Maryland
Department of
the Environment

Nutrient Trading
for
NPDES Permittees

October 22, 2018
1 to 3 PM

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MDE trading website
mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Pages/WQ-Trading-2.aspx

MDE Trading Administrator e-mail
mde.wqtrading@maryland.gov

Outline

- Trading overview
  - Roles of state agencies
  - Definitions

- Generating Credits

- Purchasing Credits

- Example Trade

What is trading?

- Water Quality Trading Program
  - Establishes a water quality marketplace for meeting and maintaining pollutant load limits
  - Between the agricultural, stormwater, wastewater, and on-site sewage disposal sectors
  - Attract public and private participation
  - Supplement the more traditional governmental approaches for improving water quality

- Goals
  - Enhance Maryland's effort to protect and restore
    - The Chesapeake Bay and its tributaries
    - Non-tidal waters
  - Achieve results faster and at a lower cost
  - Accelerating efforts to restore and improve water quality

State agency roles in the trading program

- ## MDA
  - Registration of agricultural credits

- ## MDE
  - Registration of:
    - Wastewater credits
    - Septic credits
    - Stormwater credits (and alternative practices)
    - Oyster aquaculture credits
  - Certification of trades to meet MS4 requirements

Terms

- **Credit:** A unit of load reduction equal to one pound (delivered) of nitrogen, phosphorus or sediment

- **Credit Certification:** The process where credits are quantified by the department

- **Baseline:** The practices or actions or pollution reductions that must be achieved before a credit seller can generate credit

- **Registration:** The placement of credit on the registry after verification and certification

- **Registry:** The publicly accessible ledger of credits and trades

- **Verification**: the process through which credits are authenticated, either through annual reports or inspections by qualified parties

Terms

- **EOT Ratio:** A numeric adjustment to compensate for processes through which pollutants are reduced through natural processes before reaching the bay

- **Reserve Ratio:** A 5% reduction applied to registered credits to create a credit reserve

- **Uncertainty Ratio:** A numeric adjustment to account for inaccuracies in measuring pollutant reductions
  - *1:1 typically*
  - *2:1 for trades from NPS to wastewater PS*

How credits are created and traded
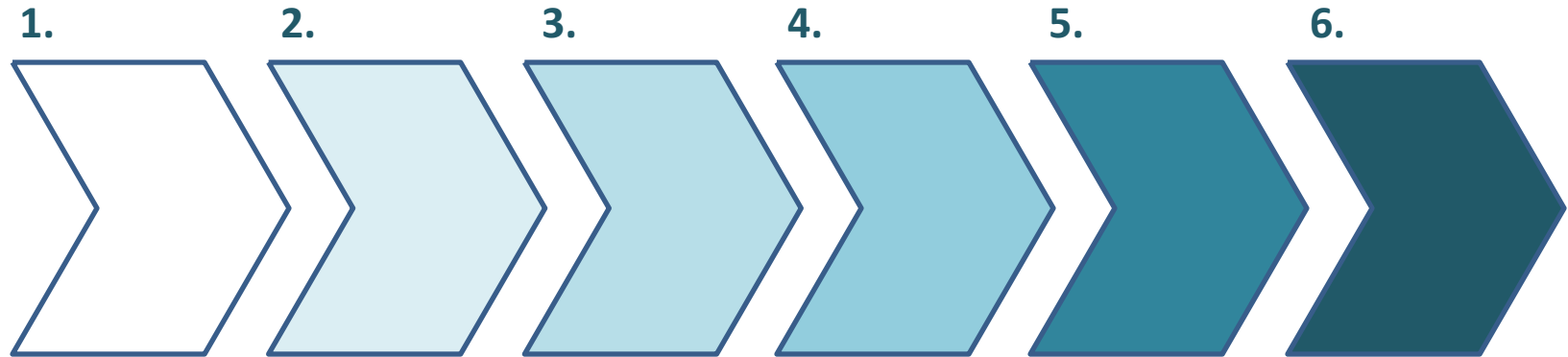
1.

