Development of a Water Quality Trading Framework in Wisconsin for Phosphorus

Nutrient TMDL Workshop
February 15 17, 2011
New Orleans, LA

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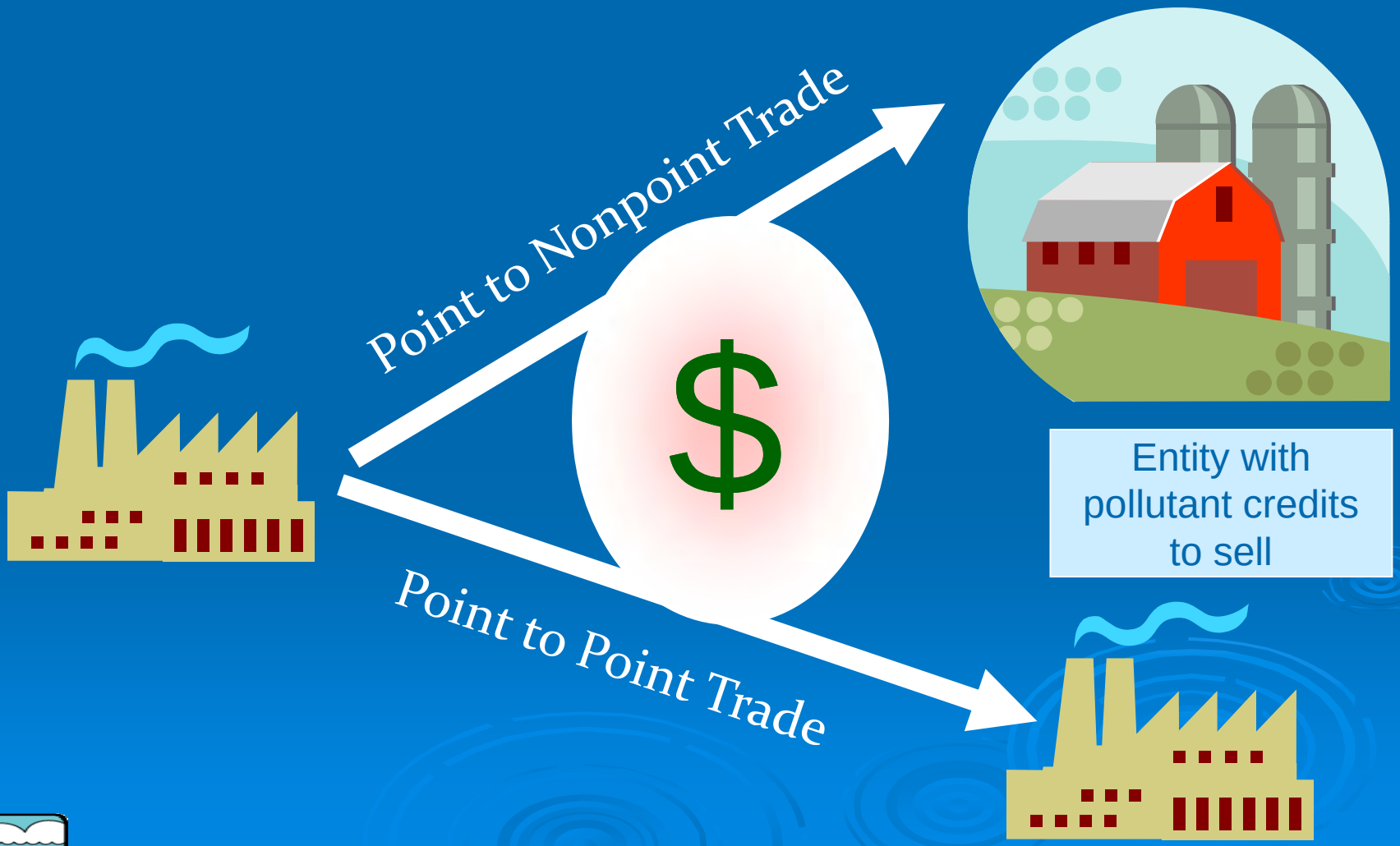
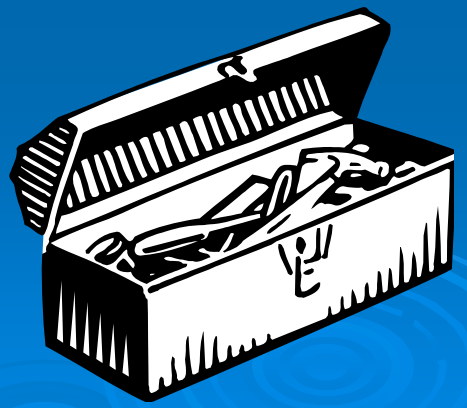
Wisconsin Department of Natural Resources

What is Water Quality Trading?



