

Integration of Tax Ditch Drainage System Data into the Delaware Enterprise GIS



DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL

Brittany Haywood
Delaware Department of Natural Resources and Environmental Control

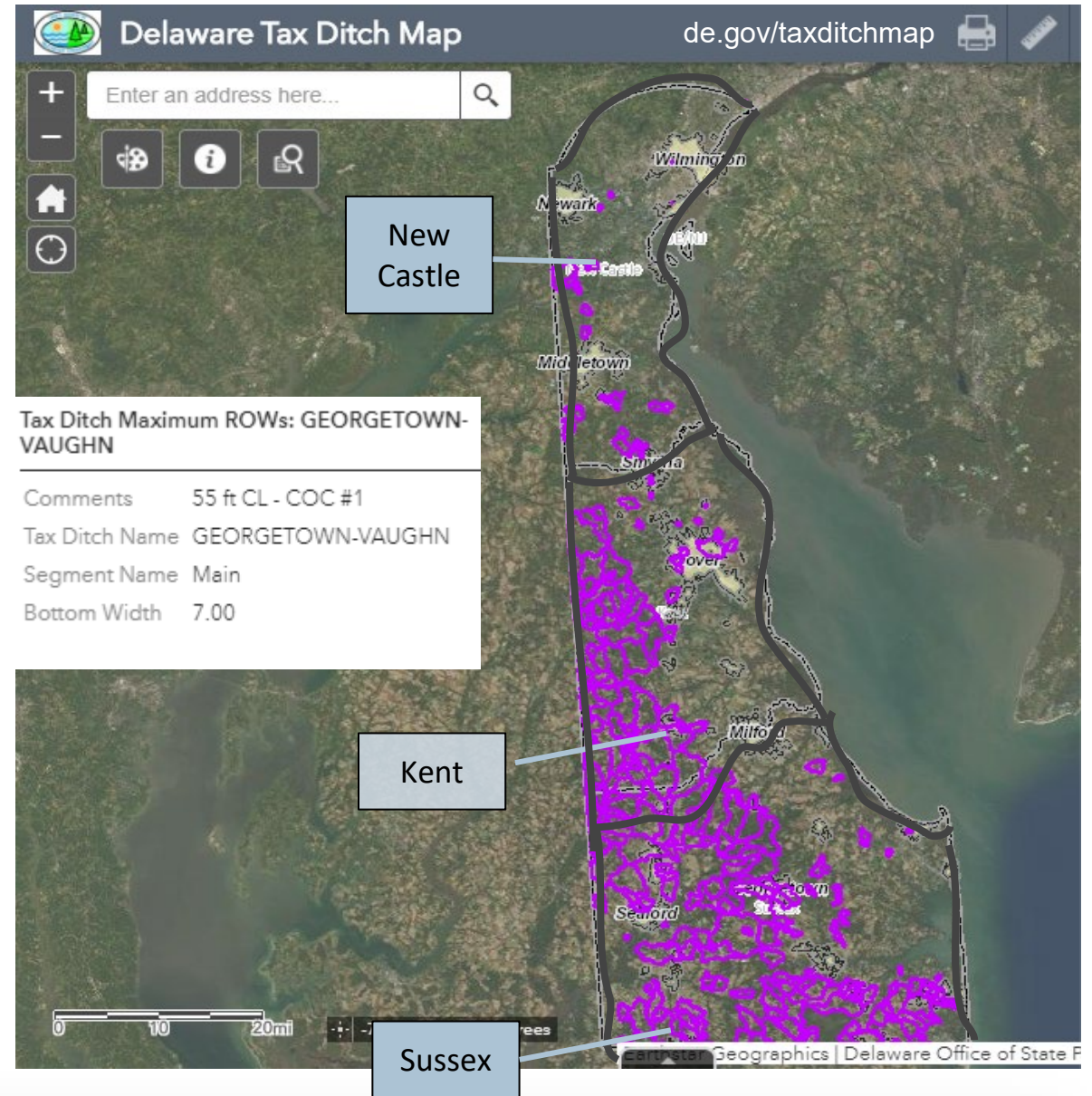


What is a Tax Ditch?



