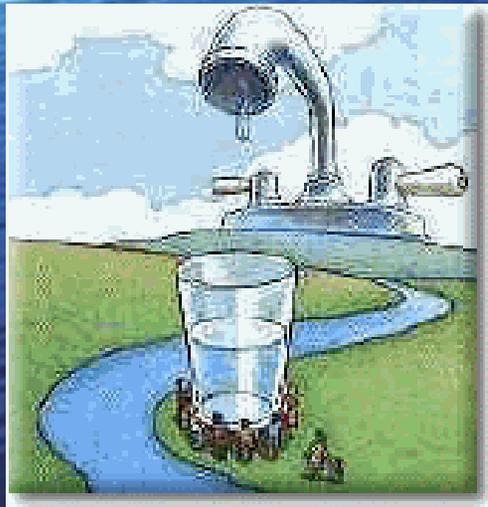


Water Quality Standards Triennial Review – Nov 2002

Utah Division of Water Quality
Salt Lake City, Utah



Protecting our Drinking
Water Sources and the
Aquatic Environment

Dec 2, 2002

Fn3-Screen Switch



Brook Trout

Salvelinus fontinalis

Utah Water Quality Standards

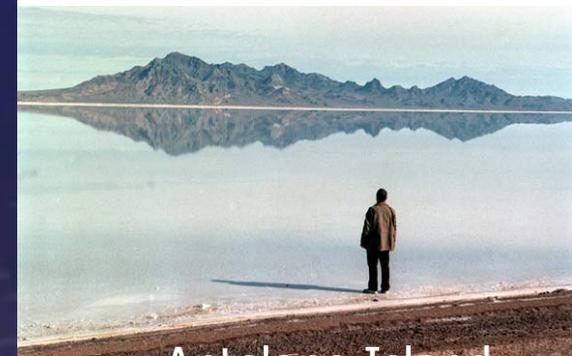
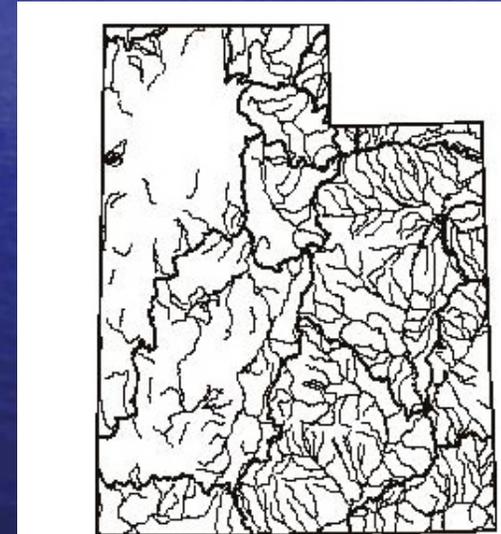
- Four Major Areas of Regulation
 - Beneficial/Designated Uses
 - Narrative Criteria
 - Numeric Standards
 - Antidegradation Policy & Implementation



