of limitations for nonfarm uses) therein. This method shall not be used for delineating a manmade floodplain.

3. All floodplain Surface Water Resource Protection Areas as depicted on the three (3) map series "Water Resource Protection Areas for the City of Newark, City of Wilmington, New Castle County, Delaware", prepared by the Water Resource Agency for New Castle County that is dated 1993, or as later amended.
4. Recorded high water marks from past floods based on historical data, including, but not limited to, photographic documentation and water marks on vegetation or structures.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended September 26, 2006 by Ordinance 06-060; amended November 10, 2009 by Ordinance 09-068; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.313 REGULATIONS PERTAINING TO ACTIVITIES IN THE FLOODPLAIN

This Section is predicated on minimizing building or filling in the floodplain.

- A. No development or structures shall be permitted in the floodplain; however, the Department may approve development or structures in the floodplain for approved uses listed in Table 40.10.210, or as approved as a beneficial use pursuant to Section 40.10.315. To determine the impact of fill on the community, the floodplain permit application must include a detailed hydrologic and hydraulic study using methodologies and study parameters for the flow rates and incorporate existing and proposed cross sections accepted by FEMA. The applicant must secure a Conditional Letter of Map Revision (CLOMR) from FEMA before the Department issues its approval. In addition, a registered professional engineer shall prepare the design specifications and plans for submission and certify that the structures are designed and constructed to withstand the hydrostatic and hydrodynamic forces anticipated during the one hundred (100) year flood event.
- B. No new residential lots shall be created in the floodplain without sufficient buildable area outside of the floodplain.
- C. Neither the gross floor area nor the footprint of existing structures located in the floodplain shall be expanded.
- D. All record subdivision plans approved pursuant to this Chapter shall incorporate all floodplain areas into the required open space. Floodplain permit applications for land disturbing activities and structures in the floodplain will only be reviewed for uses listed as L (limited use), I (environmental impact assessment), S (special use) and Y (permitted uses) in Table 40.10.210 or as approved as a Beneficial Use.
- E. Regulations pertaining to activities in the Zone A floodplain or Zone AE flood fringe:
 1. Filling shall not be used as a means of increasing the site capacity on the subject parcel(s).
 2. All uses and development occurring within a floodplain in areas/properties determined to be a Brownfield are permitted only upon approval of the Department with the consent of County Council by resolution.
 3. All new construction or substantial improvements to nonresidential structures located in a Brownfield area shall meet all of the requirements of Sections 40.10.314, 40.10.316 and 40.10.317; and the following:
 - a. Substantial improvements to structural buildings associated with an existing operational petroleum underground storage tank (UST) or above ground storage tank (AST) facility are permitted, provided the impetus for the owner of said UST or AST facility in upgrading or replacing all or a portion of the UST or AST

system is to achieve compliance with the State Regulations Governing Underground Storage Tank Systems and Regulations Governing Aboveground Storage Tanks as established under 7 Del. C., ch. 74 and 74A.

- b. All new construction or substantial improvements to nonresidential structures located in a designated Brownfield area must have the lowest floor elevation equal to or above the base flood elevation or must be flood proofed to the base flood elevation.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended March 28, 2006 by Ordinance 06-007; amended September 26, 2006 by Ordinance 06-060; amended November 10, 2009 by Ordinance 09-068; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.314 FILLING IN THE FLOODPLAIN

Where permitted by Table 40.10.210 or as approved as a Beneficial Use, the following criteria shall apply to all land disturbing activities in the floodplain:

- A. No net fill shall be permitted in the floodplain; however, the Department may approve development or structures in the Zone AE floodfringe or Zone A floodplain for approved uses listed as permitted in Table 40.10.210. To determine the impact of fill on the community, the floodplain permit application must include a detailed hydrologic and hydraulic study using methodologies and study parameters for the flow rates and incorporate existing and proposed cross sections accepted by FEMA. The applicant shall secure a CLOMR from FEMA before the Department issues its approval. In addition, a registered professional engineer shall prepare the design specifications and plans for submission and certify that the structures are designed to withstand the hydrostatic and hydrodynamic forces anticipated during the one hundred (100) year flood event.
- B. In Zone A floodplain, Zone AE floodfringe areas, and nondelineated floodplain areas no land disturbing activity will be approved unless the applicant demonstrates that the activity, when combined with all other existing and proposed land uses, will not increase the water surface elevation of the one hundred (100) year flood at any point in the community.
- C. No proposal to fill shall result in a net loss of floodplain storage on the subject parcel(s).
- D. The total area of floodplain on a parcel(s) shall not be reduced by more than ten (10) percent in conjunction with channel improvements, flood storage, and detention which would have the effect of reducing the floodplain elevation.
- E. All filling shall meet the following construction requirements:
 1. The fill shall be protected against erosion by riprap, vegetative cover, sheet piling, or other approved practices to prevent erosion.
 2. The fill shall be clean and compacted to minimize erosion potential. Grading shall meet the requirements of Chapter 12.
 3. Hydraulic openings, where not subject to state or federal design criteria, shall be designed to convey the one hundred (100) year flow unimpeded in conformance with Chapter 6.
- F. Any filling in the FEMA floodplain in conflict with the FEMA FIRM panel, whether previously authorized or unauthorized, shall not be recognized by the Department until FEMA certifies a new floodplain limit so that no development occurs in violation of this Chapter.

