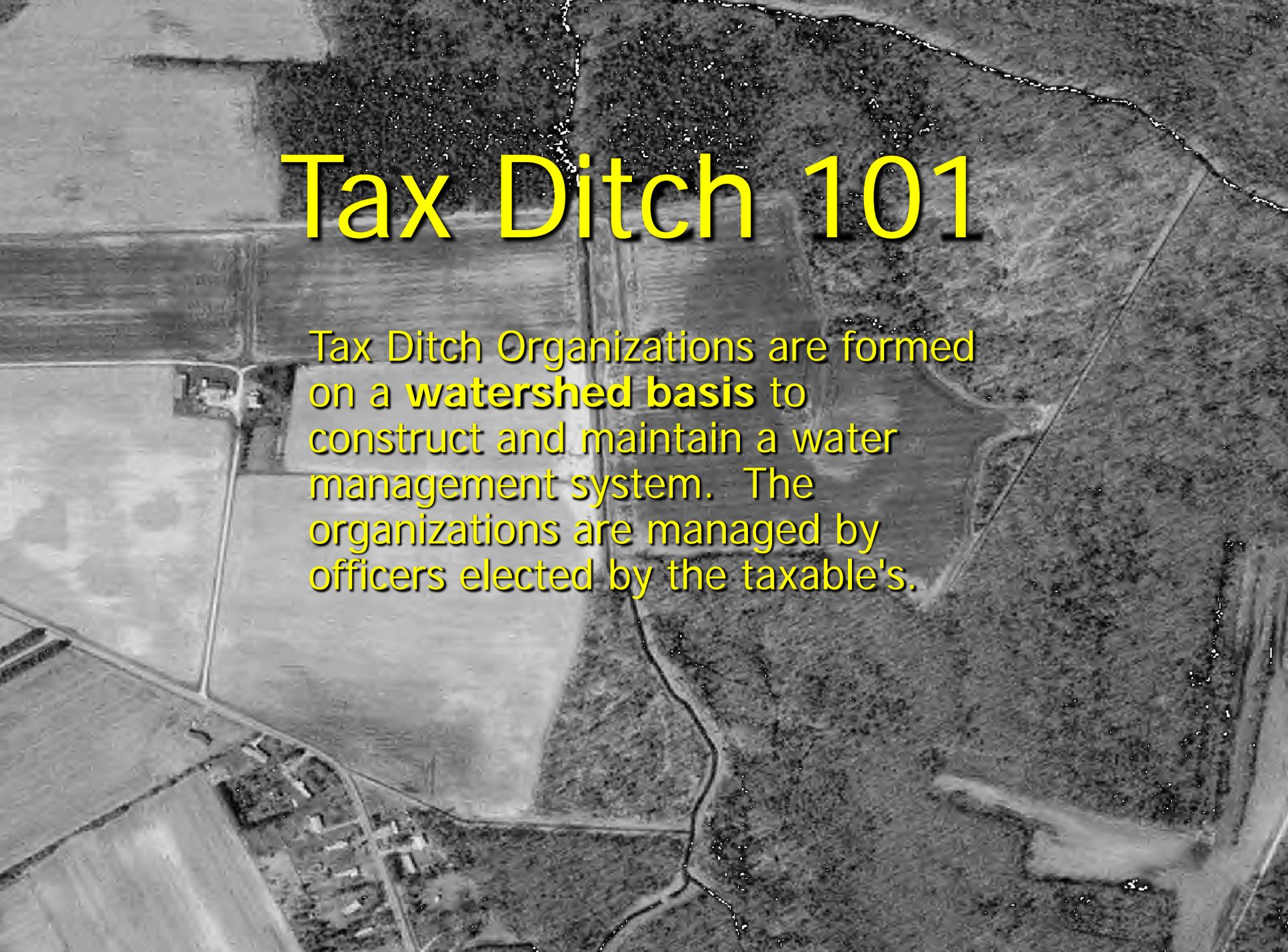
An aerial photograph of a rural landscape. The image shows a network of roads and fields. A prominent road runs vertically through the center. To the right, a stream or ditch flows through the land. The terrain appears to be a mix of agricultural fields and wooded areas. The overall tone is somewhat desaturated, with a mix of greys, browns, and muted greens.

Delaware Tax Ditch Organizations, Drainage Projects and Water Management Construction

Prepared for the Delaware Wetland Advisory
Committee Discussion

January 8, 2014
Frank M. Piorko
Brooks Cahall
DNREC Division of Watershed Stewardship

An aerial photograph of a rural landscape. The image shows a network of roads and fields. A prominent stream or ditch runs through the center of the image, winding from the top towards the bottom. The fields are divided into various shapes and sizes, some appearing to be agricultural. The overall tone is somewhat desaturated, with a mix of greys, browns, and muted greens.

