Site Specific Regulatory Approaches & NPDES

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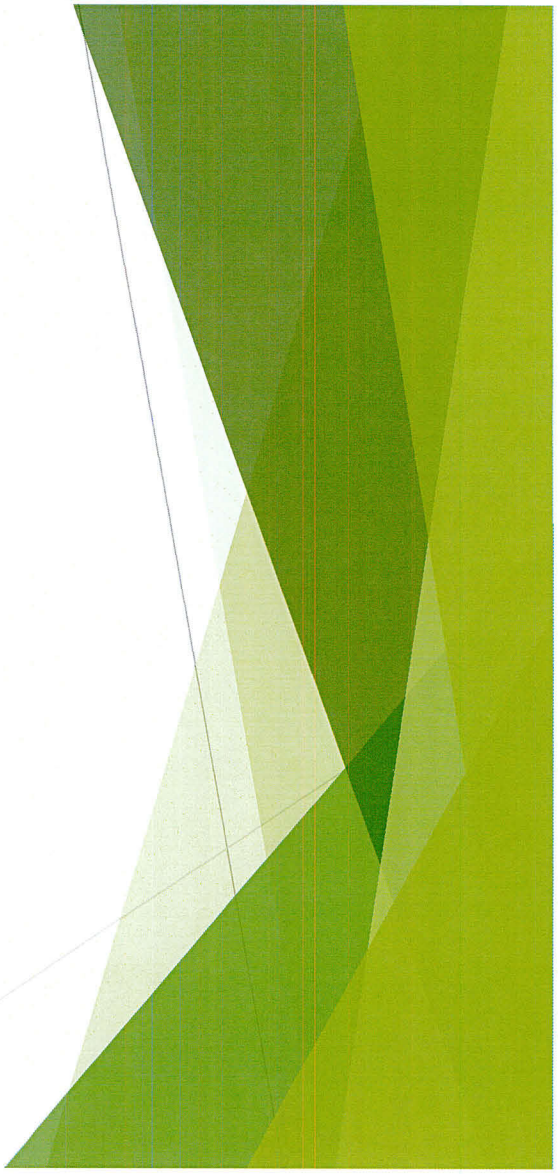
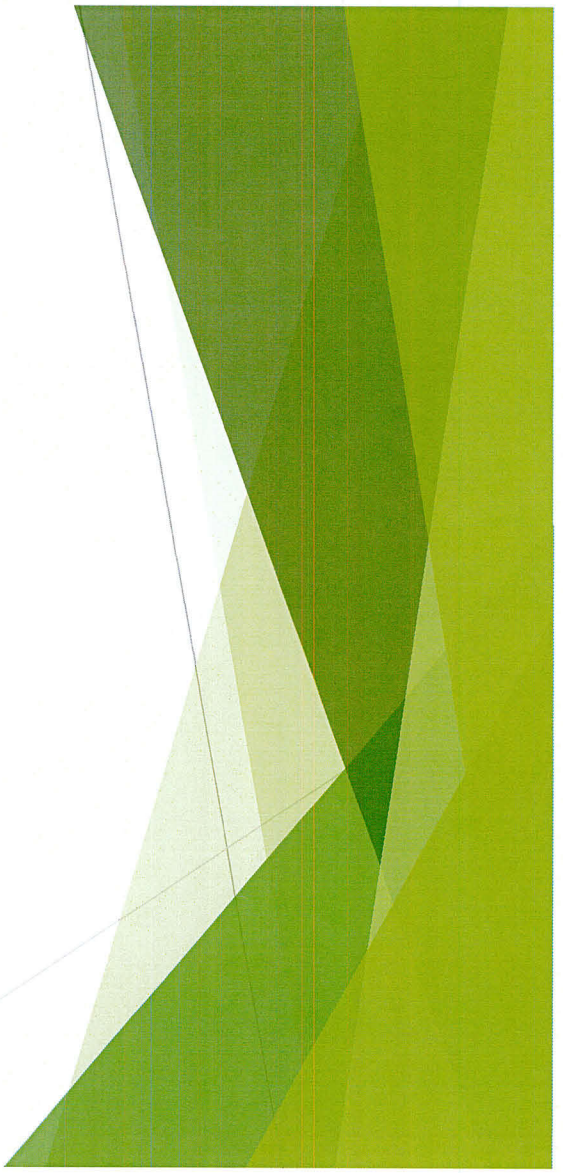
Meeting Permit Limits

