

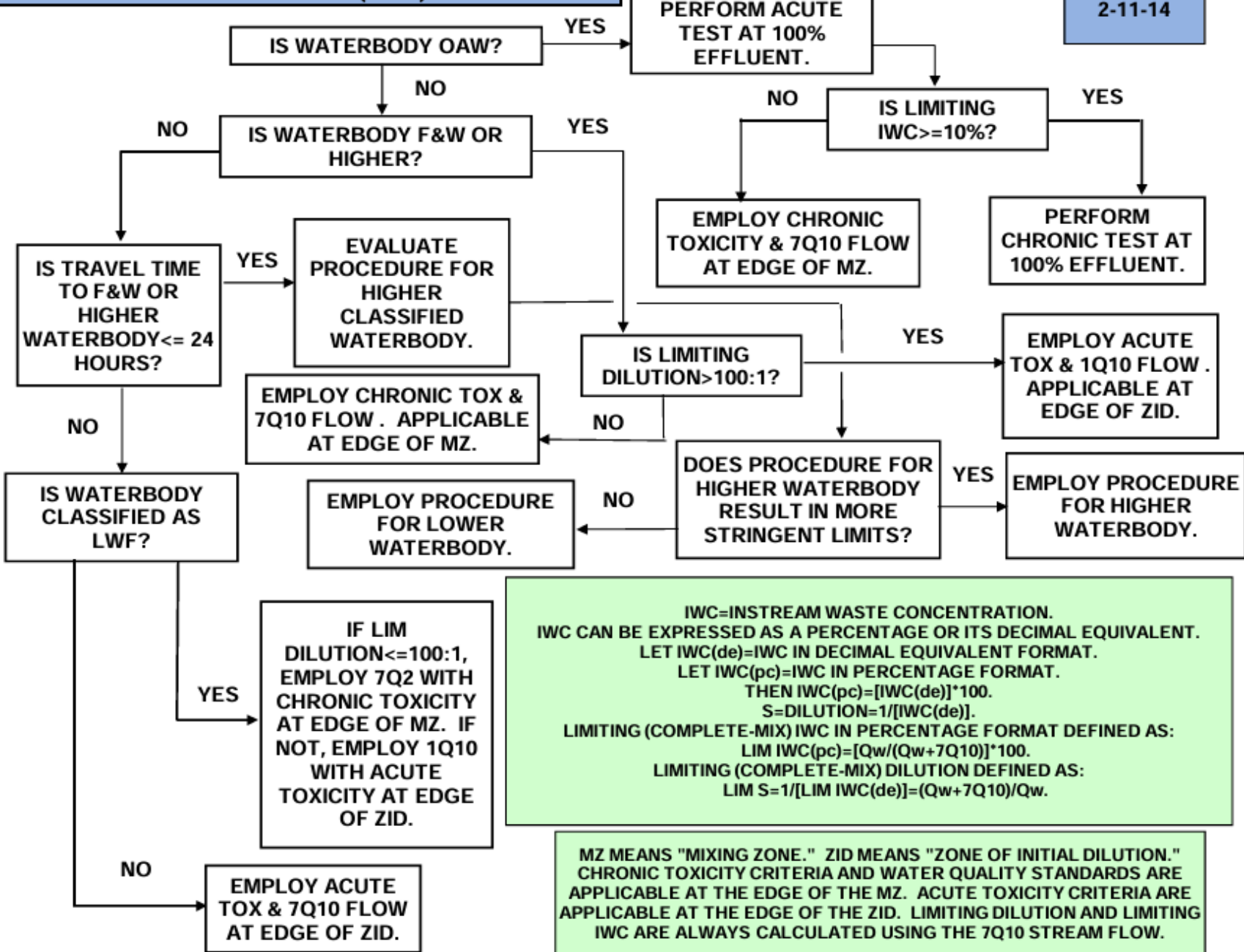
Whole Effluent Toxicity

**ACWA Conference
April 8, 2026**

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**MIXING ZONE MODEL PROTOCOL
WHOLE EFFLUENT TOXICITY (WET) FLOWCHART**