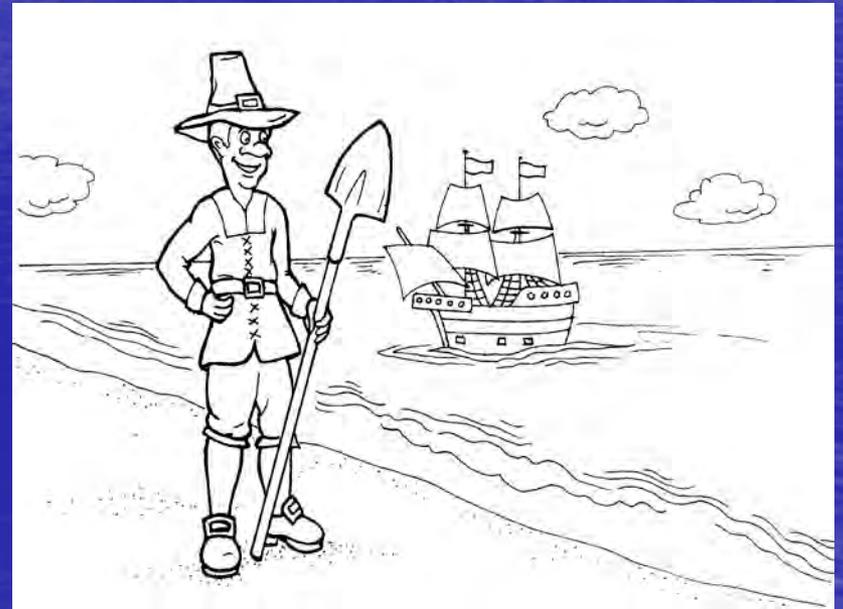
Tax Ditch 101

Tax Ditch Organizations are formed on a **watershed basis** to construct and maintain a water management system. The organizations are managed by officers elected by the taxable's.

Tax Ditch Law

- Title 7, Chapter 41 of the Delaware Code passed in 1951 last revised in 2008
 - “Drainage of Lands and Management of Waters; Tax Ditches”
 - Online @: <http://www.delcode.state.de.us>
- Law Declared:
 - “... that the drainage and the prevention of flooding of lands and the management of water for resource conservation shall be considered a public benefit and conducive to the public health, safety and welfare.”

Tax Ditch History



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 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.



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".



Delaware Drainage History

- In 1951, the current Tax Ditch Law created Tax Ditch Organizations and mandated that the DSWC and Conservation Districts would assist in the administration, planning, construction and maintenance of these organizations.



How a Tax Ditch Organization is Formed

- Petition
- Planning Order
- Commissioner's Report
- Hearing & Referendum or 100% Agreement
- Final Order
- Modify Final Order through Court Order Change Process



Tax Ditch Organizations Powers

Governmental Subdivision of the State:

- Levy taxes
- Make & execute contracts
- Receive administrative & technical assistance from Division of Watershed Stewardship
- Others as defined in §4161 of Title 7 Ch. 41

Tax Ditch Organizations Functions

- Collect Taxes sufficient enough to provide funding required for maintenance.
- Maintain The Drainage System:
 - Control vegetation on ditch bottom and slopes
 - Done every 1-3 yrs
 - Mowing
 - Weed Wiper Bar
 - Dipouts: Restore channels to the designed lines and grades.
 - Removal of Beavers and Beaver Dams

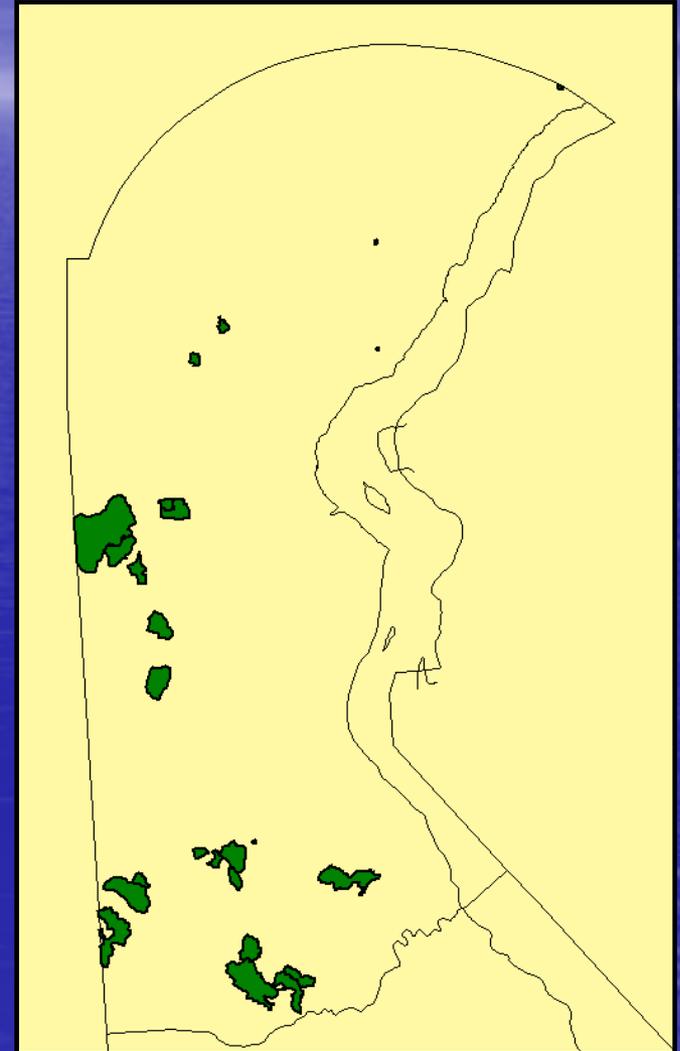
Which Is A Tax Ditch?



Answer? They all are!