- Recognition that a "new" limit can't be bet with the existing treatment system.
- Options:
  - Upgrade wastewater treatment plant
  - Alternative discharge location (pipeline)
  - Source reduction
  - Land application
  - Site specific "regulatory" change



Regulatory Approaches: When a Limit Can't Be Met

- Critical Flow
- CORMIX Modeling
- Water Effects Ratio
- Section 2.306 Study
- Use Attainability Analysis (UAA)
- TMDL Revision
- Selenium Fish Tissue Analysis



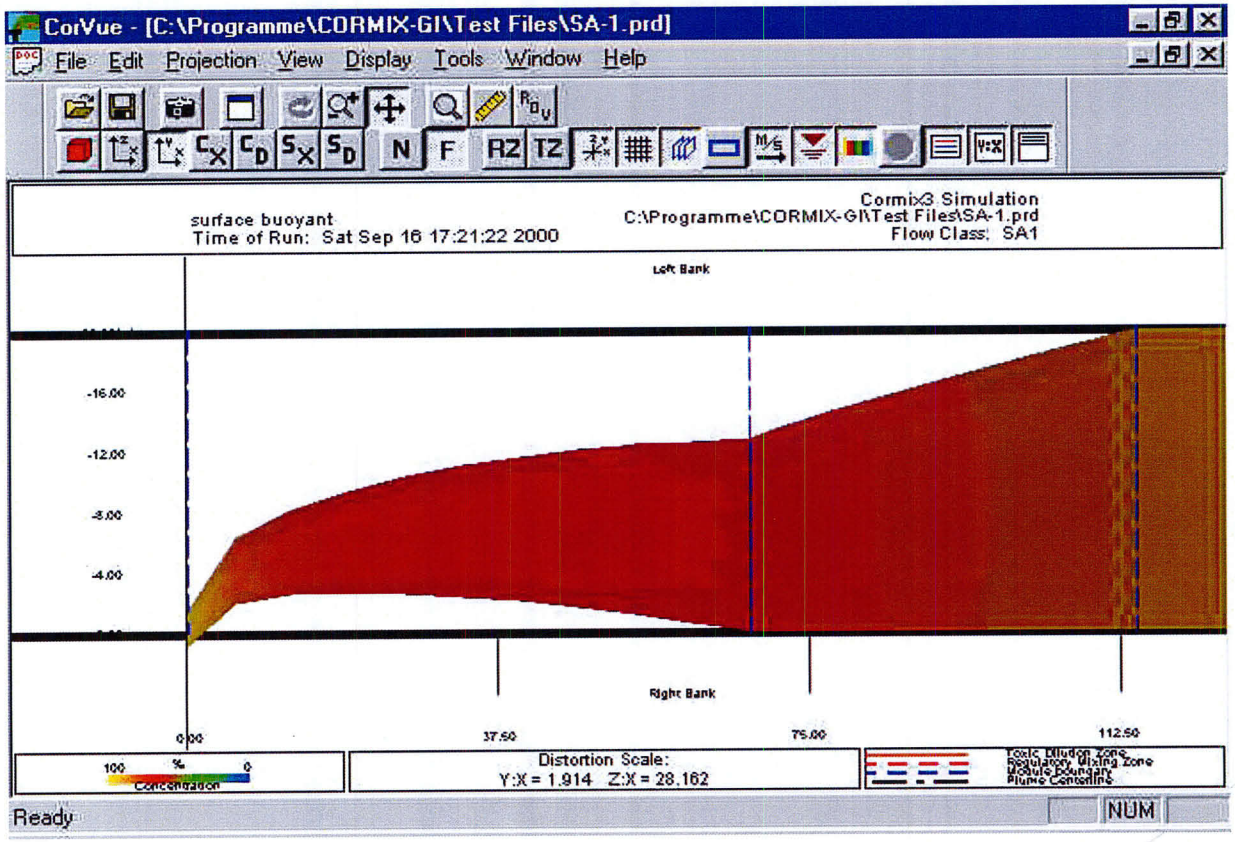
Check the Critical (upstream) Flow

- Critical flow is the upstream flow that is used in permitting calculations to determine allowable dilution.
- Critical flow is statistically determined typically using data from USGS stream gauges.
  - 7Q10
  - Long term average
  - Harmonic mean
- Often, published book values are used. These values may or may not contain current data.
- An increase in the 7Q10 can result in a higher permit limit.

CORMIX Modeling

- Typically a larger stream/river alternative.
- CORMIX is an EPA supported model used in conjunction with regulatory mixing zones.
- Used to determine available mixing dilution.
- Often used to determine diffuser design.
- Used to evaluate:
  - Temperature limits
  - Dilution for WET
  - Dilution for any WQ based effluent limits where mixing zones are applicable

CORMIX Plume Image



Water Effects Ratio (WER)

- Used to develop site specific criteria for metals.
- Initial EPA Guidance for conducting WERs issued in 1994.
- The "water effect ratio" is the difference between metal toxicity in lab water and toxicity in effluent/site water mix.
- "New" Streamlined WER Procedure for Copper issued in 2002.
- Reg. 2 has to be amended with the new criteria.

Reported Ranges for WERs

Metal	Typical Total WER Range
Cadmium	1.0 - 15.0
Chromium	1.0 - 6.0
Copper	1.0 - 15.0
Lead	1.0 - 6.0
Nickel	1.0 - 6.0
Zinc	0.7 - 3.0

Regulation 2.306 Study

- Reg. 2.306 provides a procedure establish less stringent criteria without affecting fishable/swimmable uses.
- Also provides for removing a non-fishable/swimmable use that is a non-existing use (e.g. Domestic Water Supply, Industrial Water Supply).
- Most commonly used for removal of a non-existing Domestic Water Supply and modification of minerals criteria.