Sunrise over the Great Salt Lake

Antidegradation Policy

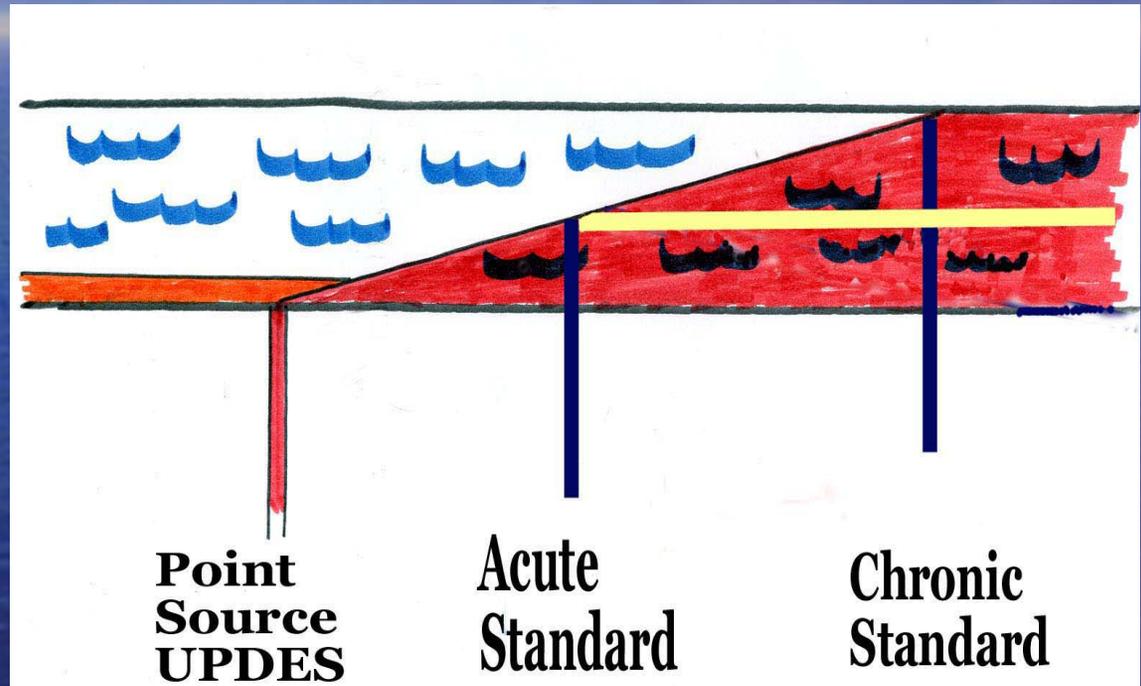
- Adding an Antidegradation Review (ADR) Policy/Procedure for **all waters Statewide**
- Addresses the remaining “assimilative capacity” of a receiving water
 - Assimilative Capacity =
(Standard – current concentration)
- Moving away from “polluting up to the standard”
- ADR Procedure Consists of:
 - Preliminary Screening – Waiver
 - ADR Review



Antelope Island

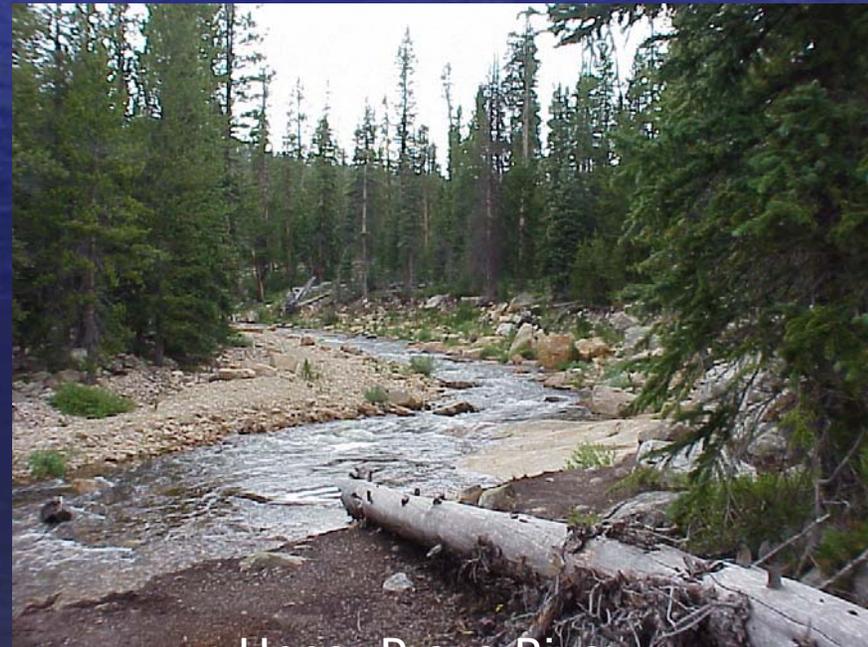
Antidegradation Policy & the Mixing Zone

- Acute Std
 - 50%
 - 15 Minutes
- Chronic Std
 - 2500 Ft.
- What % of the remaining assimilative capacity should be protected?



Antidegradation Policy

- Removal of Category III from the Antidegradation Policy
 - Provo River [Murdock Diversion to Headwaters]
- Focus on:
 - FERC [Hydro Plants],
 - UPDES Permits (402),
 - Corps of Engineers Wetlands (404), and
 - As directed by Exec. Sec.