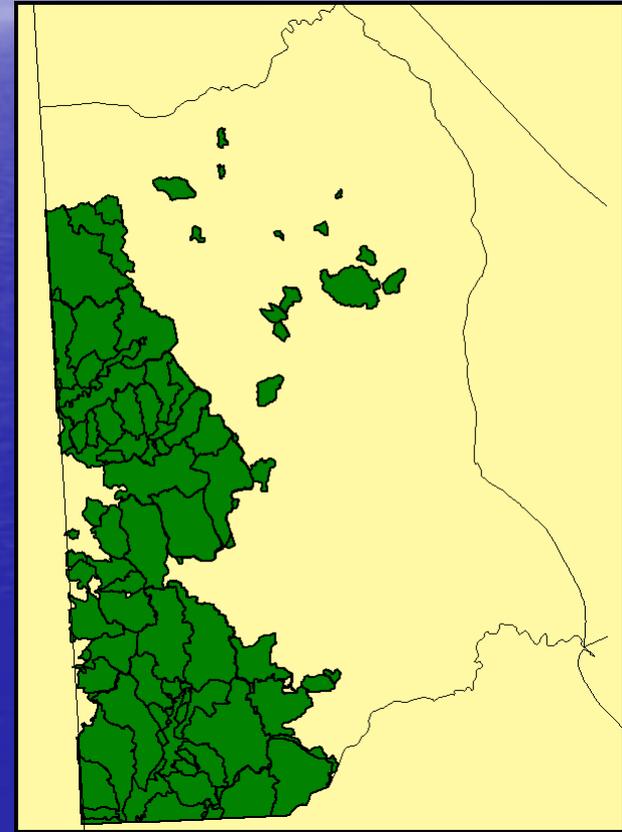
New Castle County Tax Ditch Facts

- 26 tax ditch organizations in New Castle County.
- 55 ± miles of tax ditch in New Castle County.
- 15.4 sq. miles of New Castle County are drained by tax ditches (3.5%).
- 2,822 Parcels in New Castle County are in a tax ditch watershed.



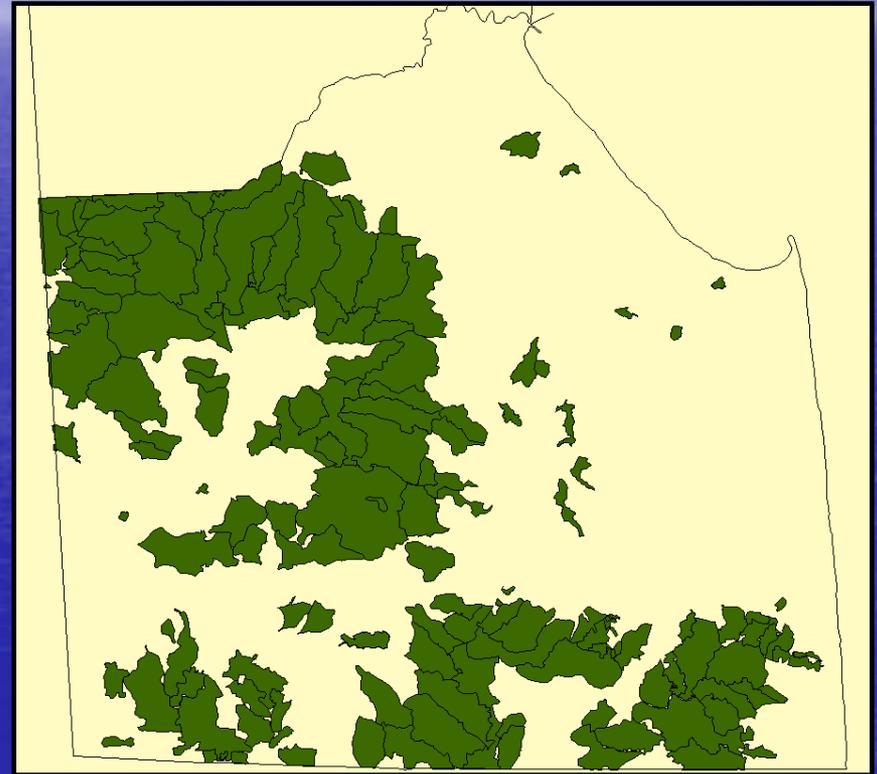
Kent County Tax Ditch Facts

- 78 tax ditch organizations in Kent County.
- 750 ± miles of tax ditch in Kent County.
- 195 sq. miles of Kent County are drained by tax ditches (32.7%).
- 14,127 Parcels in Kent County are in a tax ditch watershed.



Sussex County Tax Ditch Facts

- 136 tax ditch organizations in Sussex County.
- 1,213 ± miles of tax ditch in Sussex County.
- 394 sq. miles of Sussex County are drained by tax ditches (41.6%).
- 20,713 Parcels in Sussex County are in a tax ditch watershed.



