Dover's Source Water Protection Overlay Zone

Special Utility Committee Meeting

November 6, 2007

ATTACHMENT #1
Special Utility Committee Meeting of 11/06/2007

What Is Source Water Protection?

- Protection of the Public Drinking Water Supply
  - Focus is on both quality and quantity
  - Protection of wellhead areas
  - Protection of excellent recharge areas

Why Is This Important to Dover?

- In Delaware, Dover is a large public water supplier (Regional Supplier – Our position)
- Ground water is the sole source of Dover's water (Three Separate Aquifers)

Water Is an Economic Engine

- Critical Resource Management Issue
- No water = No growth & No economic development
- We have an obligation to our rate payers and bond holders to protect our investment

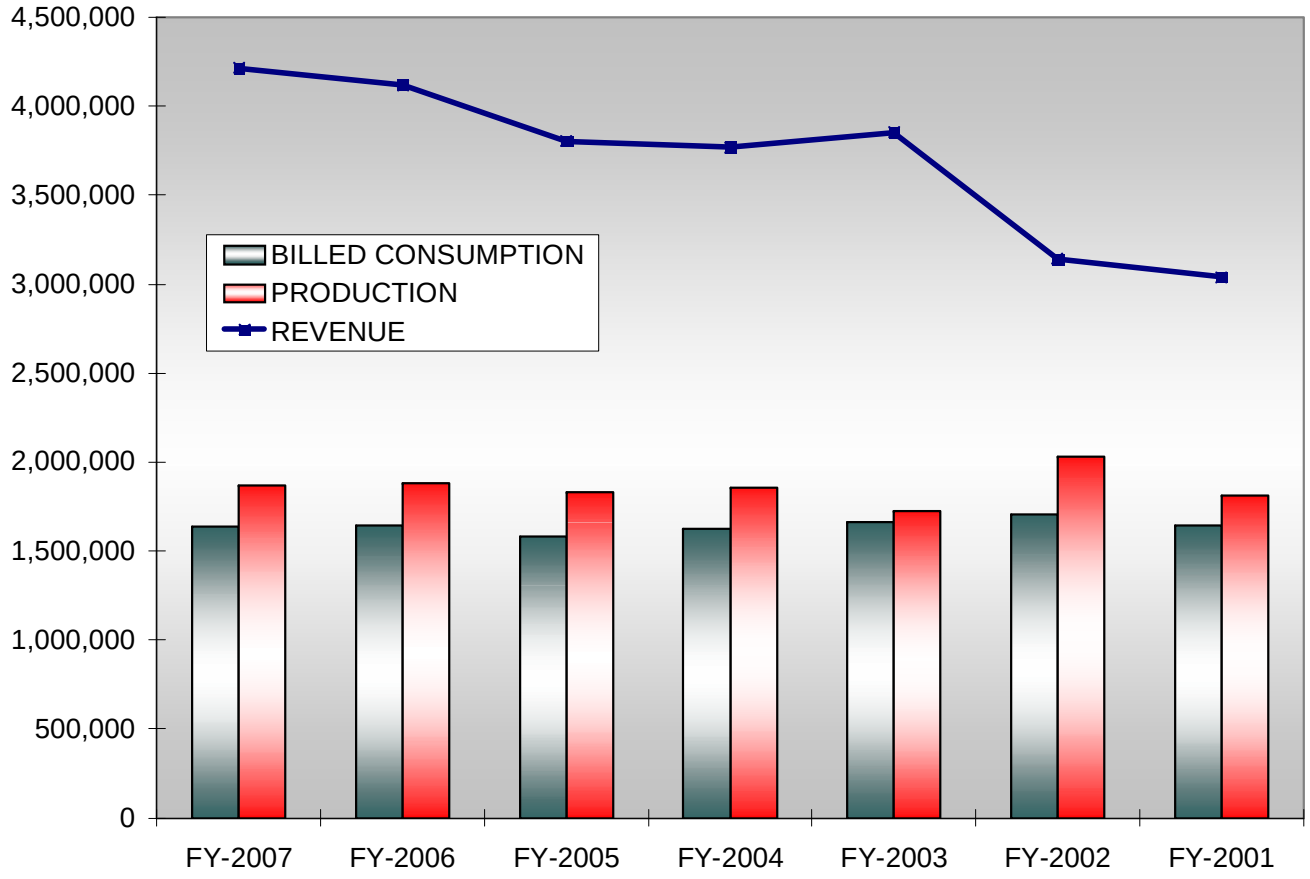
Water System Facts

- Began operations in October 1882
- Initial system, 13,000 lf +/- ($21,000), 1 Well
- Current System, 200 miles, 22 Wells
- Over 12,200 metered connections
- Certificate of Public Convenience & Necessity (CPCN)
- Average daily flow = 5.12 MGD
- Peak summer flow = 9.28 MGD
- Dover is a regional supplier

Who Are Our Largest Customers?