Tax Ditch Organization Quick Facts

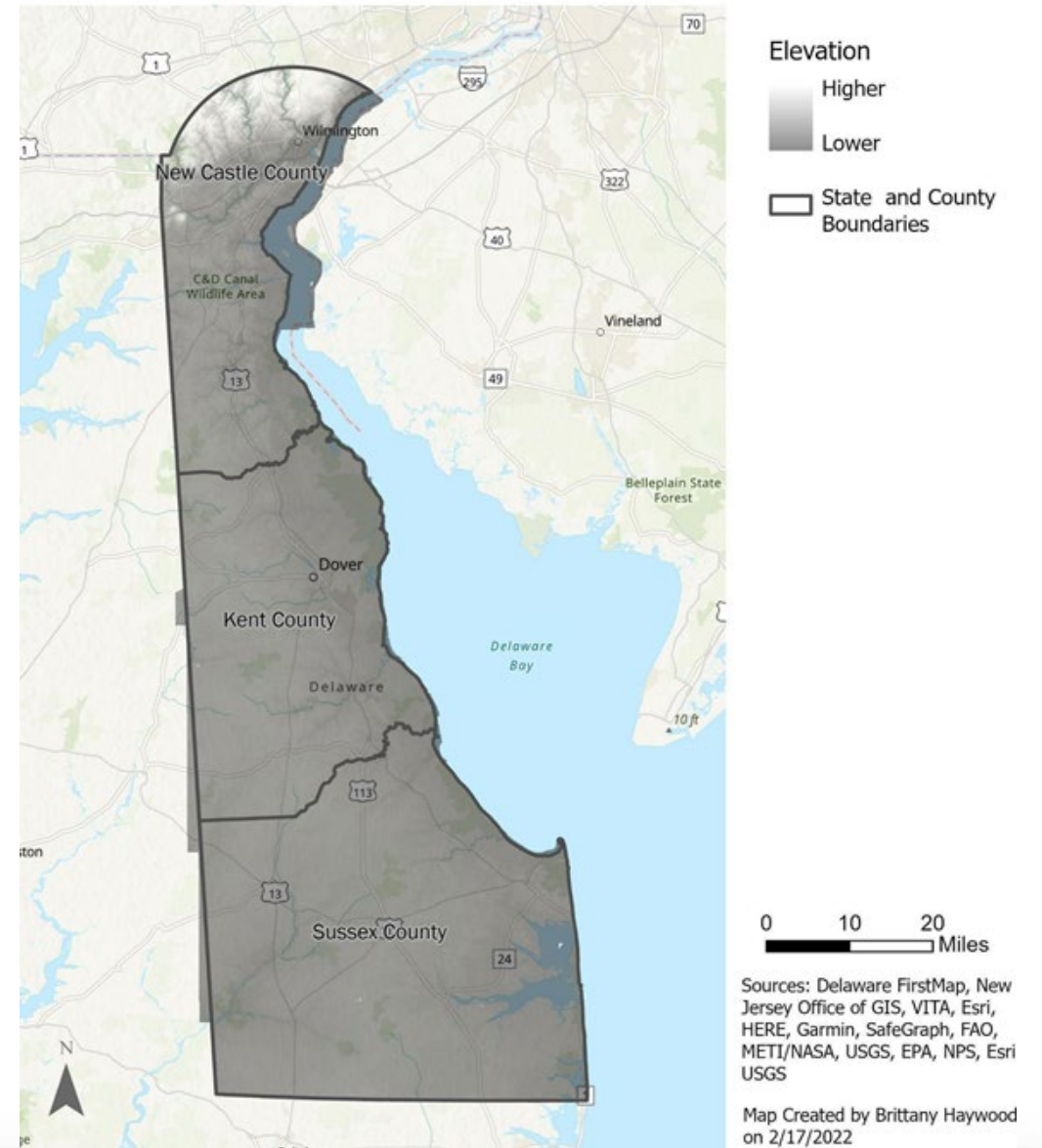
County	Number of Tax Ditches	Approx. Miles of Channel
New Castle	26	57
Kent	78*	769
Sussex	137*	1,193
Totals	234 (7 are dual county*)	2,019