- Minimum informational requirements:
  - Technological or economic limits of treatability.
  - Economic analysis of the impact on the local area.
  - Demonstration that the use to be removed is not existing and other designated uses will be protected.
- These studies have been significantly more difficult to conduct and get approved in the past several years.

Use Attainability Analysis (UAA)

- Specific study governed by Federal Regulations at 40 CFR 131.10
- Under the regulations a State may designate a use, or remove a use that is not an existing use, if justified through a Use Attainability Analysis.
- UAA's must be used to remove, or to assign a use sub-category of a use with less restrictive criteria to, fishable/swimmable uses.
- Full Body Contact Recreation v. Secondary Body Contact Recreation with differing bacterial criteria.
- Warm Water Aquatic Community v. Habitat Limited Aquatic Community with differing dissolved oxygen criteria.
- Uncommon in Arkansas.

TMDL Revision

- WLA's from older (10+ years) are still being implemented in NPDES Permits.
- It is possible to modify the TMDL given new data or changed circumstances.
- Situations where it may be appropriate to revise a TMDL (from EPA 2012).
  - Changes to the basis used for deriving the TMDLs loading capacity
  - Re-allocation between LAs and WLAs
  - Changes in applicable water quality standards

Selenium Fish Tissue Analysis (future)

- Newly finalized EPA selenium criteria guidelines.
- The final 2016 criteria guidelines contain fish tissue criteria and actual measurement of the selenium in fish is the preferred permitting approach.
- End-of-pipe limits based on water criteria are the least preferred permitting approach.
- If the new criteria is adopted as a standard then it should be possible to use the direct tissue measurement approach.

Timeframe

- Timeframe for completion of these study types can be short. Typical steps include:
  - Workplan development and approval
  - Conducting the study
  - Initial approval process
  - Reg. 2 "third party" process if needed
- For a new water quality based limit a permittee will typically get a three year compliance schedule.
- If the study requires a Reg. 2 change it is very difficult to reach completion during that timeframe.