Protecting the Aquatic Environment
Water Quality Standards
Triennial Review – July 2007

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Water Quality Standards
The Foundation of Protection

- Antidegradation Policy – Requires Minimal Decreases in Water Quality
  - Category I [No Discharge Allowed]
  - Category II [Discharge only at Background]
  - Level I and Level II Evaluations
- Beneficial Use – Classifications of Levels of Protection
  - 1C Domestic Purposes
    - Protected for use as a raw water source for domestic water systems.
  - 3A Cold Water Fishery
- Numeric Criteria – Numbers that Define the Beneficial Uses
  - 50 ug/l Selenium – 1C
  - 4.6 ug/l Selenium Chronic – 3A
- Narrative Criteria - Narrative that Defines the Beneficial Uses
  - "become offensive"
  - "undesirable physiological responses"

Rule R317-2.
Standards of Quality for Waters of the State

- Statement of Intent
  - Pollution is:
    - A menace to public health and welfare
    - Creates public nuisances
    - Harmful to wildlife, fish and aquatic life
    - Impairs best interests of the State and its policy to conserve water resources

Rule R317-2.
Standards of Quality for Waters of the State

- Statement of Intent
  - Policy is:
    - Conserve the waters of the State
    - Protect, maintain, and improve the quality for:
      - Public water supplies
      - Propagation of wildlife, fish and aquatic wildlife
      - Agricultural, industrial, & recreational uses
    - Discharges to be treated to protect the uses
    - Prevention, abatement, and control of pollution
    - Eliminate pollution which creates public health hazards
    - Insure due consideration of financial problems imposed upon polluters.
    - Cooperate with other agencies

Rule R317-2.
Standards of Quality for Waters of the State

- Scope
  - Apply to all waters of the state
    - Crossing the property line
  - Assigned to specific water through the classification procedures

Rule R317-2.
Standards of Quality for Waters of the State

- Antidegradation Policy
  - Maintenance of Water Quality
  - High Quality Waters – Category I
  - High Quality Waters – Category II
  - Other waters
    - Activities subject to antidegradation review
      - 401 – FERC [Dams, pipelines]
      - 401 – UPDES Permits [WWTP, Industrial Discharges]
      - 404 – Corps of Engineers [Wetlands]
      - As determined by Executive Secretary of WQB

Antidegradation Policy: Category 1: UPDES Permits not Allowed

- R317-2-12. High Quality Waters.

- 12.1 High Quality Waters - Category 1.
- In addition to assigned use classes, the following surface waters of the State are hereby designated as High Quality Waters - Category 1:
- a. All surface waters geographically located within the outer boundaries of U.S. National Forests whether on public or private lands with the following exceptions:
- All High Quality Waters - Category 2 as listed in R317-2-12.2.
- Weber River, a tributary to the Great Salt Lake, in the Weber River Drainage from Uintah to Mountain Green.
- b. Other surface waters, which may include segments within U.S. National Forests as follows:
- 1. Colorado River Drainage
- Calf Creek and tributaries, from confluence with Escalante River to headwaters.
- Sand Creek and tributaries, from confluence with Escalante River to headwaters.
- Mamie Creek and tributaries, from confluence with Escalante River to headwaters.
- Deer Creek and tributaries, from confluence with Boulder Creek to headwaters (Garfield County).
- Indian Creek and tributaries, through Newspaper Rock State Park to headwaters.

Rule R317-2.
Standards of Quality for Waters of the State

- High Quality Waters - Category I
  - U.S. Forests (within the outer boundaries)
  - Other designated waters
- High Quality Waters - Category II
  - Discharge at background
    - Electric Lake
    - Deer Creek (4800 ft. upstream from forest boundary)
    - 80th percentile
- [Other waters (silent)].