- Delaware State University
- Dover Downs
- Procter & Gamble
- Capitol Cleaners
- Kent General Hospital
- Tidewater Utilities
- Kraft Foods
- Sheraton Hotel
- City of Dover Power Plant
- Playtex Products
- Dover Mall
- Dover Budget Inn
- Kings Cliff Trailer Park
- Olive Garden
- Red Lobster
- Other Hotels

Production / Consumption = $$$$$

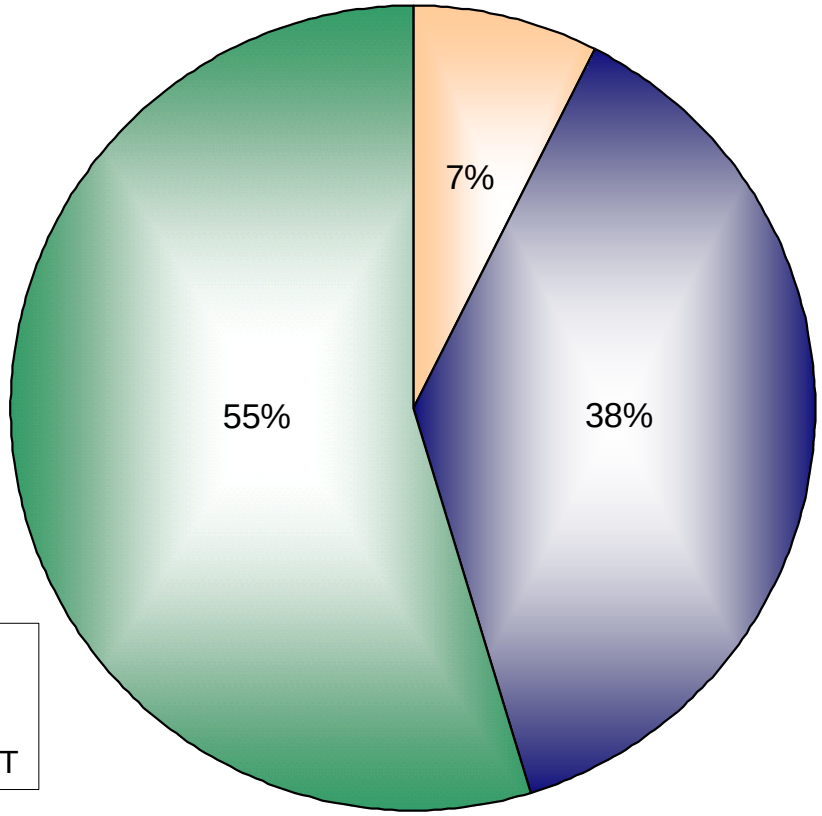


What Is Our Responsibility?

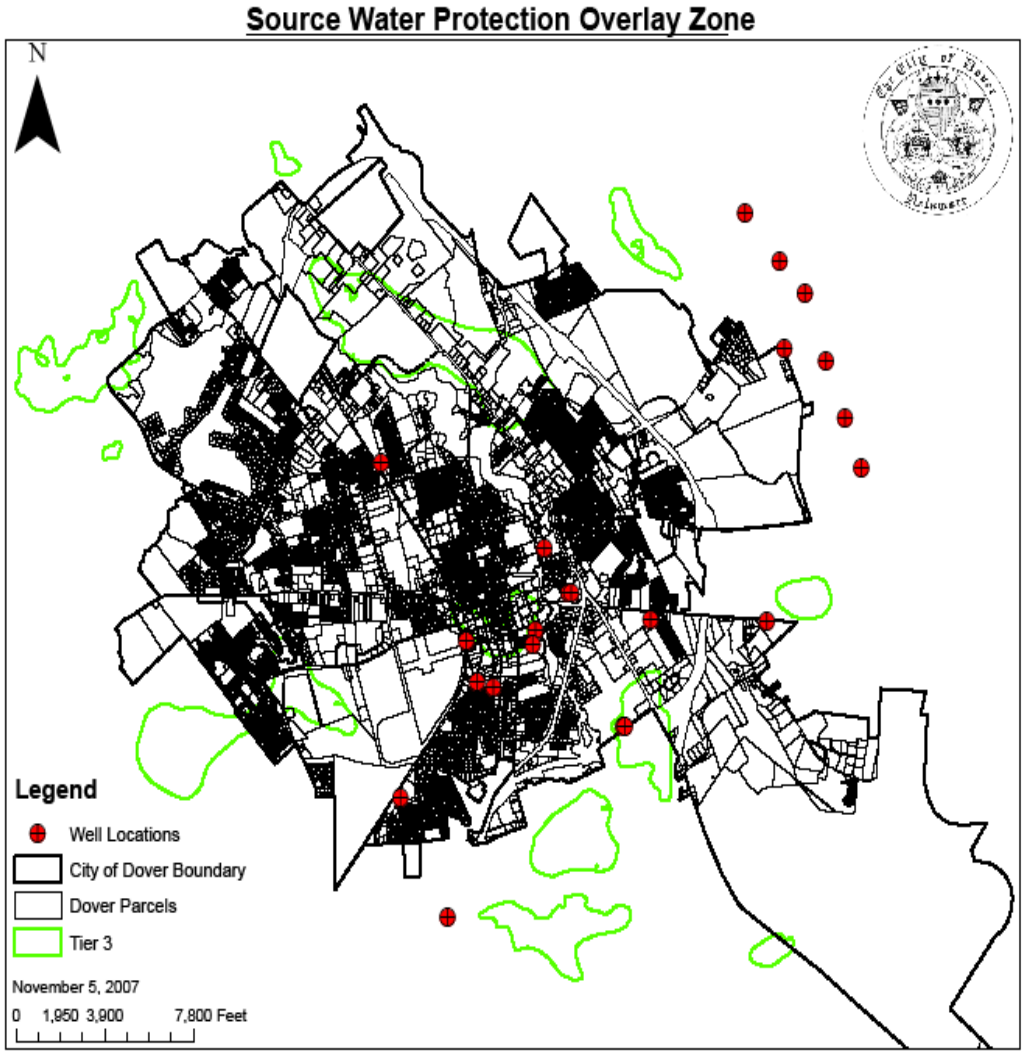
- Source Water Protection Act of 2001
- Dover must adopt maps which delineate:
  - Wellhead Protection Areas (Confined & Unconfined)
  - Excellent Recharge Areas
- Dover must adopt ordinances which regulate land use in these areas to protect our regional supply position and this critical resource.