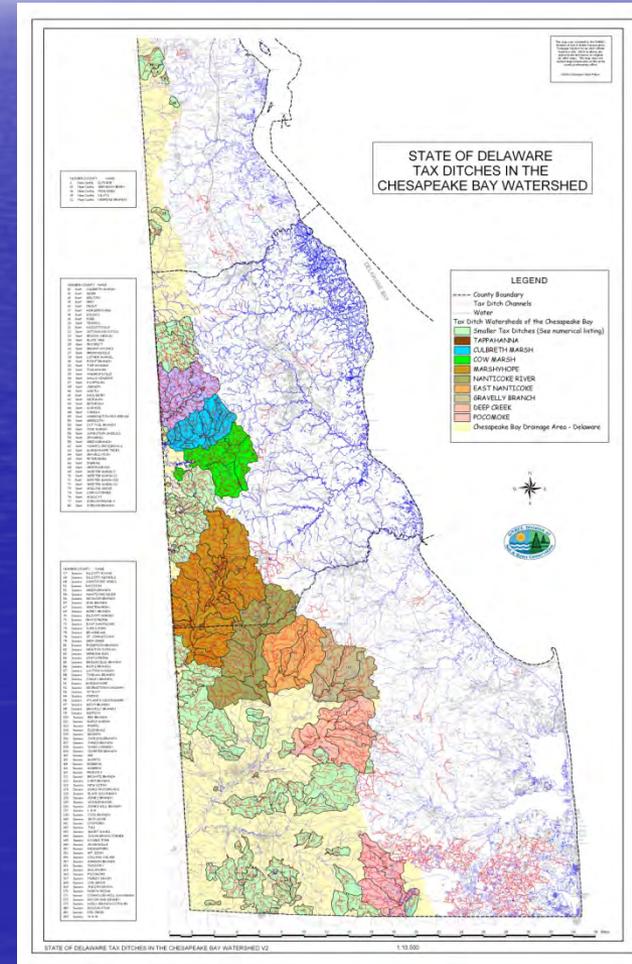
Statewide Tax Ditch Facts

- 233 Tax Ditch Organizations providing benefit to over 37,662 land parcels (over 1/3 of all Delaware lands)
- 15,000+ parcels have a TD ROW
- 56,000 acre Marshyhope Creek
- 2 acre Alban Park
- Over 2000 miles of ditch system
- Tax Ditch provide benefits to almost one-half of state maintained roads



Chesapeake Bay Tax Ditches

- 71% of Delaware's Tax Ditches are in the Chesapeake Bay watershed.



Tax Ditch Activities

- **Minor Maintenance:** controlling woody vegetation by mowing and/or applying herbicides.
- **Major Maintenance:** activities related to the dipout and spreading of accumulated sediments every 10 to 20 years.

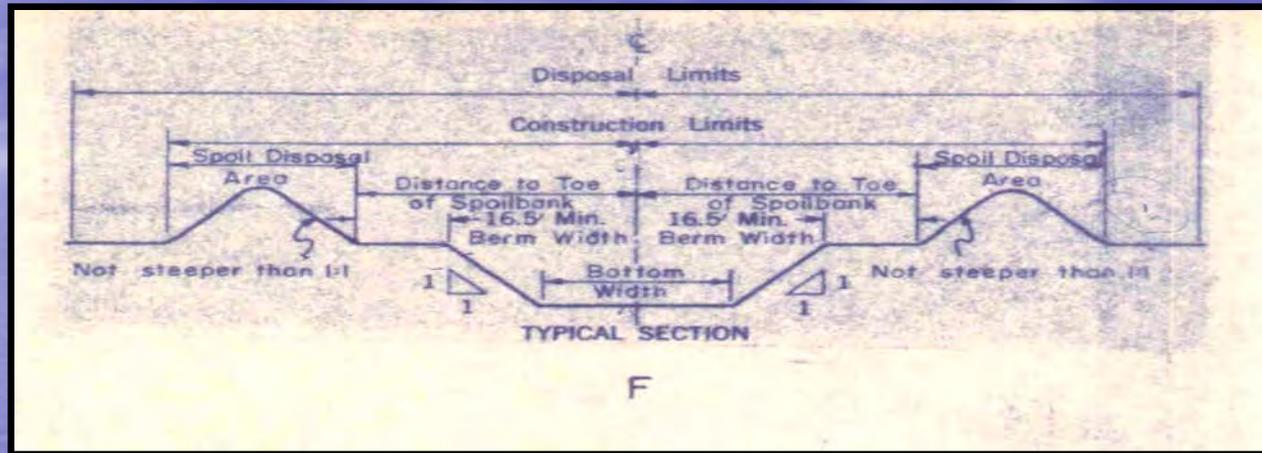


Tax Ditch Terminology

- **Dipout:** Act of removing accumulated sediment from the bottom of a tax ditch. Usually done with a Hydraulic Excavator. Time period between dipouts varies from 10 to 20 years
- **Spreading Spoil:** Act of distributing excavated material into a thin layer that is able to be incorporated in an agricultural field with minimal affect to the soil chemistry while blending spoil into existing topography. Depths are typically 2 inches or less.
- **Shaping Spoil:** Act of placing spoil in a narrow roadway, typically in woodlands, to allow for a maintenance access way and allow for the control of woody vegetation. Depths typically range from six inches to two feet.



Tax Ditch Rights-of-Way



- ROWS provide the area necessary for the construction and maintenance of ditches
- The widths of the ROWS are highly variable.
 - By Type
 - By Watershed
 - Within the Watershed
- 3 main types of ROWs
 - Maintenance
 - Typically range 16.5' to 30' measured from top of bank
 - Construction
 - Vary according to land use in some cases.
 - Usually measured from centerline of the channel.
 - Disposal Limits
 - Area where cleared material is to be placed.

