

Whole Effluent Toxicity Testing in Colorado

Who needs to do WET testing?

- 1. All POTWs with design influent flows equal to or greater than one million gallons per day;
- 2. All POTWs with approved pretreatment programs or POTWs that are required to develop a pretreatment program;
- 3. All industrial facilities identified as an EPA major;
- 4. Other POTWs or industrial facilities based on potential to discharge toxics in toxic amounts.

- At this time Colorado permit WET limits are based on lethality.
- Sublethal toxicity testing (growth and reproduction) is included as part of the chronic WET test procedure but limits are, “Report,” only.

CO WET guidance provides that permits **may** be reopened to include sublethal limits. This has historically not been done.

Standard Colorado WET test species are *Ceriodaphnia dubia* and fathead minnows



By <http://www.kara-inci.nl>

Alternate species may be used

- Acute tests only
 - *D. pulex*, *D. magna*, rainbow trout, brook trout
 - No alternating of species between tests
 - Division approval required to use alternate species option via permit action

Reasonable Potential for WET

- A WET limit is included as a permit requirement where:
 - There is reasonable potential for the discharge to cause an exceedance of the narrative standards included in subsection 31.11(1) of Regulation No. 31, The Basic Standards and Methodologies for Surface Water.

Reasonable Potential for WET

- Based upon numerous qualitative factors including:
 - Compliance/Monitoring history
 - Existence of a pretreatment program
 - Chemical characteristics of the discharge
 - Receiving water use classification
 - Number of industrial or commercial taps
 - Variable nature of the discharge

Acute vs. Chronic Tests

Chronic Test/Limit assigned when:

- Chronic low flow : Effluent flow < 10:1
- And...segment has a Class 1 Aquatic Life use or Class 2 Aquatic Life use with all of the appropriate aquatic life numeric standards

All others Acute

Chronic Endpoints

- Statistical Difference and $IC_{25} \geq IWC$
 - $IWC = \text{Instream Waste Concentration}$
 - $[\text{Design Flow} / (\text{Design Flow} + \text{Chronic Low Flow})] * 100$
 - Statistical Difference – Hypothesis test
 - No statistical difference in lethality between the control and any effluent concentration that is less than or equal to the IWC
 - IC_{25} – Point estimate test
 - The Inhibition Concentration (IC_{25}) must be $\geq IWC$
 - IC_{25} is interpreted to be “reflected by lethality”
 - Must fail both tests to be considered a WET failure

Acute Endpoints

- This is a short term lethality test (96 hrs or less)
- Limit is expressed as an LC50
 - LC50 – represents an estimate of the effluent concentration that is lethal to 50% of the test organisms in the time period prescribed by the test
- Where there is no instantaneous mixing, the limit = No LC50 at effluent concentrations less than or equal to 100% effluent

FAILED WET TESTS

- A WET test failure triggers an automatic compliance schedule with two actionable options:
 1. Accelerated testing (at least once / 2 weeks)
 - Pass 3 of 5 or 2 in a row – Issue is closed
 - Fail 3 of 5 or 2 in a row – Move on to PTI/TIE
 2. PTI/TIE Investigation
 - Tests to identify the toxicant

PTI/TIE

- Preliminary Toxicity Investigation (PTI) – A less formal, less expensive option for dischargers to quickly evaluate and determine the cause of toxicity and institute appropriate measures to control and confirm the reduction in effluent toxicity.
- Toxicity Identification Evaluation (TIE) – A process bound by conformance with procedures outlined by EPA; references for which can be found in the Division's WET guidance document.

After a PTI/TIE...

- The permittee will have to conduct instream studies, with findings presented to WQCC, or develop and implement a control program to meet WET limits if:
- an identified toxicant has a WQS based effluent limit and the permittee is meeting that limit
- an identified toxicant has no WQS - Division imposes a limit protective of the aquatic life use of the stream.

ERRATIC WET

- If a pattern of toxicity is not demonstrated but a significant level of erratic toxicity is found, the Division may require an increased frequency of routine monitoring or some modified approach in an attempt to allow toxicant identification and control.

SPONTANEOUS DISAPPEARANCE

- Permittee shall notify the Division in writing within 14 days of the disappearance of the toxicity.
- Division may require the permittee to develop and submit additional information.

REQUEST FOR RELIEF

- Relief from further investigation and testing may be requested and considered where the toxicant has not been determined and suitable treatment does not appear possible.

Whole Effluent Toxicity

WQCD

Compliance Oversight

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WET DATA PROCESSING

- Permittee develops and submits WET data on WQCD Acute or Chronic Toxicity Test Report Form.
- Upon receipt, DMR WET data entered into national database (ICIS).
- WET violations identified using ICIS violation reports (e. g. WET effluent limit violations flag as E90's).
- Original submitted DMR or WET data manually reviewed to confirm/validate violation.

WET DATA PROCESSING

(Continued)

- Historical WET data evaluated and considered in determining appropriate response.
- If accelerated testing does not establish a pattern of toxicity – generally, no further action.
- If accelerated testing does establish a pattern of toxicity, manually monitor for initiation and completion of PTI/TIE (including submittal of status reports) and implementation of Control Program.

ENFORCEMENT LIABILITY

- WET Permit Violation Types:
 - Failure to properly monitor.
 - WET effluent limit exceedance.
 - Failure to comply with WET notification requirements.
 - Failure to comply with a WET failure Automatic Compliance Schedule.
 - Failure to submit Control Program.

Each of the above is subject to the full range of enforcement and penalties authorized by the Colorado Water Quality Control Act.

ENFORCEMENT RESPONSE

- Informal enforcement (e.g. Compliance Advisory) is generally considered for infrequent violations.
- Formal enforcement, including the assessment of penalties, is generally considered for the failure to perform or complete WET automatic compliance schedules.
- Formal enforcement, including the assessment of penalties, is generally considered for chronic or frequent failure to monitor or notify violations.