What Is Our Production Profile?

- Columbia Aquifer
  - Unconfined
  - 7 Wells
- Cheswold Aquifer
  - Confined
  - 9 Wells
- Piney Point Aquifer
  - Confined
  - 6 Wells



Well Locations



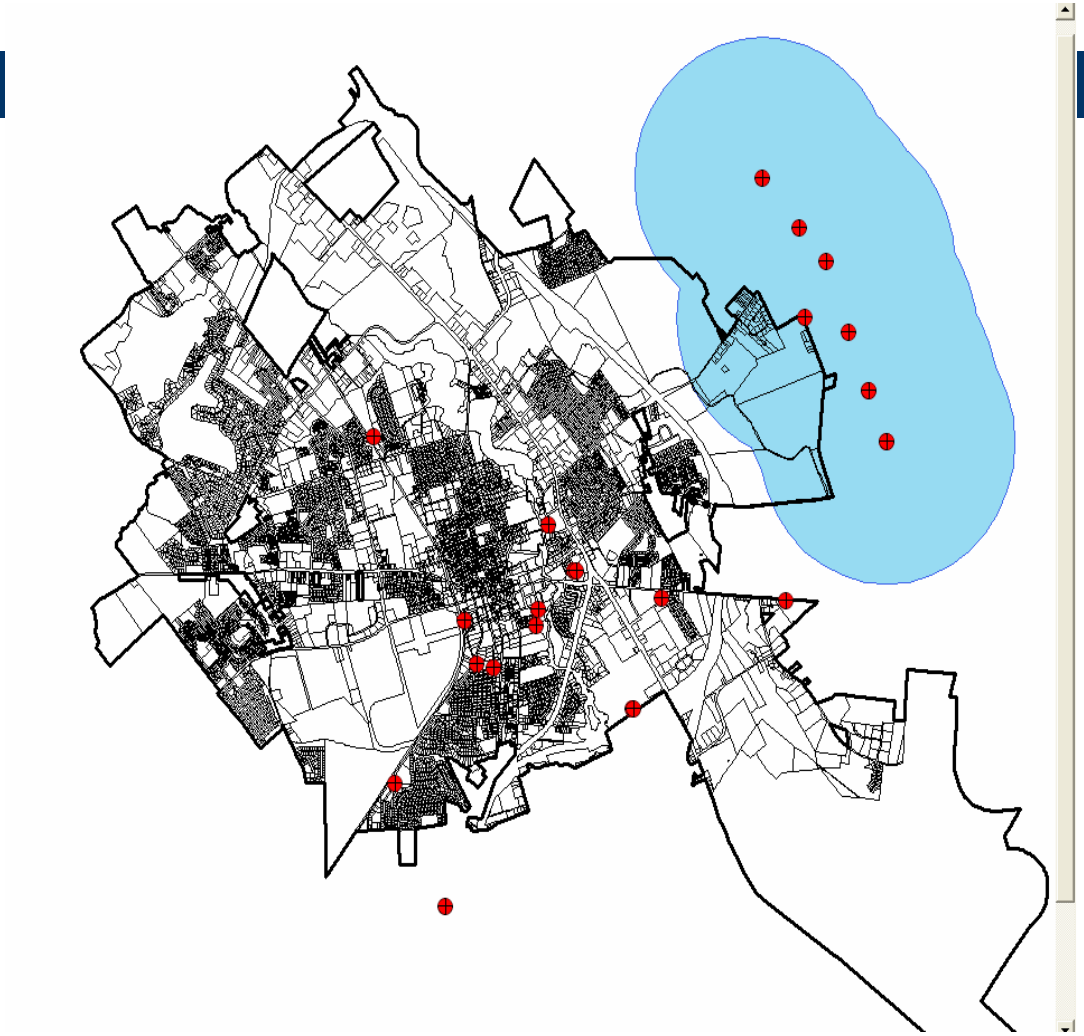
Important Details

- Dover has wellhead areas within our municipal boundaries that we must manage and protect.
- Dover owns wellhead areas outside of our municipal boundaries that must also be protected.
- Dover sits overtop underground aquifers that supply drinking water regionally and also provide base flows for various surface waters.

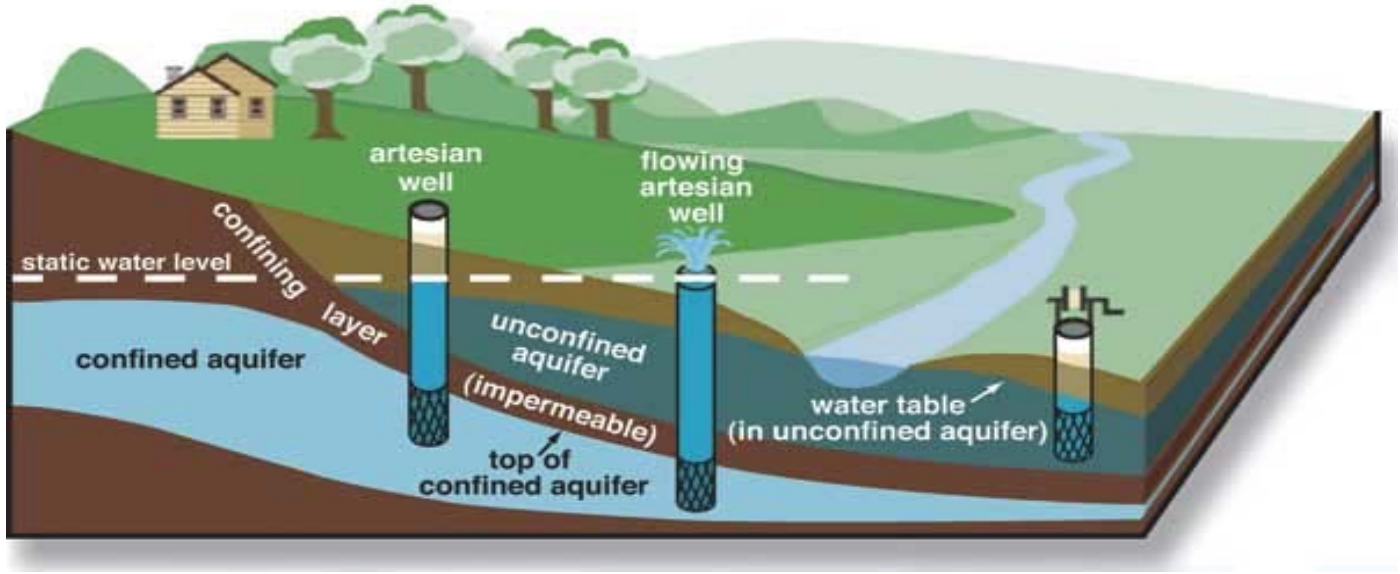
Two Components

- Protect the immediate areas surrounding wells
- Protect the ability of the various aquifers to recharge

