FLOODPLAIN AND DRAINAGE ADVISORY COMMITTEE

September 20, 2011 Meeting

http://www.dnrec.delaware.gov/swc/Pages/default.aspx

Drainage and Flooding Facts

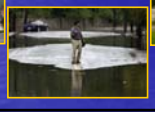
- Delaware is the lowest state in the USA with a mean elevation of just 60 feet above sea level
- Over 331 square miles or 17% of Delaware's land mass is within a mapped 100 year floodplain
- Approximately 621 road miles and over 18,000 structures are in the 100-year floodplain
- State expenditures each year to resolve drainage problems have cost taxpayers an estimated $65M since 1996

This Morning's Meeting

- Introductions
- Overview of Senate Bill 64
- Recurring Issues
- Summary and Shortfalls of Current Standards
- Definitions
- DNREC's Roles in Floodplains and Drainage
- Others' Roles in Floodplains and Drainage
- Issues Summary (Top Ten)
- Path Forward

Drainage and Flooding Consequences

- Inadequate drainage standards and inconsistent local codes contribute to chronic and nuisance flooding throughout the state
- Delaware landowners are impacted in the use and enjoyment of their personal property
- Inaction is no longer a viable alternative



OVERVIEW OF SENATE BILL 64

Prior Efforts

- Governor Minner's Task Force on Surface Water Management (2005)
  - Led to overhaul of Clean Water Advisory Council and larger role in drainage issues
- Delaware Public Policy Institute Dialogue on Financing Wastewater and Stormwater Infrastructure (2006)
  - Further assessment of wastewater and stormwater infrastructure funding needs
- Sussex County and Kent County Level of Service Analysis of Surface Water Management Needs (2008 and 2010 respectively)
  - Identified specific needs in 12 program areas

Elements of SB 64

- Authorizes Secretary to develop guidance and minimum standards for improved floodplain management and drainage after consultation with Floodplain and Drainage Advisory Committee. (9 months)
- Requires three county and all municipal governments to review their individual codes and ordinances (with DNREC assistance) to determine consistency and identify hardships and impediments to implementation (next 6 months)
- Mandates DNREC review of comments and preparation of draft and final reports to General Assembly (by March 15, 2013)
- Includes provisions for permit waivers under certain conditions such as life threatening emergencies, regulatory overlaps, etc. (not a Committee charge)

Elements of SB 64

- Drainage standards shall include general requirements and criteria for consideration by local governments
- Committee will:
  - Consider nationally recognized standards and best practices
  - Evaluate capacities of local governments to implement standards
  - Examine adequacy of existing practices associated with property purchasers
- Opportunity for public comment prior to finalizing standards

RECURRING ISSUES - DRAINAGE

Top Drainage Issues

- Disruption of Existing Drainage Patterns
- Inadequate Lot Grading
- Need for Proper Easements for Drainage Infrastructure
- Subdivision Infill by Multiple Builders
- Lack of Real Estate Disclosures

Need for Easements for Drainage Infrastructure

Orange lines are the location of a 20+ year old CMP. There is approximately 15' between houses making replacement dangerous.

Disruption of Drainage Patterns

Drainage Program provided Technical Assistance to landowner who worked with downstream neighbor to construct a ditch at their own expense. New property owner downstream is planning on filling in the ditch. Only recourse for landowner is to wait for damages then file Civil Lawsuit.

Subdivision Infill By Multiple Building Contractors

The Economic Downturn over the last several years has caused many of the national homebuilders to reduce their operations in Delaware. Since there are thousands of un-built lots in approved subdivisions, we expect much of that construction to be local builders on a site by site basis. There is currently no oversight regarding drainage or stormwater when those homes are built.

Individual Lot Grading

Raised lots create problem for home at original grade

Lack of Real Estate Disclosures

Make it clear when a property is sold whether or not is part of a community with an approved stormwater system.