**CPR
2-11-14**



IWC=INSTREAM WASTE CONCENTRATION.
IWC CAN BE EXPRESSED AS A PERCENTAGE OR ITS DECIMAL EQUIVALENT.
LET IWC(de)=IWC IN DECIMAL EQUIVALENT FORMAT.
LET IWC(pc)=IWC IN PERCENTAGE FORMAT.
THEN IWC(pc)=[IWC(de)]*100.
S=DILUTION=1/[IWC(de)].
LIMITING (COMPLETE-MIX) IWC IN PERCENTAGE FORMAT DEFINED AS:
LIM IWC(pc)=[Qw/(Qw+7Q10)]*100.
LIMITING (COMPLETE-MIX) DILUTION DEFINED AS:
LIM S=1/[LIM IWC(de)]=(Qw+7Q10)/Qw.

MZ MEANS "MIXING ZONE." ZID MEANS "ZONE OF INITIAL DILUTION."
CHRONIC TOXICITY CRITERIA AND WATER QUALITY STANDARDS ARE APPLICABLE AT THE EDGE OF THE MZ. ACUTE TOXICITY CRITERIA ARE APPLICABLE AT THE EDGE OF THE ZID. LIMITING DILUTION AND LIMITING IWC ARE ALWAYS CALCULATED USING THE 7Q10 STREAM FLOW.



Who needs Toxicity Testing (Alabama)

- All Major Industrial and Municipal Facilities
- Coal Mining Facilities
- Minors that Discharge Process Wastewater
- Minor Municipals that have an SIU
- Any discharger to an OAW

Who needs Toxicity Testing (Alabama)

- 336 facilities have toxicity in their permit
 - 72 Industrial Permits
 - 148 Municipal Permits
 - 116 Mining Permits
- We review all toxicity tests
- Have a contract lab that runs toxicity for us
- MOU requires 10% of all majors

- Acute Test
 - If effluent to receiving stream dilution is greater than 100:1
- Chronic Test
 - If effluent to receiving stream dilution is less than 100:1

- Acute Test
 - 10 % Mortality at the IWC
 - 48 hour test
- Chronic Test
 - No significant difference from the control at IWC
 - 3 24-hour composites
 - Collected every other day



General Requirements

- Pass or Fail at IWC no in between
- Some facilities choose to run definitive test but not required
- Compliance is at the IWC

- Frequency
 - Monthly
 - Quarterly
 - Semi-Annual
 - Annual
- Municipal specifies the month if its quarterly or annual

- CORMIX
 - No Diffuser
 - Diffuser
- Stream Dilution Ratio
 - 1q10 for acute
 - 7q10 for chronic
- How do you determine which to use?

- Accelerated Test
 - Acute
 - 4 additional test
 - 4 weeks
 - Chronic
 - 2 additional test
 - 2 weeks

- Enforcement options
 - Notice of Violation
 - Increased monitoring
 - TIE/TRE
 - Consent Order

- What are the limitations of Whole Effluent Toxicity testing in protection of aquatic life from the toxic effects of wastewater?
- A brief overview of which facilities are required to conduct WET testing would be great. And should we require WET testing of all new industrial permittees even if it seems they shouldn't need it based on what they are telling us they discharge?
- What factors do you consider to determine when to include WET testing requirements for a facility?
- RPA for WET?
- How do states address WET RPAs when there are no numeric criteria for WET as a parameter?
- How do states calibrate WET dilution series with scenarios where mixing zones allow <1% mix and create really low dilutions?

- How are EPA and States broadly implementing WET requirements at industrial facilities given the historical regulatory focus on municipals?
- How are EPA and the States addressing WET due to Total Dissolved Solids (TDS) at industrial facilities that discharge to freshwaters? Are there applicable numeric aquatic life-based criteria, and if so, what are the specific Acute and/or Chronic values?
- How are EPA and the States addressing Water Treatment Chemicals (WTC) or additives use at industrial facilities relative to WET?



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