A BMP is installed to reduce nitrogen, phosphorus or sediment

2.

The BMP owner or other responsible party submits a certification form and verification documentation to MDE or MDA

3.

The credit is certified and posted to the registry

4.

The credit generator reaches an agreement with a credit purchaser, and a credit acquisition form is submitted to MDE

5.

The trade is registered and the transfer of credit is posted in the registry

6.

The credit purchaser applies the credit toward meeting a permit requirement

Credit Generation

Credit Acquisition

Generating Non-Agricultural Credits

- ## MDE trading website
  - Credit generation for:
    a. Wastewater
    b. Septic systems
    c. Stormwater & alternative urban practices
    d. Oyster aquaculture
  - Currently based on Phase 5 Model
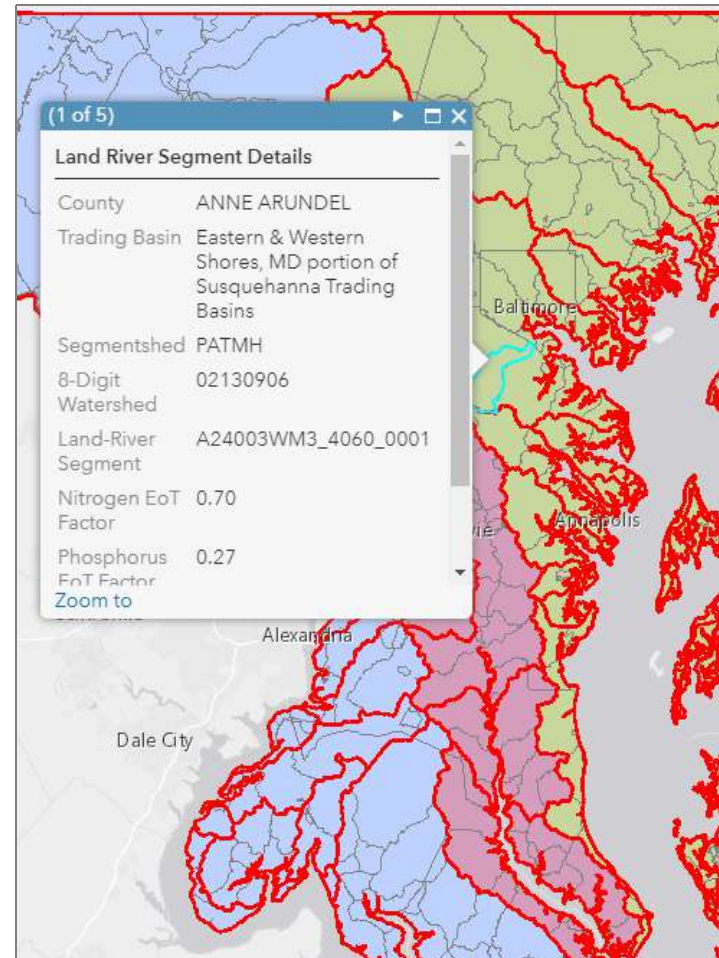   - Update with Phase 6 numbers in 2019
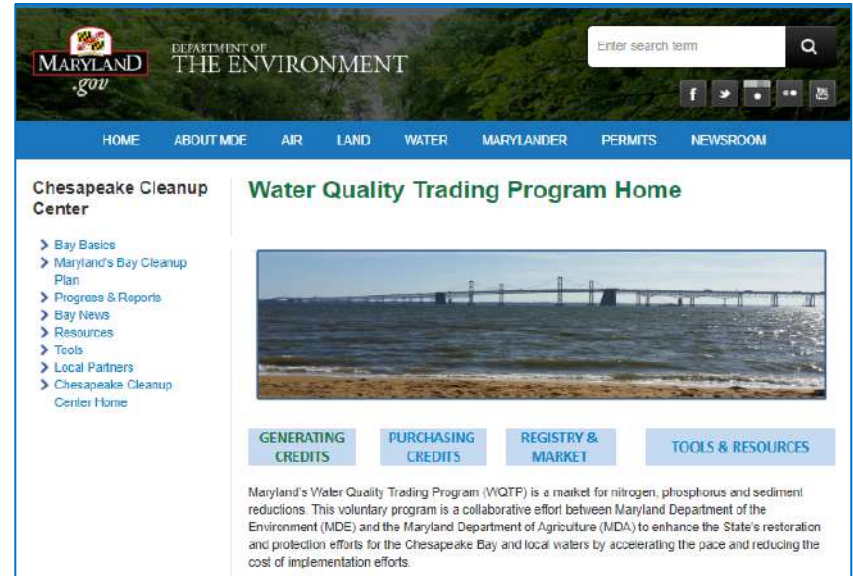
Webpage: mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Pages/WQ-Trading-2.aspx
e-mail: mde.wqtrading@maryland.gov