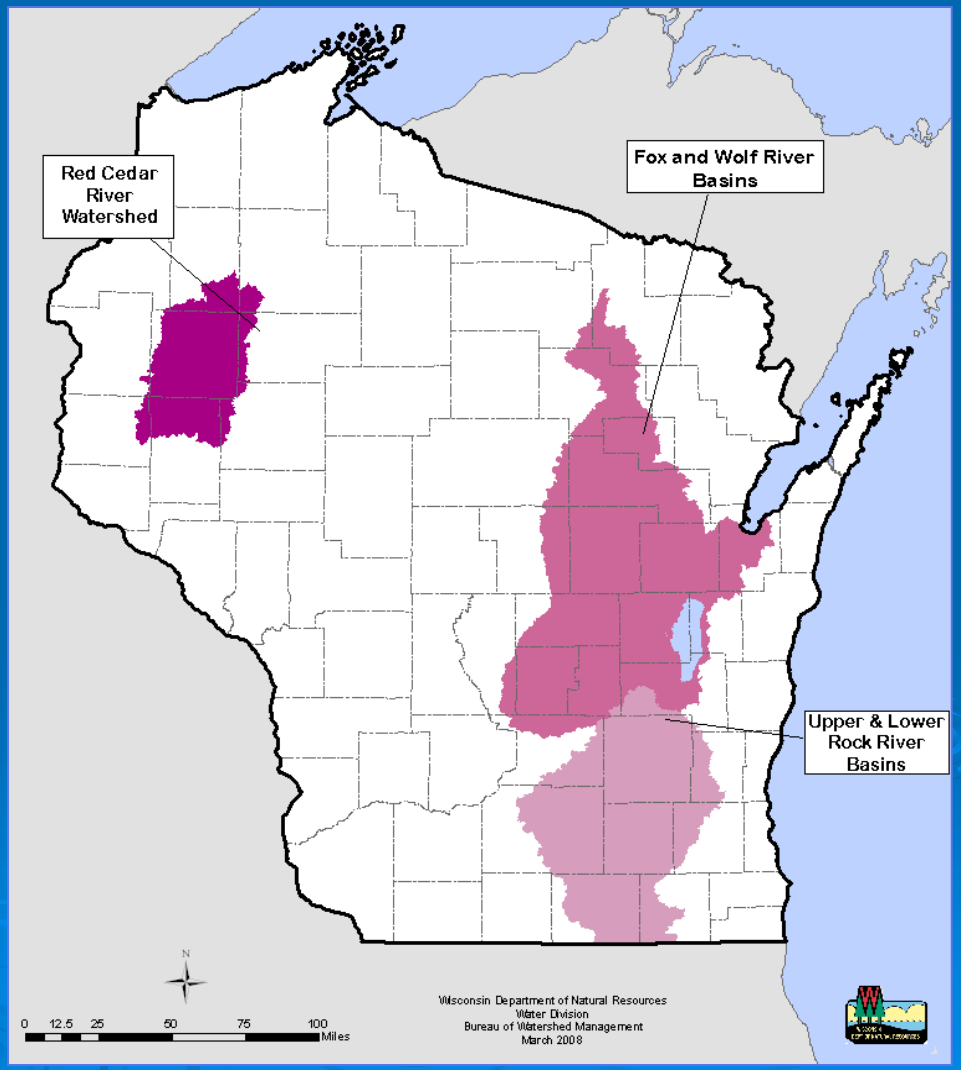
Trading is a Potential Tool

- Several options exist to meet WQBELs and TMDL allocations including:
  - Modifying wastewater treatment systems
  - Modifying your production process to limit additives or raw materials
  - Water Quality Trading
- Options can be used in combination



Wisconsin's History with Trading

- Fox River Basin
  - Developed guidance, issue summary, and reports.
- Rock River Basin
  - Developed a generic framework and pursued some trades but lack of sufficient economic incentives prevent trades ultimately resulted in no trades.
- Red Cedar Basin
  - City of Cumberland Trade



DNR Board Resolution – June 2010

Assemble a stakeholder group of those interested parties in watershed based trading issues and develop a trading framework including any recommended rules or guidance to facilitate watershed based trading, and report back to the Board no later than July 1, 2011.

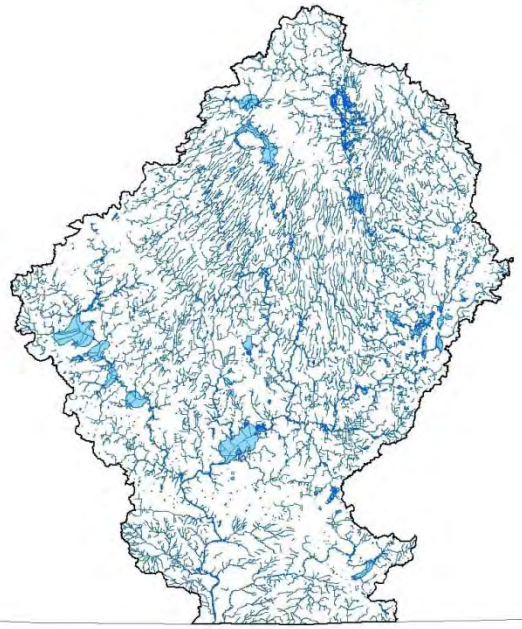
Current Status of framework: DRAFT

Why Stakeholders want Trading

- NR 102 Numeric Criteria for Phosphorus
  - 75 ug/L for wadable streams
  - 100 ug/L for nonwadable
  - Criteria for lakes and reservoirs
- NR 217 Implementation rule for NPDES permits
- NR 151 Performance Standards for nonpoint
- Development of TMDLs

Current TMDLs

Lower Fox River Basin



Upper and Lower Rock River Basins

- Lower Fox Basin
  - Point and nonpoint source blended waters
  - TSS and phosphorus
- Rock River Basin
  - Point and nonpoint source blended waters
  - TSS and phosphorus
  - Low dissolved oxygen, degraded habitat and excessive turbidity are impairments