Wellhead Protection Areas



Underground Visualization



Source: http://www.kgs.ku.edu/Publications/PIC/23figures/Fig2.jpg

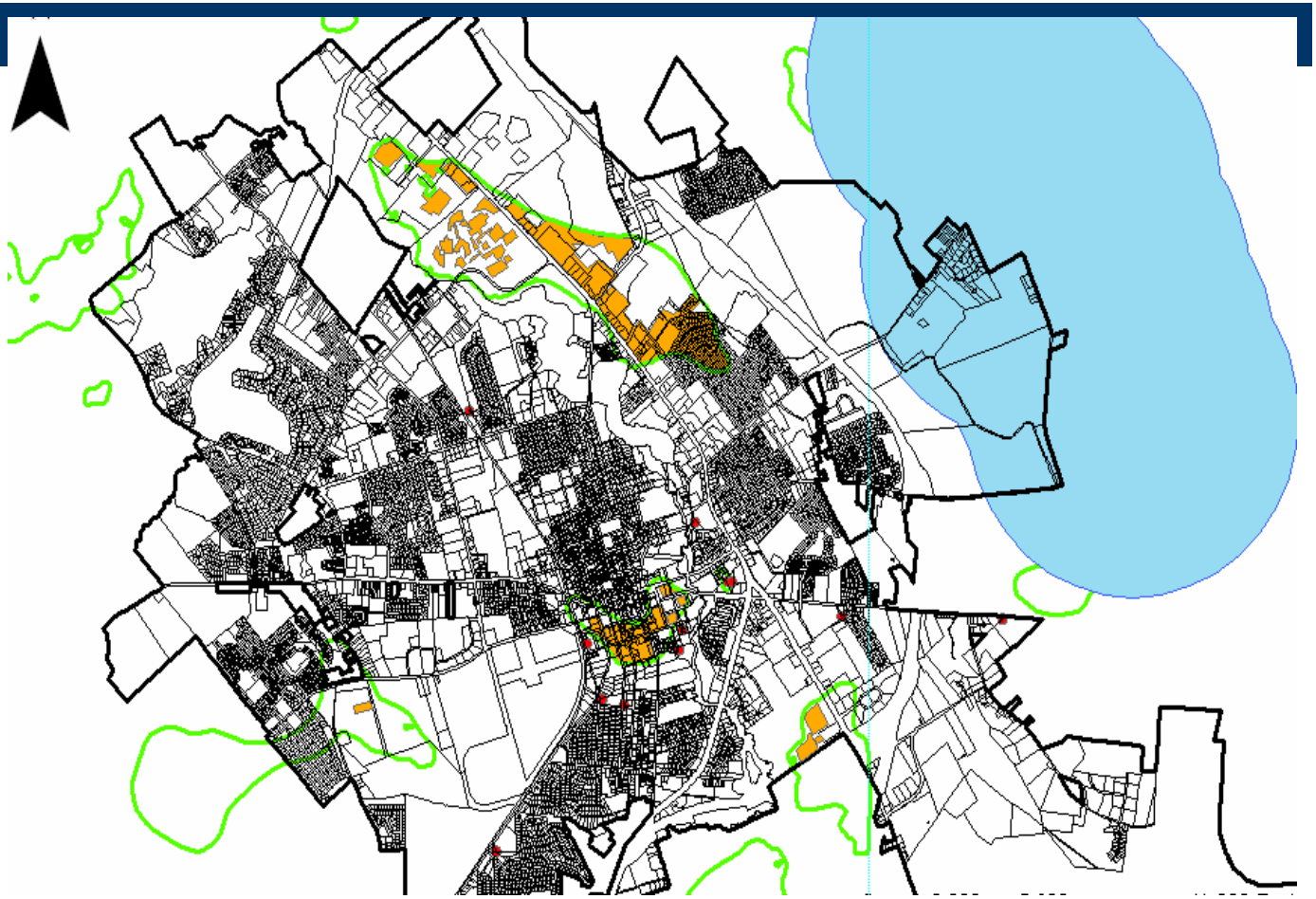
Regulating Wellhead Areas

- Differentiate between wells in the ‘confined’ and ‘unconfined’ aquifers
- Create protective land use policies
- Preserve “critical” open space
- Encourage natural stormwater runoff and redirect impervious cover runoff