EOT Factor Map

- Determining credit geography
  - Use lat-long to find:
    - Watershed
      - Segmentshed
      - Land-river segment
      - 8-Digit watershed
  - EOT Factors
  - Currently based on Phase 5 Model

arcg.is/TiDym

Land River Segment Details

County	ANNE ARUNDEL
Trading Basin	Eastern & Western Shores, MD portion of Susquehanna Trading Basins
Segmentshed	PATMH
8-Digit Watershed	02130906
Land-River Segment	A24003WM3_4060_0001
Nitrogen EoT Factor	0.70
Phosphorus EoT Factor	0.27

Wastewater Performance-Based Credit Generation

1. Modify discharge permit to allow trading (if necessary)
   - Establishes a Benchmark Load under which a permittee can generate credits
   - Establishes a formula for calculating and reporting performance-based credit

2. Complete credit estimation spreadsheet
   - Credit based on performance over one calendar year
   - Form can be completed in January of subsequent year

3. Submit credit certification form
   - To MDE Trading Administrator
   - MDE certifies credit and places credit on registry

Wastewater Credit Generation

- ## Performance-Based Credits
  - Calculating credits

  Credit = 8.34 × Actual flow [MGD] × (baseline – actual) concentration [mg/L]

  - Baseline concentration
    - POTWs at ENR: 3.0 mg/L (TN), 0.3 mg/L (TP), 30 mg/L (TSS)
    - Other facilities: assigned within permit
  - Applicable for calendar year that discharge occurred

- ## Permanent trades

- ## This process does not apply to wastewater point source to wastewater point source (point-to-point) trading

Septic Credit Generation

- Credit for BAT upgrade
  - Accounting for 5% reserve
  - Critical Area:
    - 8.8 lbs/yr EOS
  - 1,000' of non-tidal water:
    - 5.5 lbs/yr EOS
  - All other:
    - 3.3 lbs/yr EOS

- Connections to WWTP
  - Through WWTP permit
  - Through MS4 accounting

Maryland Critical Area
Non-Tidal 1000ft Buffer Zone
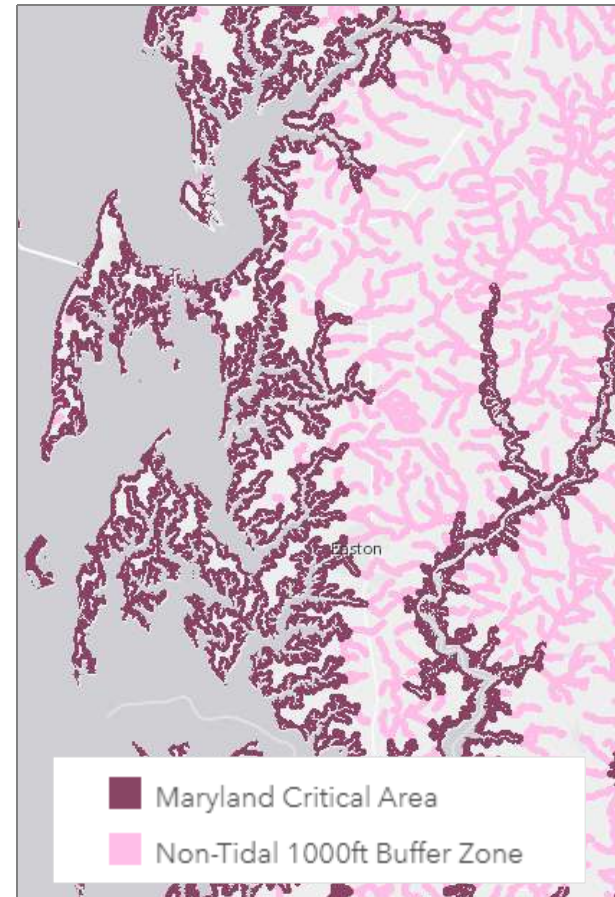
arcg.is/yuCnv