Upper Provo River

Review of Stream Classifications

- 1C - Drinking Water Sources
- 2A – Primary Recreation (Swimming)
- 2B – Secondary Recreation (Boating)
- **3A – Cold Water Fishery***
- **3B – Warm Water Fishery***
- 3C – Non-game Fishery
- 3D – Waterfowl, Shore Birds
- 3E – Severely Habitat-Limited-Waters
- 4 - Agricultural
- 5 - Great Salt Lake

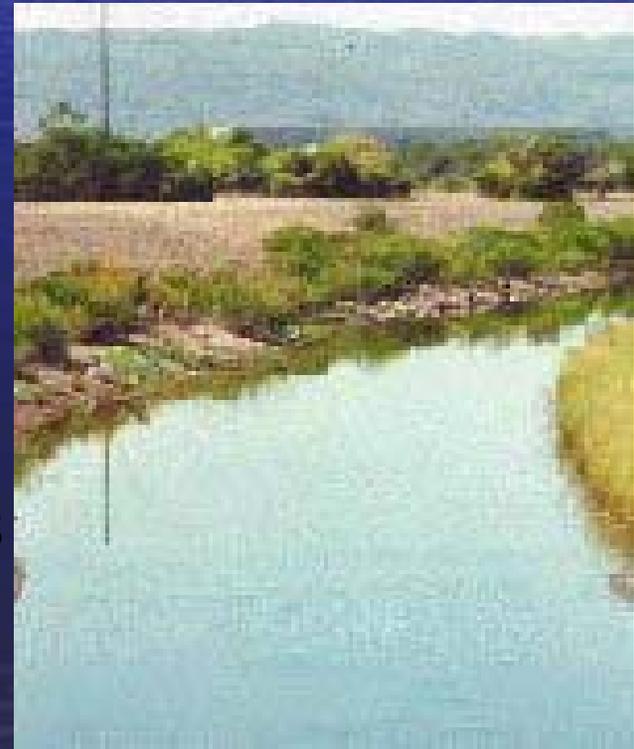


[* 80.4% of all Surface Waters

ADR Not Required

(unless ordered by Executive Secretary)

- If an affected water is classified:
 - 3C (Non-game fishery) or 3D (Waterfowl, Shore Birds)
 - And is not classified 3A or 3B also
 - 3E (Severely Habitat-Limited-Waters)
 - 4 (Agriculture)
 - And has no other classifications



ADR Not Required

(unless ordered by Executive Secretary)

- Review not required when other agencies do equivalent review.
 - Corps of Engineers
 - Wetlands 404 Permits
 - Federal Energy Regulatory Commission – FERC
 - Hydro Plants, Gas Lines



ELECTRIC | GAS | HYDRO | OIL

ADR Not Required

(unless ordered by Executive Secretary)

- Temporary impacts from sediments/turbidity where fish spawning is not occurring
 - Length of time
 - % change in background concentration
 - Long term benefits
 - Residual long term detriment
 - Discussions with DWR as appropriate
- No increase in concentration nor loading from existing UPDES permits



Stream Protection Structures

ADR Not Required

(unless ordered by Executive Secretary)

- Currently on 303d (parameter)
 - The assimilative capacity of the stream has been exceeded.
 - Issue handled by other programs: UPDES, TMDL
- Minor impacts
 - New & Existing Projects
 - Loading \leq 20% increase over prior limit
 - Loading \leq 20% over background