- G. Where homes existing as of the date of adoption of this Article can be protected from existing flooding conditions by filling and grading activity not exceeding twenty (20) cubic yards per lot, such filling may be permitted by the Department provided all the requirements of Subsection D are met.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended September 26, 2006 by Ordinance 06-060; amended November 10, 2009 by Ordinance 09-068; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.315 STANDARDS FOR BENEFICIAL USES IN FLOODPLAINS

All applicants seeking approval under a beneficial use permit application shall provide a floodplain application permit that demonstrates compliance with the requirements of Sections 40.10.313, 40.10.314, 40.10.316 and 40.10.317. In addition to the standards for beneficial use in Division 40.31.600, the following standards shall be met:

- A. A beneficial use application will not be considered for any applications proposing fill or structures in the floodway.
- B. Any other occupied residential space shall have its lowest floor, including basement, and lowest opening at least eighteen (18) inches above the flood elevation. All service and utility connections such as water, sewer, gas, and electrical and heating equipment shall be similarly located or buried with adequate cover to prevent erosion.
- C. New nonresidential construction or substantial improvement of any commercial, industrial, or other nonresidential structures, shall have the lowest floor, including basement, elevated a minimum of eighteen (18) inches above the base flood elevation or, together with attendant utility and sanitary facilities, be floodproofed so that below the base flood elevation the structure is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. A professional engineer or architect shall certify that the standards of this Subsection are satisfied. Such certification shall be made part of the building permit application.
- D. Storage, material, and equipment:
1. The storage or processing of materials within the Special Flood Hazard Area (SFHA) that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life is prohibited.
 2. Storage of other material or equipment may be allowed if not subject to major damage by floods, if firmly anchored to prevent flotation, or if readily removable from the area within the time available after a flood warning.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.316 CRITERIA FOR BUILDING IN THE FLOODPLAIN

In reviewing an application, the Department shall consider and/or require the following:

- A. No structures for human habitation shall be permitted in the floodplain except:
1. Where approved as a beneficial use per Section 40.10.315 and Division 40.31.600.
 2. Replacement of existing nonconforming structures and uses in the Zone A floodplain, Zone AE floodfringe, or nondelineated floodplain (Section 40.10.311).

- B. New construction, expansion or substantial improvement to residential and nonresidential structures shall have the lowest floor, including basement, elevated not less than eighteen (18) inches above the one hundred (100) year flood elevation within or adjacent to a floodplain.
1. All new and replacement water and sanitary sewer facilities and systems shall be located, designed and constructed to minimize or eliminate flood damages and the infiltration of flood waters.
 2. Sanitary sewer facilities and systems shall be designed to prevent the discharge of untreated sewage into flood waters.
 3. No part of any on-site sewage system shall be located within any identified floodplain area except in strict compliance with all State and local regulations for such systems. If any such system is permitted, it shall be located so as to avoid harm or contamination during a flood.
- C. Wet flood proofing that allows the free flow of flood waters through the areas of a structure above its lowest floor shall not be permitted except pursuant to Subsection E. A registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction are in accordance with accepted standards of practice for meeting these provisions.
- D. The mechanical, plumbing and other service facilities shall comply with Chapter 6.
- E. For all new construction and substantial improvements, fully enclosed areas below the lowest floor area that are useable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by a professional engineer with a background in structural design and must meet or exceed the following minimum criteria:
1. A minimum of two (2) openings having a total net area of not less than one (1) square inch or every square foot of enclosed area subject to flooding shall be provided.
 2. The bottom of all openings shall be no higher than one (1) foot above grade.
 3. Openings may be equipped with screens, louvers or other coverings or devices provided they permit the automatic entry and exit of floodwaters.
- F. All structures, residential and nonresidential, shall be:
1. Designed and adequately anchored to prevent flotation, collapse or lateral movement of the structure.
 2. Constructed with materials and utility equipment resistant to flood damage.
 3. Constructed by methods and practices that minimize flood damage.
- G. If fill is used to raise the lowest floor to the base flood elevation:
1. Fill shall extend beyond a structure for a sufficient distance to provide acceptable access.
 2. Fill material shall be compacted to provide the necessary stability and resistance to erosion, scouring and settling.
 3. The grading of earthen fill shall comply with the requirements of Chapter 12 and shall be used only to the extent to which it does not adversely affect adjacent properties.

- H. A FEMA NFIP Elevation Certificate must be submitted to the Department for any building constructed, substantially improved, or horizontally expanded in the FEMA floodplain before the certificate of occupancy is issued.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended September 26, 2006 by Ordinance 06-060; amended November 10, 2009 by Ordinance 09-068; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.311 NONCONFORMING STRUCTURES AND USES IN FLOODPLAIN

The following shall regulate nonconforming structures and uses of land within the floodplain:

- A. The reconstruction or substantial repair of a nonconforming structure in a floodplain must be authorized and approved by the Department pursuant to the standards specified in Sections 40.10.313, 40.10.314, 40.10.316 and 40.10.317 of this Article.
- B. Any existing nonconforming building, structure, or use which is proposed to be expanded or enlarged in the Zone AE flood fringe, Zone A floodplain or nondelineated floodplain may be permitted, provided that such expansion or enlargement does not result in an increase to the building or structure footprint (foundation) and has received approval from the Department. The Department's approval shall be conditioned upon the applicant addressing to the satisfaction of the Department Sections 40.10.314, 40.10.316, and 40.10.317 of this Article in a floodplain permit application.
- C. **Storage, Material, and Equipment.**
1. The storage or processing of materials within the floodplain that are in time of flooding buoyant, flammable, explosive, or could be injurious to human, animal, or plant life, is prohibited.
 2. Storage of other material or equipment may be allowed if not subject to major damage by floods, if firmly anchored to prevent flotation, or if readily removable from the area within the time available after a flood warning.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended September 26, 2006 by Ordinance 06-060)

SECTION 40.10.312 FLOODPLAIN BOUNDARY INTERPREATION

The methodologies listed below shall be used to delineate the limits of floodplains. If the result of any of the methodologies described below is a delineation that is different from that shown on the FEMA panel and has a real and material effect on the plan as determined by the Department, then a LOMR or LOMA must be submitted to and approved by FEMA before recordation of a subdivision/land development plan, approval of any site construction plans or issuance of a building permit. Where the boundary of the floodplain is disputed, the burden of proof shall rest with the applicant. All new land development and/or subdivision applications for either fifty (50) new lots or five (5) acres of development, whichever is the lesser, shall incorporate base flood elevation data according to the FEMA National Flood Insurance Program (NFIP) Regulations (44 CFR Part 60.3(b)).

