Iowa Department of Natural Resources

Leading Iowans in caring for our natural resources

Water Quality Bureau

Jon Tack
Water Quality Bureau Chief

Goal: To assist WQB personnel to design and implement Iowa-specific solutions to improve Iowa's waters.

Solutions should be:

Innovative: Nutrient Reduction Strategy, Antidegradation, Revised Chloride standard.

Practical: affordable, economically efficient, i.e. "appropriate and necessary"

Excerpts from
Iowa's Antidegradation Policy

Originally prepared by Larry Bryant, P.E.
IDNR Wastewater Engineering Section

Antideg - What is it?

- What is Antideg?
  - Antideg = Antidegradation
  - A policy required in state (and federal) water quality standards to protect waters from degradation
  - “degradation” = “a decline in the chemical, physical or biological conditions of a surface water as measured on a pollutant-by-pollutant basis”

- The third component of water quality standards
  - Designated Uses
  - Water Quality Criteria (to protect the designated uses)
  - Antideg

Antideg (a “brief” history)

- 1965 - Water Quality Act of 1965 requires states to establish and enforce water quality standards for interstate waters
- 1966 - State of Iowa issues first water quality and effluent standards
- 1968 - Secretary of the Interior Stewart L. Udall issues “non-degradation” statement
- 1971 - Non-degradation statement is incorporated into Iowa’s water quality standards
- 1972 - The Clean Water Act
- 1975 - Antidegradation is included with EPA’s first water quality standards regulations
- 1977 - Iowa replaces non-degradation statement with antidegradation policy
- 1983 - EPA promulgates federal antidegradation policy in its current form
- ~1985 to 1990 - Iowa modifies antidegradation policy
- 2010 - Iowa incorporates (and EPA approves) current antidegradation rule and **implementation procedure** into State water quality standards

42 YEARS

Current Status

- The policy language has remained substantially the same
  - 1968: Maintenance of "waters whose existing quality is better than the established standards" at their existing quality
  - Today: "Where the quality of waters exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained…"
  - 1968: Potential lowering of water quality where "justifiable as a result of necessary economic or social development"
  - Today: "…unless…allowing lower water quality is necessary to accommodate important economic or social development…"

Current Status

- Implementation has dramatically changed
  - Prior to 2010: Only certain water bodies singled out as high quality (mainly cold water trout streams)
  - Today: Current policy applies to all water bodies where quality is better than standards
  - Prior to 2010: Identifiable instances of implementation rare to non-existent
  - Today: Widespread application to all surface waters, with special protection afforded to Outstanding Iowa Waters

Where Does it Apply?

- Any “regulated activity” where a new or increased amount of a “pollutant of concern” will be discharged to a surface water
- Where it does not apply:
  - Actions that will result in neither an increase in in-stream concentration or mass for ANY pollutant of concern
  - Treatment added to a previously unpermitted discharge (e.g., unsewered communities) or newly discovered existing discharges
  - Actions within permitted treatment capacity

Where Does it Apply (Specifically)?

- Operations
  - Chemical additions/changes
  - Significant Industrial Contributor Treatment Agreements
- Construction
  - Increases in design loadings
  - New chemical treatment
- Effluent limits adjustments
  - Increases in effluent limits
- New discharges
  - New facilities or outfalls
  - Relocation of outfalls

What is Required?

- Antideg Alternatives Analysis
  - Comparison of alternatives
    - Base
    - Less-degrading
    - Non-degrading
  - Least degrading reasonable alternative
    - Practicable
    - Economically efficient
    - Affordable
  - Public notice (posted & published locally) with 30-day comment period
  - Copy of notice to **applicable** agencies & interested parties

What is Required?

- Temporary and Limited Determination
  - How long?
  - How much?
  - What pollutants?
  - Long-term water quality benefits?
  - Risk of violating water quality standards?
  - Potential of long-term effects?
- Examples
  - Temporary chemical additions
  - Pilot tests

Least Degrading Reasonable Alternative

- A Reasonable Alternative is:
  - Practicable
  - Economically Efficient
  - Affordable

Is the Alternative Practicable?

- Is it technically feasible?
  - Can it reliably meet effluent or operation permit limitations?
  - Is there a place to put it?
  - Secondary impacts
    - Treatment byproducts/residuals disposal

- Examples:
  - Treatment by membrane filtration without a viable means to dispose of reject stream
  - Wastewater with characteristics unsuitable for land application
  - Site constraints (not enough area available at a given location)

- In general, land availability at one site alone is not enough to rule out a treatment or disposal method though

Is the Alternative Economically Efficient?

- How much does it cost in comparison to the base cost of pollution control?
  - $\text{Economic Efficiency} = \frac{\text{Alternative Cost}}{\text{Base Cost}}$
  - Base cost = cost to protect existing uses and achieve highest statutory and regulatory requirements
  - In other words…the cost of compliance with your discharge/operational permit
  - Alternatives less than 115% of the base cost are presumed to be economically efficient
  - Alternatives greater than 115% should be considered if implementation will produce a substantial improvement in the discharge

- Examples
  - Treatment system and surface discharge = $0.5M. Land application (non-degrading) = $1M (200%). Land application is not economically efficient.
  - If land application alternative = $0.575M (115%)? $0.585M (117%)?

Is the Alternative Affordable?