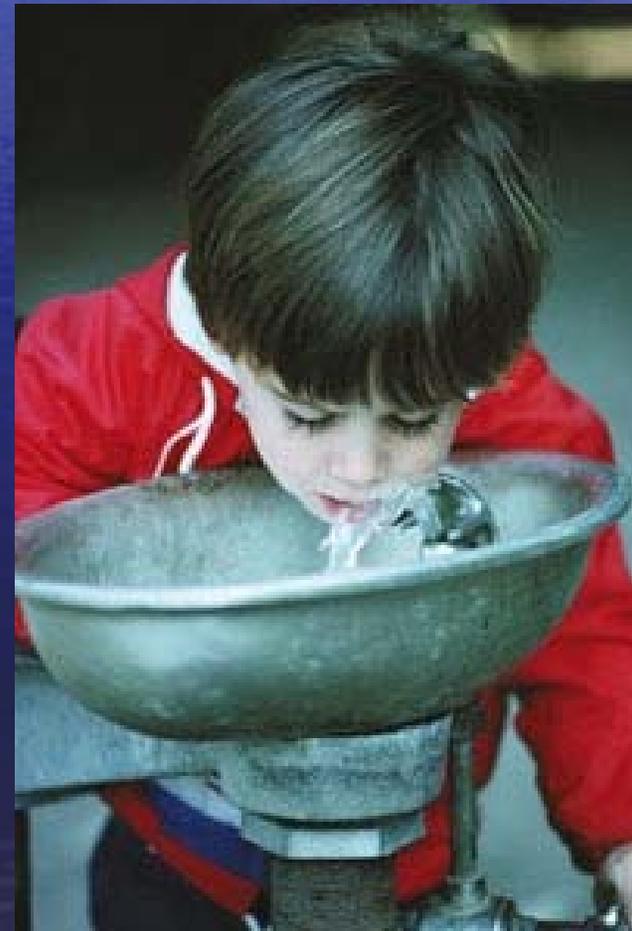
ADR Required

- Those failing preliminary review - waiver
- Those requested by the Exec. Secretary, at his discretion, e.g.,
 - 1C Waters
 - Blue Ribbon Fisheries
 - Special Wetland Areas, Etc.
 - Threatened & Endangered Species



Any water may be ordered to have an Antidegradation Review

- e.g., Water classified as 1C may require a ADR as directed by the Executive Secretary.
 - Location / Proximity to drinking water diversions
 - In consultation with Division of Drinking Water and other agencies and stakeholders



Antidegradation Review Requirements

- Higher levels of treatment
 - Suspended solids removal
 - More Disinfection, UV
- Alternative treatment options
- Specific contaminant removal
- Monitoring
 - Giardia, Cryptosporidium, viruses
- Connection to other facilities
- Reduce size of project
- Pollutant trading
- Total/Partial containment
- Etc.



Disinfection by
Ultraviolet Radiation

Antidegradation Review Requirements

- No violation of WQS
- Existing uses maintained/protected
- Verify economic and social importance
 - Enhance employment
 - Increased community tax base
 - Correction of environmental/health problems



Geese Coming Up Off of
Farmington Bay

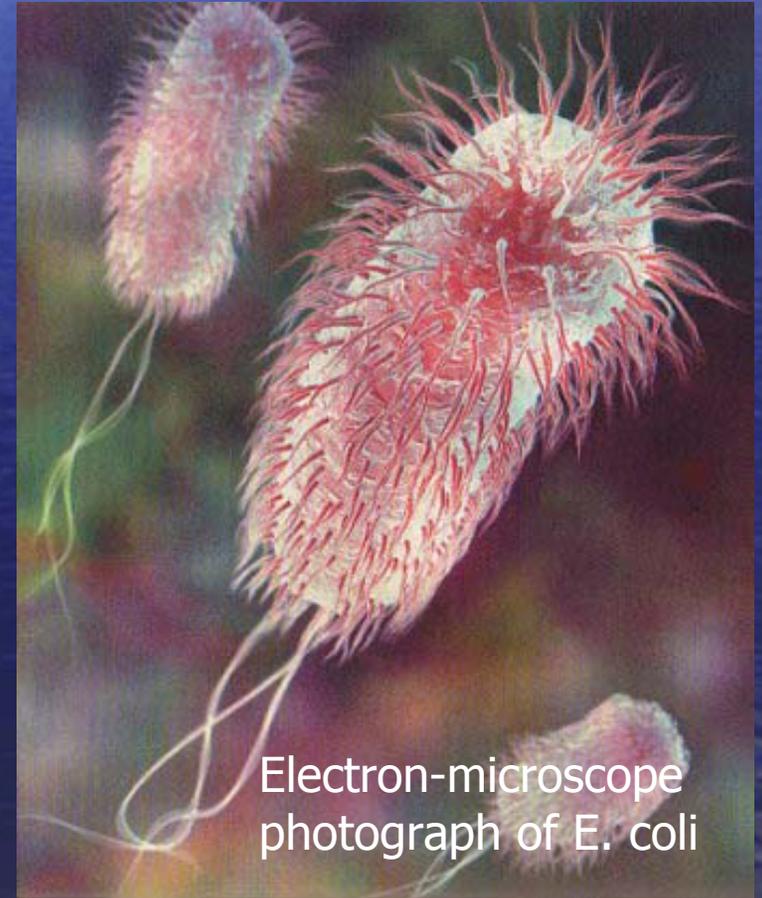
ADR Review Procedure

- When a Project Needs an ADR
 - Applicant Meets with DWQ
 - Develop Information Jointly
 - Public/Agencies Invited to Comment
 - Preliminary Approval
 - Public Notice
 - Formal DWQ Approval
- Questions/Discussion