- A. **FEMA mapped floodplains.** Those areas within the limits of the Zone A floodplain and Zone AE floodway and flood fringe as depicted on the Federal Emergency Management Agency's National Flood Insurance Rate Maps (FIRM) for unincorporated New Castle County.
1. **Floodplain (Zone A - no flood elevations provided).** Scale the delineation from the appropriate FIRM panel and superimpose it on a topographic map with a compatible datum. The extent to which the delineations differ as determined by the Department may result in a LOMC (Letter of Map Change) application to FEMA to certify the limit of the floodplain; however, the delineation from the FIRM map and FIS governs unless amended by FEMA.
 2. **Flood fringe (Zone AE - flood elevations included on the FEMA panel).** Scale the delineation from the appropriate FIRM panel and Flood Insurance Study (FIS) and superimpose it on a topographic map with a compatible datum. Next, transfer the base flood elevations from the appropriate FIRM panel onto a topographic map with a compatible datum. The extent to which the delineations differ as determined by the Department may result in a LOMC application to FEMA to certify the limit of the floodplain; however, the delineation from the FIRM map and FIS governs unless amended by FEMA.
 3. **Floodway (Zone AE).** The limit of the floodway shall be scaled from the appropriate FIRM panel using a street or mapped roadway as a reference point.
- B. **Nondelineated floodplain (see Division 40.33.300 for definition).** The subdivision or development of land within and adjacent to a nondelineated floodplain shall include the submission of a flood study from the applicant to establish the limits of flooding from the one hundred (100) year storm event using one of the following methodologies as designated by the Department.
1. Where the specific one hundred (100) year elevation cannot be determined using the sources established in this Subsection, the applicant for the proposed development shall submit his or her suggested determination of this elevation in accordance with accepted hydrologic and hydraulic engineering techniques. Hydrologic and hydraulic analysis shall be performed only by a professional engineer with a background in hydraulics and hydrology, who shall certify to the Department that the technical methods used correctly reflect currently accepted technical concepts. The applicant shall submit studies, analyses, computations, etc. in sufficient detail to allow a thorough technical review. The studies shall designate the one hundred (100) year flood elevations established by the County based on existing applicable codes. It is the applicant's responsibility to incorporate or refute the findings of any flood study previously accepted by the County into an updated submission.
 2. *U.S. Department of Agriculture, Soil Survey Manual for New Castle County (1970)* or as later amended. Soils considered to be evidence of a nondelineated floodplain are those designated as flood hazard soils (including tidal flooding) or high water table soils on table 7 (estimated degree and kinds of limitations for nonfarm uses) therein. This method shall not be used for delineating a manmade floodplain.
 3. All floodplain Surface Water Resource Protection Areas as depicted on the three (3) map series "Water Resource Protection Areas for the City of Newark, City of Wilmington,

New Castle County, Delaware", prepared by the Water Resource Agency for New Castle County that is dated 1993, or as later amended.

4. Recorded high water marks from past floods based on historical data, including, but not limited to, photographic documentation and water marks on vegetation or structures.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended September 26, 2006 by Ordinance 06-060; amended November 10, 2009 by Ordinance 09-068; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.316 CRITERIA FOR BUILDING IN THE FLOODPLAIN

In reviewing an application, the Department shall consider and/or require the following:

- A. No structures for human habitation shall be permitted in the floodplain except:
 1. Where approved as a beneficial use per Section 40.10.315 and Division 40.31.600.
 2. Replacement of existing nonconforming structures and uses in the Zone A floodplain, Zone AE floodfringe, or nondelineated floodplain (Section 40.10.311).
- B. New construction, expansion or substantial improvement to residential and nonresidential structures shall have the lowest floor, including basement, elevated not less than eighteen (18) inches above the one hundred (100) year flood elevation within or adjacent to a floodplain.
 1. All new and replacement water and sanitary sewer facilities and systems shall be located, designed and constructed to minimize or eliminate flood damages and the infiltration of flood waters.
 2. Sanitary sewer facilities and systems shall be designed to prevent the discharge of untreated sewage into flood waters.
 3. No part of any on-site sewage system shall be located within any identified floodplain area except in strict compliance with all State and local regulations for such systems. If any such system is permitted, it shall be located so as to avoid harm or contamination during a flood.
- C. Wet flood proofing that allows the free flow of flood waters through the areas of a structure above its lowest floor shall not be permitted except pursuant to Subsection E. A registered professional engineer or architect shall develop and/or review structural design, specifications, and plans for the construction are in accordance with accepted standards of practice for meeting these provisions.
- D. The mechanical, plumbing and other service facilities shall comply with Chapter 6.
- E. For all new construction and substantial improvements, fully enclosed areas below the lowest floor area that are useable solely for parking of vehicles, building access or storage in an area other than a basement and which are subject to flooding shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by a professional engineer with a background in structural design and must meet or exceed the following minimum criteria:
 1. A minimum of two (2) openings having a total net area of not less than one (1) square inch or every square foot of enclosed area subject to flooding shall be provided.
 2. The bottom of all openings shall be no higher than one (1) foot above grade.

3. Openings may be equipped with screens, louvers or other coverings or devices provided they permit the automatic entry and exit of floodwaters.
- F. All structures, residential and nonresidential, shall be:
1. Designed and adequately anchored to prevent flotation, collapse or lateral movement of the structure.
 2. Constructed with materials and utility equipment resistant to flood damage.
 3. Constructed by methods and practices that minimize flood damage.
- G. If fill is used to raise the lowest floor to the base flood elevation:
1. Fill shall extend beyond a structure for a sufficient distance to provide acceptable access.
 2. Fill material shall be compacted to provide the necessary stability and resistance to erosion, scouring and settling.
 3. The grading of earthen fill shall comply with the requirements of Chapter 12 and shall be used only to the extent to which it does not adversely affect adjacent properties.
- H. A FEMA NFIP Elevation Certificate must be submitted to the Department for any building constructed, substantially improved, or horizontally expanded in the FEMA floodplain before the certificate of occupancy is issued.