TMDL = WLA + LA + MOS

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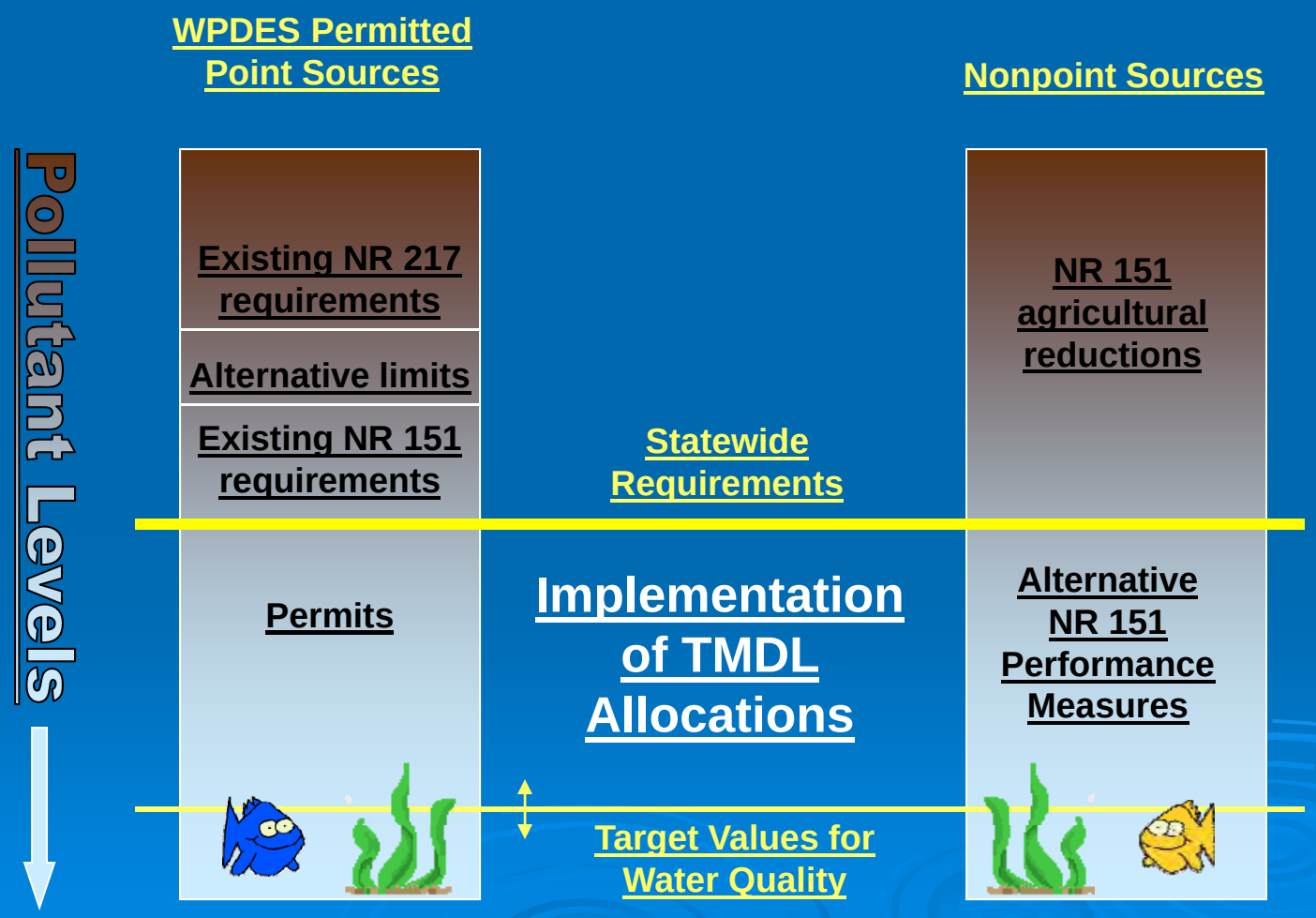
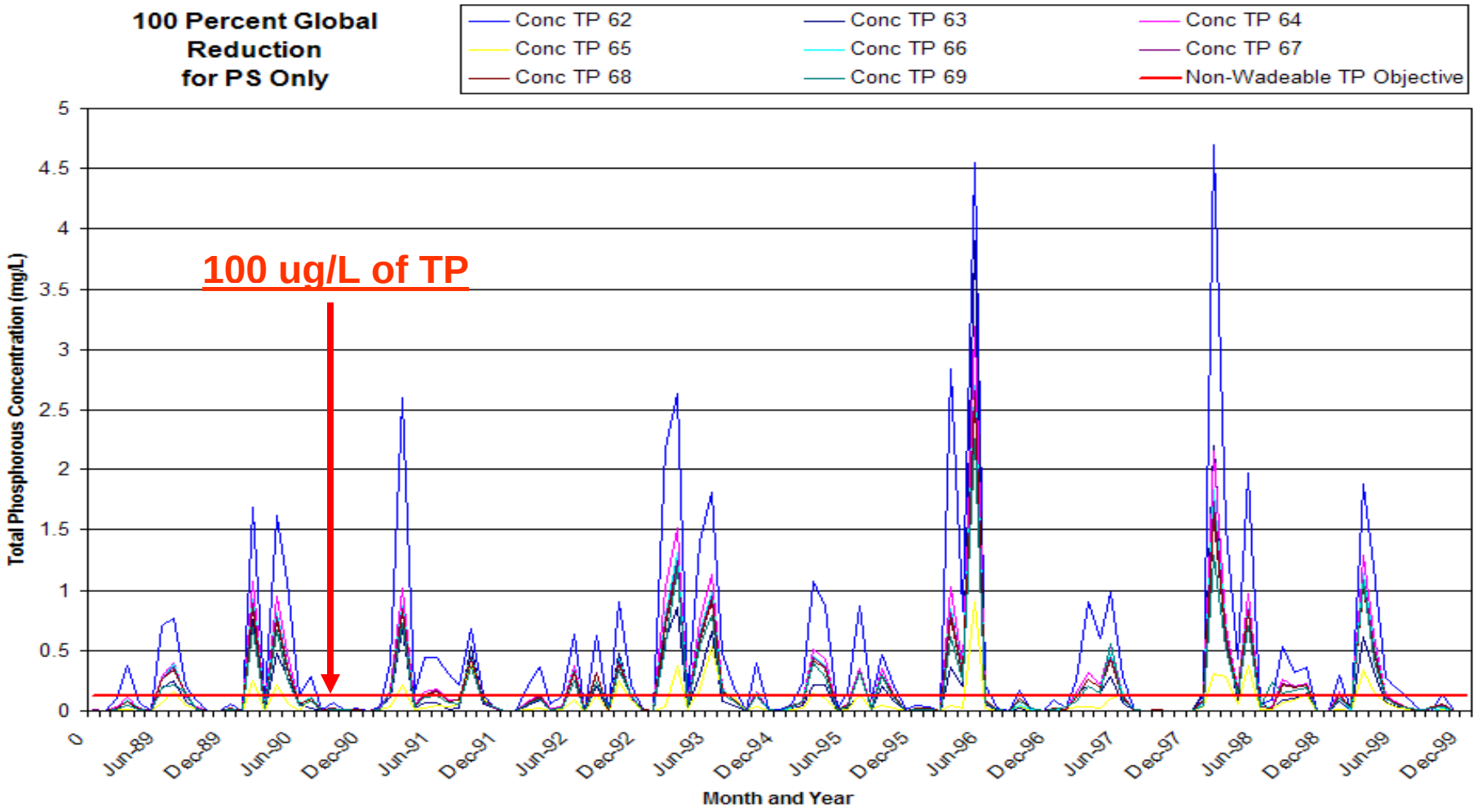
Load Reduction Approach



Rock River TMDL Point Sources = 0



Evaluation Period 1989 to 1999

Rock River TMDL Allocations

- Allocations / reductions based on percent contribution.
- Stakeholders - what about least cost allocations or allocations based on cost?
- DNR - pollutant trading allows for implementation of least cost options.

Review of EPA Material

- Final Water Quality Trading Policy, Jan. 13, 2003
- Water Quality Trading Toolkit for Permit Writers
  Aug. 2007, EPA-833-R-07-004
  Updated June 2009