Electric Lake

Rule R317-2. Standards of Quality for Waters of the State

- Levels of Antidegradation Review
  - Level I
    - Mathematical Determinations (Off-ramps)
      - 11 Categories
        - » e.g., … for discharge permit renewals, if the increase in project loading over the prior permit is less than 20%
  - Level II
    - 8 Requirements in the Review
    - You may not be allowed to “pollute up to the standard”

$$d_o = \frac{(h_o \cdot f + h_s \cdot f)}{h_s}$$

Where:

d_o = distance from object to lens

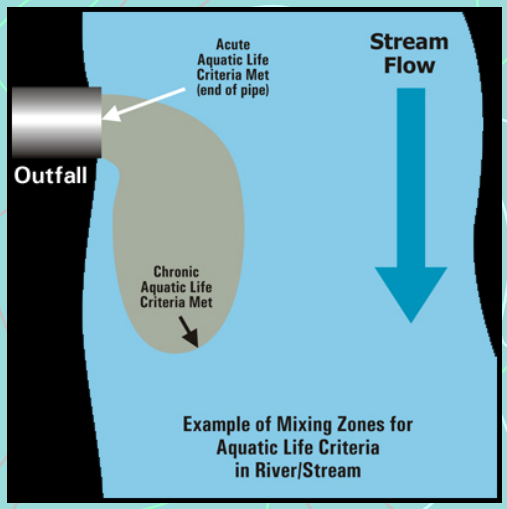
h_o = height of object

f = focal length

h_s = height of image sensor

Rule R317-2.
Standards of Quality for Waters of the State

- Colorado River Salinity Standards
- Mixing Zones
  - Acute mixing zone: Acute standard to be met
    - 50% of river or 15 minutes downstream
  - Chronic mixing zone: Chronic standard to be met
    - 2,500 feet downstream
  - Individual mixing zone: 7 Factors



Rule R317-2.
Standards of Quality for Waters of the State

- Classifications: p. 11-43
  - According to river basin and segments
  - Multiple classifications
- Unclassified Waters
  - Default: 2B, 3D

Rule R317-2.
Standards of Quality for Waters of the State

- General Classifications
  - Class 1: Protected for Raw Water Drinking Source
  - Class 2: Protected for Contact Recreation
  - Class 3: Protected for use by Aquatic Wildlife
  - Class 4: Protected for Agriculture/Stock Watering
  - Class 5: Protected for contact recreation, aquatic wildlife, and mineral extraction [Great Salt Lake]

Rule R317-2.
Standards of Quality for Waters of the State

- More Detail: Use Classifications
  - 1C: Treatable drinking water sources
  - 2A: Primary contact recreation
  - 2B: Secondary contact recreation
  - 3A: Cold water game fisheries, food chain
  - 3B: Warm water game fisheries, food chain
  - 3C: Non-game fisheries, food chain
  - 3D: Waterfowl, shore birds, food chain
  - 3E: Severely habitat-limited. Narrative standards, drainage ditches
  - 4: Agricultural: Irrigation, stock watering.
  - 5: Great Salt Lake: Recreation, waterfowl, food chain, mineral extraction

Rule R317-2.
Standards of Quality for Waters of the State

R317-2-13. Classification of Waters of the State (see R317-2-6).

13.1 Upper Colorado River Basin

a. Colorado River Drainage

Ferron Creek and tributaries,
from Millsite Reservoir to headwaters: 1C 2B 3A 4

Beneficial Uses:
Protecting Public Water Supplies – 1C

Deer Creek Reservoir

Beneficial Uses: Protecting Recreation – 2A, 2B

Swimming

Boating

Beneficial Uses: Protecting Aquatic Wildlife – 3A…3E

A male brook trout in its fall spawning colors is a magnificent creature.

Game Fish &
Non-Game Fish

Waterfowl &
Shore birds

Beneficial Uses:
Protecting Agricultural Irrigation – Class 4

Beneficial Uses:
The Great Salt Lake - 5

Rule R317-2.
Standards of Quality for Waters of the State

- Application of Standards
  - Numeric criteria to be assigned to use classifications
  - Unlawful to:
    - Interfere with uses protected by classes
    - Cause standards to be violated
- Narrative Standards
  - Unlawful to:
    - … offensive, unnatural deposits, floating debris, oil
    - … nuisances, color, taste, odor
    - … undesirable physiological responses in fish or other wildlife
    - … undesirable human health effects