(Amended September 22, 1998 by Ordinance 98-080; amended October 5, 2004 by Ordinance 04-058; amended September 26, 2006 by Ordinance 06-060; amended November 10, 2009 by Ordinance 09-068; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.317 REVIEW CRITERIA FOR PUBLIC HEALTH, SAFETY AND WELFARE

In reviewing an application, the Department shall consider and/or require the following:

- A. The danger to life and property due to increased flood heights or velocities caused by encroachments.
- B. The danger that materials may be swept onto other lands or downstream to the injury of others or property.
- C. The proposed water supply and sanitation systems and the ability of these systems to avoid causing disease, contamination, and unsanitary conditions.
- D. The expected heights, velocities, duration, and sediment transport of the floodwater expected at the site during the one hundred (100) year storm event to determine whether the proposed activity will aggravate flood damage in the community.
- E. The proposed activity's undue alteration of natural water flows and whether adequate drainage conveyance has been provided to minimize the flood hazard.
- F. Any permitted development is subject to all applicable State and federal rules and regulations.
- G. Manufactured homes shall be placed on a permanent foundation and shall have the lowest floor elevated not less than eighteen (18) inches above the one hundred (100) year flood level and anchored to resist flotation, collapse and lateral movement.

- H. The susceptibility of the proposed use to flood damage. New structures are located and designed to minimize the potential for flood damage.
- I. The protection of individuals who might choose, despite the flood dangers, to develop or occupy land on the floodplain; or protection of other landowners from damages resulting from the development in a floodplain and the consequent obstruction of the floodwaters; or the protection of the entire community from individual choices of land use which requires subsequent public expenditures for public works and disaster relief; or protection of the quality of surface and subsurface water supplies adjacent to and underlying floodplain areas.
- J. The safety of access to the property in times of flood for ordinary and emergency vehicles.
- K. The likelihood that the proposed use will result in extraordinary public expense, will create nuisances or will conflict with existing County ordinances or regulations.

(Amended October 5, 2004 by Ordinance 04-058; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.332 SURFACE WATER BODIES

A. A. Non-water-supply water bodies.

1. No septic systems shall be allowed within the RBA.
2. All developments shall maximize the drainage amount conducted in natural swales rather than storm sewers. A stormwater system's discharge to streams or watercourses shall be by sheet flow through a grassland or discharged from a stormwater management facility having a wetland or aquatic bench.
3. Stormwater runoff from all parking areas shall be directed to a stormwater management facility before it is discharged into an RBA.

B. Public water supply surface storage reservoir.

1. All developments which drain on the surface or underground to existing public water supply reservoirs shall be limited to ten (10) percent impervious coverage. Public water supply reservoirs (or reservoir watersheds) are depicted on the three (3) map series "Water Resource Protection Areas for the City of Newark, City of Wilmington, New Castle County, Delaware", prepared by the Water Resources Agency for New Castle County that is dated 1993, or as may be amended.
2. No septic systems shall be allowed within six hundred (600) feet of the water supply surface storage reservoir.
3. All developments shall maximize the drainage amount conducted in natural swales rather than storm sewers. A stormwater system's discharge to streams or watercourses shall be by sheet flow through a grassland or discharged from a stormwater management facility having a wetland or aquatic bench.
4. No industrial or commercial parking shall be permitted within three hundred (300) feet of the public water supply surface storage reservoir.

(Amended September 22, 1998 by Ordinance 98-080)

SECTION 40.10.340 STEEP SLOPES

- A. **Public purpose.** The public purpose of this Section is to protect the public health, safety and welfare. To this end, this Section is intended to protect the environment through the preservation of natural resources and to complement the sections relating to open space. This Section is designed to encourage the sensitive treatment of hillsides and their related soil and vegetation resources in an effort to minimize adverse environmental impacts. The following objectives serve to complement these specific purposes and the overall purposes of this Section, and the objectives shall be to:
1. Conserve and protect steep slopes from inappropriate development, such as excessive grading, land form alteration and extensive vegetation removal.
 2. Avoid potential hazards to property and the disruption of ecological balance which may be caused by increased runoff, flooding, soil erosion and sedimentation, blasting and ripping of rock and landslide and soil failure.
 3. Encourage the use of steep slopes for open space and other uses which are compatible with the preservation of natural resources and protection of areas of environmental concern.
 4. Avoid public expenses of repair and restoration of damage to downhill sites caused by the improper development of steep slopes.
- B. **Standards and criteria.** The following practices shall be required when developing in a precautionary steep slope area:
1. All grading shall be minimized, and no grading shall be undertaken within any area of the steep slope area except where approved.
 2. Disturbance of steep slopes must consider unique characteristics of topographic, soil and vegetation resources and the techniques proposed to mitigate potential adverse environmental impacts.
 3. The effect the development of the steep slope would have on adjacent properties.
 4. The compatibility of the proposed uses with public purposes.
 5. No other alternative location within the subdivision being considered is feasible or practical.
 6. Earth-moving activities and vegetation removal will be conducted only to the extent necessary to accommodate proposed uses and structures and in a manner that will not cause excessive surface water runoff, erosion, sedimentation or unstable soil conditions.
 7. Mitigation techniques will be utilized, including but not limited to retaining walls, tree wells, the establishment of ground covers and/or low spreading shrubs, the use of erosion control fabric and the like.
 8. The proposed buildings or structures shall be of sound engineering design. Footings shall be designed in response to the site's slope, soil and bedrock characteristics.
 9. Disturbance to particularly sensitive features of the site shall be minimized; special emphasis in planning for the site should be given to the protection of:

- a. Soils with seasonal high water table, as listed in appendix I, Table C of Chapter 12 of this Code pertaining to drainage.
 - b. Underlying geology which comprises or contributes to a major groundwater resource including the flow of existing springs.
10. Disturbance shall be minimized where the length of area of steep slope, both on the site and on adjacent lands within two hundred (200) feet of the site, is extensive.
11. The proposed development, any impervious ground cover and the resultant disturbance to the land and existing vegetative cover will not cause runoff and/or related environmental problems off the site.
12. Removal of or disturbance to existing vegetation on the site shall be minimized. The proposed impacts on existing vegetation shall be evaluated in terms of the potentially detrimental effects on slope stability, recharge of stormwater and existing drainage patterns.
13. Road construction shall follow the natural topography, with cuts and grading minimized; the location of any proposed point of access to an activity or use on the lot shall reflect the need to avoid steep slope disturbances.
- C. In a prohibitive steep slope area, roads and driveways shall only be permitted if no viable alternative alignment or location is feasible provided that such roads and driveways are aligned predominately parallel to the contours as demonstrated by an environmental impact assessment report.
- D. Permits shall require all earth work to be conducted so as to be concluded one (1) month prior to the end of the planting seasons (i.e., April 30th and September 30th). This practice will enable a ground cover to be established after work completion.
- E. A ground cover shall be placed on all exposed surfaces prior to the end of the planting season, or as the work is completed prior to that date. The Department is authorized to permit temporary cover in limited situations where unusual weather or the type of project requires earth work beyond a planting season. Surety may be required for remedial work if temporary cover is to be used.
- F. All slopes exceeding fifteen (15) percent or where water flows can be anticipated shall have a protective cover to hold the seed or plants in place. All protective covers shall be approved by the Department.
- G. All plant materials should be approved by the Department as suitable for the area's soils and exposure, growth, and coverage rate.

(Amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.380 WATER RESOURCE PROTECTION AREA (WRPA)

- A. Water resource protection areas are the Cockeyville Formation, Cockeyville Formation Drainage Area, wellheads, and recharge areas. All such areas are as depicted on the three (3) map series "Water Resource Protections Areas for the City of Newark, City of Wilmington, New Castle County, Delaware," prepared by the Water Resources Agency for New Castle County that is dated 1993, or as amended. These areas shall be protected as required by the following sections to protect the County's water resources from contamination and pollution and to insure adequate water quantity for future needs.
- B. No development shall be permitted to have more than twenty (20) percent impervious surface ratio unless an environmental impact assessment report certified by a State-registered professional geologist or professional engineer with a background in hydrogeology indicates that additional development would not endanger the public or the environment. All environmental impact assessment reports performed pursuant to this Section shall be reviewed in accordance with Section 40.10.385 and the procedures set forth in Article 30 and Article 31 for environmental impact assessment reports. The impervious surface ratio and open space ratio operate independently and are based on the base site area.
- C. The Department may permit the expansion of existing nonconforming sites within WRPA's, which exceed the twenty (20) percent impervious cover standard, provided the proposed expansion of the site will reduce the existing impervious cover by a minimum of five (5) percent for sites of two (2) acres or less, a minimum of ten (10) percent for sites greater than two (2) acres and less than five (5) acres, and a minimum of twenty (20) percent for sites greater than five (5) acres and larger.
- D. The Department may consider the contribution of like land by the applicant to be preserved in other WRPA's. A conservation easement or the outright acquisition of the like land or resource shall occur which will prohibit the disturbance of the like land in perpetuity. Like lands are those lands within a Recharge or Wellhead WRPA that have infiltration rates that are equal to or greater than those found on the subject property. The minimum area of the restricted land shall be the area that would otherwise be required by this Chapter.

(Amended September 22, 1998 by Ordinance 98-080; amended December 14, 1999 by Ordinance 99-075; amended September 26, 2006 by Ordinance 06-060; amended November 10, 2009 by Ordinance 09-068; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.381 COCKEYSVILLE FORMATION

Special on-site investigation as required by Section 40.22.110.

- A. The County shall require a subsurface investigation report on the stability of the rock formation and likely contamination risks.
- B. In addition, surface drainage shall be designed to prevent infiltration that could lead to increased erosion of supporting rock. The County may require lined channels or stormwater pipes that decrease the level of infiltration to the groundwater.
- C. In determining whether development may be permitted beyond the twenty (20) percent impervious surface ratio limitation of this Division, the contribution of like land by the applicant to be preserved in the Cockeysville Formation shall be considered as a factor in the environmental study and report.

SECTION 40.10.382 RESERVED.

(Amended December 14, 1999 by Ordinance 99-075)

SECTION 40.10.383 WELLHEAD PROTECTION AREAS (PUBLIC WATER SUPPLY WELLS)

- A. Wellhead protection areas.
 - 1. Type A wellhead areas shall be one hundred (100) percent open space within three hundred (300) feet of the wellhead. Within that area, impervious surface shall be limited to building and access associated with the well and distribution and treatment facilities and their maintenance. In the case where the three hundred (300) foot required open space cannot be attained on the same lot as the wellhead, a conservation easement on one or more adjacent lots shall be necessary.
 - 2. Type B and C wellhead areas shall be limited to twenty (20) percent impervious surface ratio within three hundred (300) feet of the wellhead.
- B. The resource protection area around a public water supply well which draws from a confined aquifer as interpreted by the Delaware Geological Survey (DGS), DNREC, or a State-registered professional geologist with approval by DGS and DNREC shall be one hundred and fifty (150) feet. The protection area around a well not interpreted as drawing from a confined aquifer may be reduced below three hundred (300) feet where an environmental impact assessment report is approved demonstrating that a minimum sixty (60) day time of travel from a potential contaminant to the public water supply well is maintained. In no case shall the protection area for unconfined aquifers be less than one hundred fifty (150) feet. The assessment

reports shall be based on an on-site hydrogeologic study.