- EPA Website:
  http://water.epa.gov/type/watersheds/trading.cfm

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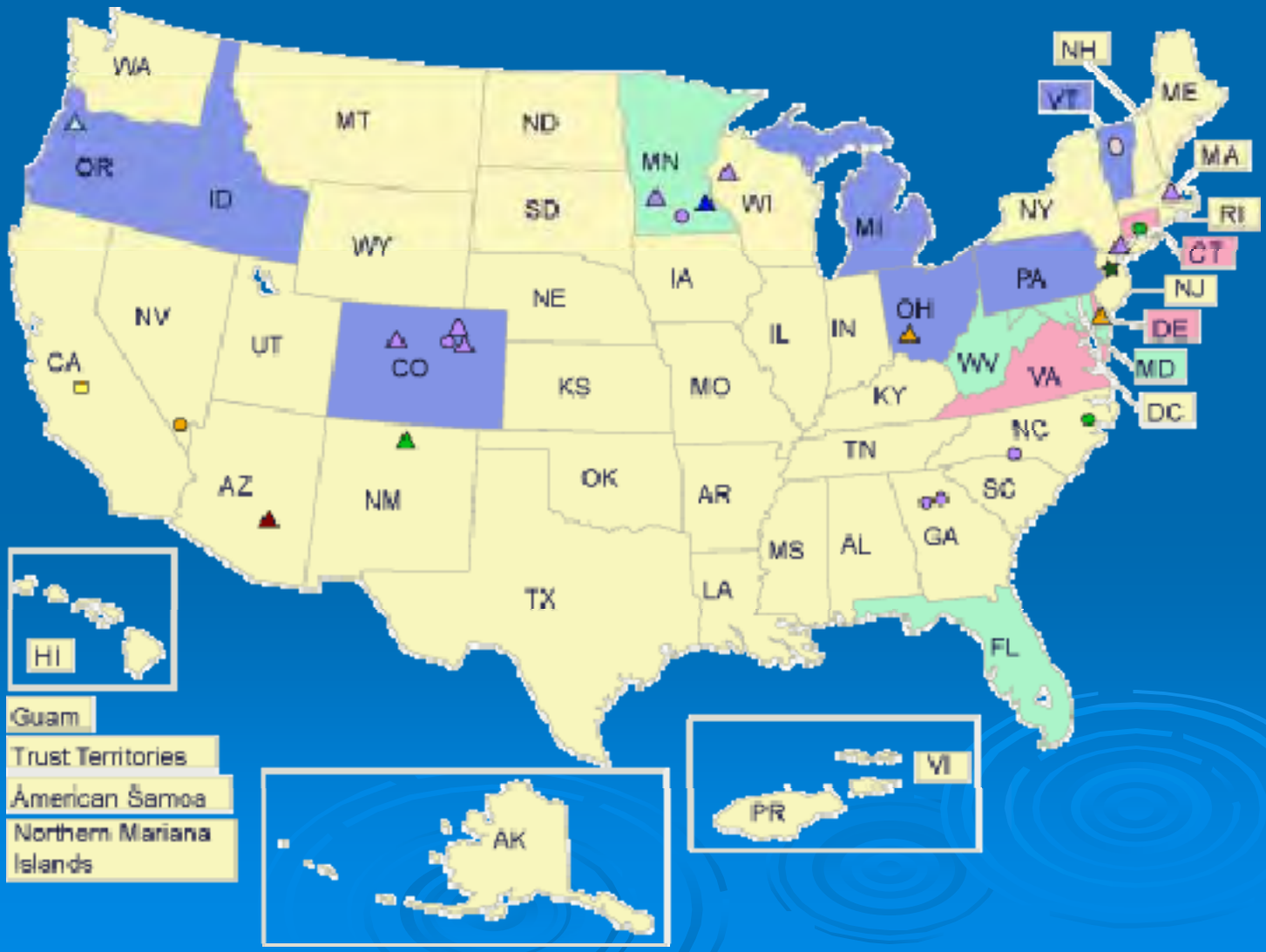
Review of other Trading Programs



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Forces “for” and “against” Trading

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EPA Trading Program Structure

- Potential "Dark-side" issues for stakeholders?
  - EPA Trading Policy does not allow trading to meet a federal technology-based effluent limit (TBEL). Trading can be used to meet water quality based effluent limits (WQBELs) only.
  - Timing of credits: Credits should be generated and used within the same time period in order to comply with permit limits and prevent localized exceedance of water quality standards.
  - How will trading parties meet EPA baseline requirements and keep trading economically feasible.

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Trading Scenarios

- Meet NR 217 Water Quality Based Effluent Limits (WQBELs)

- Meet TMDL wasteload (WLA) or load allocation (LA) requirements.
  - EPA Trade Requirements – final trade
  - Concept of an Interim Trade

Ranking of Framework Elements

1. Location
2. Baseline
3. Trade Ratio Calculation
4. Trade Duration
5. Compliance / Enforcement
6. Monitoring / Quantifying credits
7. Trade Administration
8. Legislation, Legal Issues, and Rules

Possible pollutants addressed:

- Sediment
- **Phosphorus**
- Nitrogen
- Mercury
- Temperature

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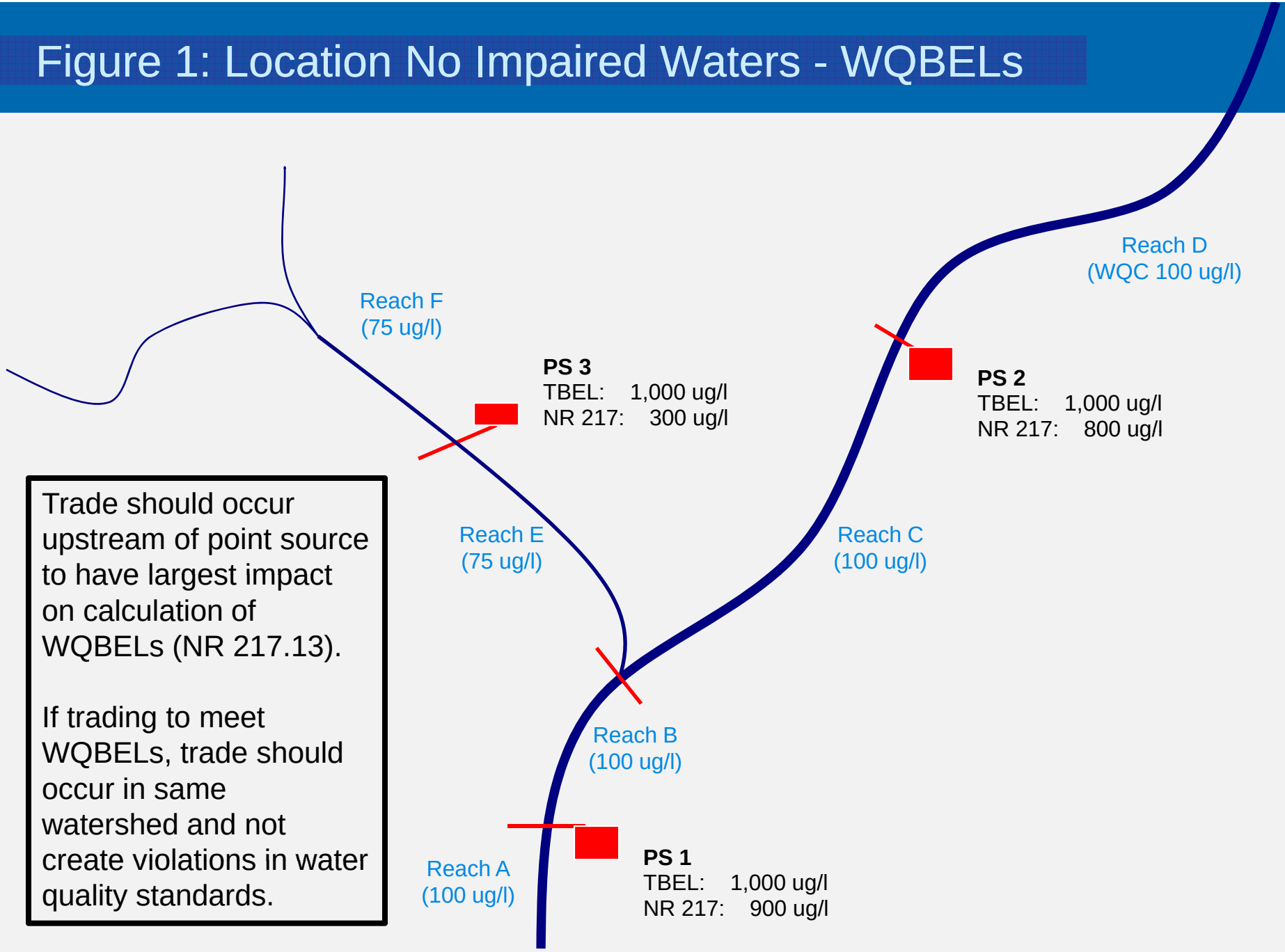
Key Elements – Location of Trade