Rule R317-2.
Standards of Quality for Waters of the State

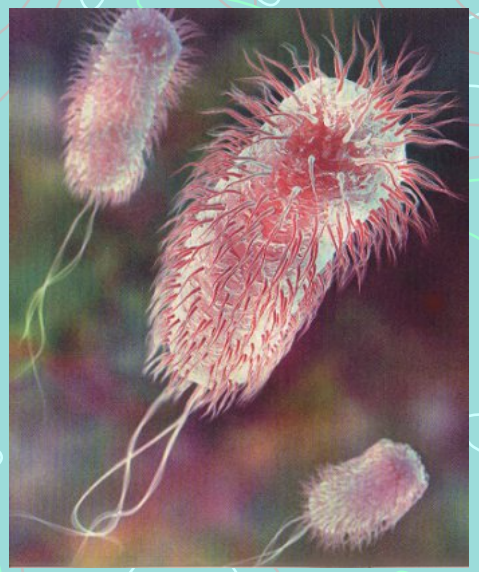
- Narrative Standards
  - Illegal to Pollute
    - "become offensive"
    - Tires in a River
    - Oil Slicks
  - "undesirable physiological responses"
    - Nuisance Algal Growth
    - Phosphorus Laden Rocks for Fill

Rule R317-2.
Standards of Quality for Waters of the State

- Protection of Downstream Uses
- Intermittent Waters
  - Unusually high or unusually low
    - Not cause for action against dischargers
- Laboratory Analyses
  - Procedures approved by Division of Water Quality
  - Performed by:
    - Office of the State Health Laboratory
    - Laboratories certified by the Utah Department of Health

Numeric Criteria: 1C Designation

- E. coli
  - 126 per 100 ml to protect designated swimming areas [primary recreation]
  - 206 per 100 ml to protect for surface drinking water sources and secondary recreation
  - 30 day geometric mean
  - E. coli 940 per 100 ml as a maximum not to exceed.



Methodologies: Class 1C

- E. coli: 206 organisms per 100 ml.
  - Utilization of Quanti-Tray 2000 technology

Presence or Absence

MPN

Rule R317-2.
Standards of Quality for Waters of the State

- Numeric Criteria
  - Domestic, recreation, agricultural uses
    - By classification
    - Numeric criteria
      - » Se [chronic], 4.6 ug/l
    - Footnotes
      - Site specific standards
  - Aquatic wildlife

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Standards of Quality for Waters of the State

- Toxics Criteria for Protection of Human Health
  - Consumption by humans
    - Water only
    - Water and Organisms

Identified Issues of Concern
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Issues: Antidegradation

- Level I procedures allow “pollution creep” from permit renewal to renewal
- Confusion between a Level I and Level II review.
- Excluding all but 3A and 3B waters is arbitrary and improper
- Too many off-ramps
- Excluding all but 3A and 3B waters is arbitrary and improper

Issues: TDS Criteria

- Should the current two level TDS standard be maintained:
  - 1,200 mg/l for irrigated crops
  - 2,000 mg/l for stock-watering
- Rule is confusing in that there are two standards for the same classification (Class 4 Agriculture)
- Removing the 2,000 mg/l could affect de-icing our highways
- The maximum not to exceed value should not be eliminated, but strengthened.

Issues: Recreation Use Defination and Criteria

- E. coli criteria
  - Elimination of maximum value
- Establish numeric criteria for viruses, antibiotics and other exotic pollutants
- How do you determine the difference between Primary and Secondary Recreation [full-face immersion when water-skiing or rafting].
- There should be better definition of “wildlife areas”

Issues: Site Specific Criteria - Dissolved Oxygen

- The site specific standard for the Jordan River and the Surplus Canal should be eliminated.
- Standard should reflect diurnal variability.

Issues: Mixing Zones

- Prohibit mixing zones where there are endangered species
- Mixing zone size is excessive

Issues: Other

- Define Assessment Methodologies
- Define Use Attainability Analysis Process
- Wetlands Criteria
- Develop Nutrient Standards [phosphorus & nitrogen]
- Develop Biological Standard
- Tighten the narrative standard to be more specific
- Clean-up some classifications
- Better define temporary impacts
- Re-evaluate Standards for lakes & reservoirs
- Great Salt Lake Beneficial Use and Criteria

Strange creature in the Great Salt Lake found at 7 meters in 13 mg/l H2S [rotten egg gas]

Reported to be found by: Theron Miller, Ph.D.