Notwithstanding any other provisions of this Chapter, the minimum lot area required for a public water supply well and related facility drawing from a confined aquifer shall be one (1) acre; and, the minimum lot area required for a public water supply well and related facility drawing from an unconfined aquifer shall be two (2) acres. In the case where the minimum lot area cannot be met, because the public water supply well and related facility is proposed on an existing lot less than the minimum required, and where the total wellhead protection area required is not wholly owned by the public water utility, a conservation easement on one or more adjacent properties shall be necessary to satisfy the appropriate public water supply well minimum wellhead protection areas. The terms of the conservation easement shall prohibit any activity detrimental to the public water supply well. The owner of the public water supply well shall be responsible for monitoring the property pursuant to the terms of the easement.

- C. The natural runoff flowing into wellhead areas shall be allowed and all new stormwater runoff shall be diverted around the wellhead protection areas wherever practical.
- D. A stormwater system's discharge to wellhead WRPA's shall be by sheet flow through a grassland or discharged from a stormwater management facility having a wetland or aquatic bench. Stormwater runoff from all parking areas shall be directed to a stormwater management facility before it is discharged into a wellhead WRPA.
- E. The replacement of any existing public water supply well that was not required to meet this wellhead protection requirement at the date of its original installation and that has failed, shall be exempt from meeting this wellhead protection requirement.

(Amended September 22, 1998 by Ordinance 98-080; amended December 14, 1999 by Ordinance 99-075; amended November 10, 2009 by Ordinance 09-068; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.384 RECHARGE AREAS AND COCKEYSVILLE FORMATION DRAINAGE AREAS

- A. When impervious cover is proposed by the applicant at a rate greater than twenty (20) percent of the site, the applicant shall be required to demonstrate that the quality of storm water runoff is equal to or greater than predevelopment conditions and the quantity of stormwater runoff is equal to or less than predevelopment conditions.
- B. Those areas of open space not currently forested, shall have a minimum of twenty-five (25) percent of their area reforested pursuant to Section 40.10.351 . The Department may reduce this requirement where the applicant prepares an Environmental Impact Assessment Report demonstrating to the satisfaction of the Department that

reforestation will result in more than a twenty (20) percent loss in groundwater recharge due to the soils and hydrogeologic conditions of the site. The report shall include an annual water budget compiled on a month by month basis comparing existing and post-development mature forest conditions. Applicants shall submit information regarding the types of trees evaluated, soil conditions (including percolation rates), pH types, assumptions regarding rainfall events, and topography. The report shall also include a water quality analysis comparing the water quality benefits of mature forest cover to the proposed alternative ground cover.

(Amended September 22, 1998 by Ordinance 98-080; amended December 14, 1999 by Ordinance 99-075)

SECTION 40.10.385 UNIFORM STANDARDS AND CRITERIA

- A. The following standards and criteria shall be applicable to any limited use, special use or other use requiring an environmental impact assessment report permitted pursuant to this division:
1. Stormwater management facilities shall be designed and constructed in accordance with DNREC "Delaware Sediment and Stormwater Regulations," dated January 23, 1991 or as later revised.
 2. With the exception of floodplain and erosion-prone slope water resource protection areas, stormwater management and recharge facilities shall be designed with the goal of maintaining the quantity and quality of groundwater recharge at predevelopment levels. To facilitate the design of recharge facilities, a manual of best management practices for the design, construction and maintenance of recharge structures shall be developed. The manual shall be approved by the Resource Protection Area Technical Advisory Committee (RPATAC) and may be revised as necessary to reflect advances in recharge technology.
 3. In order to establish the predevelopment standards required by Subsection A.2, a study shall be prepared under the supervision of a State-registered professional geologist or professional engineer with a background in hydrogeology. The report of the study shall be submitted to the Department, the Delaware Geological Survey and the Water Resources Agency and shall be reviewed in accordance with the procedures set forth in Article 30 for environmental impact reports.
 4. In wellhead water resource protection areas all development shall be maintained at a minimum sixty (60) day horizontal time of travel from any public water supply well as established by the on-site hydrogeologic study required by Subsection A.3 or three hundred (300) feet from the public water supply well, whichever is less.
 5. When facilities are proposed to augment groundwater recharge, to ensure that the quality of groundwater recharge shall be maintained, a groundwater quality monitoring program shall be established as part of the report prepared pursuant to Subsection A.3. The program shall establish the number of wells to be installed, as well as the duration

and frequency regarding the monitoring of the wells to be installed. The wells shall be installed and secured in accordance with DNREC "State of Delaware Regulations Governing the Construction of Water Wells." All laboratory test results shall be submitted to the Water Resources Agency to ensure the County that satisfactory water quality is maintained.

6. Provisions for the maintenance of groundwater recharge facilities and the frequency of groundwater quality testing and monitoring shall be established by a water management agreement between the property owner and the county. The agreement shall not be amended without the approval of the County.
7. In water resource protection areas, sanitary sewer systems which utilize land application of treated effluent shall be required to use extended aeration and disinfection. Treated wastewater shall not be applied to the ground at a rate that saturates soils. Crops or vegetation to which treated wastewater is applied shall be harvested periodically to prevent a build-up of metals or other constituents in the soil or groundwater.