Stormwater Credit Generation

- Crediting to follow current MS4 Accounting Guidance
  - Runoff Reduction practices
  - Stormwater Treatment practices
  - Stream Restoration
  - Shoreline Management
  - Forest Planting
  - Impervious surface removal

- Baseline
  - MS4s: meet permit requirement
  - Non-MS4: current conditions

- Verification
  - State or county inspector
  - Professional Engineer
  - Department approved verifier

- Maintenance
  - A maintenance plan must be in place during lifespan of credit
  - Must be done by seller, but can be transferred to buyer

- Stormwater practices are eligible for funding through Bay Restoration Fund – Clean Water Commerce Act
  - Alternative to trading

mde.state.md.us/programs/water/StormwaterManagementProgram/Documents/NPDES%20MS4%20Guidance%20August%2018%202014.pdf

Oyster Aquaculture Credit Generation

- Based on Chesapeake Bay Program Expert Panel Report on Oyster Tissue Reductions

Default Estimates						
Oyster Size Class Range (inches)	Size Class Midpoint (inches)	Size Class Midpoint (mm)	Content in Oyster Tissue (g/oyster)			
			Diploid*		Triploid**	
			Nitrogen†	Phosphorus‡	Nitrogen†	Phosphorus‡
2.0 - 2.49	2.25	57	0.05	0.01	0.06	0.01
2.5 - 3.49	3	76	0.09	0.01	0.13	0.01
3.5 - 4.49	4	102	0.15	0.02	0.26	0.03
4.5 - 5.49	5	127	0.22	0.02	0.44	0.05
≥ 5.5	6	152	0.31	0.03	0.67	0.07

Agricultural Credits

- Nutrient Trading Tool
  - Credit calculator for agricultural BMPs

e-mail: nutrade.mda@maryland.gov
website: mdnutrienttrading.com
website: cbntt.org

Registry

- Publically-accessible ledger of credits and trades
  - Initially …
    - Credits generated from wastewater, stormwater and septic practices will be posted on MDE's Water Quality Trading website in a basic ledger
  - Later …
    - Registry will be migrated to the Chesapeake Bay Nutrient Trading Tool

- Each credit will receive a unique ID
  - Indicating the year in which it was created

Purchasing Credits

- Credit Purchaser reaches agreement with Credit Generator

- Form submitted to MDE Trading Administrator

- Once approved, transfer of credits will be posted to registry

Webpage:
mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Pages/WQ_Trading_Purchasing_Credits.aspx

Using Traded Credit to Meet Stormwater Permit Requirements

- Phase I MS4 permits
  - Current permits must be modified to allow nutrient trading for meeting restoration requirement
  - Subsequent Phase I MS4 permits to allow traded credit for meeting restoration requirement

- Phase II MS4 permits
  - Current permits allow traded credit to be applied to restoration requirement

- General Permit for Industrial Stormwater
  - Permit is being modified to allow nutrient trading for meeting restoration requirement

- Wastewater Permits
  - Need to apply 2:1 uncertainty ratio if purchasing NPS credits

- Purchased on Maryland's Registry & Marketplace
  - MDE Trading website to provide instructions

- Credit must be conform with:
  - Trading geography
  - Trading year
  - Maintenance and verification