Bacteria [Ambient Waters]

- EPA “high priority item” to move from Coliform bacteria to to **E. coli**.
- More than 17 states have “switched”
- Geometric mean
 - Should be 5 samples
- Implementation Date:
 - June 1, 2003



Electron-microscope
photograph of E. coli

Bacteria [Ambient Waters]

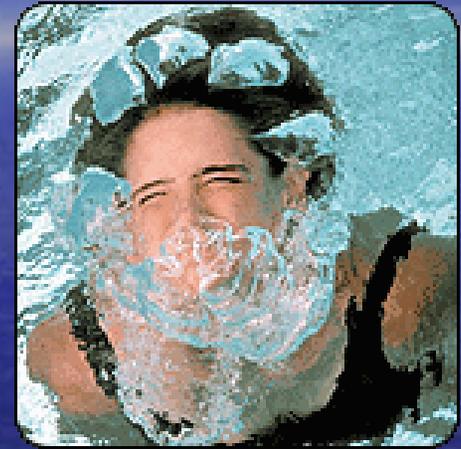
- Why the change for this human health indicator?
 - Coliforms are ubiquitous in the environment
 - E. coli is a more host specific indicator (mammal)
 - E. coli contamination has good correlation with human illness whereas coliforms do not
 - New laboratory technology in the 1980's
 - New field method technology in 2002
 - 6 Hour holding period



Laboratory & Field Methods

Bacteria [Ambient Waters]

- Proposed Standards:
 - 126 organisms per 100 ml [8 illness per 1000 persons] for drinking water sources and primary & secondary recreation waters
 - The 126 applies to waters which are designated swimming waters, or which are heavily used for swimming. Other waters which are not so designated or which are infrequently or incidentally used for full body contact, the standard is 548 organisms per 100 ml
 - Based upon risk factors



E. coli Testing – New Field Method

- Add reagent to sample bottle and then pour into “tray”.
- Seal tray in Sealer



E. Coli Testing – New Field Method

- Incubate for 24 hours @ 35 deg. C.
- Count wells and refer to MPN Table
- Total Coliform = **Yellow**
- E. coli = Blue under Ultraviolet Light
- 23.9 Bacteria per 100 ml of sample



Bacteria [Point Source & Nonpoint Source Compliance Monitoring]

- Possible Application
 - 10 Samples Above Source
 - 10 Samples Below Source
 - Calculate Increase % Because of Source
 - Apply Significance Test
 - Apply Narrative or Numeric Standard for Compliance



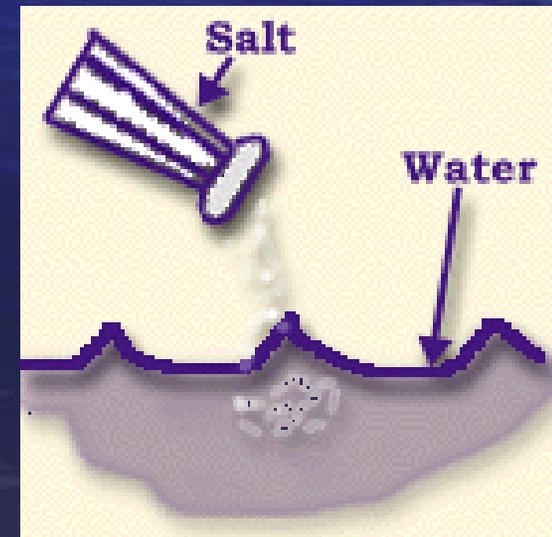
Bacteria [Compliance Monitoring]

- Many states using *E. coli* for WWTP reporting with “tacit” EPA approval (no objection).
- Current DWQ Policy: WWTP to remain with Fecal Coliform until formal EPA approval for NPDES programs nationwide.
- Questions/Discussion