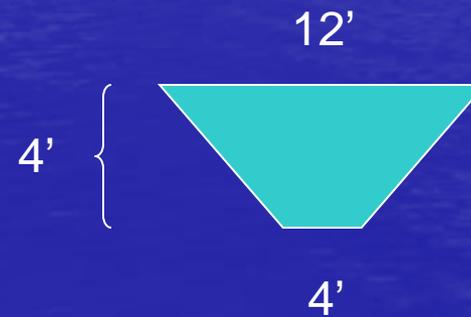
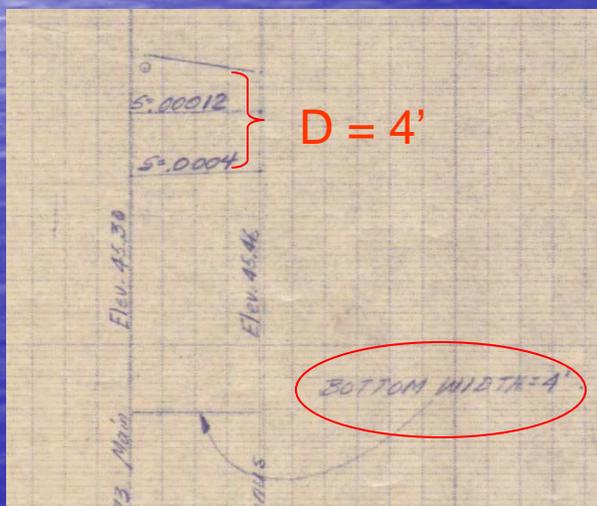
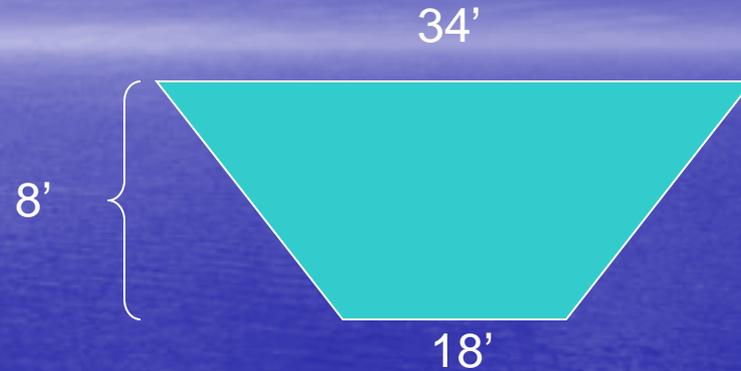
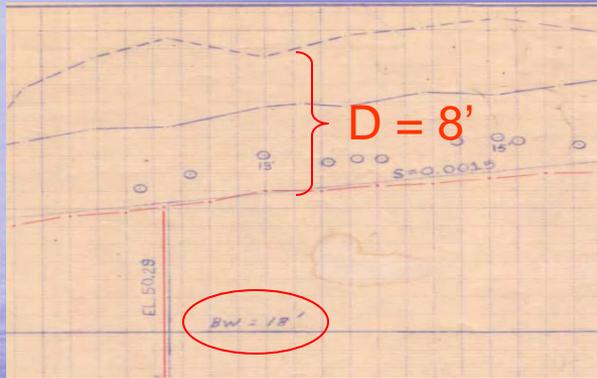


Tax Ditch Terminology

- Minor Maintenance Right of Way: Area typically used for minor maintenance.
- Construction and Major Maintenance Right of Way: Area typically used for construction, reconstruction, major maintenance.



Profile and Cross-Section Dimensions



Tax Ditch Formation and Recordation

- Superior Court Order
- Constructed and Maintained According to the Plan, Rights of Way (ROW) and Court Order
- The Tax Organization (not DWS) is the legal entity
- TD Managers are elected by the organization
- The TD landowners are taxed for maintenance of the TD.
- Tax Ditches are located on private property
- Tax Ditch ROW exist for the purpose of dedicated maintenance of the Tax Ditch
- TD ROW are now recorded in the Recorder of Deeds office
- The Tax Ditch can be modified with the approval of the affected parties, legal petition or majority vote at a meeting.
- DWS and Conservation Districts assist the TD Managers

TD ROW Task Force

- Identified problems with the types of TD ROW's
- Identified issues with how TD ROW's were recorded
- Identified problems with landowner rights and structures that needed to be resolved

TD ROW Recordation

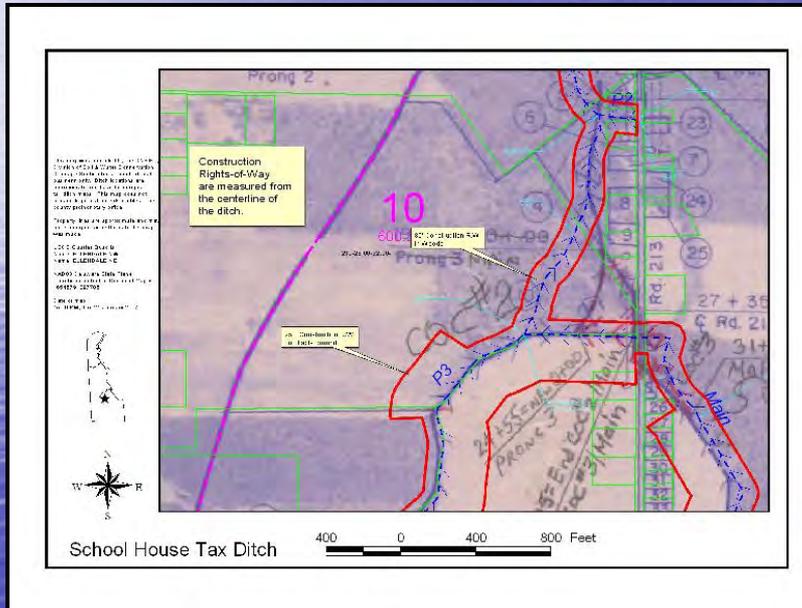
- Law changed to reflect recordation in Recorder of Deeds Office
- Created three tiers of TD ROW widths
- Created two rights - of - way
- Reduced the TD ROW for thousands of parcels
- Grandfathered permanent obstructions that were in the reduced TD ROW