Trading Geographies for MS4s

Chesapeake Bay 1 Tidal Fresh

Gunpowder River Oligohaline

Patapsco River Mesohaline

Chesapeake Bay 2 Oligohaline

Middle River Oligohaline

Back River Oligohaline

Chesapeake Bay 3 Mesohaline

Trading Geographies for MS4s

maryland.maps.arcgis.com/home/webmap/viewer.html?webmap=fdb18dc827654f799d26496f1475055d&extent=-79.9643,37.2887,-75.037,40.1804

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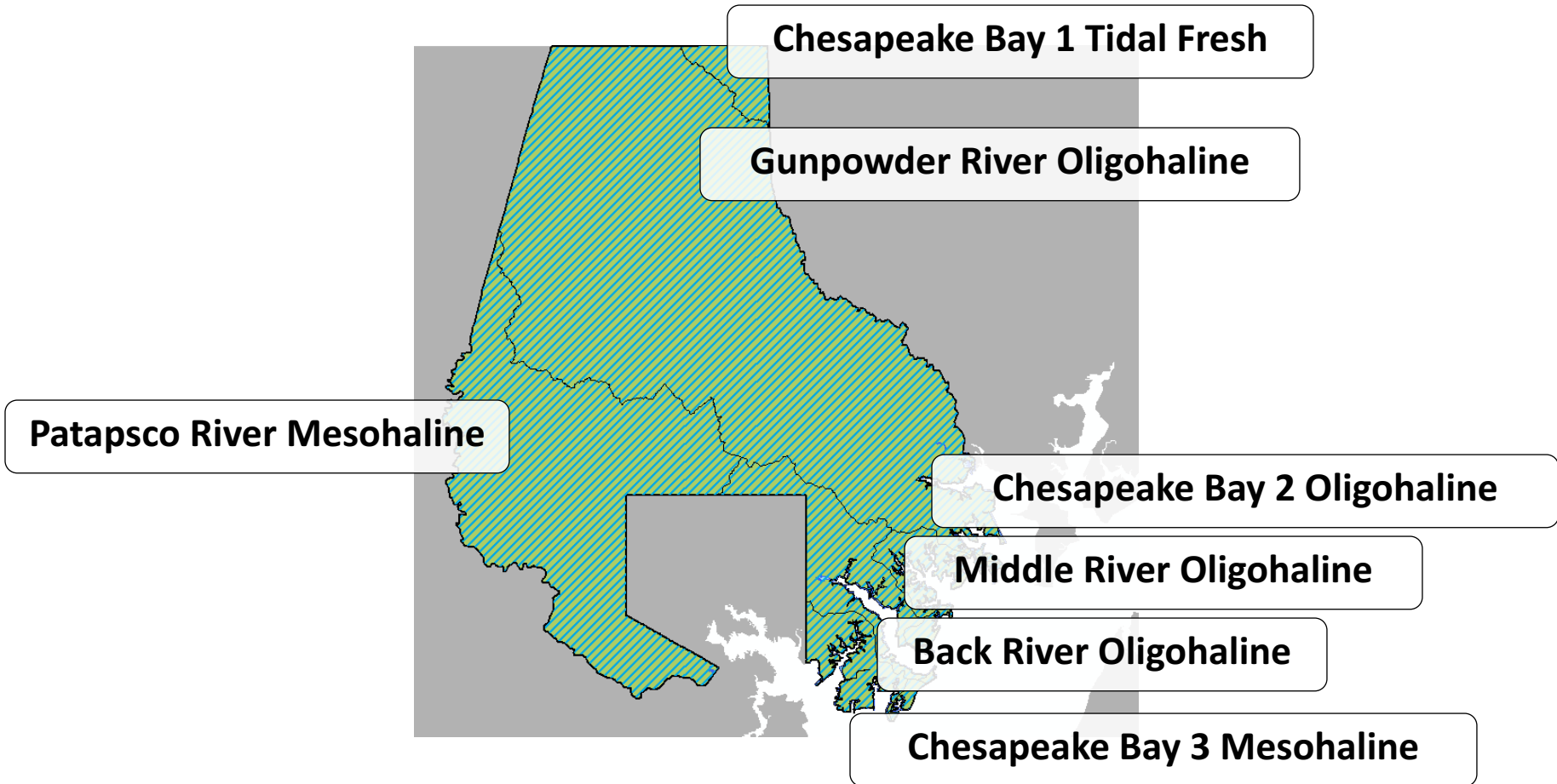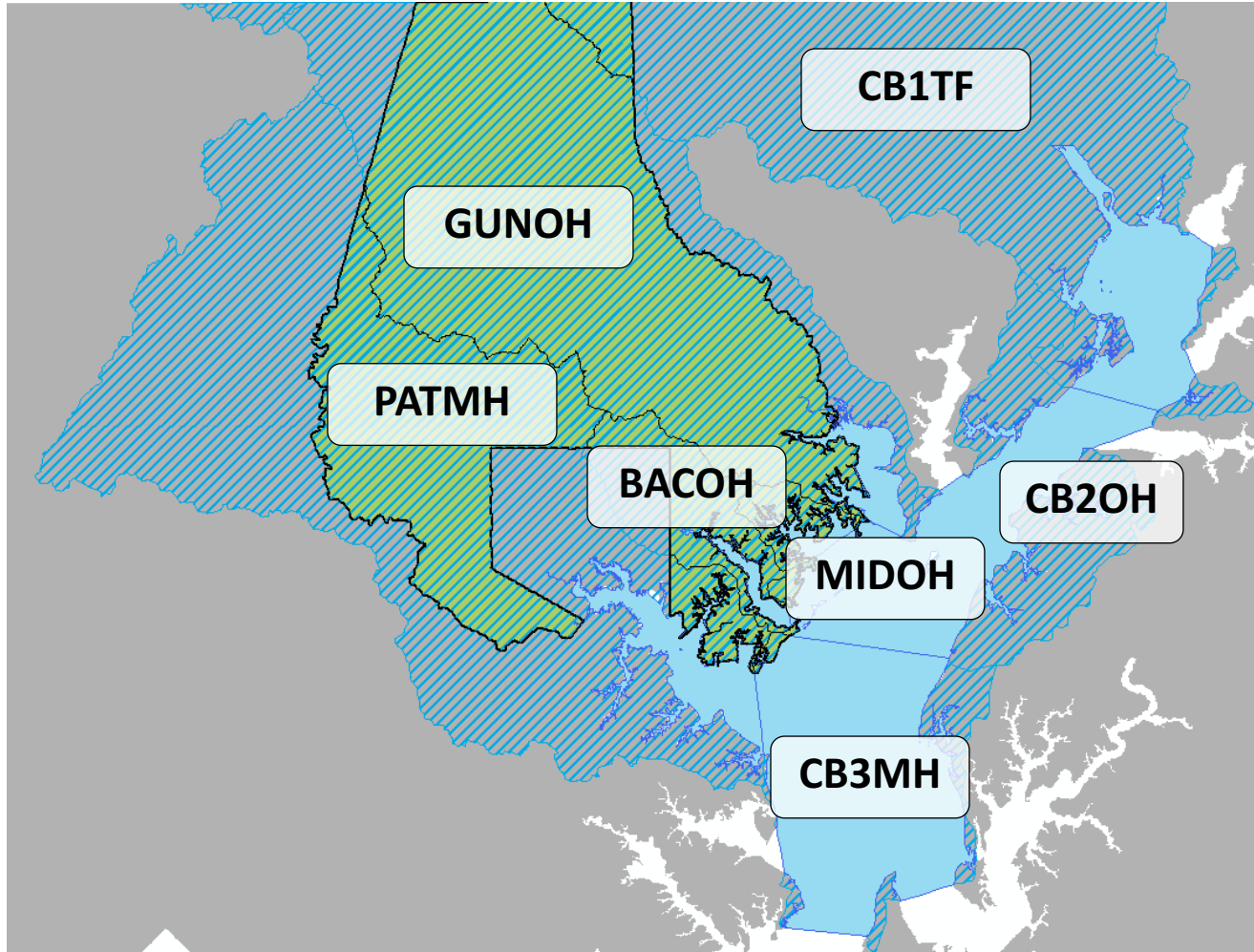
Example Trade A (slide 1)