- Many of the elements are inter-related.

- Factors that influence location
  - WQBEL calculations under NR 217 point of discharge
  - TMDL allocations
  - Minimize potential for “hotspots”

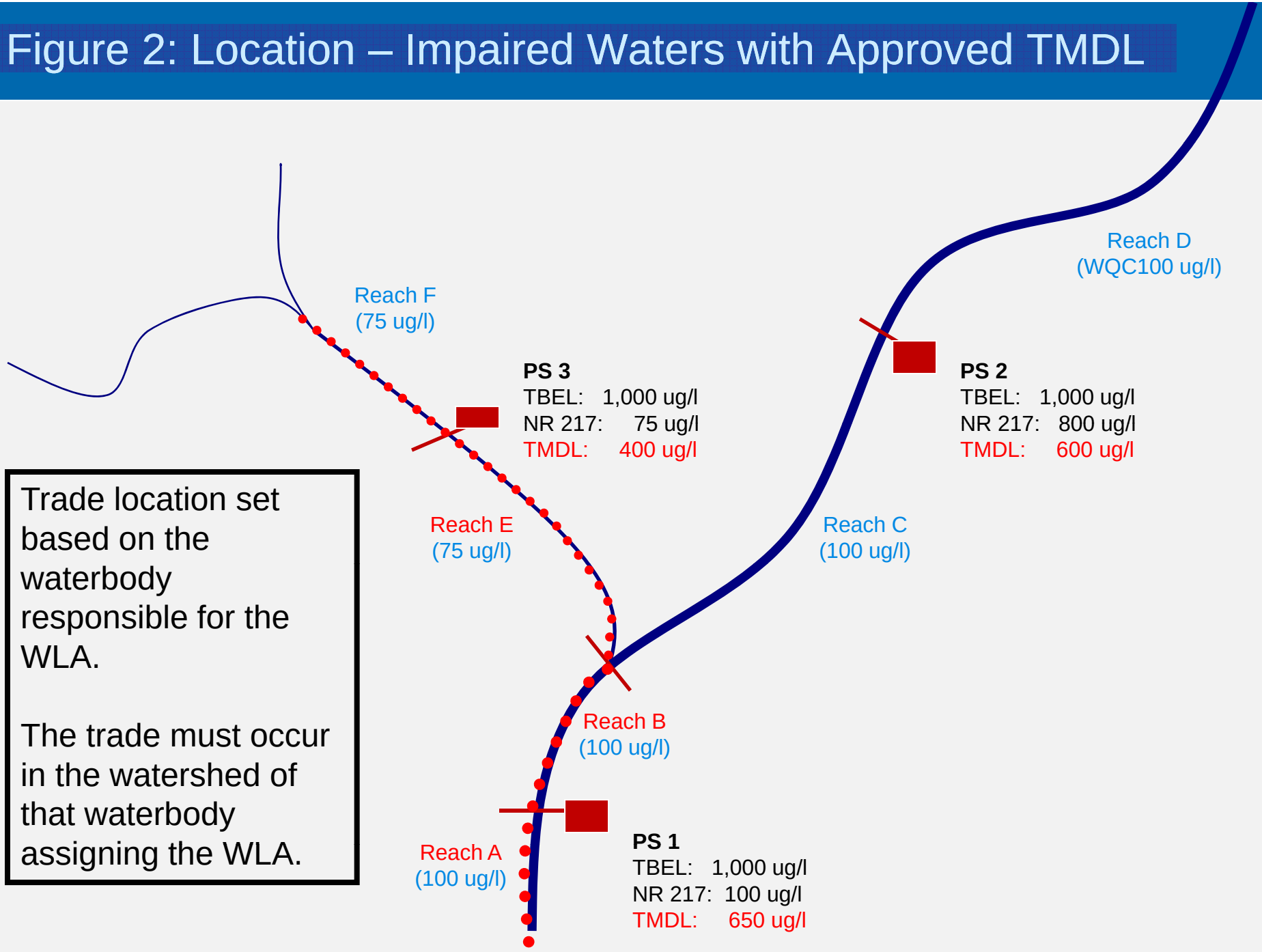
Figure 1: Location No Impaired Waters - WQBELs



Trade should occur upstream of point source to have largest impact on calculation of WQBELs (NR 217.13).

If trading to meet WQBELs, trade should occur in same watershed and not create violations in water quality standards.

Figure 2: Location – Impaired Waters with Approved TMDL



Trade location set based on the waterbody responsible for the WLA.

The trade must occur in the watershed of that waterbody assigning the WLA.

EPA Baseline Guidance

- What are EPA baselines?
  - A buyer should meet its TBEL before buying credits.
  - A buyer can use credits to meet its water quality-based effluent limit (WQBEL).
  - A nonpoint source seller should meet its TMDL load allocation or, if there is no TMDL, it should meet any state and local requirements before it can generate credits but WI has cost share requirements for nonpoint agriculture.