TAX DITCH RIGHT-OF-WAY TASK FORCE - PAGE 13

to tax ditches where rights-of-way were previously defined as "adequate" or "sufficient". There shall be no effect of these new rights-of-way that extends either the existing construction and major maintenance or minor maintenance right-of-way.

TIER 1	TIER 2	TIER 3
3' to 4' Bottom Width	5' to 10' Bottom Width	Over 10' Bottom Width
80' from Top of Bank or Existing Construction ROW (whichever is less)	120' from Top of Bank or Existing Construction ROW (whichever is less)	Existing Construction ROW to remain as filed in Court Order

DWS and Conservation District Support



- Administrative support for finances, administration, audits, meetings, election of officers, dissemination of information.
- Technical support for right of way information and tax parcel assessment as well as changes to the court order.
- Technical support for maps, help with contractors, landowners issues with development and resolving disputes.
- Cost share and funding assistance for minor and major maintenance.

DWS and Conservation District Support



- Consultation with the TD Organization
- Permitting
- Construction Funding Assistance
- Construction Support
- Survey, Project Layout
- Project Inspection

Tax Ditch / Drainage Permitting

- Exemption less than 800 acres/Maintenance exemption greater than 800 acres
- Federal Regulatory Requirements and Exemptions
- Maintenance
- Construction
- Restoration

§ 7217. Special exemptions.

(a) This chapter shall not apply to any work performed by any state, county, municipal government or conservation district, or their designated contractor, when that work occurs in **non-tidal** submerged lands in the Delaware Atlantic **Coastal Plain** Province with a contributing drainage area of **less than 800 acres**.

State Subaqueous Lands Exemption

§ 7217. Special exemptions.

(b) This chapter shall not apply to **maintenance, reconstruction or retrofitting** work performed by or with the assistance of any state, county, municipal government or conservation district when that work occurs in any **non-tidal** submerged lands. Such maintenance, reconstruction or retrofitting work shall comply with the standards and specifications associated with best management practices in the Delaware Erosion and Sediment Control Handbook, 1989 or as revised (68 Del. Laws, c. 268, § 2).

Federal Permit Exemptions

33 CFR Part 323 Permits for Discharges of Dredged or Fill Material Into Waters of the United States

323.4 (a) 3

(3) Construction or maintenance of farm or stock ponds or irrigation ditches, or the maintenance (but not construction) of drainage ditches.

Sometimes we use the minor maintenance 323.4 (a) 1 (iii) c (1) (i) and (ii).



Typical Maintenance Excavation (dip-out)



Non-Tidal usually can be accomplished with an exemption from state and federal permits.

Often there will be notification letter along with location maps; sometimes a delineation and delineation report submitted.

Best Management Practices Always Employed

- Excavation is completed only during normal or low flow conditions with a cleanout bucket that has no teeth to create smooth surface.
- The excavator bucket is filled to 80-85% of its capacity in one motion from the far ditch bank to the near ditch bank across the original bottom, leaving the ditch banks undisturbed.
- Spoils are placed in uplands and reverse grading is used to avoid deposition of spoils back into the ditch. Maintenance activities are inspected on a daily basis to ensure compliance.

New culvert crossing in existing tax ditch.
Permits depends on the size of the drainage area
and if it is a farm crossing or not.



Water Control Structure – 7271c State Exemption and Federal NWP 18 – Minor Discharge



Tax Ditch Design Methodology

Nearly all of Delaware's Tax Ditches
have been designed by the Natural
Resources Conservation Service
(NRCS) formerly the Soil Conservation
Service (SCS)

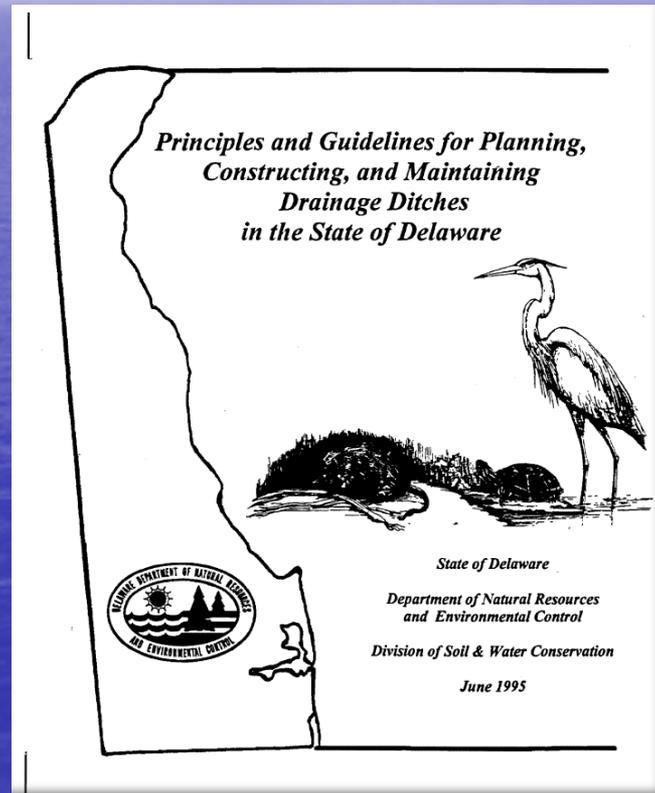
Design Background Information

- Except for a few in New Castle County, Tax Ditches were designed to remove EXCESS runoff from Agricultural Fields
- It was considered acceptable for runoff to accumulate to shallow depths for short periods of time so long as there was no crop damage.
- The GOAL was to remove excess runoff over a 24 hour period.