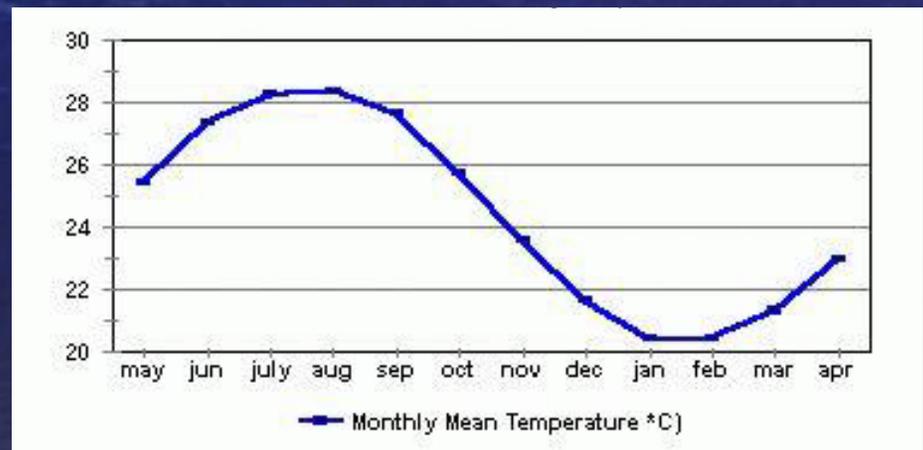
Total Dissolved Solids

- Add 2,000 mg/l for stock watering (Class 4)
- Total Dissolved Solids (TDS) standards will be background concentration where it can be shown that natural or un-alterable conditions prevent its attainment.



Temperature

- Temperature standard shall be at background where it can be shown that natural or un-alterable conditions prevent its attainment.



Metals Standards Revision

- Equations from EPA have been changed with new toxicological information
- For the most part, more stringent
- Waters with a hardness of 400 mg/l as CaCO_3 or more calculated as if at 400 mg/l



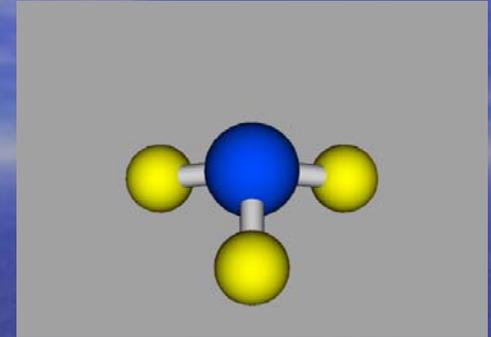
Acid Mine Drainage

Total Suspended Solids Indicator

- Eliminated

Ammonia Standards Revision

- Temperature component eliminated for acute
- Includes a component for “early life forms”
- Generally less stringent
 - Some areas more stringent