Identifying Excellent Recharge Areas



Recharge & Coverage



Recharge

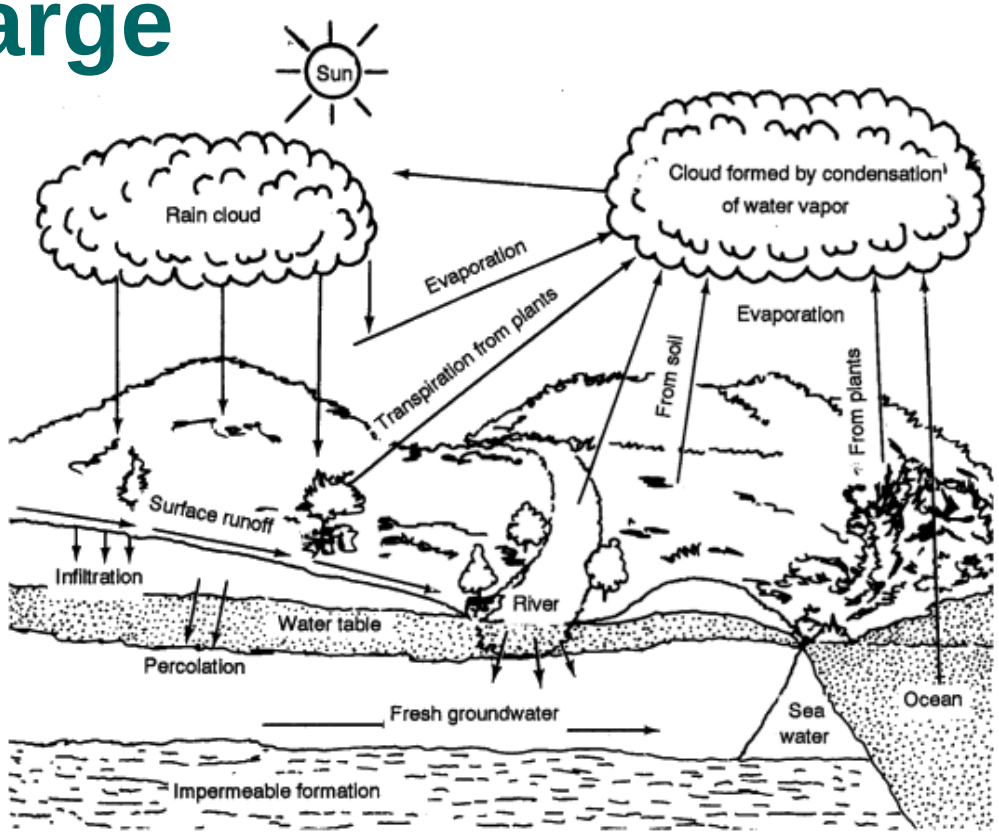


Figure 2-1. Hydrologic cycle

Source: http://www.globalsecurity.org/military/library/policy/army/fm/5-484/fig2-1.gif

Can the Science behind the Mapping Be Challenged?

- Yes
- State law requires use of data developed by DNREC
- Ordinance provides for a procedure to challenge the mapping
- Challenge similar to flood plain and/or wetland delineation

What Is the Value of an Excellent Recharge Area?

1 acre of Excellent Recharge Area =

1.39 acres of Good Recharge Area

6.45 acres of Fair Recharge Area

142 acres of Poor Recharge Area

Source: Andres, A. Scott, 2004, Ground-water recharge potential mapping of Kent and Sussex counties, Delaware: Delaware Geological Survey Report of Investigations No. 66, 20 p. http://www.udel.edu/dgs/Publications/pubsonline/RI66.pdf

Regulating Excellent Recharge Areas

- Create protective land use policies
- Limit impervious cover via best management practices
- Implement 15% impervious cover reduction rule for redevelopment
- Allow for and encourage ‘green design’

The Process

- Staff researched and consulted experts – Draft ordinance
- August 9 - Public Workshop
  - Notified all affected property owners
  - Revised ordinance
- October 9 – Park, Recreation & Community Enhancement Committee
- October 15 – Public Hearing before Planning Commission
  - Notified all affected property owners
  - October 22 – Public Hearing before City Council, Issued referred to the Utility Committee
- December 31 – Deadline for Adoption of the Ordinance
- January 2008 – Public Hearing & Action – City Council

Leadership Issue

- Focus is on the City of Dover
- Current & Future CIP
  - FY 2008 – Well #8 Replacement (Cheswold)
  - FY 2008, FY 2009 & FY 2010 – 1MG Elevated Storage, Piney Point Well
  - FY 2013 – Additional Columbia Well
- Permitting & Funding (State Revolving Fund)
- Regional Position

Path Forward….

Utility Committee
(November 6, 2007)
Wellhead Protection Only

BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF DOVER, IN COUNCIL MET:

That Appendix B - Zoning Ordinance, Article 3 – District Regulations be amended by inserting the a new section as follows:

Section 29 Source Water Protection Overlay Zone (SWPOZ)

29.1 Purpose. The purpose of this Source Water Protection Overlay Zone is to provide a safe drinking water supply and to ensure that groundwater is adequately protected and maintained. The Overlay Zone's purpose is to protect public health and safety by minimizing contamination of the aquifer and to ensure that the aquifer is property maintained and supplied with clean water through the reduction of impervious surfaces.

29.2 Definitions.

Aboveground Storage Tank (AST). An AST is a single containment vessel greater than 250 gallons as defined in the Delaware *Regulations Governing Aboveground Storage Tanks*. ASTs with a storage capacity greater than 12,499 gallons containing petroleum or hazardous substances, and ASTs with a storage capacity greater than 39,999 gallons containing diesel, heating fuel or kerosene are subject to the design, construction, operation and maintenance requirements of the Delaware AST regulations.

Underground Storage Tank (UST). An UST is one or a combination of Tanks including underground Pipes, the volume of which is 10% or more belowground, as defined in the Delaware *Regulations Governing Underground Storage Tank Systems*. The following USTs are not subject to the design, construction, operation and maintenance requirements of the Delaware UST Regulations: Residential Heating Fuel, Agricultural and Residential Motor Fuel USTs less than 1,100 gallons and any UST less than 110 gallons.

29.3 Use and Bulk Requirements. The uses and bulk standards which govern the underlying zoning designations attached to the properties within the Source Water Protection Overlay Zone shall apply in all instances except where uses are specifically prohibited by this section and except pertaining to Impervious Surface, Ground Cover, and Floor Area Ratio. Where issues of Impervious Surface, Ground Cover, and Floor Area Ratio are concerned, the provisions of the Source Water Protection Overlay Zone are the governing provisions, overriding the existing zoning for the property.

29.4 Zone Boundaries. This section of the *Zoning Ordinance* encompasses the lands demarcated on the City of Dover Zoning Map as set forth in Article 2 §2 of this Ordinance, as the Source Water Protection Overlay Zone.