What Do We Do Different Today?

1995 Principles and Guidelines

- General Criteria
- Scope of Work
- Environmental Studies/Mitigation
- Conservation Practices



- Perform one-sided construction
- Minimize clearing widths through forested areas
- Relocate channels around sensitive and significant habitat or wetland areas
- Minimize construction of downstream outlets
- Block off old channels that drain only wetland areas



6.5 miles of ditch cleanout was accomplished on 14 projects in calendar year 2012 with the DCC labor crew of 13 workers.



DSWC and Conservation District staff are working with the Tax Ditch managers to determine that maintenance is necessary, making recommendations for minimizing impacts to the extent possible.



Making use of techniques such as the
“weed wiper bar for vegetative management



Using total disposal for spoils in urban and
suburban settings.

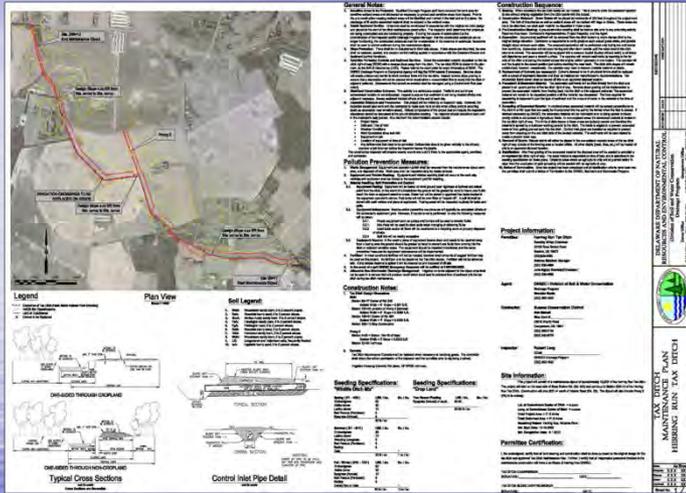


One sided maintenance rights of way
when possible

Minimizing Impacts to Trees and Tree Canopy



Developing Better Plans and Techniques



Standard Plan for
Tax Ditch Maintenance



Working to improve construction
methodologies for minimizing impacts

Blackwater TD Bank Stabilization





Maintaining the TD access while still leaving trees along the ROW



Maximizing vegetative establishment in Tax Ditch ROW's with cooperative landowners.

Tax Ditch Restoration Efforts



- Channel Restoration
- Wetland Creation
- Connecting Floodplains
- Creating Channel Buffers