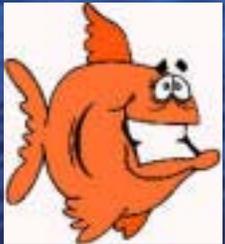


Ammonia – NH₃



Fish Fry with Egg Yolk Attached

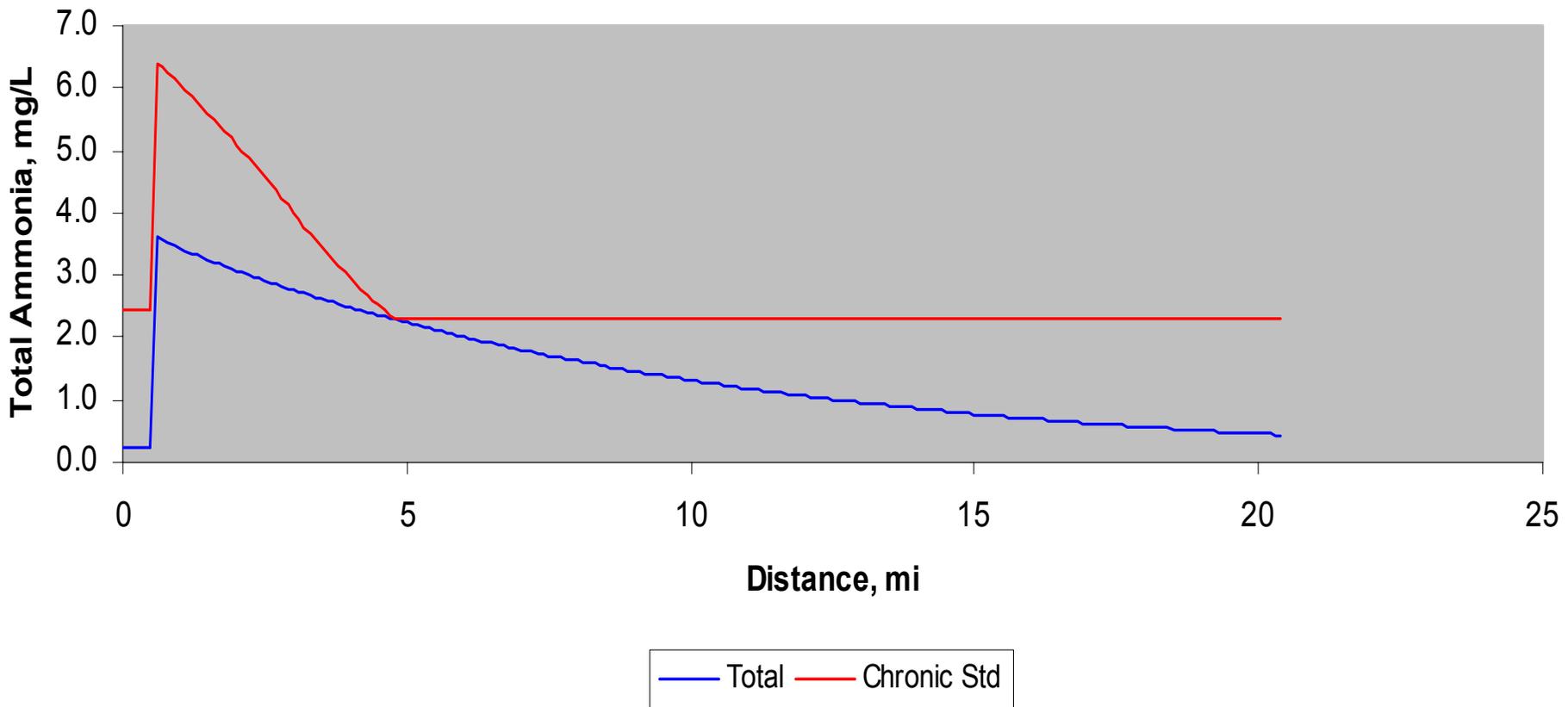
True Meaning of "Fish Fry"



Oh no! Don't eat me!

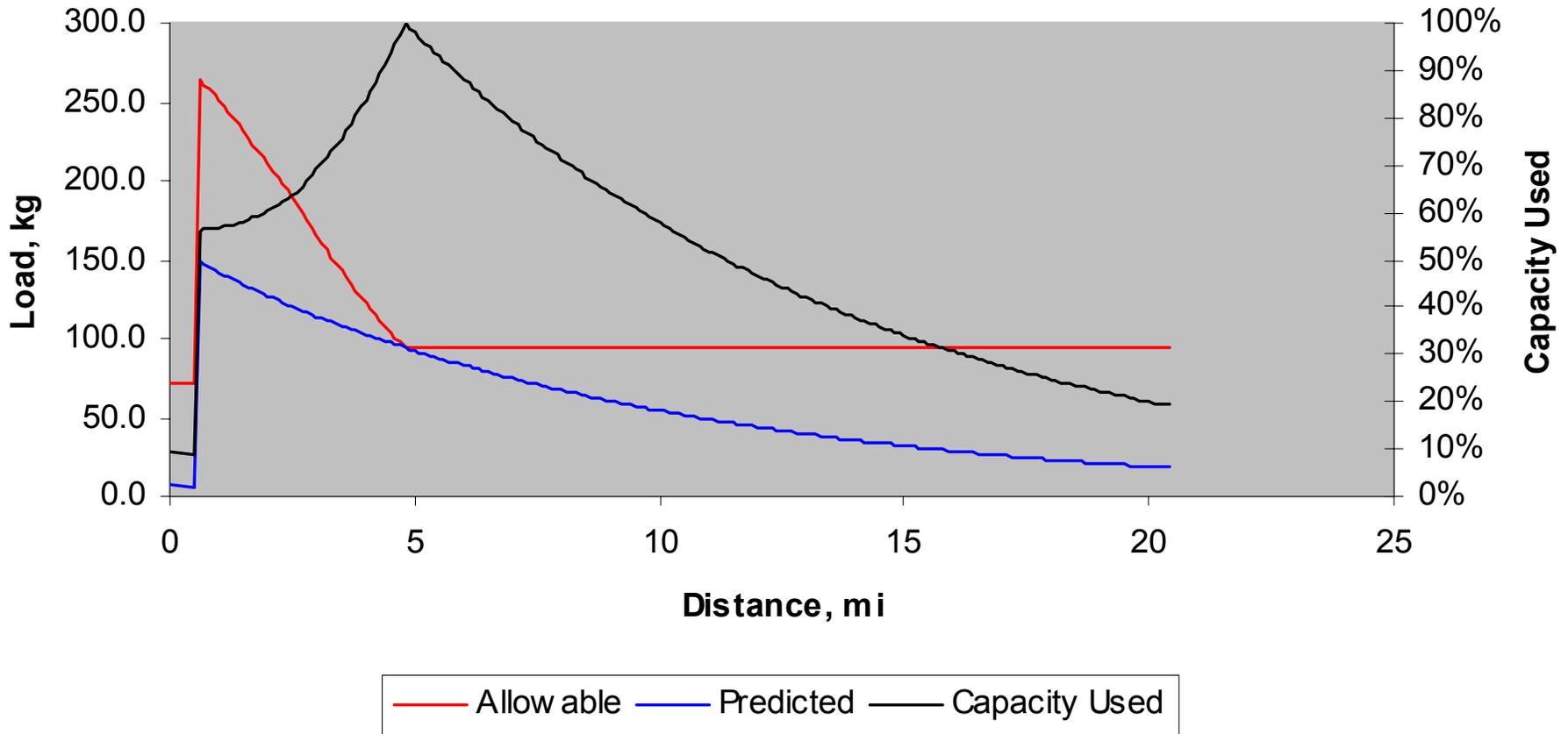
AMMTOX - pH Rebound causes less stringent Permit Limits