Tax Ditches Impact:

- Drainage across the state
- Where structures can be built on a property
- A property's taxes
- Access by the tax ditch on private property

State of Delaware Land Elevations



Stakeholders

- Public (Taxables)
- Officers* (Taxables)
- DNREC*
- Conservation districts*
- Land use and stormwater permitting and planning agencies
- County tax collection agencies
- County courts
- Maintenance contractors
- Elected officials
- DeIDOT

*Key Stakeholders



DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL



Photo by [Ana Muncio](#) on [Unsplash](#)

Determining GIS Needs

DNREC Staff & Stakeholders



DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL

GIS Needs: DNREC Staff

- **Who** is requesting
- **What** information
- **Where** - scope
- **When** is it requested
- **Why** is it requested
- **How** is the info used



Photo by [Fredrik Solli Wandem](#) on [Unsplash](#)



Responses: DNREC Staff



Response *(Taxables)*

- Phone Calls
- Emails
- Office drop-ins



Accountability *(State & County)*

- High-level reporting



Technical Assistance *(Officer, Contractor & Permitting Agency)*

- Design
- Survey & stakeout
- Permits
- Maintenance prioritization

GIS Needs: Stakeholder



DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL



2021

Tax Ditch Modernization Workgroup Report

A compilation of findings from the Workgroup related to improving the effective function, design and practices around Delaware's tax ditches.

E&O.5 Tax ditch maintenance planning reference materials and resources				
E&O.5.1	Develop a digital/GIS based tax ditch infrastructure and conditions inventory that can be easily shared, including reports provided, to officers and maintenance contractors. Include clearly defined responsibilities for infrastructure in tax ditches.	Findings: 2.0, 3.1, 4.0, 4.3 Workgroup Recommendation: F.1 & F.6	<ul style="list-style-type: none"> Determine funding needed to complete this effort (DNREC/Partner) Secure funding (DNREC/Partner) Prepare and solicit Request for Proposals (RFP) (DNREC/Partner) 	Long Term
F.6 Improve warrant rate recommendations to better reflect anticipated maintenance of the tax ditch system.				
F.6.1	Develop a tool to estimate and project future routine expenses to determine appropriate annual warrant rates.	Findings: 1.1, 7.0, 7.3, 7.4, 8.1, 9.0 Workgroup Recommendation: E&O.5.1	<ul style="list-style-type: none"> Develop tool and document assumptions (DNREC/Partner) Share tool with tax ditch officers and county conservation districts for use. (DNREC/Partner) Provide training as needed (DNREC/Partner) Evaluate and update tool based on expenses every other year (DNREC/county conservation districts) 	Medium Term Implemented continually
F.6.2	Calculate and provide suggested warrant rates ahead of annual meetings for officer and taxable consideration.	Findings: 1.1, 7.0, 7.4, 8.0, 8.1, 9.0 Workgroup Recommendation: F.1 & E&O.5.1	<ul style="list-style-type: none"> Fulfillment of F.6.1 (DNREC/county conservation districts) Calculate and provide warrant rate suggestion and associated paperwork for officers ahead of annual meeting (DNREC/county conservation districts) Consider whether collecting an appropriate warrant rate should be an eligibility criterion for tax ditch matching funds (county conservation districts) 	Medium Term Implemented continually



DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL



Photo by [Mathew Schwartz](#) on [Unsplash](#)

Where's the Information?



Data held in multiple formats and places

Where We Are

Where We're Headed

One-stop-shop to address common tasks

Current Status

Prepared by: DNREC
Division of Watershed Stewardship
21309 Berlin Road, Unit 6
Georgetown, DE 19947

Page 1 of 3

SUNSET BRANCH TAX DITCH C.A. #06M-11-144

COURT ORDER CHANGE NO. 9
(SUSSEX COUNTY)