(Amended September 22, 1998 by Ordinance 98-080; amended March 12, 2002 by Ordinance 01-112; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.386 BOUNDARY DETERMINATION

- A. All subdivision and land development plans depicting development or land disturbance submitted for County review shall be evaluated for the existence of water resource protection areas by scaling the distances shown on the water resource protection area map. If existing, the boundaries of the areas shall be delineated on the plan.
- B. When there appears to be a conflict between the mapped boundary and actual site conditions, the applicant may engage the services of professional practitioners set forth in this Section to prepare a report intended to determine more accurately the precise boundary of the water resource protection area, which report shall be submitted to the Department with the detailed findings necessary to indicate the location of the boundary in conformance with the definitions given in Article 33, including:
 1. A detailed topographic layout of the subdivision and/or area to be developed and prepared by a State-registered professional land surveyor or professional engineer;
 2. For floodplain and erosion-prone slopes boundary determinations, a revised surface soils map of the subdivision and/or area prepared by a DNREC-licensed soil scientist including a written report of the on-site field inspection and test boring data;
 3. For reservoir watershed, Cockeysville Formation, wellhead and recharge boundary determinations, a site-specific geological and hydrogeological analysis shall be performed by a State-registered professional geologist or professional engineer with a background in hydrogeology and shall be based upon thorough site investigation, subsurface testing and other testing as may be determined appropriate by the Department; and
 4. Evidence derived from a site-specific investigation which may include aquifer testing, test borings, test pits, observation wells, groundwater elevations and topography surveys as appropriate for the type of water resource protection area to clearly demonstrate that

the area in question does not meet the definition of a water resource protection area as defined in this Division.

- C. Reserved.
- D. The Department, with the advice of the Delaware Geological Survey and the Water Resources Agency, may adjust the boundary or area designation based thereon. Such adjustments shall have the effect of exempting the subject parcel from the use regulations of this Chapter and shall have the effect of amending the limits of the water resource protection area. However, when the water resource protection area map is updated or amended, the Department shall review each of the exemptions approved since the last map revision to determine if a district boundary should be amended to reflect the findings of the geologic analysis performed at the time of the exemption.
- E. Notwithstanding any other section of this Chapter, if an owner initiates a precise boundary delineation pursuant to this section, any and all time review limitations shall be stayed pending the submission of the report contemplated by this section. Following submission of the report, the Department shall have twenty (20) days to finally approve or disapprove the exploratory sketch plan submission or such further time as deemed necessary by the Department, but not to exceed an additional twenty (20) days.

(Amended September 22, 1998 by Ordinance 98-080; amended December 14, 1999 by Ordinance 99-075)

SECTION 40.10.387 RESOURCE PROTECTION AREA TECHNICAL ADVISORY COMMITTEE (RPATAC)

- A. The purposes and duties of the RPATAC are to:
 - 1. Provide technical support and recommendations to the Department concerning the technical definition and criteria of any resource protection area or level as depicted in Table 40.10.010.
 - 2. Advise the Department when it is determined that environmental standards contained in this Article should be amended.
 - 3. Provide technical support and recommendations to the Department, Board of Adjustment and Planning Board concerning any application.
 - 4. Provide technical support, review and recommendations on all variance applications concerning the reduction of the required OSR for major residential land developments depicted in Table 40.04.110.
 - 5. Upon the request of the Department, RPATAC shall provide recommendations regarding application of the standards to rezoning, subdivision, and land development submissions relative to any issue involving a protected resource.
 - 6. Assist the Department as requested.

(Amended December 14, 1999 by Ordinance 99-075; amended July 8, 2003 by Ordinance 03-045; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.388 RPATAC REVIEW

Neither the Board of Adjustment, nor the Planning Board shall consider any application for a variance from this Article until the RPATAC has had an opportunity to review the application and make a written

recommendation to the respective board. Any application for a variance from this Article shall be transmitted to the RPATAC, which shall have forty-five (45) days from the filing of the application to review and issue its recommendation.

(Amended December 14, 1999 by Ordinance 99-075; amended July 13, 2004 by Ordinance 04-059)

SECTION 40.10.410 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

If a proposed use requires an environmental impact assessment report, the applicant shall have such a report certified by a professional engineer, geologist or other certified professional in the applicable environmental discipline. Mitigation cannot be used where the conflict can be avoided or minimized. The report shall contain the following criteria, given in order of preference:

- A. **Site character.** The report shall identify all potential on-site sensitive environmental concerns.
- B. **Avoidance.** Alternative sites or routes shall be identified that would not damage the resource or result in less resource damage. Reasons shall be provided explaining why using these sites is impossible or infeasible versus that proposed.
- C. **Minimization.** The applicant shall demonstrate that the plan minimizes the impact of the activity, route, or use on the resource. The applicant shall also demonstrate that the areas impacted shall be the lowest quality and result in the least damage to the resource.
- D. **Mitigation.** A mitigation plan shall be submitted indicating mitigation activities. On-site replacement is the most acceptable form of mitigation. However, mitigation can include restoration and enhancement after the use is abandoned. Mitigation by replacement on another site shall be at a ratio of two to one (2:1). Mitigation may also include enhancement; this ratio shall be four to one (4:1). See Table 40.10.350B.
- E. **Conservation design.** Any activity proposed within natural resource area open space shall also demonstrate how the principles of conservation design will be effected, how they will be advanced, and how the proposed activity will be addressed in the natural resource area open space management plan.

(Amended September 22, 1998 by Ordinance 98-080; amended March 12, 2002 by Ordinance 01-112; amended July 8, 2003 by Ordinance 03-045)

SECTION 40.10.421 CLEARING

All natural resources. Clearing shall be permitted only under the following conditions:

- A. To prepare land for a use permitted by this Chapter; or,
- B. As a reforestation measure, or to enhance or improve the quality of existing vegetation or as a means to eliminate dead, diseased, or hazardous tree stands.

Where a clearcutting operation is deemed permissible for one (1) of the reasons stated in this subsection, it shall be consistent with the terms of a forest management plan approved by the Department, following review and comment by the State Department of Agriculture Division of Forest Services.

SECTION 40.10.422 NURSERIES

Floodplains and riparian buffers. Nurseries shall be permitted only for raising wetland species. The area shall be disconnected from adjoining wetland areas. The disturbance level requires the area be diked off

from the adjoining wetlands to control the water flow or sediment movement from the nursery to the surrounding wetlands. The following shall be required:

- A. A water control structure shall permit backflow into the nursery area.
- B. Water shall be discharged through a channel, grassed channel, or new wetland.