Stormwater Pond Maintenance can be costly and often requires hiring professionals. Prospective buyers should be aware that they are jointly responsible for this work when it is needed. Many stormwater ponds are now 20 years old at the point where major maintenance will be required.

RECURRING ISSUES - FLOODPLAINS

Major Subdivisions are being built in floodplains without accurate floodplain delineations, accurate topography, or base flood elevations determined.

Top Floodplain Issues

- Lack of Real Estate Disclosures
- Development in Areas Without Sufficient Floodplain Mapping and Flood Data
- Inadequate Building Standards
- Inconsistent and / or Minimum Code Provisions
- Lack of Enforcement of Existing Standards

Individual property owners are forced to pay for flood study first to get a building permit, and again to correct inaccurate map when flood insurance proves to be unaffordable.

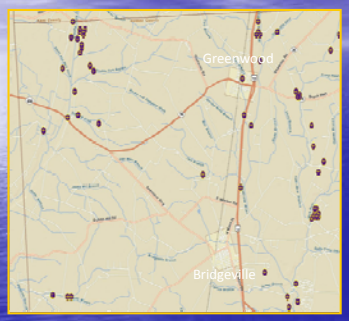
- Projects in flood-prone areas are being built without accurate flood data
  - Developments and construction activities should be based on accurate flood and topographic data
  - Property by property flood studies are the least efficient way to determine flood risk
  - Creates large flood insurance price increases

Completion of a detailed flood study proves that the previous floodplain area was completely inaccurate. Cost of mis-rated flood insurance and individual surveys greatly exceed the up-front flood study cost.

Better Strategy

- Establish a standard for flood studies prior to the subdividing of lots
  - This takes a tremendous amount of burden off the homeowner
- Disclose flood risk to prospective buyers
- Site plans show results of flood study with FEMA map revised to show accurate floodplain

Improved Floodplain Mapping



Benefits:

- Over 50 Floodplain corrections to bad map in one part of Sussex County
- Each property owner spent $1000+ on survey and $1000+/year in flood insurance
- Potential saving of about $10,000 per mile of stream with improved mapping

Improved Floodplain Mapping

Benefits:

- More accurate depiction of flood risk
- Prevents property owners survey-engineering cost to assess flood risk themselves
- Lowers the cost of flood insurance or prevents the need entirely

- Filling and encroachment are occurring in and out of floodplains which creates adverse flood and drainage impacts on neighbors.

Numerous houses built in floodplain without an accurate flood study. Many property owners in this neighborhood have required assistance from DNREC, and had to hire engineers and surveyors for floodplain assistance.

Filling in floodplains should be designed to avoid impacts to adjacent properties

Establish standards to ensure that development activities do not exacerbate flooding and drainage problems

Require adequate hydrostatic venting within one foot of grade. Lack of proper flood vents subjects foundation walls to hydrostatic pressure and greatly increases the cost of flood insurance.

A great deal of new construction is designed to minimum standards which do not provide acceptable levels of flood risk

- First floor elevated just to base flood elevation levels with no freeboard
- Below grade crawl spaces and basements accumulate water following floods and make flood insurance prohibitively expensive

Improved Floodplain Regulations and Enforcement

Foundation collapse of improperly elevated house $60,000 to repair

Adjacent house built 1.5 feet above flood level undamaged

Benefits:

- Notify potential buyers about flood risk and insurance requirements
- Prevent flood damage which is not covered by homeowners insurance limited coverage by flood insurance
- Reduce the need for expensive flood abatement projects

Structures can be elevated 1-2 feet above the base flood elevation for very little additional construction cost. Flood insurance savings will quickly pay for this higher standard. In many cases, a structure with its first flood elevated to the base flood elevation have sustained severe damage.