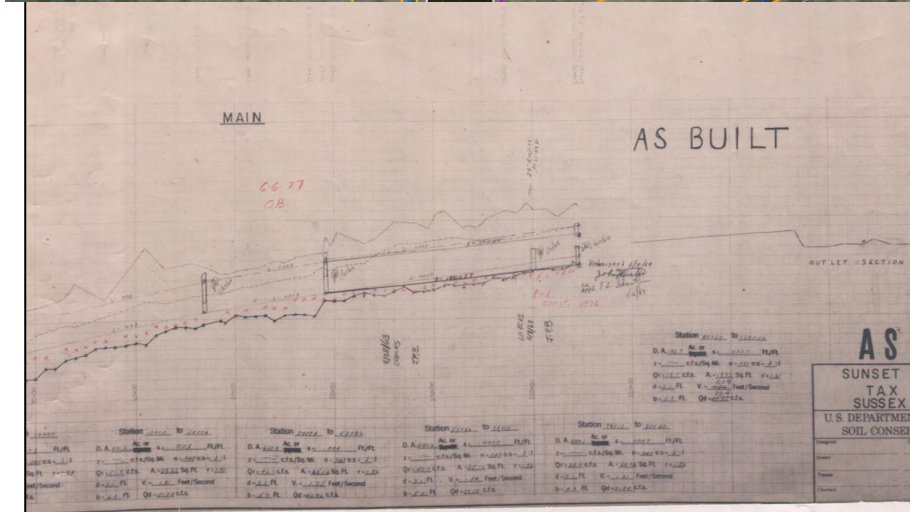
WHEREAS, the present owner of Property No. 17B of the Sunset Branch Tax Ditch desire to change the construction and major maintenance rights-of-way on Sub 1 of Prong 3 on the right side, looking upstream, from Sta 0+35 to Sta 3+16, to 40' from the top of the constructed ditch bank, and to include the ditch from the top of the bank to the centerline; and

WHEREAS, construction, major and minor maintenance costs will not be materially affected; and

WHEREAS, the landowner of Property No. 17B shall be responsible for assuring that this Court Order Change is filed with the Recorder of Deeds for Sussex County; and

WHEREAS, no other landowners are involved;