1. Baltimore County needs 5,000 nitrogen credits to meet its 2018 MS4 permit requirements

2. They contact Example City WWTP, an ENR plant in Harford County in the CB1TF watershed.

3. Example City WWTP has been discharging nitrogen at 2.6 mg/L—below its 3.0 mg/L benchmark load.

4. Example City WWTP is on track to discharge 10,000 pounds below its benchmark load.
   – With an EOT Ratio of 0.57 and a retirement ratio of 5%, it is on track to generate 5,415 pounds of credit for 2018

5. Baltimore County MS4 contacts its permit writer to ensure that this credit will be valid for meeting its restoration requirement

6. Example City WWTP requests and is granted a permit modification to allow credit generation

7. Baltimore County MS4 requests and is granted a permit modification to allow trading to meet its restoration requirement.
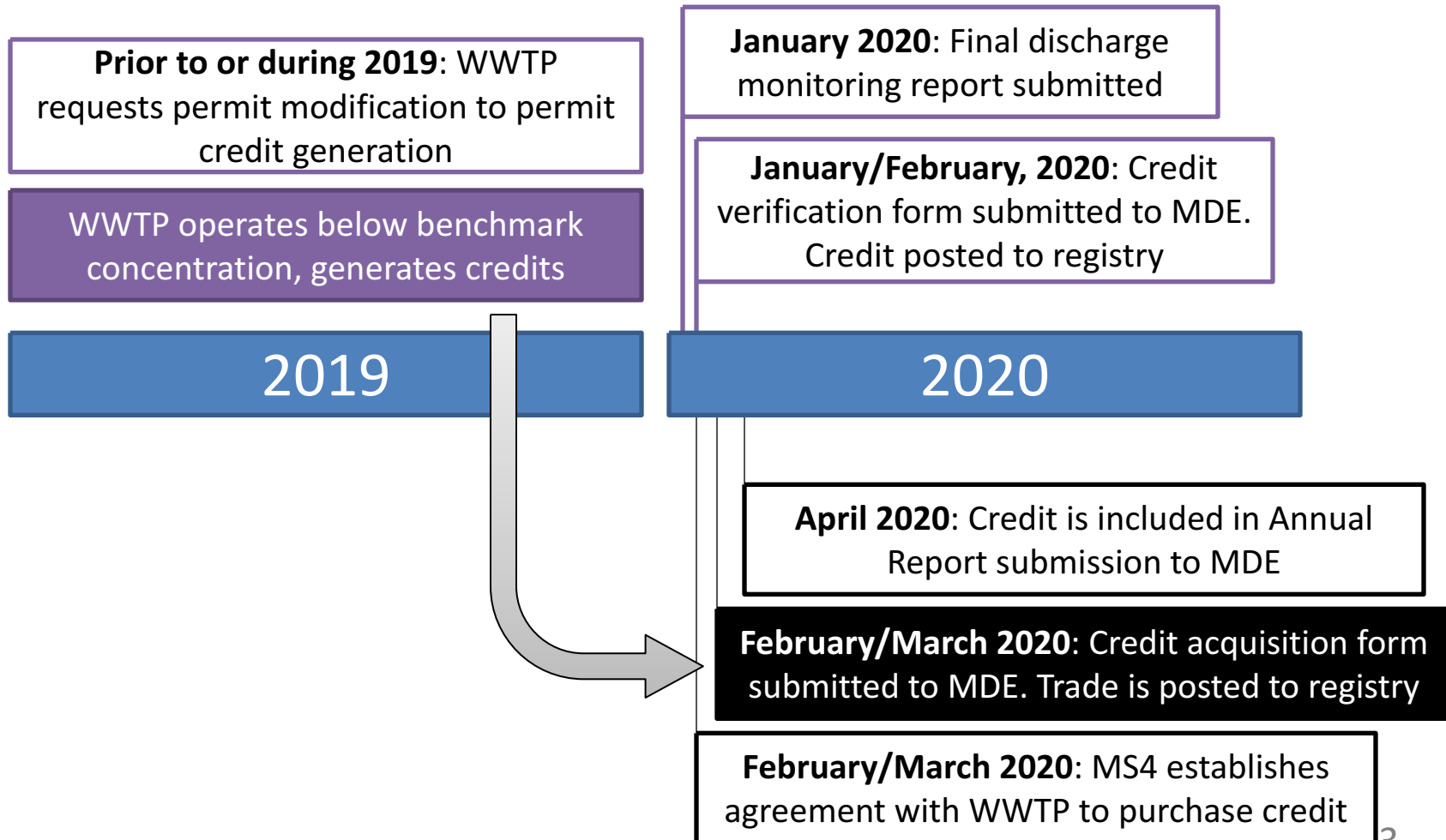
8. In January 2019, Example City WWTP collects its discharge data for 2019 and determines that it can generate 6,000 credits

