

Cooling Tower VOC Emissions

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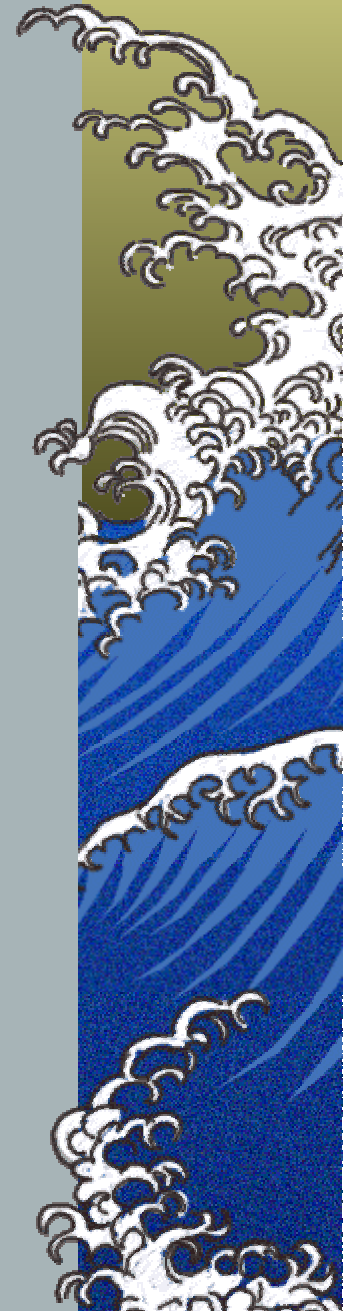
Cooling Tower VOC Emissions

- ▶ Background
- ▶ VOC Emission Estimating Issues
- ▶ TCEQ Research



Cooling Tower VOC Emissions Background

- ▲ Emission Estimating Workshop
 - ▲ TCEQ, EPA, Universities, Consultants, Environmental, Industry
 - ▲ Question: Confidence in emission estimating protocols
 - ▲ Accuracy
 - ▲ Adequately supported by science or data
 - ▲ Opportunity to improve accuracy of emission estimates



Cooling Tower VOC Emissions -Issues

▲ VOC Emission Estimating Issues

▲ Available Methods

▲ AP-42 Factors

- ▲ Based on very limited and old data
- ▲ Do not reflect actual cooling water system operation and maintenance

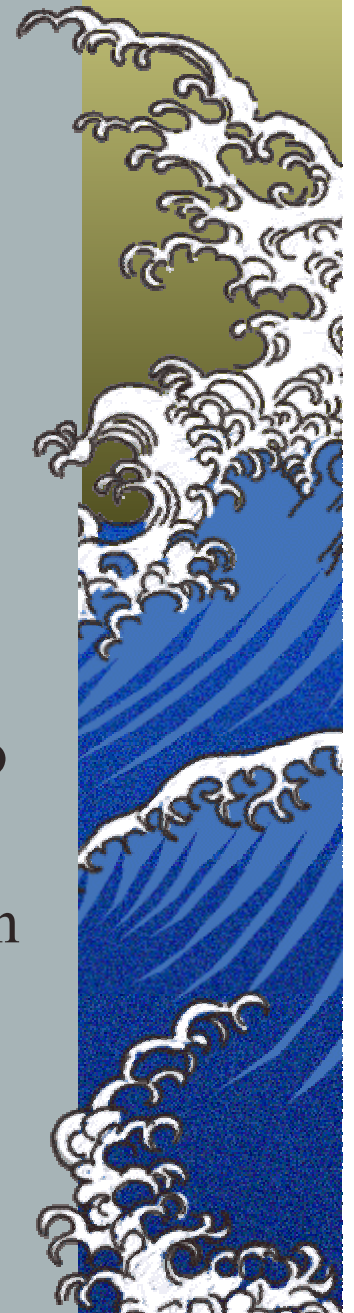
▲ Calculation based on VOC in water measurement

- ▲ Reflect actual cooling water system operation and maintenance
- ▲ What is the accuracy and sensitivity of measurements?



Cooling Tower VOC Emissions -Issues

- ▲ VOC Emission Estimating Issues
 - ▲ Generally AP-42 factors are used
 - ▲ Usually the *controlled* AP-42 factor is used
 - ▲ Uncontrolled: 6 lb/million gallon of cooling water
 - ▲ Controlled: 0.7 lb/million gallon of cooling water
 - ▲ AP-42 controlled factor is suppose to be used *only if* a control technology is used to minimize VOC leaks into the cooling water
 - ▲ Generally control technology used is a “Leak Detection and Repair Program” (LDAR)
 - ▲ A wide variety of indirect monitoring methods
 - ▲ Measurement of VOC in the water
(NESHAPS FF and TCEQ Appendix P)



Cooling Tower VOC Emissions -Issues

- ▲ Do the current LDAR methods constitute a valid “control technology”?
 - ▲ How sensitive are these monitoring methods?
 - ▲ How effective (detection limits)?
 - ▲ How much emission reduction really?

▲ TCEQ Field Office Testing

In some cases for Cooling tower with a leak detection and repair program, measured emissions were significantly higher than AP-42 controlled emission factor



Cooling Tower VOC Emissions

▲ TCEQ Testing Research

- ▲ VOC in water measurement method development and improvement

- ▲ Compounds of interest:

Ethylene, Propylene, 1,3-butadiene, butenes

- ▲ Accuracy and Sensitivity

- ▲ Subpart FF VOA

- ▲ TCEQ Appendix P (air stripping method)

- ▲ Results not yet available



Cooling Tower VOC Emissions

▲ TCEQ Research Team:

▲ Contractors: University of Texas, Center for Energy and Environmental Research

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