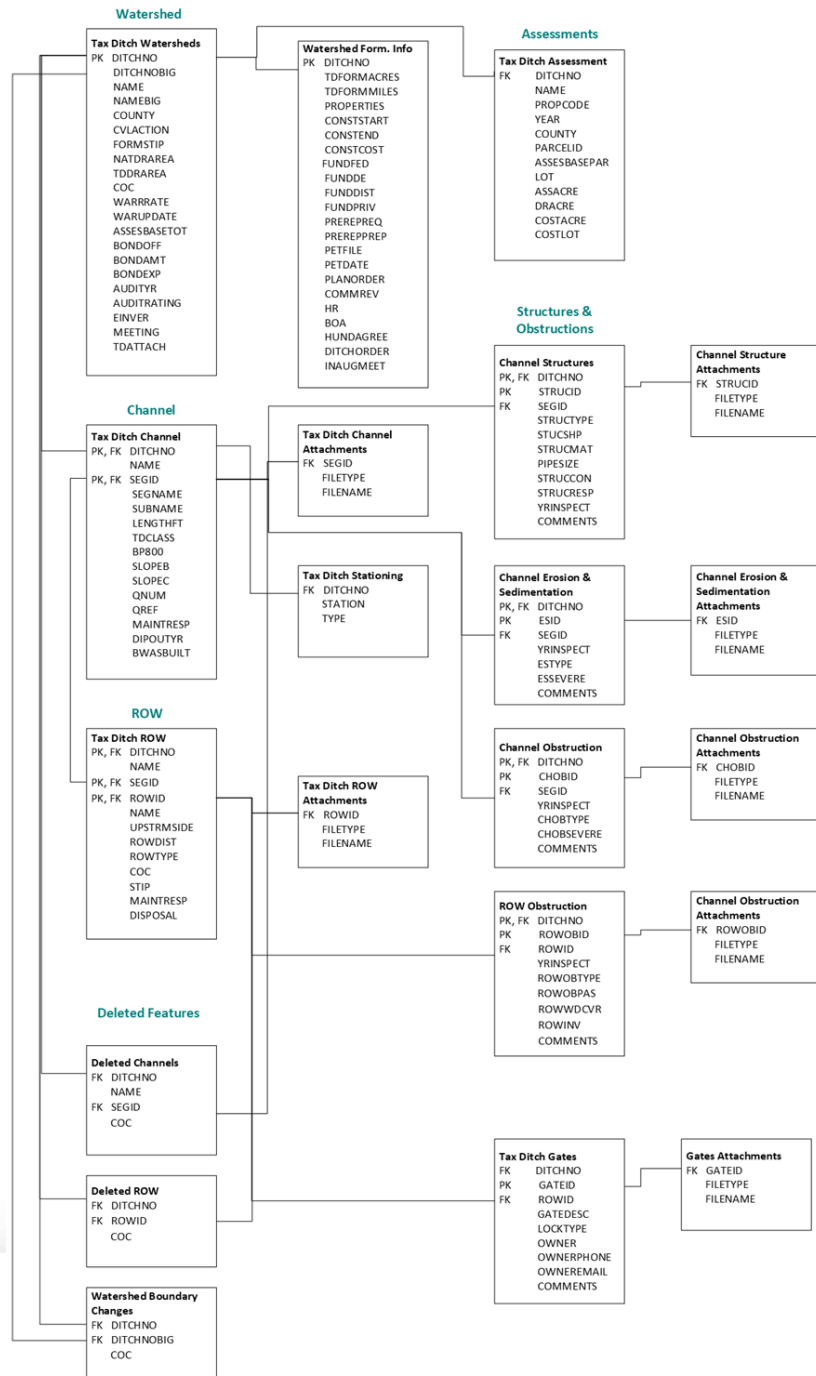
NOW, THEREFORE, I the undersigned, the present owner of Property No. 17B of the Sunset Branch Tax Ditch, hereby agree to the change in the widths of the construction and major maintenance rights-of-way on Sub 1 of Prong 3 on the right side, looking upstream, from Sta 0+35 to Sta 3+16, to 40' from the top of the constructed ditch bank, and to include the ditch from the top of the bank to the centerline, as shown on the drawing attached hereto and made a part of this agreement; and I, the landowner of Property No. 17B, further agree to be responsible for assuring that this Court Order Change is filed with the Recorder of Deeds for Sussex County.