Chronic conditions



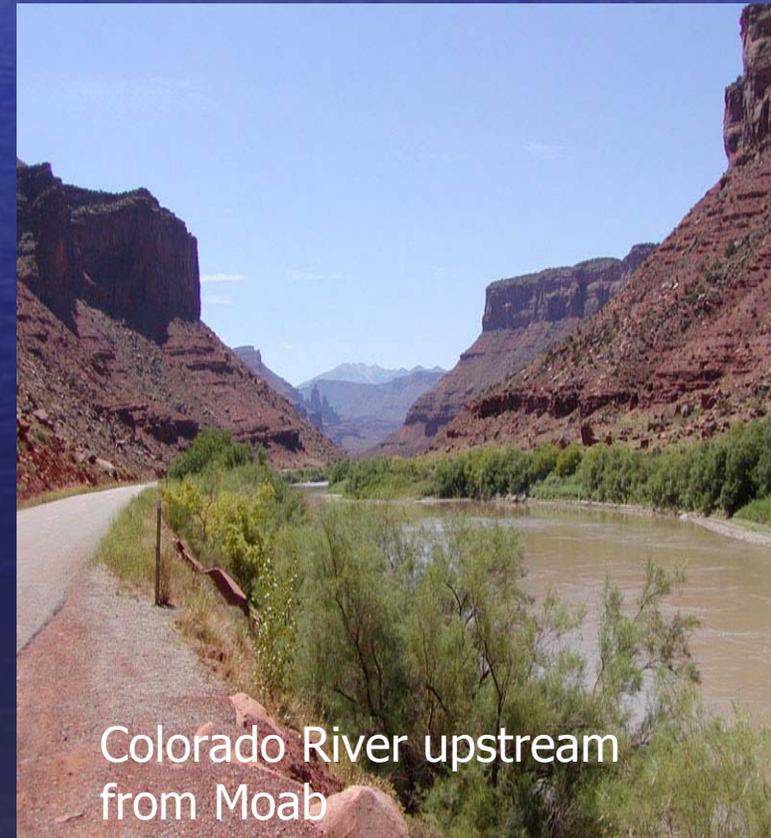
AMMTOX – Calculations allow for ADR considerations in “Capacity Used”.

Chronic conditions



Minor Changes

- Incorporating Colorado River Salinity Revisions to our rules.
 - 1 ton per day
 - Exemption: ≤ 500 mg/l TDS
 - Exemption: Increase ≤ 400 mg/l
Drinking Water: Source to WWTP Effluent
- Updating use classifications
- EPA recommend toxics values adjusted from more recent studies.



Water Quality Standards Revisions