29.5 Uses Prohibited. The following uses are specifically prohibited throughout the Source Water Protection Overlay Zone:

29.51 Uses Prohibited

a) Automobile body/repair shop, motor vehicle, boat or farm equipment service
b) Gas stations and motor vehicle service stations
c) Fleet/trucking/bus terminal
d) Dry cleaner
e) Electrical/electronic manufacturing facility
f) Machine shop
g) Metal plating/finishing/fabricating facility
h) Chemical processing/storage facility
i) Wood preserving/treating facility
j) Junk yard/scrap yard/salvage yard
k) Mines/gravel pit
~~l) Irrigated nursery/greenhouse stock~~
~~m) Confined animal feeding operations~~
n) Land divisions resulting in high density (>1 unit/acre) septic systems
o) Equipment maintenance/fueling areas
p) Injection wells/dry wells/sumps, except for single-family residences directing gutter downspouts to a drywell
q) Underground storage tanks
r) All other facilities involving the collection, handling, manufacture, use, storage, transfer or disposal of any solid or liquid material or waste having potentially harmful impact on groundwater quality
s) All uses not permitted in the underlying zone district

29.6 Geothermal Wells. Geothermal wells are permitted uses within the Source Water Protection Overlay Zone in accordance with other City and State regulations.

29.7

Reserved

29.8 Tier 2: Primary Wellhead Protection Areas. Lands defined as Tier 2 lands, are areas which have been identified as Primary Wellhead Protection Areas.

29.81 Purpose and Intent. The purpose of the Primary Wellhead Protection Areas is to safeguard the potable water resources of Dover and Kent County and to safeguard the public health, safety, and resources through regulation of land use and development within zones of protection surrounding potable water supply well fields.

29.81(a) Future Land Use. The preferred Future Land Use for all property within Tier 2 lands is Open Space. Where possible, land in Tier 2 should be acquired and reserved for permanent Open Space either through purchase or through the use of Transfer of Development Rights.

29.82 Areas within three hundred (300) feet of the well shall be one hundred (100) percent open space.

29.83 New development within five hundred (500) feet of the well must demonstrate that the new development will not produce, store, transfer or otherwise handle hazardous materials or substances.

29.84 The Primary Wellhead Protection area around the well may be reduced to a one hundred and fifty (150) foot radius provided a hydrogeological report, prepared by a Delaware Registered Geologist and submitted to the satisfaction of the Delaware Geological Survey and the DNREC, is prepared. The report must certify that (1) the minimum 60-day time of-travel from a point to the public water supply well is maintained and (2) the well draws from a confined aquifer. Upon completion of such a report, the regulations governing Tier 1 lands within the Source Water Protection Overlay Zone will apply.

29.85 Runoff. The natural runoff flowing into wellhead areas shall be allowed and all new stormwater run-off shall be diverted around the wellhead protection areas wherever practical.

29.86 The stormwater system's discharge to Tier 2: Primary Wellhead Protection Areas land shall be by sheet flow through a grassland or discharge 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 Primary Wellhead Protection Area.

29.87 Boundary Disputes. For wellhead protection area boundary determinations, a site-specific geological and hydro-geological analysis shall be performed by a State-registered professional geologist and shall be based upon thorough site investigation, subsurface testing and other testing as may be determined appropriate by the City of Dover.

29.9 Tier 1: Secondary Wellhead Protection Areas. Lands defined as Tier 1 lands, are areas which have been identified as Secondary Wellhead Protection Areas. Secondary Wellhead Areas extend a buffer of 150 feet radius from the well point located in an area of the confined aquifer.

29.91 Purpose and Intent. The purpose of this Secondary Wellhead Protection Areas is to safeguard the potable water resources of Dover and Kent County and to safeguard the public health, safety, and resources through regulation of land use and development within zones of protection surrounding potable water supply well fields.

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29.10 Intergovernmental Coordination

29.101 Review. The City of Dover, through the Development Advisory Committee, will coordinate with the Kent Conservation District and DNREC as necessary to ensure compliance with the Source Water Protection Overlay Zone.

29.102 Memorandum of Understanding. A Memorandum of Understanding must be kept and maintained between the City and any review agencies which evaluate the implementation of the required elements of the Source Water Protection Overlay Zone through the Development Advisory Committee process.

29.11 Data Distribution

29.141 The digital delineation of this overlay zone will be provided upon written request. Distribution of this information will be governed by the City of Dover's Geographic Data Use and Distribution Policy.

29.12 Existing Development. Existing developed land which is located within the Source Water Protection Overlay Zone will be treated as a non-conforming use, subject to the provisions of Article 7.

29.13 Effective Date. ~~The effective date for the Source Water Protection Overlay Zone shall be January 1, 2008.~~ The requirements of the Source Water Protection Overlay Zone shall apply to all site plan and subdivision applications filed after adoption of these requirements by City Council.