Geodatabase Relationship to Stakeholders

Stakeholders	Existing Features	Deleted Features	Assessment	Structures	Maintenance Concerns	Technical Assistance
Public	X		X			
Officers	X	X	X	X	X	X
DNREC	X	X	X	X	X	X
Conservation Districts	X	X	X	X	X	X
Land Use & Stormwater Permitting & Planning Agencies	X			X		X
County tax agencies			X			
County Courts	X	X	X			
Maintenance Contractors	X			X		X
Elected officials	X		X		X	X
DelDOT	X			X	X	





Geodatabase Review: Recommendations

- Make a plan!
- Ensure database is catered to your users
- Balancing database size versus efficiency can be tricky
- Linking to a file sharing service can assist in keeping GIS data size down



Photo by [ron dyar](#) on [Unsplash](#)

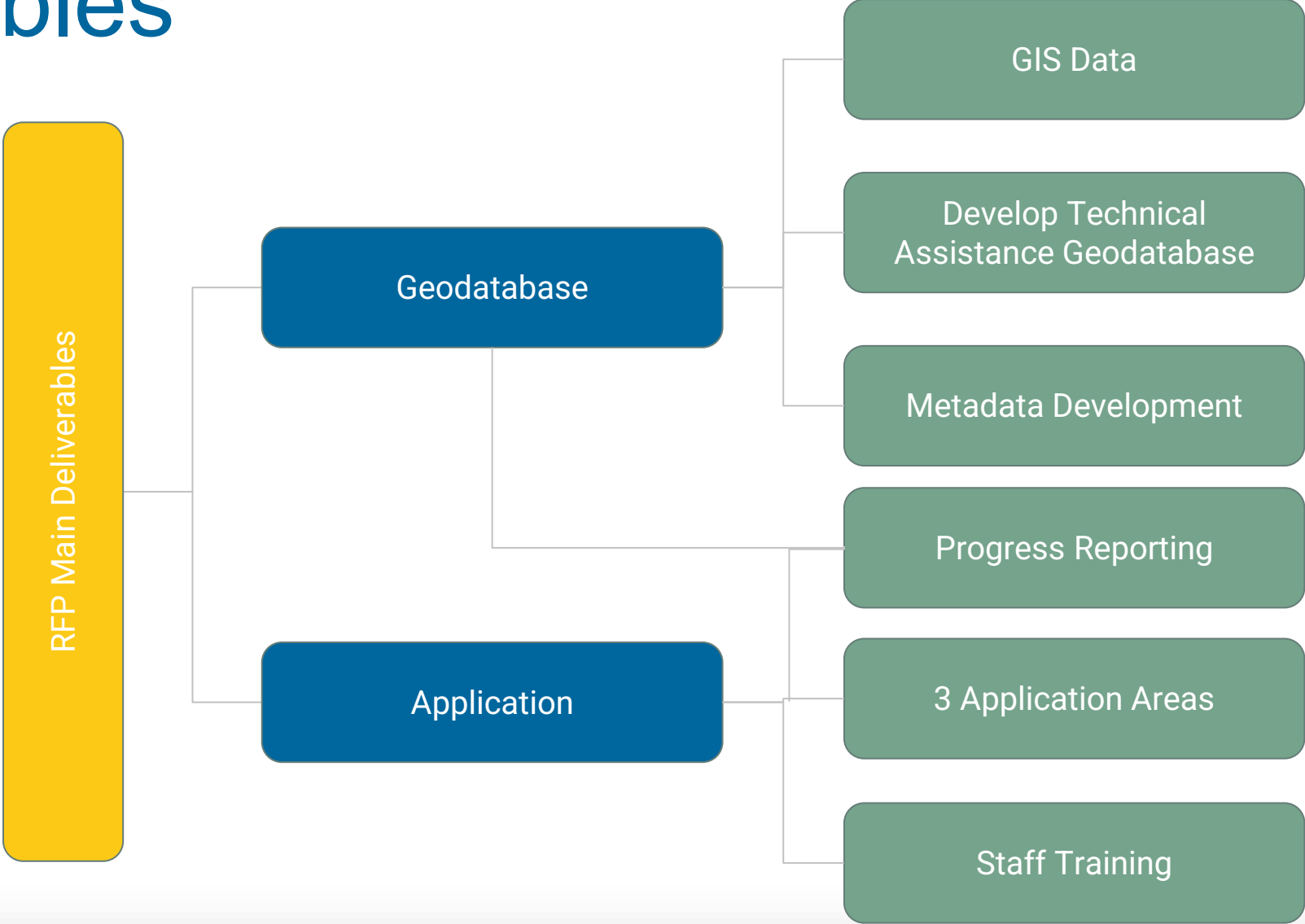
Request for Proposals (RFP)