Improved Floodplain Regulations and Enforcement

Benefits:

- Lowers the cost of flood insurance
- Avoiding NFIP probation ensures continued insurance availability
- Reduce flood damage and expensive drainage solutions

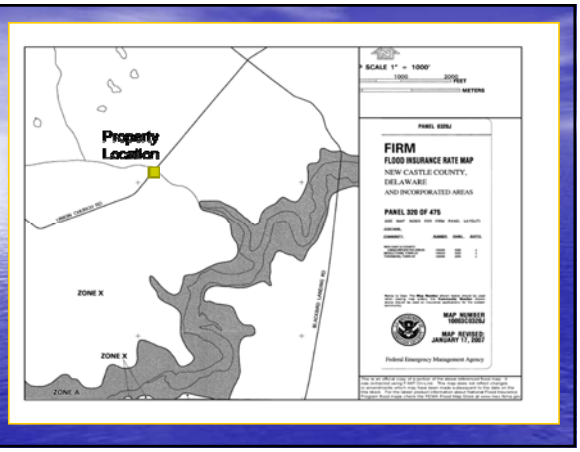
Without adequate enforcement, even good standards will not reduce flood impacts.

New house with basement floor 4 feet below the 100-year flood elevation

Flooding to house on a stream which has not been mapped by FEMA. This house may not be repairable due to extensive damage during Hurricane Irene.

Sample Insurance Costs Based on Lowest Floor

- 2 feet above BFE = $550 per year
- At BFE = $1,850 per year
- 1 foot below BFE = $4,700 per year
  - Based on $250,000 in building coverage only.



- Few if any standards existing for development immediately adjacent to the floodplain or outside mapped floodplains
- 30% of flood damages nationally occur to structures which are not in a FEMA-mapped floodplain

House with proposed basement under construction just outside the floodplain filled with groundwater.

COMMITTEE DISCUSSION

DNREC and Conservation Project Costs for Drainage and Minor Flooding

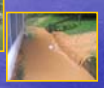
- $65 M appropriated since 1996
- 500 projects remain to be completed with an estimated cost - $58 M
- $8.5 M spent in the past four years with no new appropriations

EXPENDITURES RESULTING FROM SHORTFALLS IN CURRENT STANDARDS

Federal, State, and Local Costs for Major Flood Mitigation

- $30 M in NFIP claims since 2000. Uninsured higher.
- 200+ flooded houses purchased - $50 million since 2000
- $10 M spent on commercial/ industrial flood acquisition floodproofing since 2000

Drainage and Flooding Challenges



- 316 public drainage and flooding concerns received and investigated by DNREC and the Conservation Districts in FY 11 alone.
- Over 350 new project requests added to the 21st Century Fund List in the past four years with no additional funding.

DEFINITIONS AND TERMINOLOGY

Stormwater / Drainage Definitions

- ***Stormwater Quality*** – those characteristics of stormwater runoff from a land disturbing activity that relate to the chemical, physical, biological, or radiological integrity of water.
- ***Stormwater Quantity*** – those characteristics of stormwater runoff that relate to the rate, volume and duration of flow to downstream areas resulting from land disturbing activities.
- ***Stormwater Conveyance*** – the transport of runoff in open channels or through enclosed pipes.
- ***Hydrology*** - scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.
- ***Hydraulics*** – physical science and technology of the static and dynamic behavior of fluids.
- ***100-year Event*** – hydrologic event having a 1 percent chance of happening in any given year.
- ***25-year Event*** – hydrologic event having a 4 percent chance of happening in any given year.

Floodplain Definitions

- ***Floodplain*** – the lowland and relatively flat areas adjoining inland and coastal waters including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year.
- ***Base Flood*** – the flood which has a one percent chance of being equaled or exceeded in any given year (also known as a 100-year flood). This term is used in the NFIP to indicate the minimum level of flooding to be used by a community in its floodplain management regulations.
- ***Regulatory Floodway*** – the area regulated by Federal, state or local requirements to provide for the discharge of the base flood so the cumulative increase in water surface elevation is no more than a designated amount (not to exceed one foot as set by the NFIP).
- ***Freeboard*** – a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. Freeboard is not required by NFIP standards, but communities are encouraged to adopt at least a one-foot freeboard. Freeboard results in significantly lower flood insurance rates due to lower flood risk.