SECTION 40.10.423 HUNTING AND FISHING AREAS

Hunting and fishing shall be permitted pursuant to State regulations.

SECTION 40.10.424 GOLF COURSES

Golf courses shall be permitted on floodplains, wetlands, steep slopes, forested areas, or riparian buffer areas provided that the following standards are met:

- A. **Floodplains.** Golf courses shall be permitted provided that there is no change in the flood elevation due to the construction. Tees and greens shall be above flood elevation.
- B. **Steep slopes.** Areas of protected steep slope may be used as part of the golf course provided this does not involve the cutting of forest cover. If natural grass cover is to be disturbed, the earth work should be finished in less than sixty (60) days and a new vegetative cover installed immediately. Erosion control matting shall be used to reduce erosion and prevent the seed from washing out.
- C. **Forests.** No area of protected forest shall be used for golf courses if the tree cover is to be disturbed.
- D. **Riparian buffer areas.** Golf courses shall be permitted within a riparian buffer area provided that it meets the requirements of Subsections A, B, and C, and provided that the requirements of Subsection C apply to areas planted with new vegetation.

(Amended December 14, 1999 by Ordinance 99-075; amended March 12, 2002 by Ordinance 01-112; amended January 18, 2011 by Ordinance 10-113)

SECTION 40.10.425 PLAYING COURTS AND POOLS

Only playing courts shall be permitted in the floodplain; pools shall be prohibited. Swimming in natural or artificial ponds shall be permitted. The playing courts shall be designed and located so as not to trap debris resulting in floodwater backups. No fill shall be permitted.

(Amended September 22, 1998 by Ordinance 98-080)

SECTION 40.10.426 RESERVED

(Amended September 22, 1998 by Ordinance 98-080)

SECTION 40.10.427 ROADS, PARKING LOTS AND UTILITIES

- A. **All resource areas.** Protected resources shall not be disturbed with roadways, parking lots or utility lines. The applicant must demonstrate no possible alternative to crossing the resource exists and the route selected must be the least disruptive.

(Amended September 22, 1998 by Ordinance 98-080; amended July 8, 2003 by Ordinance 03-045)

SECTION 40.10.428 ESSENTIAL ACCESS

Essential access shall be permitted only upon finding (in the Environmental Impact Assessment Report) that the access cannot avoid crossing a protected resource area. If several properties in the area suffer the

same problem, then the essential access shall be designed to serve all properties, and access easements shall be provided. The Department shall make every effort to gain the cooperation of all property owners, including financial sharing of costs. If adjoining property owners do not cooperate, the landowner making the improvements may submit a certified billing on the cost of the access. Subsequent essential access requests in the area shall be denied. The landowners shall be required to use the initial access and pay for their share of the documented expenses based on the number of dwellings or lots served. In the review of developments the County shall seek to identify areas of adjoining properties that might qualify and provide stub streets so as to eliminate the need for this type of mitigation.

(Amended March 12, 2002 by Ordinance 01-112)

SECTION 40.10.427 ROADS, PARKING LOTS AND UTILITIES

- A. **All resource areas.** Protected resources shall not be disturbed with roadways, parking lots or utility lines. The applicant must demonstrate no possible alternative to crossing the resource exists and the route selected must be the least disruptive.

(Amended September 22, 1998 by Ordinance 98-080; amended July 8, 2003 by Ordinance 03-045)

SECTION 40.10.428 ESSENTIAL ACCESS

Essential access shall be permitted only upon finding (in the Environmental Impact Assessment Report) that the access cannot avoid crossing a protected resource area. If several properties in the area suffer the same problem, then the essential access shall be designed to serve all properties, and access easements shall be provided. The Department shall make every effort to gain the cooperation of all property owners, including financial sharing of costs. If adjoining property owners do not cooperate, the landowner making the improvements may submit a certified billing on the cost of the access. Subsequent essential access requests in the area shall be denied. The landowners shall be required to use the initial access and pay for their share of the documented expenses based on the number of dwellings or lots served. In the review of developments the County shall seek to identify areas of adjoining properties that might qualify and provide stub streets so as to eliminate the need for this type of mitigation.

(Amended March 12, 2002 by Ordinance 01-112)

DIVISION 40.10.600 STORAGE OF HAZARDOUS SUBSTANCES AND PETROLEUM PRODUCTS

The storage, maintenance, use, or sale of substances listed in 40 CFR 116 in an aggregate quantity equal to or greater than a reportable quantity as defined in 40 CFR 117 shall be governed by the following provisions. Petroleum products shall also meet the requirements of this section.

- A. All such activities are prohibited in floodplains, floodways, wellhead class A, B or C, the Cockeysville Formation, drainageways, recharge areas, steep slopes, critical natural areas, wetlands, riparian buffers and sinkholes, unless such substances are used in the process of public water supply and treatment and sewer treatment facilities.
- B. The replacement of existing underground petroleum storage tanks in any area other than a WRPA shall be permitted provided all State and Federal regulations are met. The replacement of existing underground petroleum storage tanks in a WRPA where an upgrade is required by

DNREC shall be permitted provided all State and Federal regulations are met and secondary containment is provided.

- C. In all other areas where permitted, above ground storage shall be permitted provided such facilities are designed so that all spills are fully contained in a secondary containment facility that is designed such that there is no spill into soils, surface waters, sewers. The replacement of existing above ground storage facilities in any area shall be permitted provided the State Fire Marshall's Office provides the Department with written approval and all other applicable State and Federal regulations are met and secondary containment is provided. Secondary containment shall not be required for above ground storage used exclusively for private residential purposes when located on the residential lot within the setback lines.
- D. In all other areas where permitted, underground storage shall be permitted only for petroleum products, provided all State and Federal regulations are met.

(Amended September 22, 1998 by Ordinance 98-080; amended December 14, 1999 by Ordinance 99-075; amended January 18, 2011 by Ordinance 10-113)