- Affordability evaluation not required for alternatives which are not practicable or economically efficient
- No universal procedure
- Guidance
  - EPA Interim Economic Guidance for Water Quality Standards
  - Disadvantaged community rule
- Criteria (non-binding)
  - Public
    - Household cost/MHI
    - Unemployment rate
    - Bond rating
  - Private
    - Profit
    - Liquidity
    - Solvency
    - Leverage

FAQs

- Pollutants of Concern
  - What is a pollutant of concern?
    - "pollutants which are reasonably expected to be present in the discharge and may reasonably be expected to negatively affect the beneficial uses of the receiving water"
    - All things that have a numeric water quality criterion
      - Ammonia, chloride, sulfate, E. coli, metals, etc., etc.
    - Some things that do not have criteria (but are known to have potential effects)
      - Total nitrogen, phosphorus, proprietary chemicals with known toxicity (e.g., polymers)
  - What is <u>not</u> a pollutant of concern?

FAQs

- What is a regulated activity?
  - "any activity that requires a permit or a water quality certification pursuant to the following federal laws: 1) CWA § 402 NPDES permits, 2) CWA § 404 dredge and fill permits, 3) any activity requiring a CWA § 401 certification.
  - Basically, anything covered under the Clean Water Act
  - Mostly…point source discharges covered under an NPDES permit

FAQs

- Treatment Chemicals
  - Do new chemical additions require antideg?
    - Most of the time…yes
  - Do changes in chemical types require antideg?
    - Most of the time…yes
    - No if the chemicals are identical (change in brand name/supplier)

De Minimis

Issues to consider:

- One of the most common grounds for legal challenge
- Requires the determination of, at a minimum:
  - Assimilative capacity of stream.
  - Percent decrease in assimilative capacity.
  - Justify percent decrease treated as de minimis.
  - Consider cumulative effects.
  - Account for variations in toxicity.

De minimis exceptions are normally applicable to increases in load rather than the addition of a new pollutant/chemical.

Justification of decreases in water quality vs. justification of increases in pollutant discharge (Iowa method).

FAQs

- Contacts/resources
  - Who should I talk to about antideg?
    - Your NPDES permit writer
    - Your DNR construction permit reviewer
  - Where can I go to find out more?
    - http://www.iowadnr.gov/InsideDNR/RegulatoryWater/WaterQualityStandards/Antidegradation.aspx

Iowa Nutrient Reduction Strategy

May 29, 2013

Nutrients and Water Quality

• Nutrient over-enrichment is creating problems for recreation, drinking water and aquatic life.

– *Big Creek Lake (Polk Co.)*
Recreation

– *Lake Rathbun (Appanoose Co.)*
Drinking Water Supply

– *Middle Fork of South Beaver Creek (Grundy Co.)*
Aquatic Life

– *Gulf of Mexico Hypoxia*

Why this strategy?

– Excessive nutrients can cause water quality problems
  - In state
  - Downstream

– Numeric nutrient criteria development presents challenging problems
  - No definitive cause & effect relationship

– Tough for Iowa to apply numeric nutrient criteria
  - Difficult to comply with permit limits and costly to try
  - 10 years of new, more stringent WQ –based regs (rebuttable presumption, antideg, chloride, etc)

– A different approach needed

PS and NPS Common Threads

– Acknowledgement of the problem

– Recognition that traditional approaches are not workable (e.g. cost, technically)

– Willingness to want to do something now to make Progress

– Needs to be practical in its implementation

PS/NPS Collaboration

- Nonpoint sources
  - 41% reduction of statewide N load
  - 29% reduction of statewide P load
- Point sources
  - 4% reduction of statewide N load
  - 16% reduction of statewide P load
- **Combined 45% N and P reductions**

Iowa Strategy General Approach

1) Achieve nutrient load reductions through technology-based actions, while

2) Continuing to assess and evaluate the nutrient water quality standards

Point Source Strategy

- In Iowa point sources contribute 8% of the TN and 20% of the TP

- Point sources can have greater impacts at low flows and certain Watersheds

- Working closely with CWA regulated community

- Use existing rules (Chapter 567 IAC Chapter 62)

- Use technology-based limits in lieu of nutrient criteria
  - Limits based on the effect of the pollutant in the water and feasibility and reasonableness of treating such pollutant

Point Source Strategy

Focus on:

- **99** major municipal wastewater treatment plants
- **29** major industries (10 of which have nutrients)
- **17** minor industries with biological treatment for process waste
- **Total of 145 (130 expected to have sig. nutrient loads)**

For major POTWs:

- Treat more than 1 million gallons of wastewater a day
- Handle **80 percent** of all municipal wastewater
- Provide wastewater treatment for **55-60 percent of Iowa's population**

Implementation Details

- Submit feasibility and planning study within two years
- DNR reviews study
- Negotiate Construction schedule
- Amend permit to incorporate the schedule
- Limits incorporated in permit following one year performance evaluation
- Implementation Flexibilities for Point Sources
  - Regulatory certainty – 10 year assurance
  - Economic Considerations
  - Ability to fine tune
  - Annual average permit limits

Progress g to Date on Point Source Side

- 54 NPDES Permits issued with studies to date; goal is 20/year
- 1st set of feasibility studies due this September
- Facilities beginning to submit schedules to install BNR

Potentional 2/3 to 3/4 reduction in nutrient loading from Point sources

Who You Can Contact

Wastewater Engineering Section

- Construction Permit Writer
- WES Section Supervisor: Satya Chennupati 515-725-8436

NPDES Permits Section

- NPDES Permit Writer
- NPDES Section Supervisor: Eric Wiklund 515-725-0313

Water Quality Bureau Chief: Jon Tack 515-725-8401

Wasteload Allocations: Connie Dou 515-725-8400

Iowa Department of Natural Resources

Leading Iowans in caring for our natural resources