Stormwater / Drainage Definitions

- **Adverse Impact** – a negative impact resulting from a construction or development activity that may include, but is not limited to, increased risk of flooding; degradation of water quality; increased sedimentation; reduced groundwater recharge; negative impacts on aquatic habitat; and threatened public health and safety.
- ***Lines and Grades*** –prepared plan usually depicting existing and proposed contours, building elevations, stormwater conveyances, property lines and easements, etc., intended to demonstrate no adverse impacts.
- ***Easement*** – a grant or reservation by the Owner of land for the use of such land by others for a specific purpose or purposes and which must be included in the conveyance of land affected by such easement.
- ***Impervious surface*** – means a surface which either prevents or retards the entry of water into the soil. Increases in impervious surface generally result in increases in runoff unless proper measures are taken.
- ***Drainage Management*** – assuring the adequate passage of surface water away from structures and towards major waterways (rivers and bays) over 24 to 48 hours.

COMMITTEE DISCUSSION

Floodplain Definitions

- ***National Flood Insurance Program (NFIP)*** – A federal program managed by FEMA. The NFIP has 3 components: Flood Insurance, Floodplain Management, and Flood Hazard Mapping.
- ***Flood Insurance Rate Map*** **(FIRM)** – an official map of a community on which the Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community. FIRMs are also available digitally, and are called Digital Flood Insurance Rate Maps (DFIRM).
- ***The Community Rating System (CRS)*** – a voluntary program for NFIP-participating communities. The goals of the CRS are to reduce flood losses, to facilitate accurate insurance rating, and to promote the awareness of flood insurance. The CRS has been developed to provide incentives for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. The incentives are in the form of premium discounts.

DNREC's ROLES IN DRAINAGE AND FLOODPLAIN MANAGEMENT

Sediment & Stormwater Program

The goal of the statewide Sediment and Stormwater Program is to prevent existing water quantity and quality problems from becoming worse when land changes or construction activities for residential, commercial, industrial, or institutional projects occur.

- DNREC Responsibilities
  - Develop Standards
  - Review Program Implementation
    - ✓ 7 Delegated Agencies
    - ✓ Enforcement Actions
  - Coordinate with Federal Agencies
  - Conduct Studies
  - Educational Programs
    - ✓ Certified Construction Reviewer
    - ✓ Blue Card Course
  - Approve Designated Watersheds
  - Approve Projects on State-owned Property (except DelDOT)
  - Provide Technical Assistance

Tax Ditch Administration

Tax Ditch Organizations are governmental subdivisions of the State that are formed on a watershed basis to construct and maintain a drainage system. The organizations are managed by officers elected by the taxables.

- Technical Assistance
  - Field Support
    - ✓ Inspections
    - ✓ Survey Crew
  - Environmental Permitting
    - ✓ Wetlands Permits
    - ✓ Sediment and Stormwater permits
  - Maintenance
    - ✓ Small Projects Crew
    - ✓ VOP Crew
- Administrative Assistance
  - Assistance with Meetings
  - Documents & Maps
  - Financial Assistance
    - ✓ Audits
    - ✓ Loan Applications
- Court Order Changes
- Assessment Updates
- Right of Way Research

Delaware Drainage History

- Legislative actions authorizing public drainage facilities date back to 1793.
- A history of drainage activities undertaken by the federal and state government as well as private citizens in Delaware is well documented.
- In the 1930's some of this work was undertaken by the "CCC"
- "Ditch Companies" were prevalent prior to 1951.

