James River
Chlorophyll Study

In Response To
Chesapeake Bay TMDL

Talk Outline

- Basis for Chlorophyll a Criteria – Summary of 2005 process
- VA Implementation Since 2005
- Impact of EPA’s TMDL Allocations
- VA WIP/Bay TMDL Process
- Current Status

James River Segments
Existing Chlorophyll a
spring/summer criteria
(ug/l)

Need for Numeric Chlorophyll a Criteria

- James is eutrophic
- High chlorophyll levels
- High and increasing levels of undesirable species
- Unbalanced community composition
- Algal blooms
- James listed as impaired under CWA § 303
- Dissolved oxygen or water clarity criteria not driving nutrient reductions
Virginia Regulations

**Existing Before 2005**
- **Designated Uses** - 9 VAC 25-260-10
  "...balanced, indigenous population of aquatic life..."
- **General Criteria** - 9 VAC 25-260-20
  "...undesirable or nuisance aquatic plant life..."
- **Nutrient Enriched Waters** - 9 VAC 25-260-330
  "...undesirable growths of aquatic plant life in surface waters..."

**Adopted in 2005 for All Bay Waters**
- **Narrative chlorophyll a criterion** - 9 VAC 25-260-185
  "concentrations of chlorophyll a shall not exceed levels...undesirable...unsuitable...ecologically undesirable water conditions..."

**Basis for Chlorophyll a Numeric Criteria**
- **Balance** = Phytoplankton Index of Biotic Integrity (IBI), Diversity Indices
- **Undesirable or nuisance aquatic plant life** = HAB, food quality issues
- **Natural characteristics**
- **Attainability**

**Attainability - Alternatives Analysis**
- **Alternative Loading Scenarios**
- **Levels of chlorophyll**
- **Attainability**
- **Environmental Benefits**

**Alternatives Analysis Example**
Results of Alternatives Analysis

- Staff recommended adjustments to four of the ten criteria
- Criteria will lead to improved water quality
- Move toward better ‘balance’
- Protect from harmful algal blooms
- Believe to be attainable

Public Comment Received (in 2005)

- **Environmental** – must have numerical criteria; prefer the originally proposed criteria or close to the original criteria; no more delays.
- **Citizens** – reflect environmental comments.
- **Regulated** – concerns with scientific basis of criteria particularly in lower James; prefers upward adjustments of criteria; cost too high; benefits not clear or measurable.

DEQ Responses / Conclusions

- There is a need to set numerical criteria in the tidal James River.
- Setting chlorophyll criteria is not as quantitatively precise as the dissolved oxygen or water quality recommendations.
- Attainability can be used to focus in on a criterion value that will remain protective of designated uses based on the available scientific findings.
VA Implementation since 2005

- Non-point source actions taken based on Tributary Strategies
- Point source actions based on nutrient caps adopted by the SWCB adopted in 2005 and included in the Watershed General Permit
- Over $400 million expended for plant upgrades

Impact of EPA TMDL Allocations

- Set nutrient load caps for all river basins throughout Bay watershed
- EPA set cap for James basin much lower than VA had expected when EPA approved chlorophyll standard in 2005
- Impact estimated to add $1-2 billion to nutrient reduction costs
- VA conclusion: let’s make sure first

VA WIP/Bay TMDL Process

- VA Phase I WIP – November 2010
  - Described VA concerns with allocations
  - Outlined need for study of existing chlorophyll criteria and review of modeling framework
  - Presented staged implementation approach for point source discharges in James Basin
- EPA Agreed with approach
  - Included Staged Implementation in Appendix X of Chesapeake Bay TMDL – December 2010
  - Tacit recognition that VA is reviewing chlorophyll criteria

James River Basin Two Track Approach

**Staged Implementation**

- VA Phase I WIP outlines nutrient reduction actions to achieve TMDL Implementation 60% reduction target by 2017
- Additional reductions scheduled after 2017 Phase III WIP

**Scientific Study with Standards Adjustment**

- Conduct 3-4 year additional scientific study to provide more precise and defensible basis for setting chlorophyll standard
- Revise standard/TMDL by 2017, as appropriate
Status: Implementation

- Proposed revisions to Watershed General Permit for wastewater discharges conforms to Bay TMDL
- Comment period ended July 22; presentation to State Water Control Board this fall
- Revised Permit due to be effective January 1, 2012

Status: Scientific Review

- Additional scientific study to provide a more precise and defensible basis for setting final nutrient allocations
- DEQ contracted with VCU to assist in managing study and Science Advisory Panel; first meeting - August 22
- Designing future data collection efforts
- Working to complete detailed work plan for study
- Initiating Rulemaking process – to help ensure schedule is achieved; NOIRA under Executive Review; plan to set up Regulatory Advisory Panel

Questions & Discussion