RFP to go out in December 2022

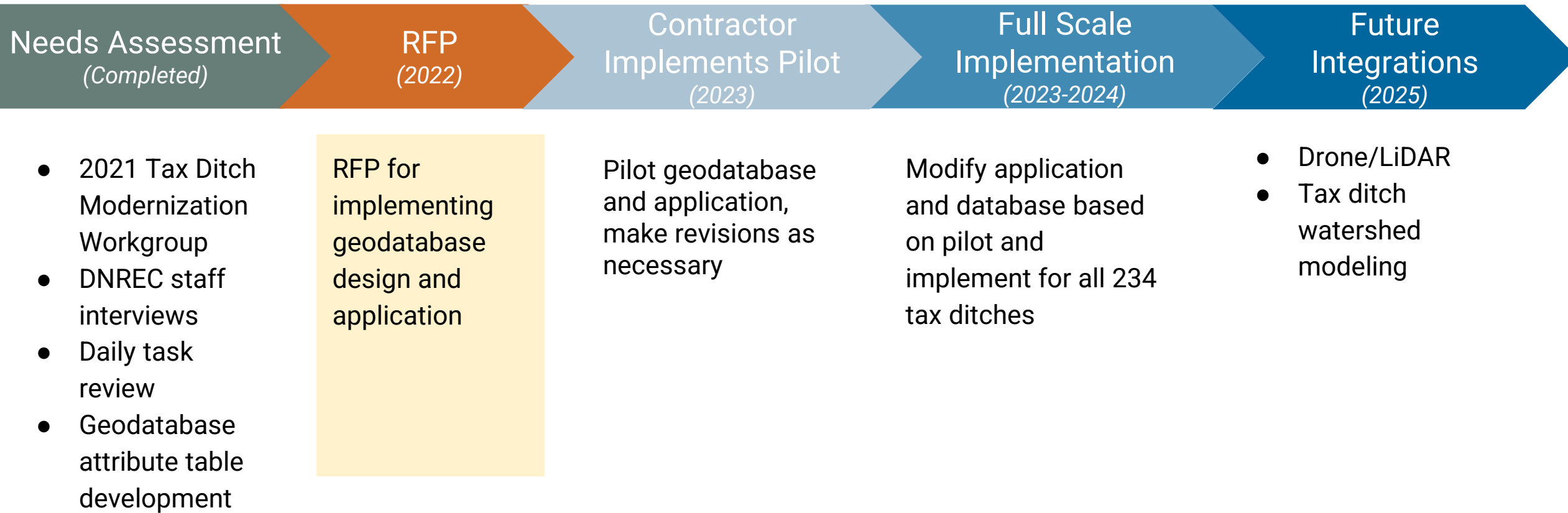


DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL

Deliverables



DNREC Tax Ditch GIS Integration





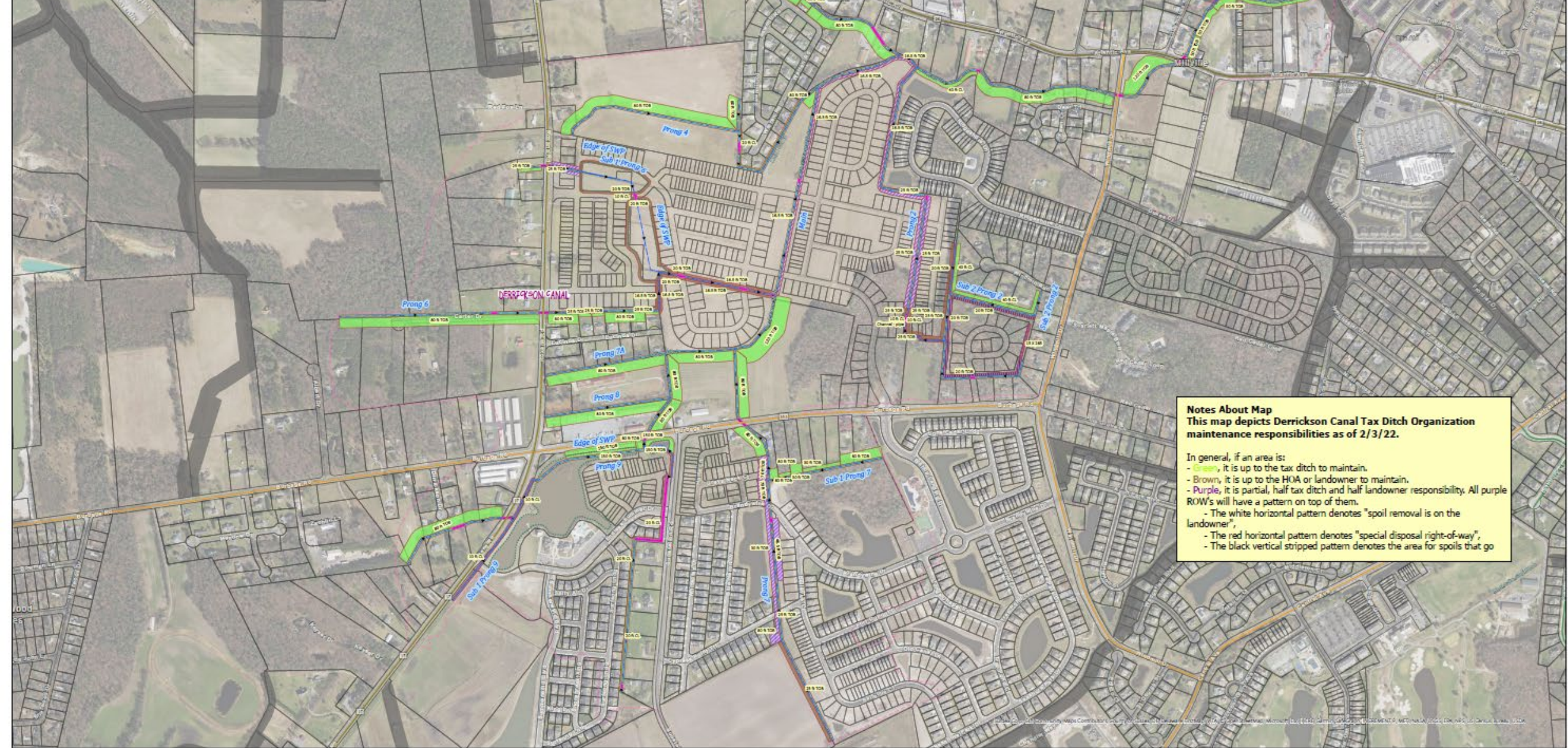
Use Case



Excerpt from Derrickson Canal Tax Ditch Court Order Change #26

- to pay the cost of and be responsible for future major and minor maintenance of Prong 2 (P2) from Sta 23+22 to Sta 28+50, Sub 2 of Prong 2 (S2P2) from Sta 0+00 to Sta 2+50, Sub 1 of Sub 2 of Prong 2 (S1S2P2) from Sta 0+00 to Sta 6+00, Prong 6 (P6) from Sta 0+00 to Sta 12+39, and Sub 1 of Prong 6 (S1P6) from Sta 0+00 to 14+90 to Department of Natural Resources and Environmental Control, Division of Watershed Stewardship, Conservation Programs Section, Drainage Program specifications; and
- to pay the cost of and be responsible for maintenance of any pipes located with Prong 2, Sub 2 of Prong 2, Sub 1 of Sub 2 of Prong 2, and Sub 1 of Prong 6; and





Notes About Map
 This map depicts Derrickson Canal Tax Ditch Organization maintenance responsibilities as of 2/3/22.

In general, if an area is:

- **Green**, it is up to the tax ditch to maintain.
- **Brown**, it is up to the HOA or landowner to maintain.
- **Purple**, it is partial, half tax ditch and half landowner responsibility. All purple ROW's will have a pattern on top of them.
 - The white horizontal pattern denotes "spoil removal is on the landowner",
 - The red horizontal pattern denotes "special disposal right-of-way",
 - The black vertical striped pattern denotes the area for spoils that go



Derrickson Canal Tax Ditch 2022 Maintenance Map