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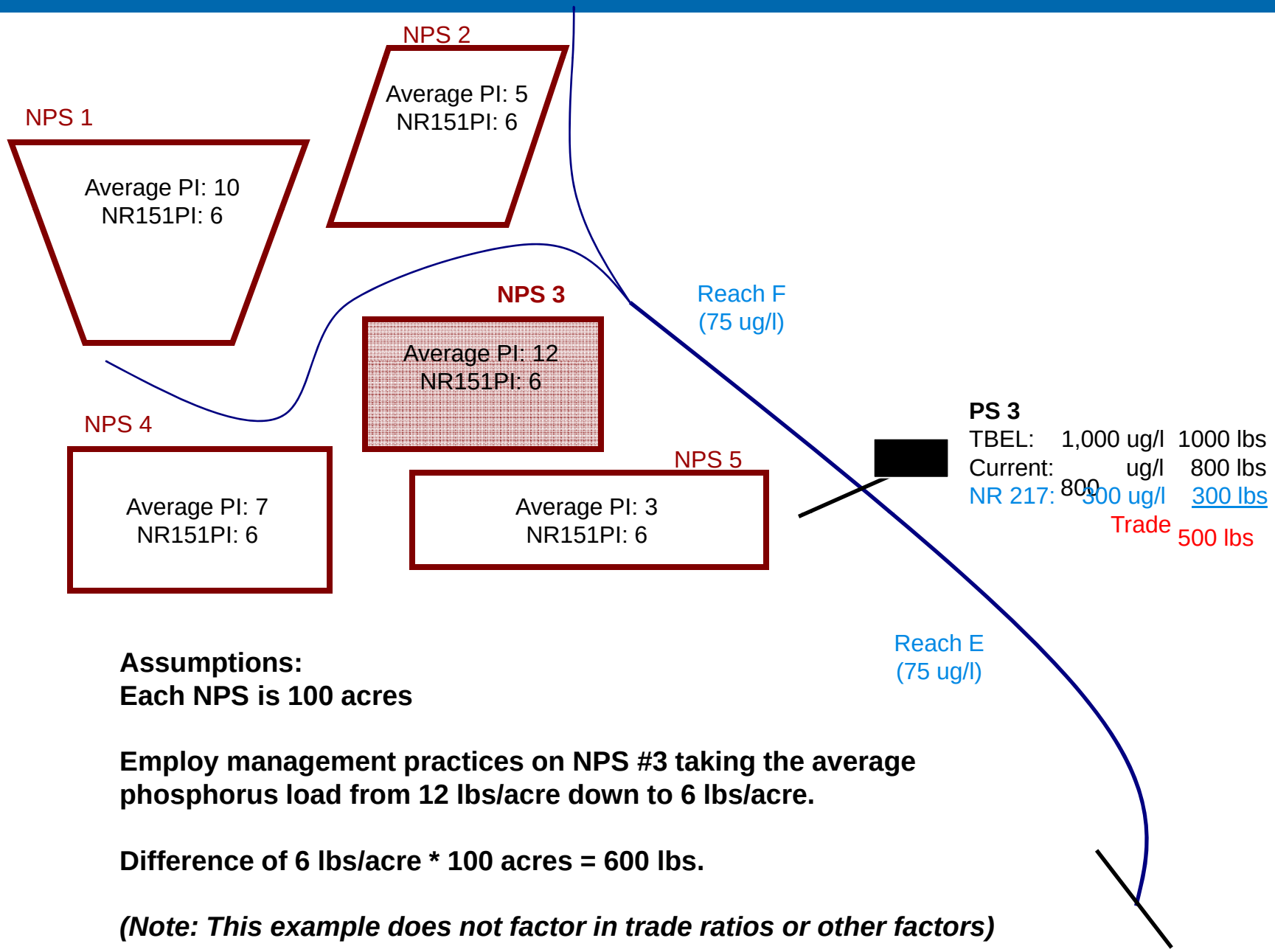
Baseline: Trade for WQBEL and no TMDL established

- A trade with a nonpoint source must bring the nonpoint source in compliance with the NR151 performance standards.
- Credit can be taken for the reduction from existing loads to the NR 151 performance standard.
- A trade can take a field below the NR 151 performance standard.

Figure 3: Baseline – No Impaired Waters



Assumptions:
Each NPS is 100 acres

Employ management practices on NPS #3 taking the average phosphorus load from 12 lbs/acre down to 6 lbs/acre.

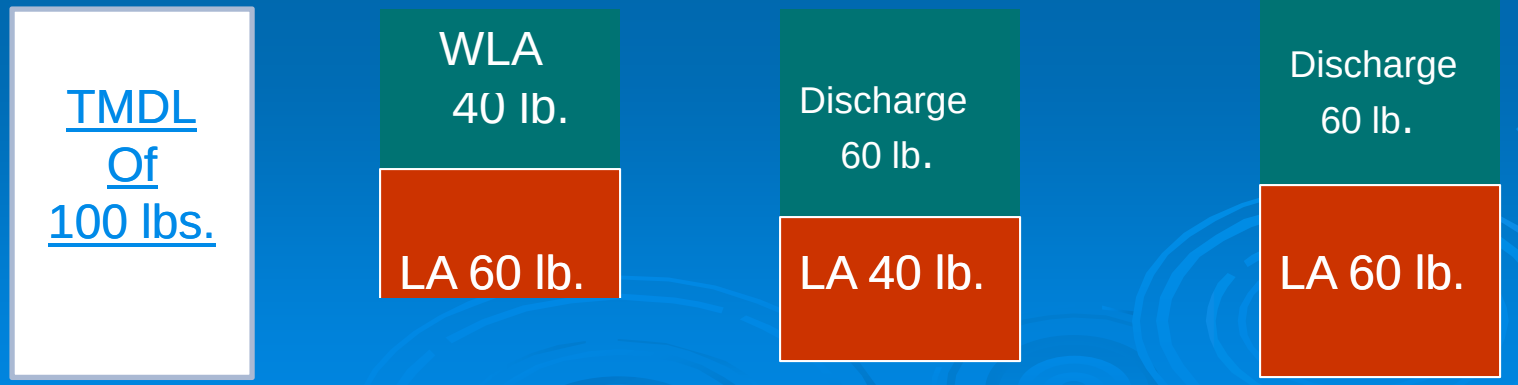
Difference of 6 lbs/acre * 100 acres = 600 lbs.

(Note: This example does not factor in trade ratios or other factors)

Baseline - TMDL

- Long-term Trade
  - Must meet nonpoint load allocation before credits available.
  - Length of trade “permanent” provided management practice is maintained and functioning.