Restoration Efforts – Haines TD





Floodplain Connection SGS Woodland TD





Joe Johnson – Cart Branch TD



Hangst Property Wetland Creation



Webber Farm Wetland Creation



Solberg Property



Urban Tax Ditch Restoration



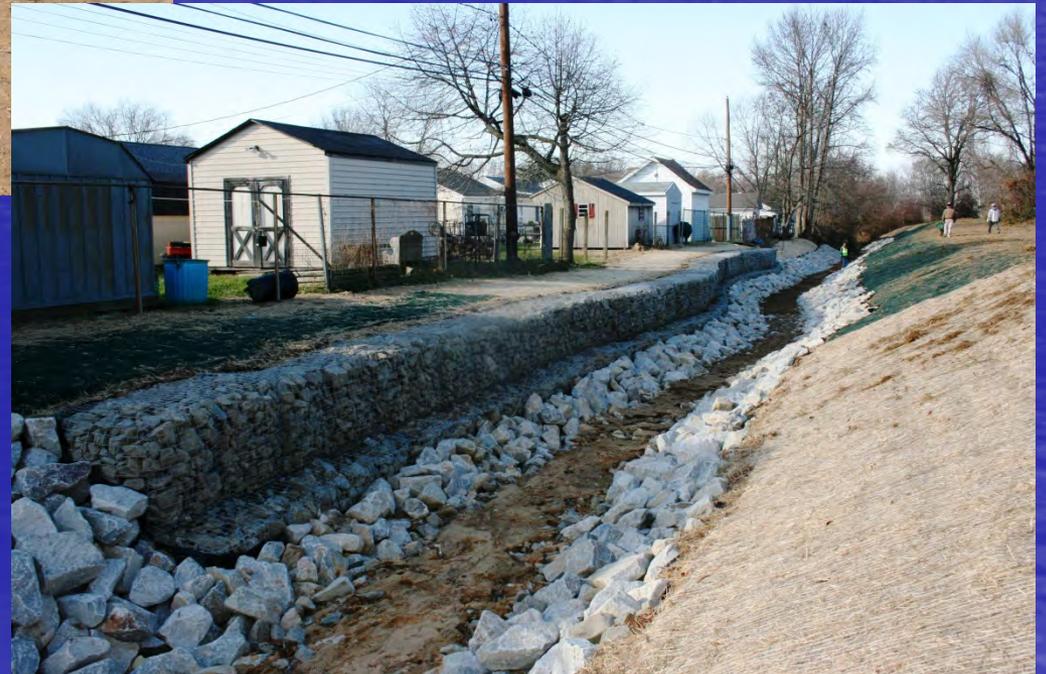
Urban Stream Relocation and Restoration



Urban Stream Relocation and Restoration



Urban Drainage Public Ditch Project



Minor Emergency Dam Improvements



Army Creek Emergency Dike Repair

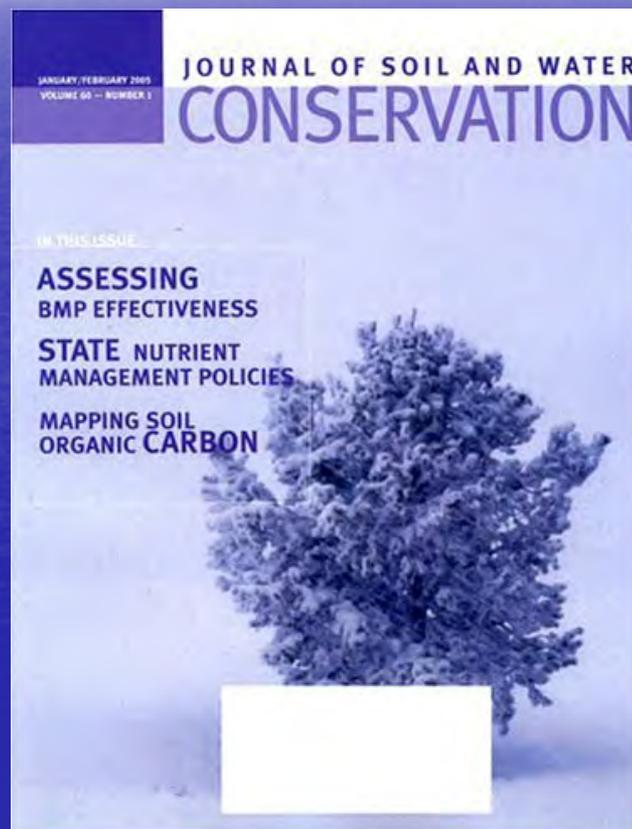


Assawoman Canal Dredging



Tax Ditches and Water Quality

- Better assessment of water quality
- Better integration of water quality BMP's
- More research and monitoring

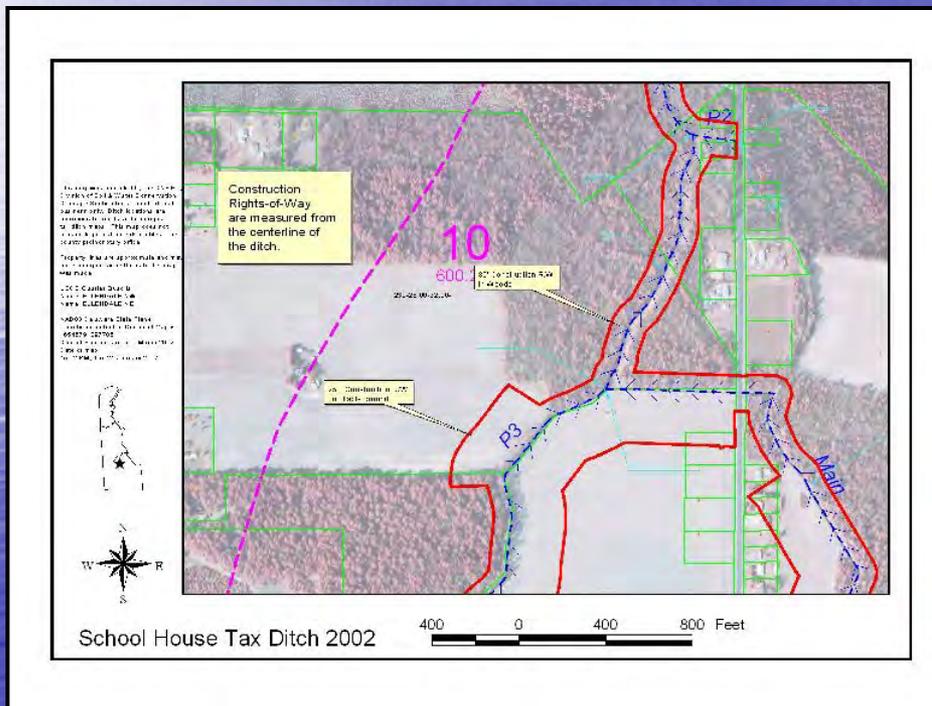


University of Delaware TD Research

- Objective 1: Determine selected physical and chemical characteristics of ditch sediments and quantify the mass of nutrients removed from the drainage network using current dip-out practices.
- Objective 2: Predict dissolved and particulate nutrient loss from spoil amended areas used for crop production.
- Objective 3: Quantify nutrient loads in agricultural drainage from ditches prior to and following dip out.

The Tax Ditch System

- Presents unlimited opportunities
- Understand the root utility of these systems
- Need to establish more dialogue among programs



Next Steps... further policy development and more coordinated strategy



Less this



More this