Publicly Funded Drainage Projects

The investment strategy for the 21st Century Fund was outlined in the FY96 Bond and Capital Improvements Act. Revitalization of Communities was one of three broad program areas. Under this area, Resource Conservation and Development (RC&D) was targeted for funds to ...enhance the health of communities by ameliorating watershed and drainage issues statewide.

- Projects are approved by the Joint Committee for Capital Improvements (Bond Bill)
- Projects using 21st century funds require a match of at least 10% but often exceeds the minimum amount.
- Other Funding Sources
  - Community Transportation Funds
  - State & County Matching Funds (§3921)
  - County or Municipal Funds
  - Private landowners
- Approximately 12 F.T.E. General funded and Contractual Employees working on these projects.

Delaware Drainage History

"...drainage of lands and wetlands was encouraged by governments and society so farmers could farm every possible acre to feed the armies and war ravaged countries, for medical reasons, to support timber harvesting and because keeping land dry, rich and clean seemed like the right thing to do".

Modern Drainage Program has two primary objectives:

- Tax Ditch Administration
- Publicly Funded Drainage Projects

Floodplain Management

- Maps floodplains in partnership with FEMA
- Provides training and oversight of local floodplain management programs
- Performs flood mitigation projects, often in partnership with FEMA and local partners

OTHER ORGANIZATIONS' ROLES IN DRAINAGE AND FLOODPLAIN MANAGEMENT

County Responsibilities

- Varies by county
- Typical responsibilities may include:
  - Regulating new and existing development
  - Plan review, permits, and inspections
  - Coordination with home owner associations (HOAs)
  - Standards for source water protection
  - Minor capital improvements
  - Maintenance and inspections of non-tidal streams

Federal Responsibilities

- U.S. Army Corps of Engineers
  - Funding for major or watershed level projects
  - Beach nourishment
  - Individual and more general nationwide permits
- Environmental Protection Agency (EPA)
- Natural Resources Conservation Service (NRCS)
- Federal Emergency Management Agency (FEMA)

Municipal Responsibilities

- Varies by municipality
- Typical responsibilities may include:
  - New Development Plan Review
  - Stormwater Facility Inspection
  - Stormwater Facility Maintenance
  - New Construction Oversight
  - Minor Capital Projects

DelDOT Responsibilities

- Review of development plans
- Capital improvements of conveyance and stormwater management facilities
- Maintenance of conveyance and stormwater management facilities
- Implementation of NPDES MS4 permit

Conservation District Responsibilities

- Varies by county
- Typical responsibilities may include:
  - Minor drainage improvement and stream bank stabilization projects
  - Assistance to tax ditch organizations
  - Implementation of Sediment and Stormwater Program
    - Review and approval of Sediment and Stormwater Management Plans
    - Construction inspection to assure compliance with approved Plans
    - Assistance and education to local communities

ISSUES SUMMARY
TOP TEN

COMMITTEE DISCUSSION

Drainage

1. Disruption of Existing Drainage Patterns
2. Inadequate Lot Grading
3. Lack of Proper Easements for Drainage Infrastructure
4. Subdivision Infill by Multiple Builders
5. Lack of Real Estate Disclosures

PUBLIC COMMENT

Floodplains

6. Lack of Real Estate Disclosures
7. Development in Areas Without Sufficient Floodplain Mapping and Flood Data
8. Inadequate Building Standards
9. Inconsistent and / or Minimum Code Provisions
10. Lack of Enforcement of Existing Standards

PATH FORWARD

- Suggested plan for how meetings will work
- Dates/Times/Topics for next Committee meetings
  - Sept – Introduction
  - Oct – Floodplains – current standards, issues
  - Nov – Stormwater and Drainage – current standards, issues
  - Dec – Brainstorm/draft minimum standards
  - Jan – Review/debate minimum standards
  - Feb – Finalize proposed minimum standards
- Schedule
  - Committee meetings
  - Public and / or other outreach meetings
  - Municipal reviews

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September 20, 2011 Meeting

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