9. Example City WWTP submits formwork to MDE Trading Administrator to certify 6,000 nitrogen credits

10. MDE Trading Administrator certifies the credits.

11. Baltimore county MS4 reaches an agreement with Example City WWTP to trade 5,000 credits

12. Baltimore County MS4 and Example City WWTP formally complete the trade by submitting a purchase form to MDE Trading Administrator

13. Baltimore County MS4 includes the 5,000 credits in its 2019 MS4 Annual Report
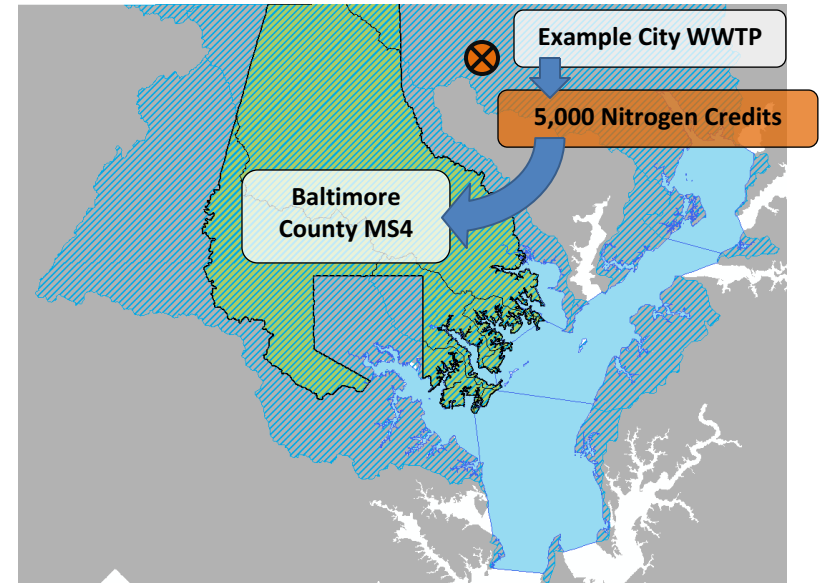
13. Baltimore County will continue purchasing 5,000 nitrogen credits in subsequent years until it has replaced them with structural practices

Example City WWTP

5,000 Nitrogen Credits

Baltimore County MS4

Generic timeline for POTW to MS4 trades

Prior to or during 2019: WWTP requests permit modification to permit credit generation

WWTP operates below benchmark concentration, generates credits

January 2020: Final discharge monitoring report submitted

January/February, 2020: Credit verification form submitted to MDE. Credit posted to registry

2019

2020

April 2020: Credit is included in Annual Report submission to MDE

February/March 2020: Credit acquisition form submitted to MDE. Trade is posted to registry

February/March 2020: MS4 establishes agreement with WWTP to purchase credit

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Contact Information

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