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Hazardous Material. A material which is defined in one or more of the following categories:

> *Ignitable:* A gas, liquid or solid which may cause fires through friction, absorption of moisture, or which has low flash points. Examples: white phosphorous and gasoline. Carcinogenic: A gas, liquid, or solid which is normally considered to be cancer causing or mutagenic. Examples: PCB's in some waste oils.
> *Explosive:* A reactive gas, liquid or solid which will vigorously and energetically react uncontrollably if exposed to heat, shock, pressure or combinations thereof. Examples: dynamite, organic peroxides and ammonium nitrate.
> *Highly Toxic:* A gas, liquid, or solid so dangerous to man as to afford an unusual hazard to life. Example: chlorine gas. Moderately Toxic: A gas, liquid or solid which through repeated exposure or in a single large dose can be hazardous to man. Corrosive: Any material, whether acid or alkaline, which will cause severe damage to human tissue, or in case of leakage might damage or destroy other containers of hazardous materials and cause the release of their contents. Examples: battery acid and phosphoric acid.

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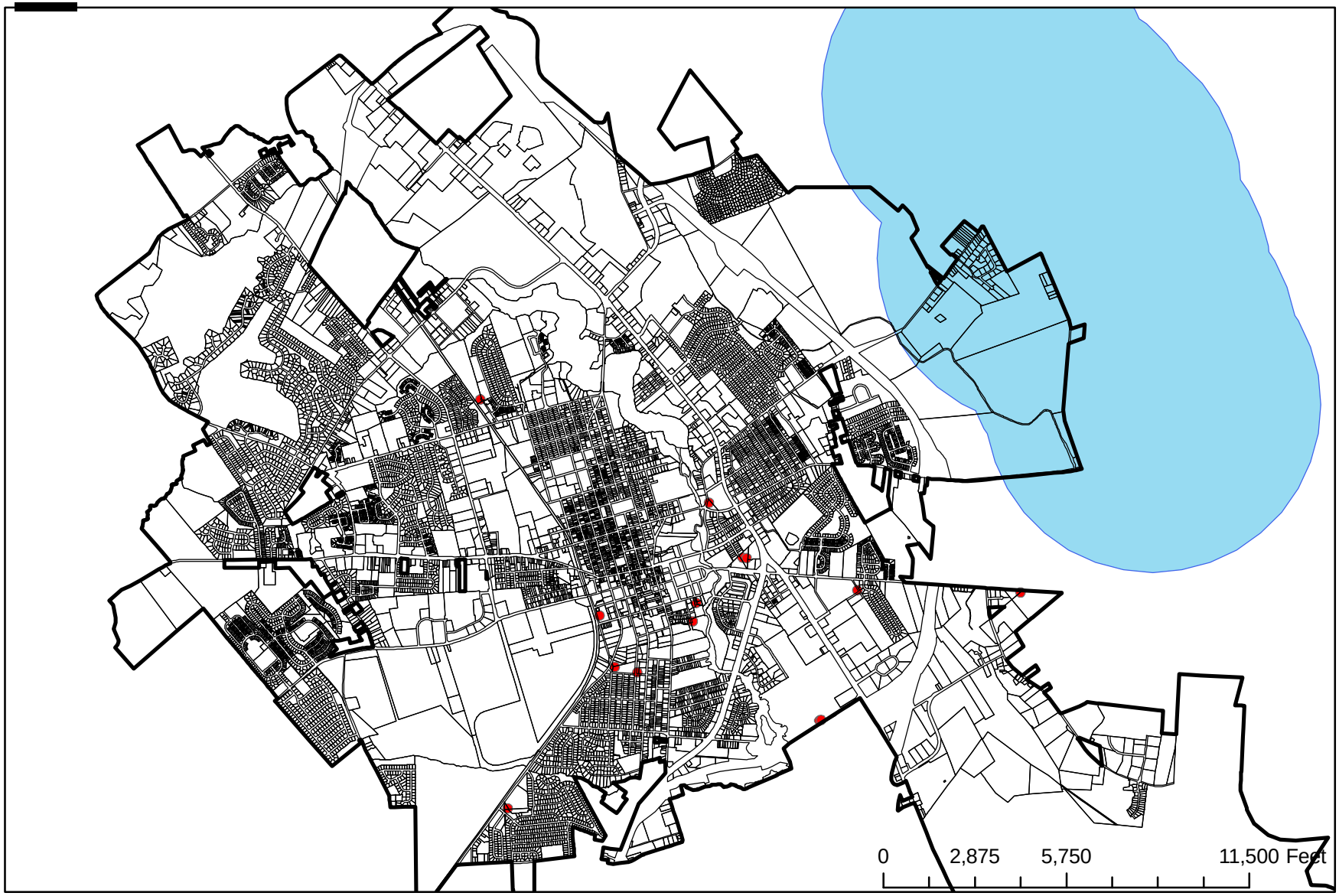
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Source Water Protection Overlay Zone

Legend

- City of Dover Boundary
- Dover Parcels
- Tier 1
- Tier 2

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