Sample TMDL Allocation



Baseline - TMDL

- Interim Trade
  - Credit for reduction from existing nonpoint load to the state performance standards. Minimum requirement to come down to state performance standards.
  - Trade duration limited and at end of term the facility needs to go find another set of trades.
  - Portion of pollutant “retired” between each interim trade through a retirement factor.
  - Three permit $_{term}$ limit in NR 217 if not making progress on meeting TMDL.

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Key Elements – Trade Ratio

- Trade ratios create an equivalency and normalize the value of pollutant credits.
  - A ratio of 2:1 means one pound of pollutant from a point source is equivalent to two pounds from a nonpoint source.

- The most typical trade ratio is 2:1 often with lower ratios for point-point trades and higher ratios for point-nonpoint trades.

Key Elements – Trade Ratio

- Trading ratios typically account for:
  - Uncertainty
  - Location and delivery ratios
  - Equivalency of pollutant (soluble vs. sediment)
  - Administrative costs for the trade

- Trade ratios that account for multiple factors can rapidly become complex and difficult to implement. We propose keeping factor separate and not lumping together.

Trade Ratio: Uncertainty

- Based on effectiveness and ease of verification of the management practices employed. Practices will be classified into different categories and assigned ratios.

Example Trade Ratio Table

Lower Ratio	2:1 Ratio	Higher Ratio
Companion Crops	Buffer with upland practices	Tillage Practices
	Fall cover crops	Buffer without supporting practices

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Trade Ratio: Location and Delivery

- Accounts for the distance between a pollutant source and the downstream waterbody and the impact that this can have on fate and transport of the pollutant.

- Delivery
  - If trading to meet allocations in a TMDL the delivery assumptions used in the TMDL to generate the WLA are used in the trade analysis.

  - For NR 217 WQBEL trades either will have a limited geographic extent (watershed size), provide a default delivery ratio, or a permittee may calculate a site specific delivery ratio.

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Trade Ratio: Equivalency

- Accounts for situations where two sources may discharge the same pollutant but the composition may differ with respect to the forms of the pollutant.

- The framework will create an equivalency that is pollutant specific.
  - For phosphorus, the current criteria (NR 102) is for total phosphorus with no differentiation between soluble P and sediment bound P.

Key Element: Trade Duration

- The length of the trade or period of time for which credits can be generated or traded.

- Discussing two options:
  - Duration of permit (5-years) – Interim Trades
  - Duration of manament practice – Long-term Trades
    - Short: 1-year (cover crop, nutrient management)
    - Medium: 5-years (no-till, grassed waterways)
    - Long: 10-years (filter strips or buffers)

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Key Element: Compliance / Enforcement

Trade Agreement

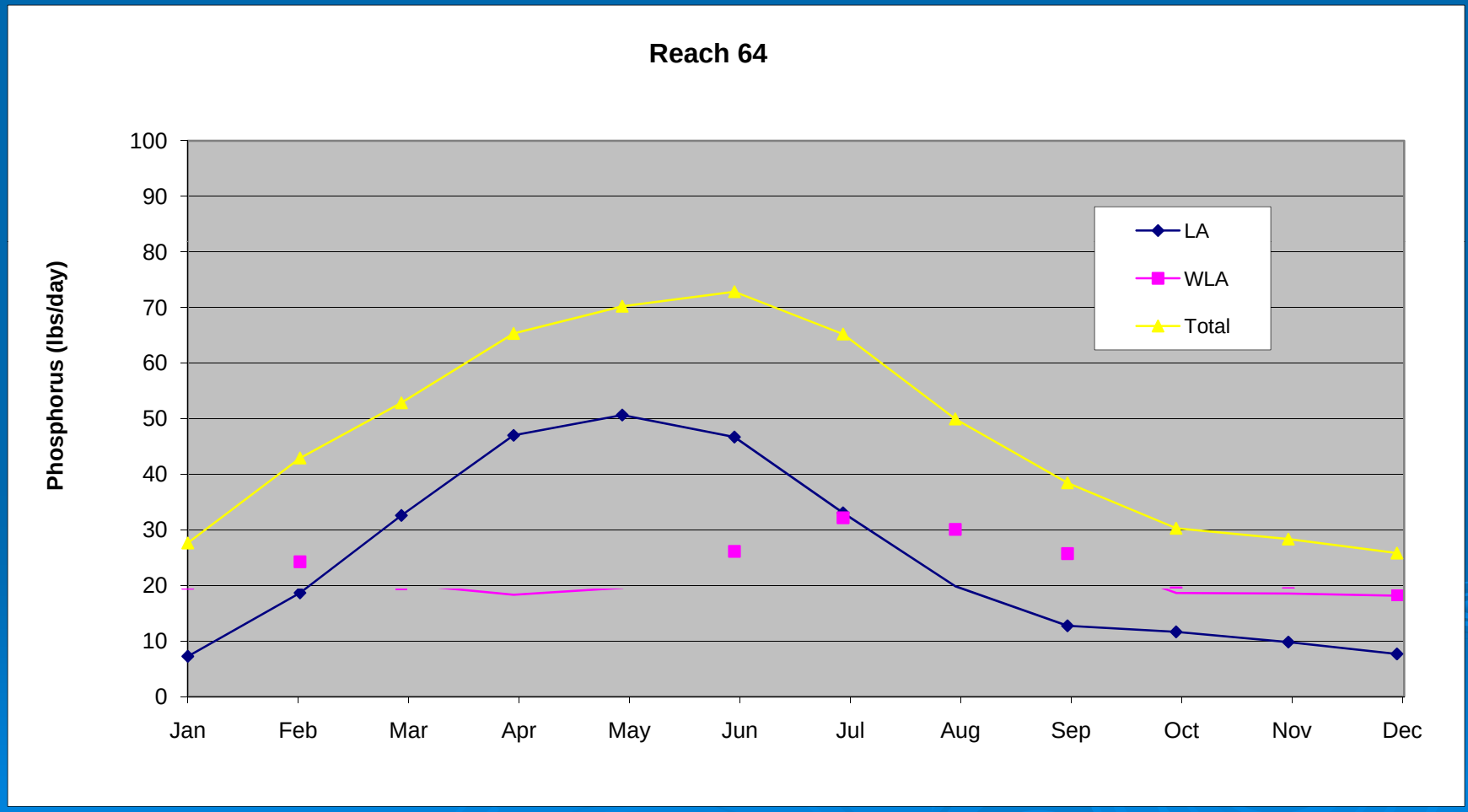
- Submitted by Permittee for Department Approval
- Indentifies credit generator
- Identifies method(s) to be used to generate credits
- Provides site location where credits are generated
- Provides amount of credits that will be generated
- Provides trade ratio for each site and/or management practice.