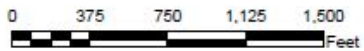
Sussex County

Communities	HOA/ Landowner
State Parcels	Partial
Guardrails	Derrickson Tax Ditch
Tax Ditch Features	Other Tax Ditch
Tax Ditch Channel	COC Stipulations
Pipes	Has Special Disposal Right-of-Way
Special Access ROW	Special Disposal Right-of-Way
Extent of Right-of-Way	Spoil Removal on Landowner
Watershed Boundary	

This map was compiled by the DNREC, Division of Watershed Stewardship, Drainage Program. Ditch locations and all features are approximate and based on field information, other agency layers and original tax ditch maps. This map does not replace legal tax ditch instruments on file at the county prothonotary office. Property lines are from the FirstMap 2.0 Parcel Feature service (https://enterprise.firstmap.delaware.gov/arcgis/rest/services/PlanningCadastre/DE_StateParcels/FeatureServer) and are approximate and may have changed since the date this map was made.

Map Created by: Brittany Haywood

Map Created on: 2/3/2022 at 10:46 AM



1:4,500



Revamping GIS Program Considerations:

- It takes time
- In house needs assessment versus contracting needs assessment
- Will GIS data/ applications improve staff efficiencies and easily incorporate into workflow?
- Do you have in-house support for maintaining GIS data/applications?
- Well defined RFP can:
 - Conveying the project to non-GIS upper management
 - Set expectations of existing GIS programs/staff



Thank You!



DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL

Brittany Haywood

Program Manager

DNREC Tax Ditch Program

Brittany.Haywood@delaware.gov

302-855-1930



DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL