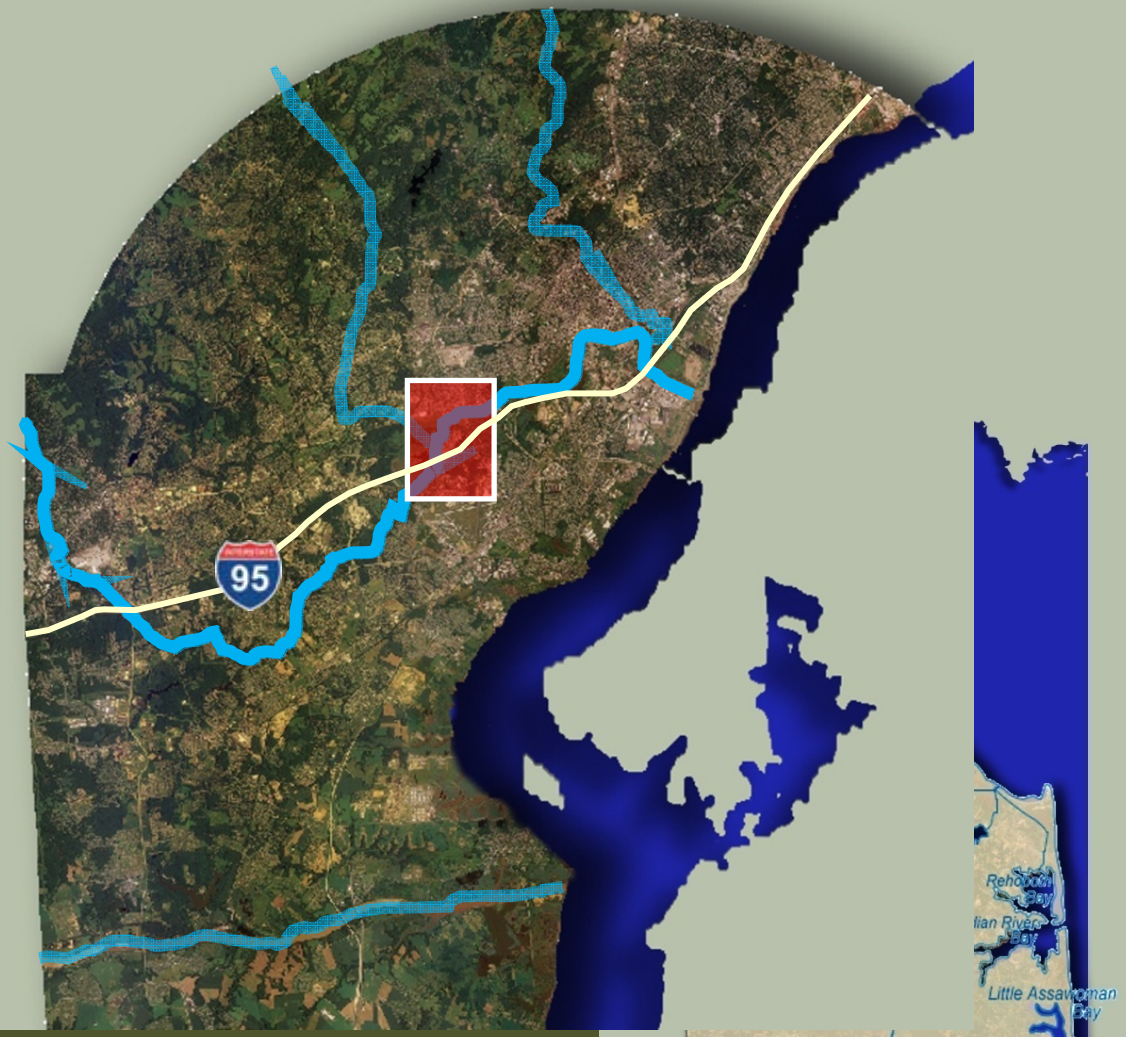
CATHCART:
Wetland Mitigation Along the Christina

January 20, 2010

Presentation Objectives

- Highlight Cathcart wetland mitigation design process: site selection, design, construction & monitoring
- Demonstrate how permitting and regulatory oversight can lead to successful mitigation
- Communicate lessons learned



CATHCART: Wetland Mitigation Along the Christina

Churchmans Marsh

Regulatory Requirements

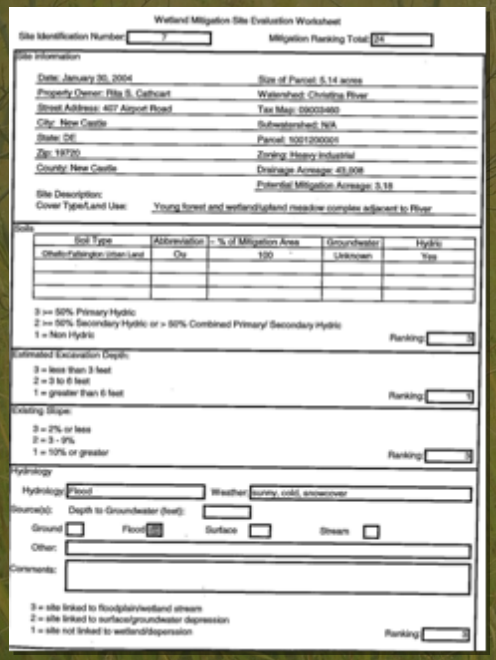
- DRBA & DelDOT mitigation for I-95 and I-295 roadway improvements
- State & federal permits
  - Performance standards
  - 5 years monitoring
- Agencies involved
  - USACE – design, construction & monitoring
  - EPA -- design
  - USFWS – design
  - DNREC – design, construction

Site Selection

- Most impacts non-tidal
- Originally 16 sites: 8 tidal, 8 non-tidal
- Site ranking

Site Selection

Site Evaluation Form


Wetland Mitigation Site Evaluation Worksheet

Site Identification Number: 7 Mitigation Ranking Total: 24

Site Information

Date: January 30, 2004 Size of Parcel: 5.14 acres
Property Owner: Rita S. Cathcart Watershed: Christina River
Street Address: 407 Airport Road Tax Map: 09003460
City: New Castle Subwatershed: N/A
State: DE Parcel: 1001200001
Zip: 19720 Zoning: Heavy Industrial
County: New Castle Drainage Acreage: 45.008
Potential Mitigation Acreage: 3.18

Site Description:
Cover Type/Land Use: Young forest and wetland/upland meadow complex adjacent to River

Soils

Soil Type	Abbreviation	% of Mitigation Area	Groundwater	Hydric
Othello/Fallsington Urban Land	Oy	100	Unknown	Yes

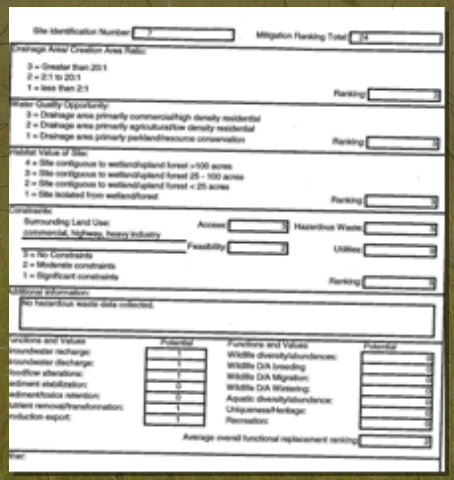
3 >= 50% Primary Hydric
2 >= 50% Secondary Hydric or > 50% Combined Primary/ Secondary Hydric
1 = Non Hydric
Ranking: 3

Estimated Excavation Depth:
3 = less than 3 feet
2 = 3 to 6 feet
1 = greater than 6 feet
Ranking: 3

Existing Slope:
3 = 2% or less
2 = 3 - 9%
1 = 10% or greater
Ranking: 3

Hydrology
Hydrology: Flood Weather: sunny, cold, snowcover
Source(s): Depth to Groundwater (feet):
Ground ☐ Flood ☒ Surface ☐ Stream ☐
Other:
Comments:

3 = site linked to floodplain/wetland stream
2 = site linked to surface/groundwater depression
1 = site not linked to wetland/depression
Ranking: 3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Drainage Area/ Creation Area Ratio:
3 = Greater than 20:1
2 = 2:1 to 20:1
1 = less than 2:1
Ranking: 3

Water Quality Opportunity:
3 = Drainage area primarily commercial/high density residential
2 = Drainage area primarily agricultural/low density residential
1 = Drainage area primarily park/land/resource conservation
Ranking: 3

Habitat Value of Site:
4 = Site contiguous to wetland/upland forest > 100 acres
3 = Site contiguous to wetland/upland forest 25 - 100 acres
2 = Site contiguous to wetland/upland forest < 25 acres
1 = Site isolated from wetland/forest
Ranking: 3

Constraints:
Surrounding Land Use: commercial, highway, heavy industry
Access: 3 Hazardous Waste: 3
Feasibility: 3 Utilities: 3
3 = No Constraints
2 = Moderate constraints
1 = Significant constraints
Ranking: 3

Additional Information:
No hazardous waste data collected.

Functions and Values	Potential	Functions and Values	Potential
Groundwater recharge:	1	Wildlife diversity/abundances:	3
Groundwater discharge:	1	Wildlife D/A breeding	3
Floodflow alteration:	1	Wildlife D/A Migration:	3
Sediment stabilization:	0	Wildlife D/A Wintering:	3
Sediment/toxics retention:	0	Aquatic diversity/abundance:	3
Nutrient removal/transformation:	1	Uniqueness/Heritage:	3
Production export:	1	Recreation:	3

Average overall functional replacement ranking: 3

Other:

Evaluation Basis

- Land use
- Landscape position
- Hydrologic connectivity
- Potential for wetland creation
- Site size
- Proximity to impacts

Site Selection

- Narrowed to 2 tidal sites: Cathcart and Artesian
- Resource Agencies agreed that Cathcart showed the greatest potential since it would require cleanup and improve overall habitat value

History: Former Dump Site

History: Former Dump Site

Lesson Learned:

- Disturbed sites may require test pit evaluations in addition to bore holes

Concept Design

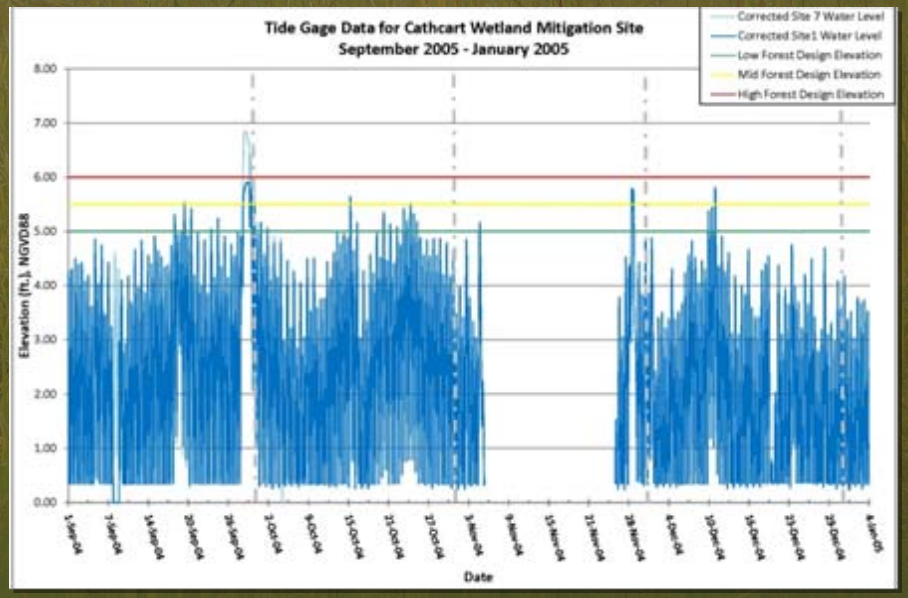
Churchman's Marsh

Site

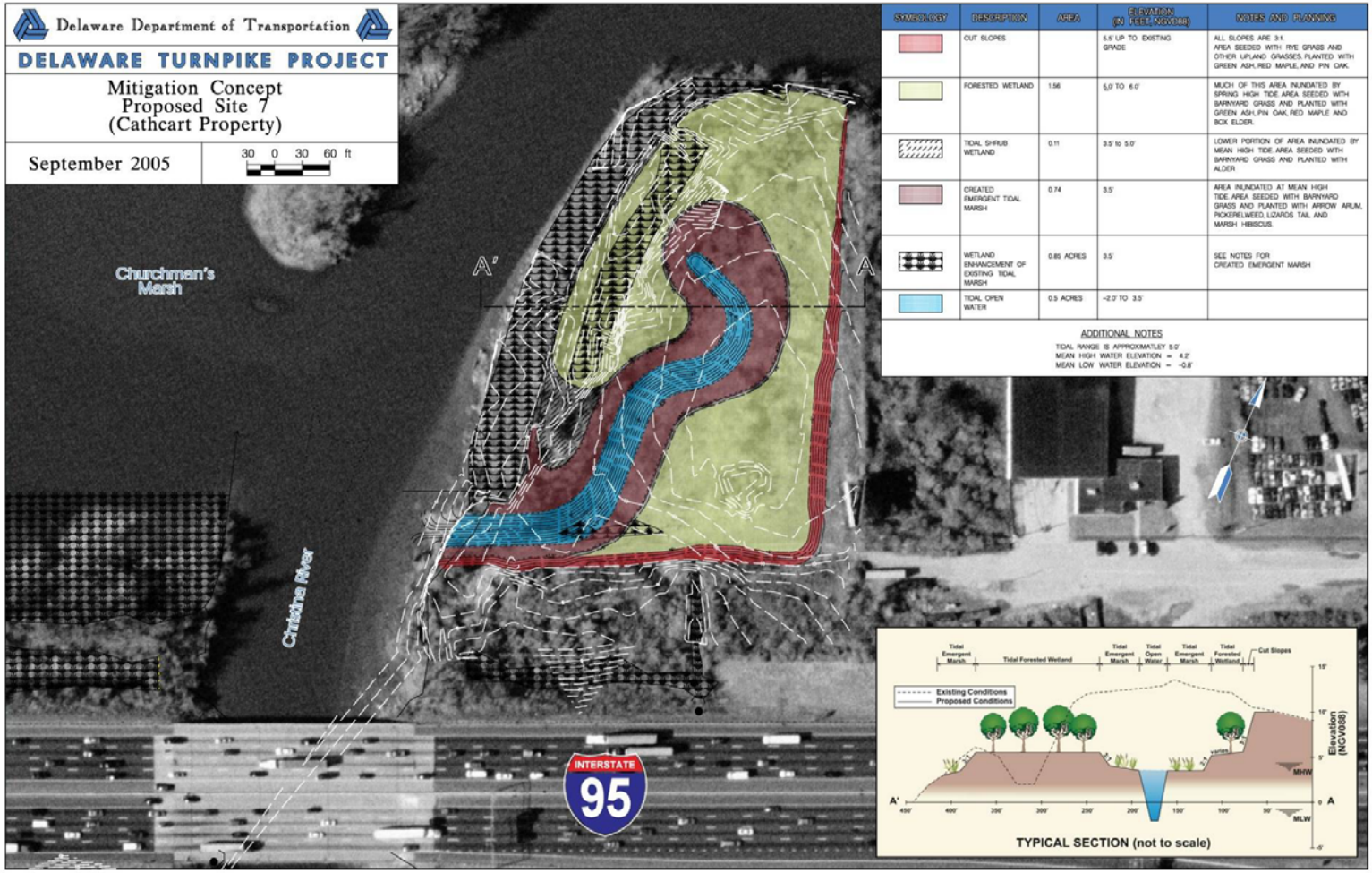
Concept Design

Biobenchmark Reference Area

Tide Gauge Data



Concept Design



Final Design

CATHCART WETLAND MITIGATION PLANTINGS

Emergent Tidal Marsh

Acorus americanus	American Sweetflag
Hibiscus moscheutos	Marsh Habiscus
Nuphar advena	Yellow cow-lily
Peltandra virginica	Arrow Arum
Pontederia cordata	Pickerelweed
Saururus cernuus	Lizard's Tail

Tidal Shrub Wetland

Alnus serrulata	Smooth Alder

Tidal Forested Wetlands

Trees

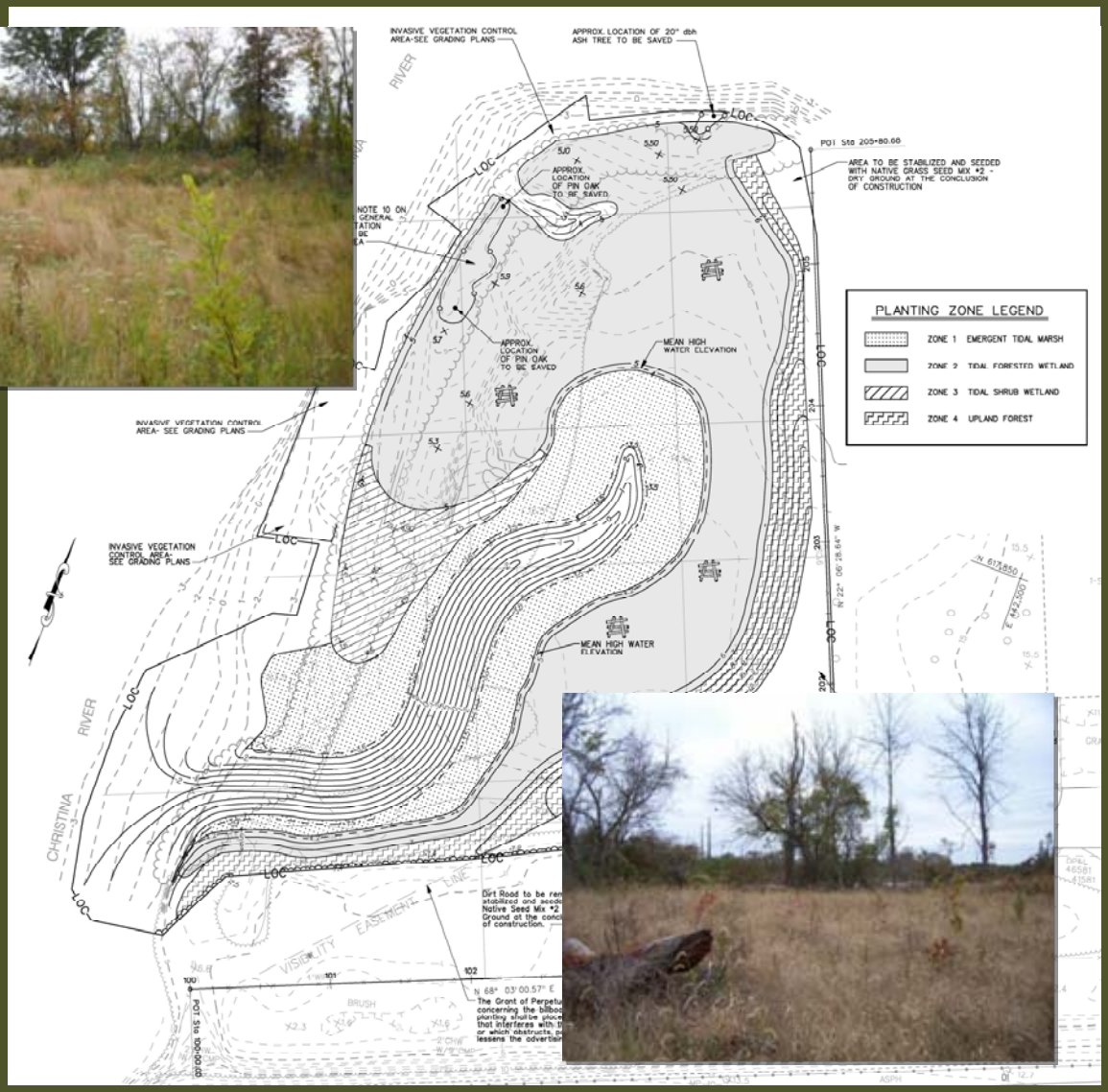
Acer negundo	Box Elder
Acer rubrum	Red Maple
Fraxinus pennsylvanica	Green Ash
Nyssa sylvatica	Black Gum
Platanus occidentalis	American Sycamore
Quercus palustris	Pin Oak
Quercus phellos	Willow Oak

Understory Trees

Carpinus caroliniana	American Hornbeam
Viburnum nudum	Smooth Witherod

Shrubs

Alnus serrulata	Smooth Alder
Clethra alnifolia	Sweet Pepperbush
Cornus amomum	Silky Dogwood
Ilex verticillata	Winterberry
Viburnum dentatum	Arrowwood



Construction Process

- Good contractor relations
- DelDOT environmental inspector
- RK&K designer on-site during milestone events

Results