Key Element: Compliance / Enforcement

Initial Discussions on WPDES Permit Conditions

- WQBELs from Approved TMDL or ch. NR 217
- Limits expressed as Monthly Average/Total
- Effluent monitoring and reporting requirements
- Permit language allowing credits to be used when demonstrating compliance with limits
- Reporting requirements for source and amount of credits acquired
- Certification by permittee that BMPs are in place and effective

Timing of Pollutant Credits



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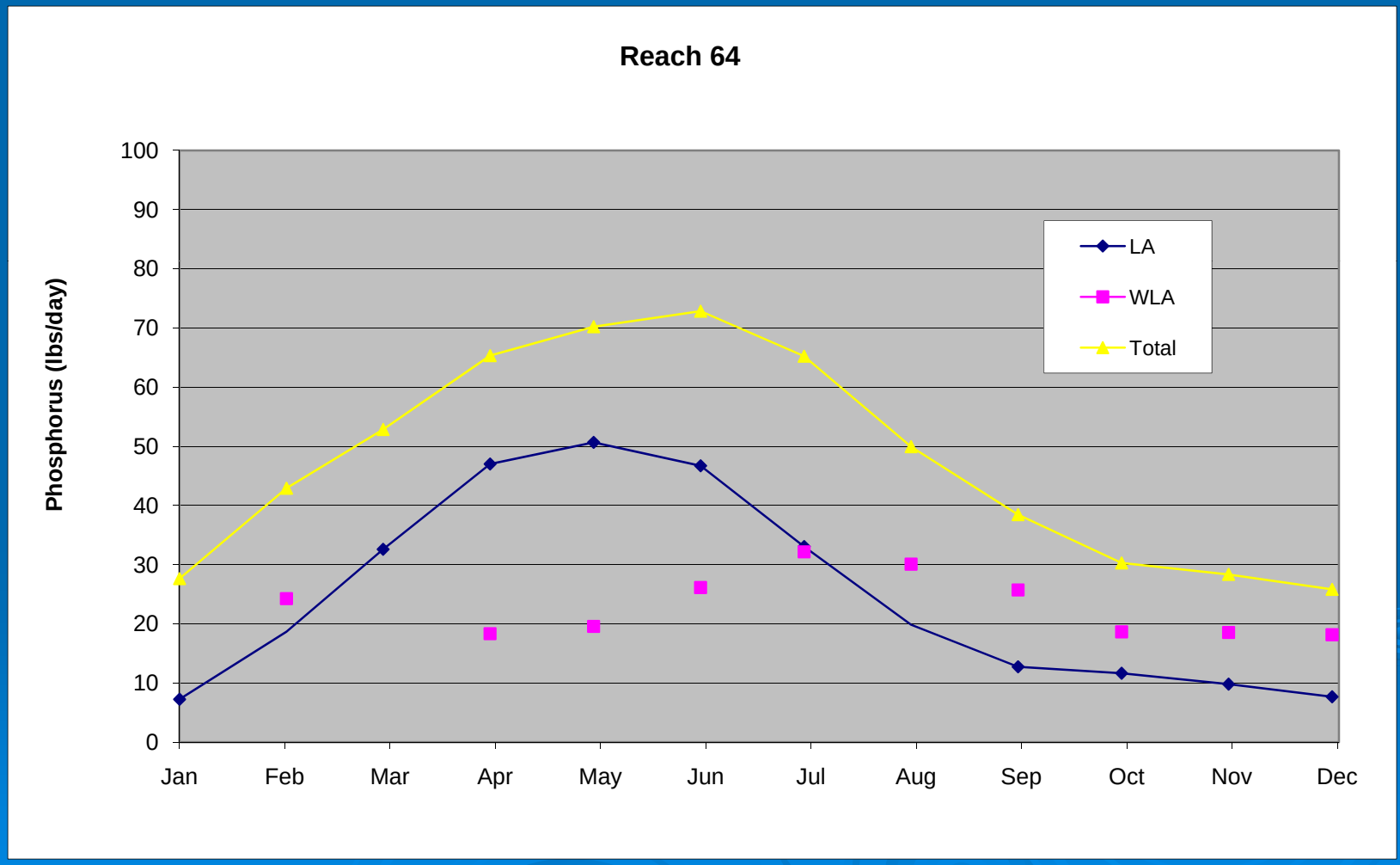

Monitoring / Quantifying credits

- Quantification of credits for nonpoint sources can be obtained from modeling.
  - SNAP-Plus and RUSLE2 for agricultural field practices
  - SLAMM and P-8 for urban practices
- Effluent monitoring for verification of point to point trades.
- Still evaluating the role of in-stream monitoring.

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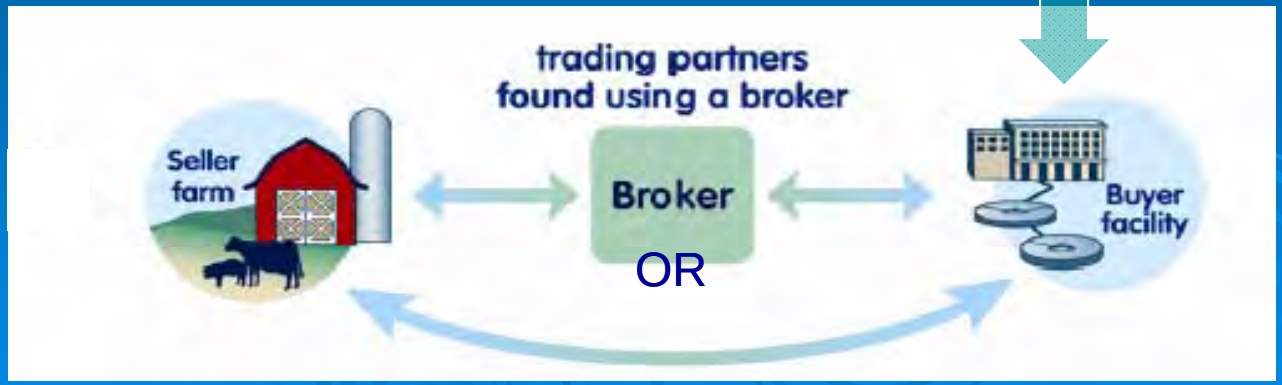
Trade Administration

DNR will deal with the permittee and not be involved in contract negotiation nor anticipates filling the role of a trade broker.

Buyer and Seller may use a contract.

DNR may provide ground rules for brokers and central exchange.

DNR Administration and Enforcement Through permit conditions



Next Steps

- More meetings with report to DNR Board by July 1, 2011
- Follow the webpage for updates: http://fyi.uwex.edu/wqtrading/advisory-committee/
- Questions