

Where the CWA meets the SDWA: Relationships between Raw and Finished Water Quality

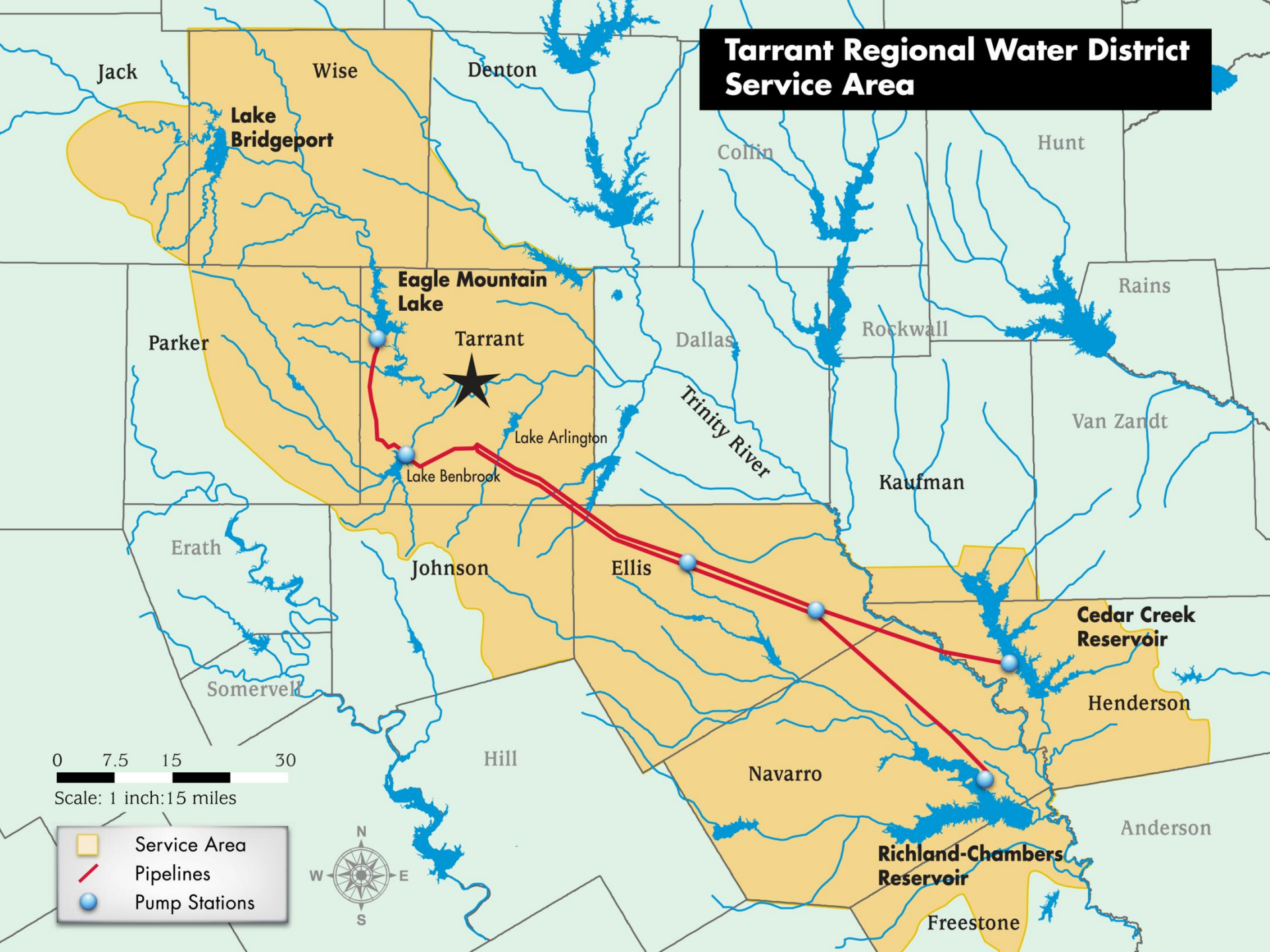
OCLWA 2015

Mark R. Ernst

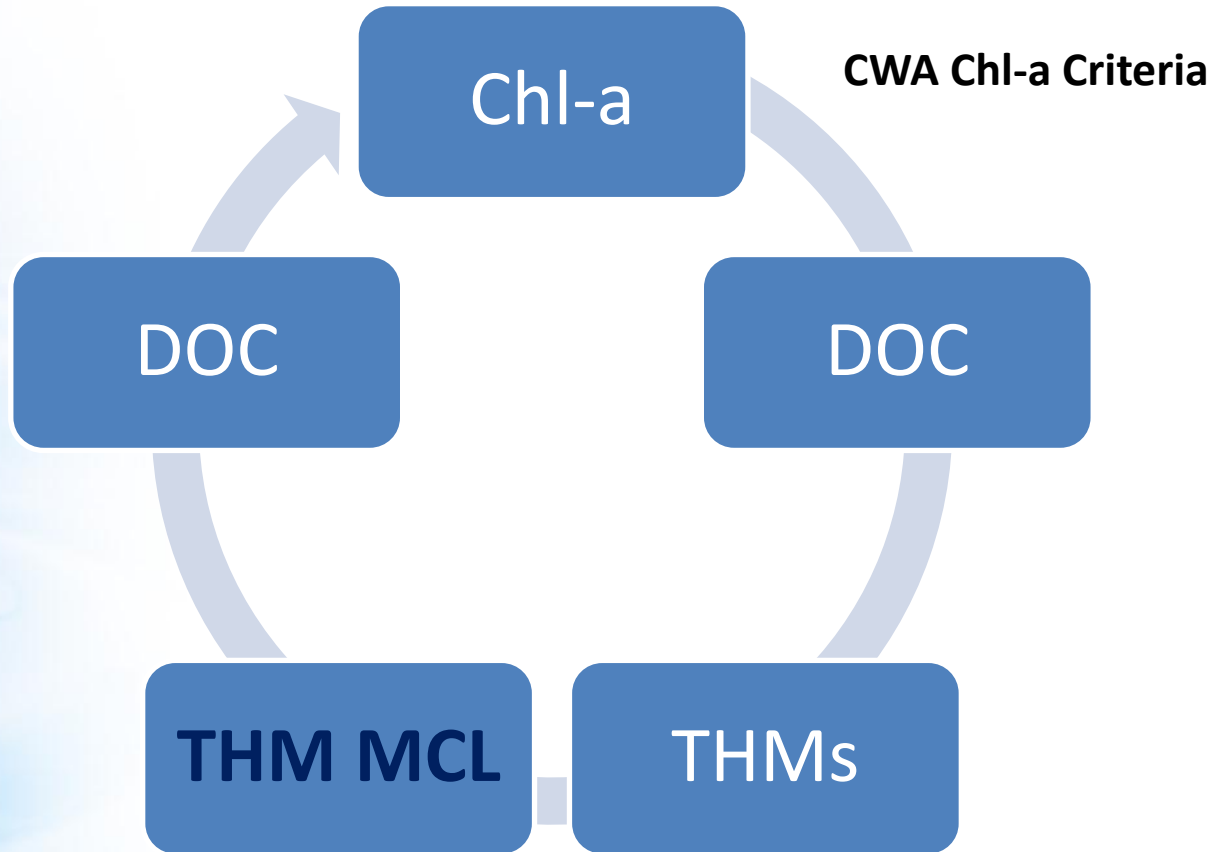
Tarrant Regional Water District

Fort Worth, Texas

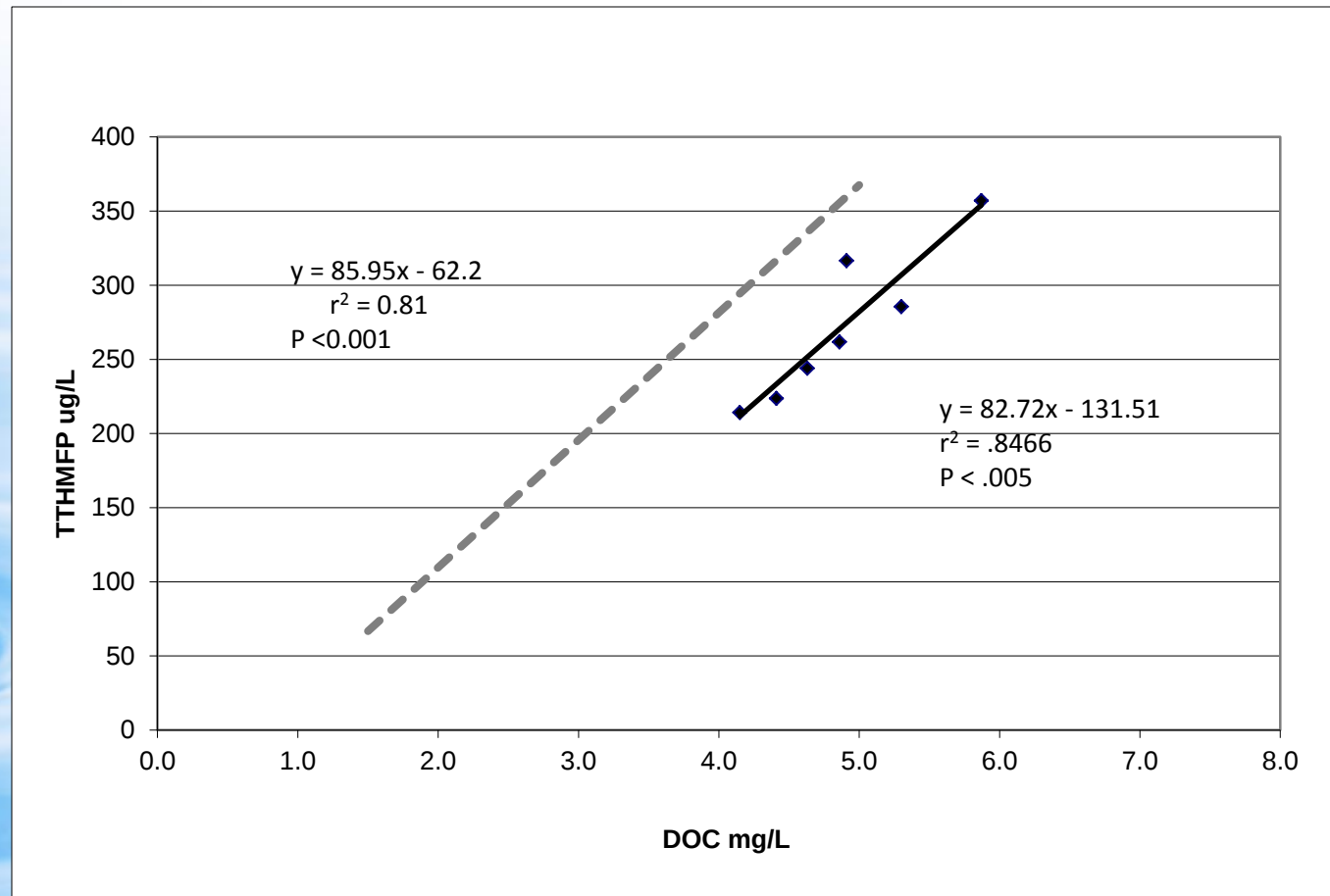
Tarrant Regional Water District Service Area



Process to Link CWA to SDWA

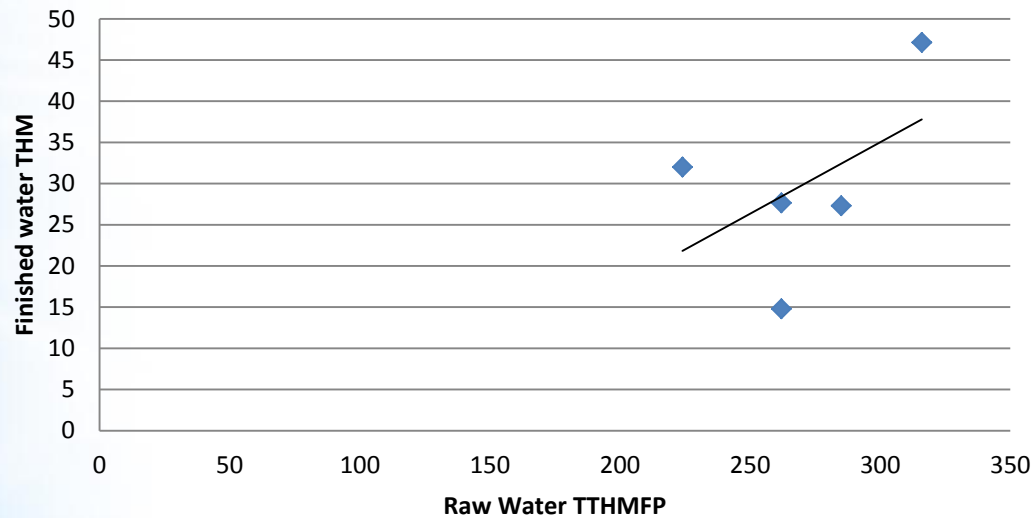


THMFP vs DOC Relationships

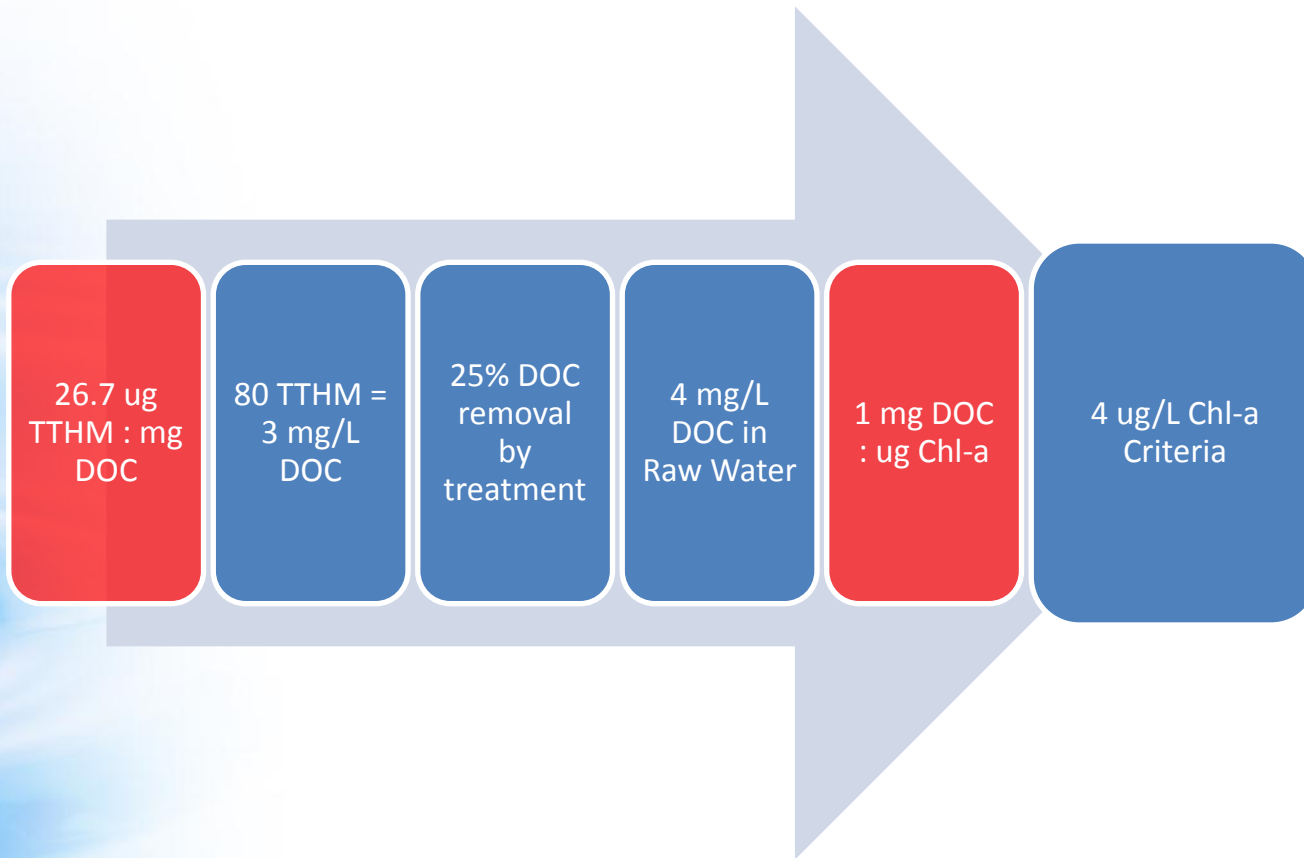


THMFP vs THM Relationship

Approximate 9 to 1 ratio

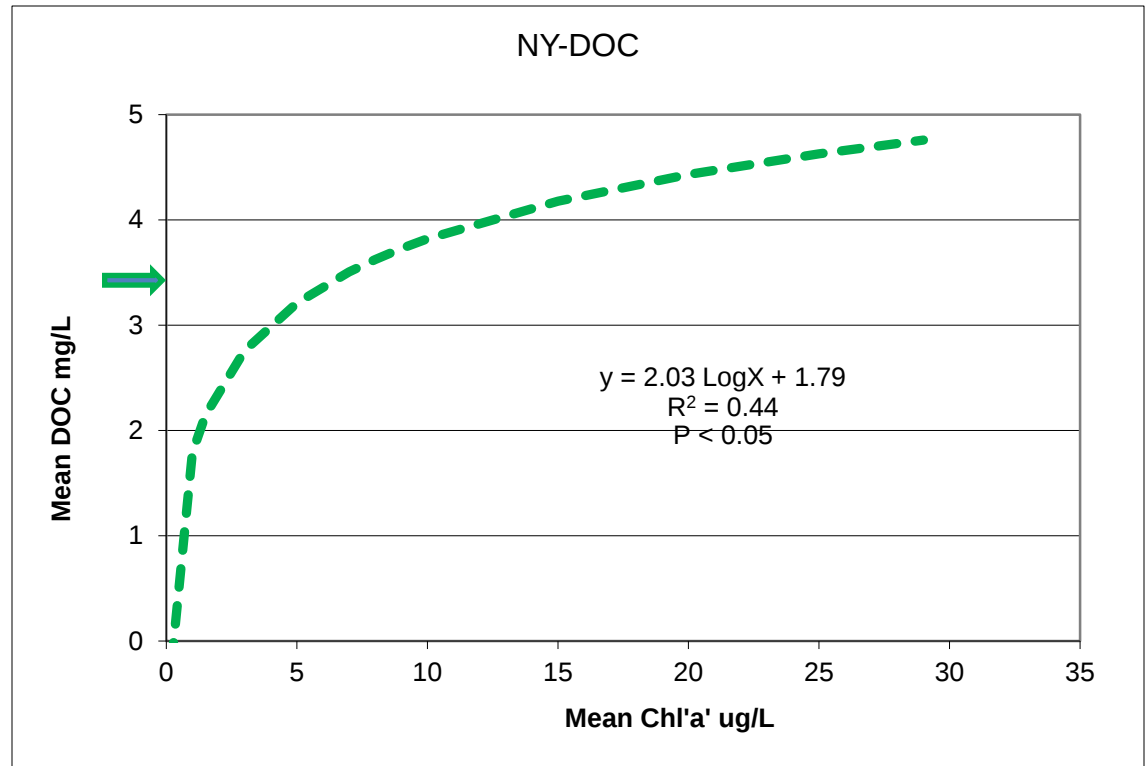


Colorado Process



New York Process

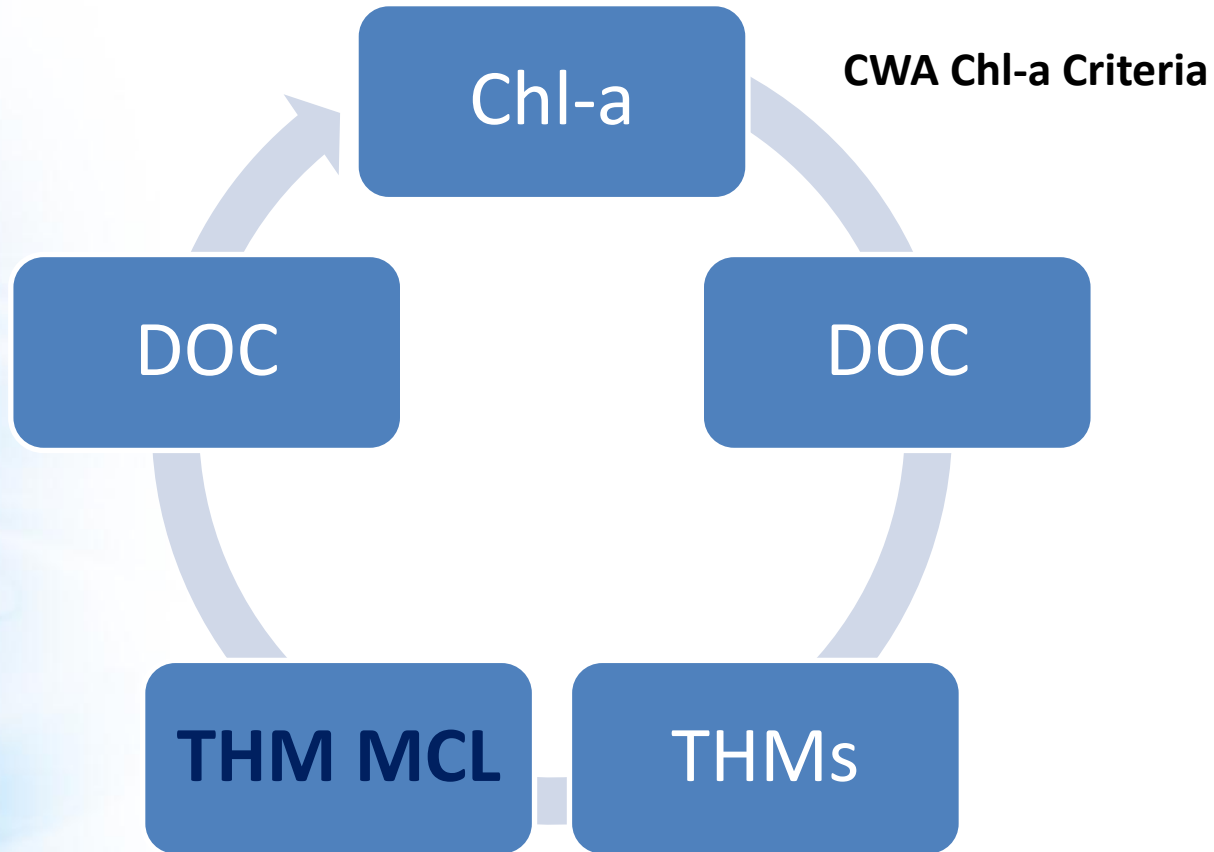
- Critical DOC 3.3 mg/L

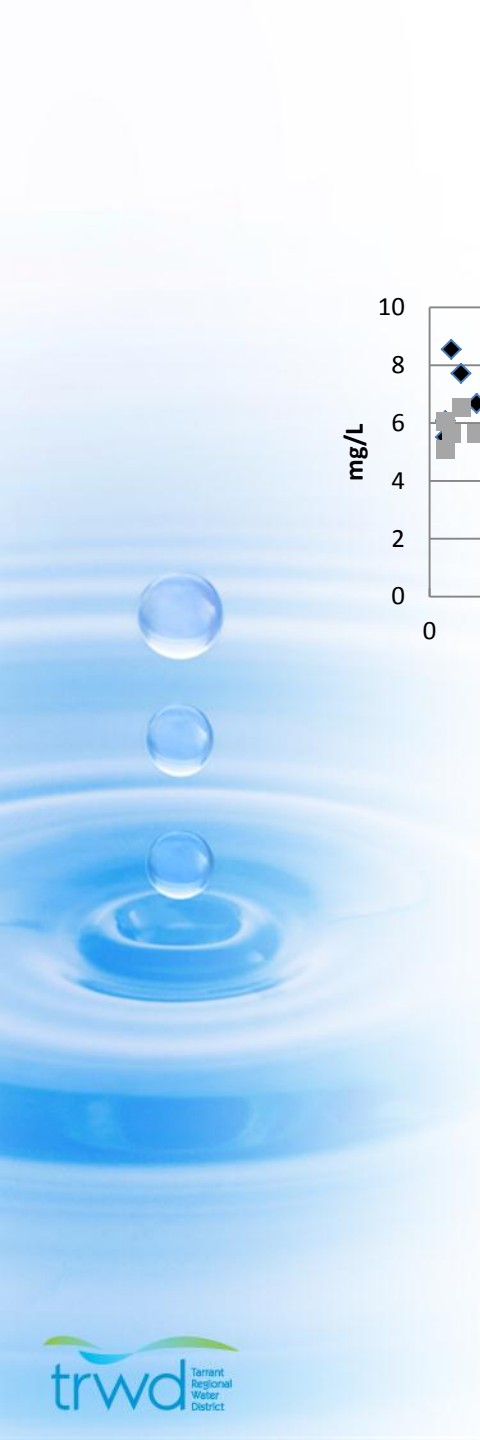


Texas Surface Water Treatment Rule

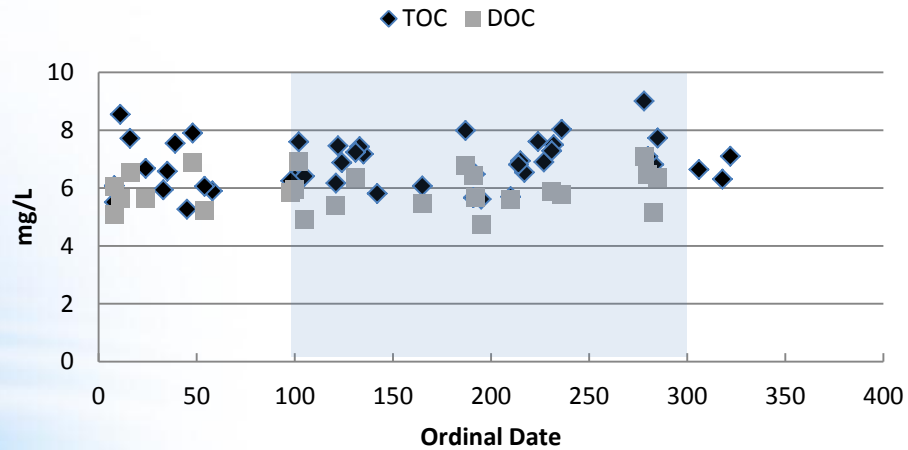
- TAC 30 Chapter 290.42D
- All water secured from surface sources shall be given complete treatment at a plant which provides facilities for pretreatment disinfection, taste and odor control, continuous coagulation, sedimentation, filtration, covered clearwell storage, and terminal disinfection of the water with chlorine or suitable chlorine compounds.

Process to Link CWA to SDWA

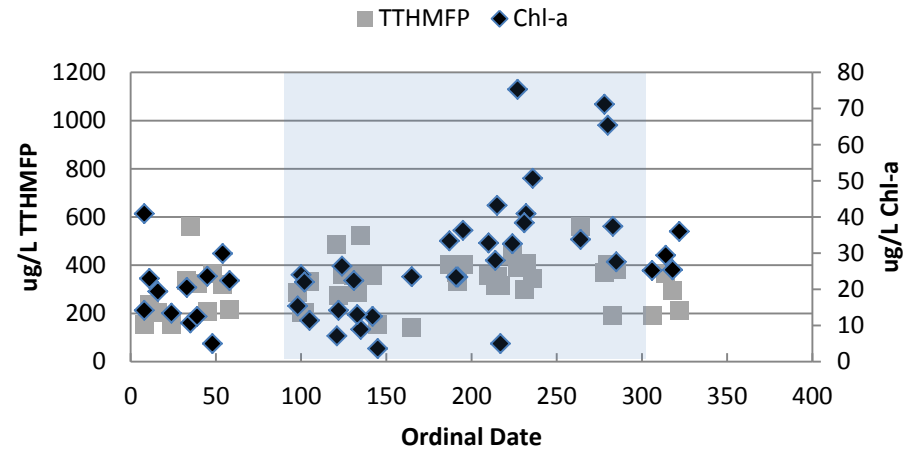




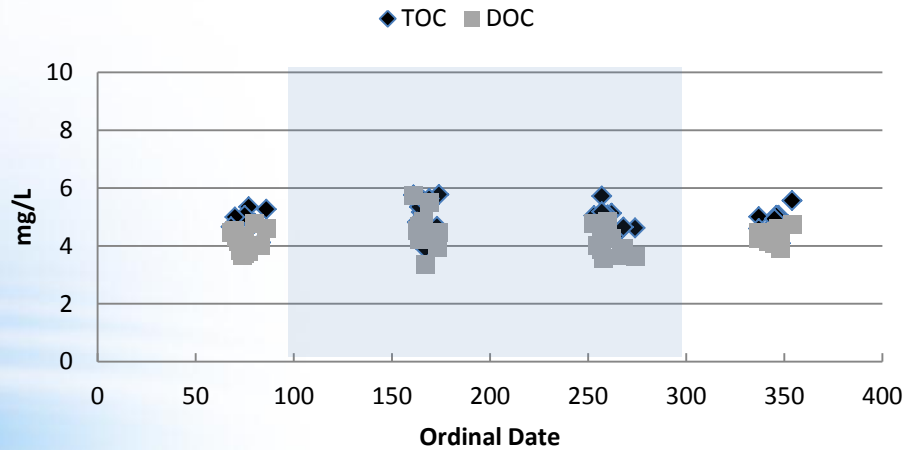
Cedar Creek



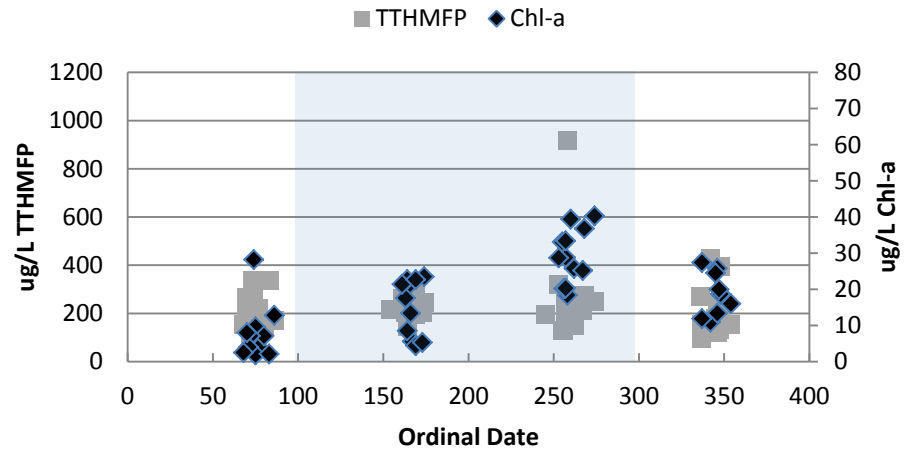
Cedar Creek



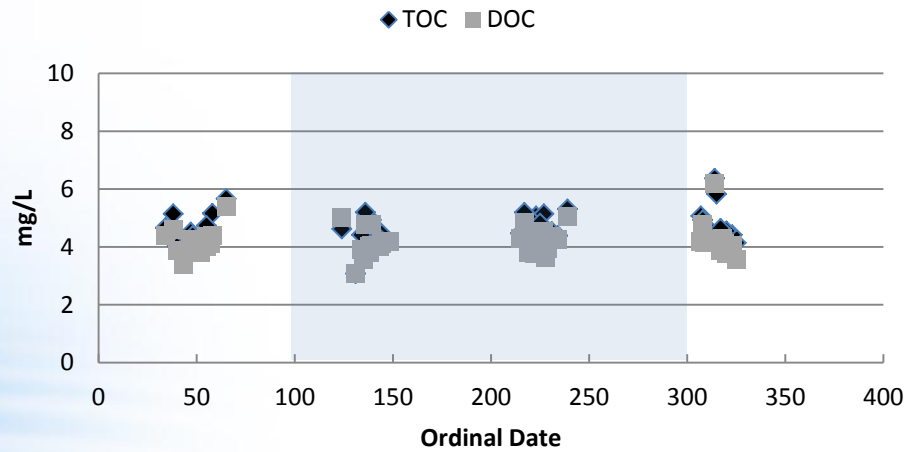
Lake Benbrook



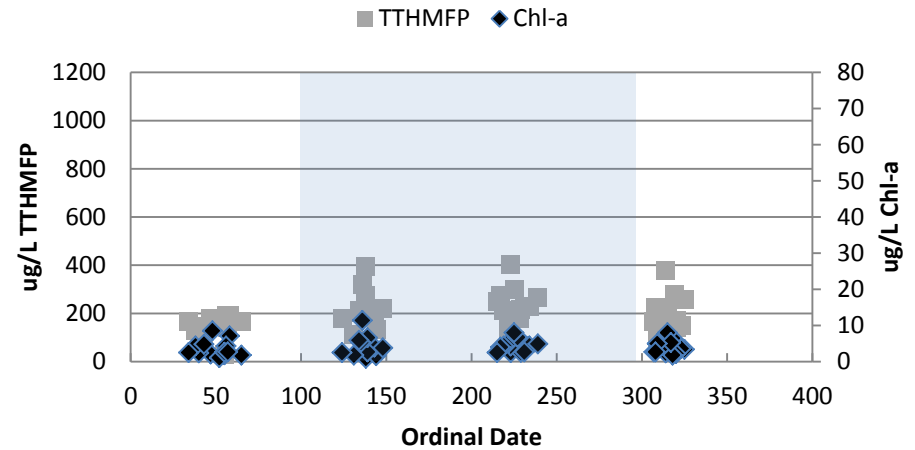
Lake Benbrook



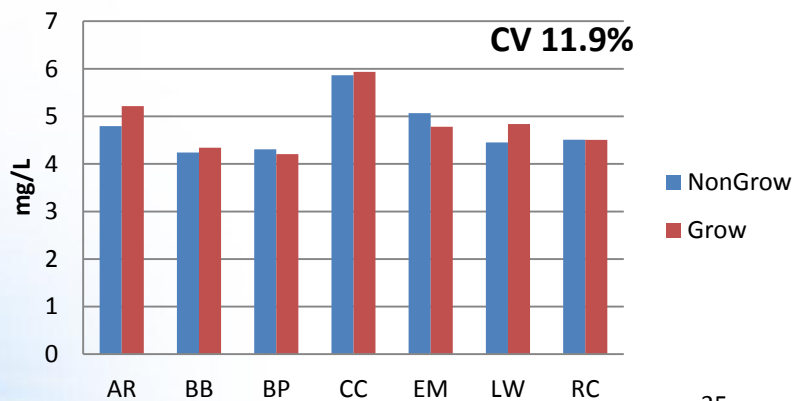
Lake Bridgeport



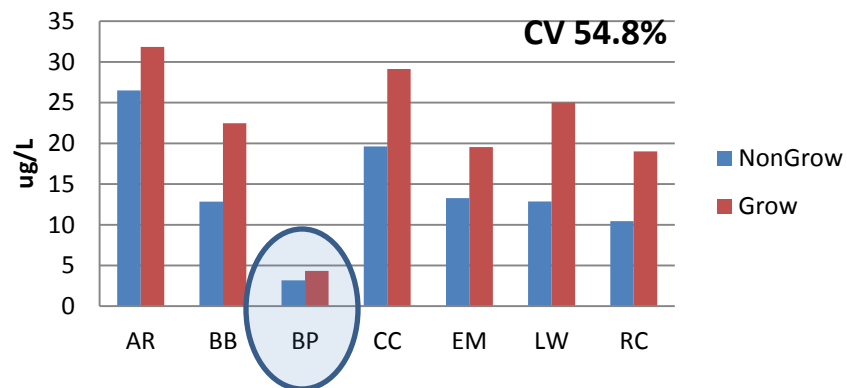
Lake Bridgeport



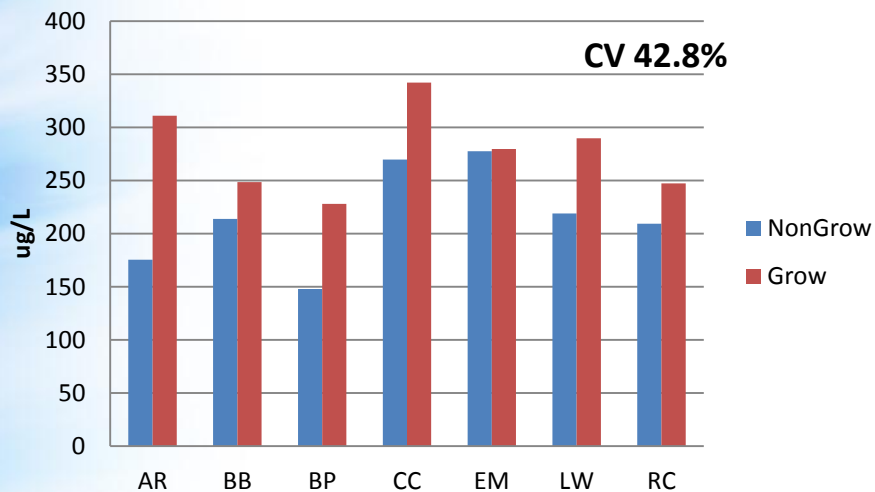
Average DOC



Average Chl'a'

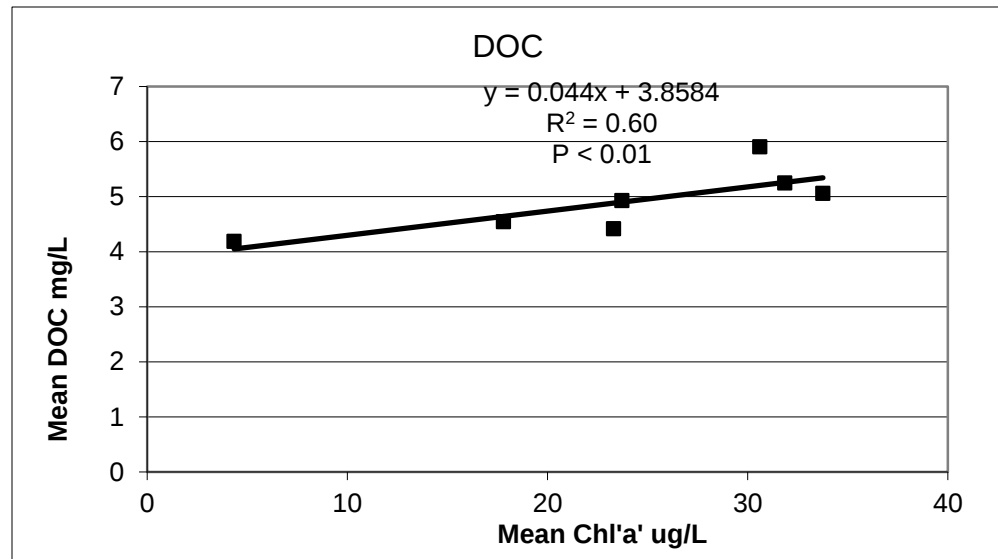


Average TTHMFP

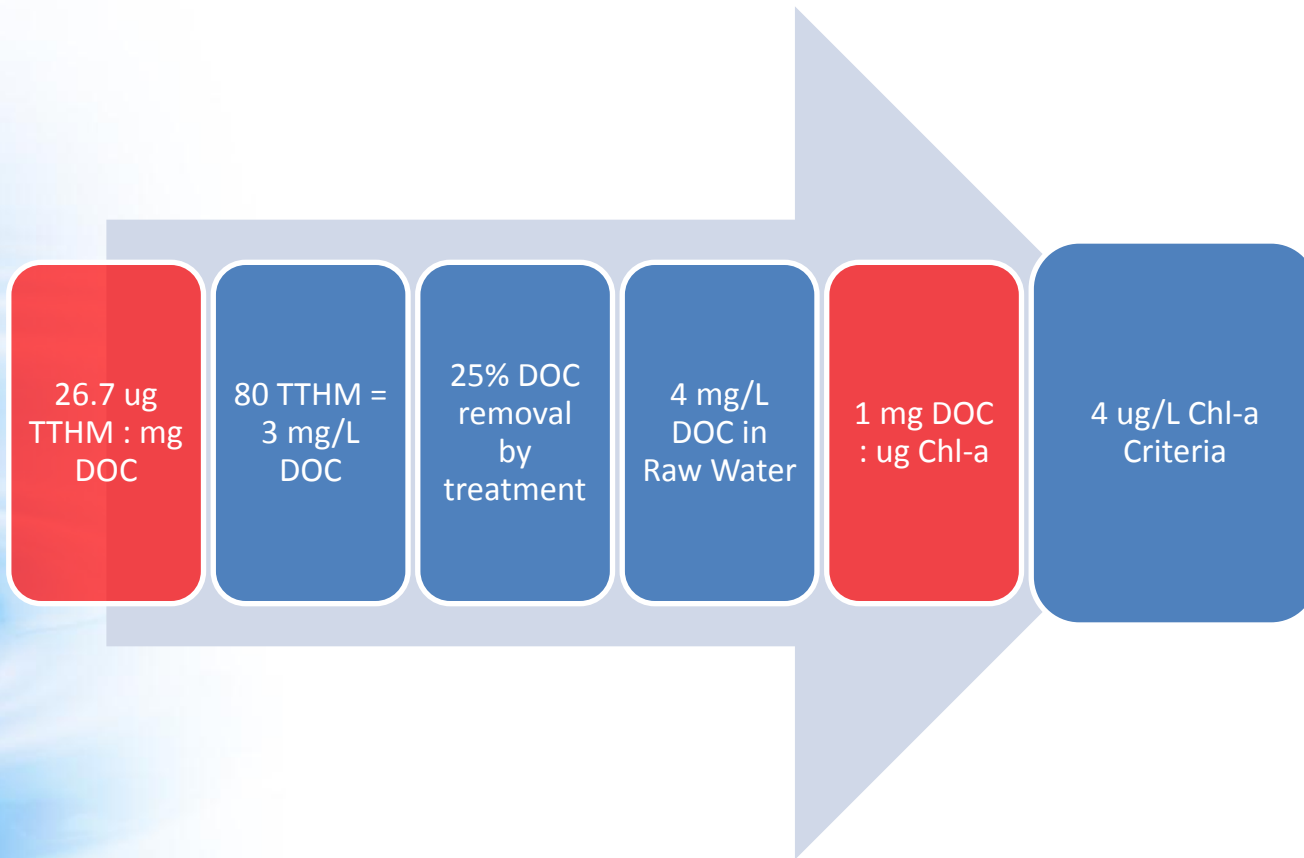


Ratios and Regressions

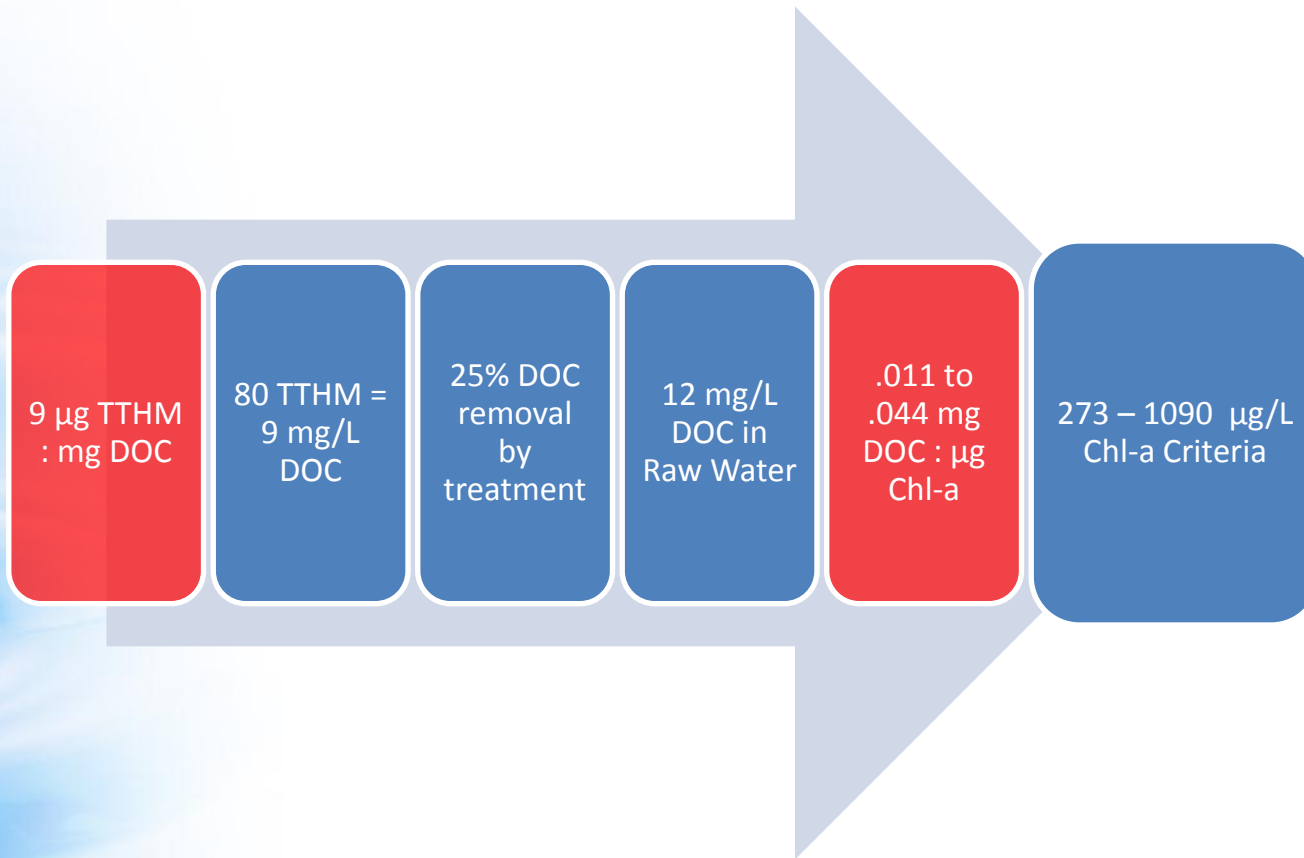
- **CO** - Ratio the growing season Chl-*a* and DOC: .011 mg DOC / μg Chl-*a* or slope for regression .044 mg DOC/ μg Chl-*a*. THM yield 9 μg per mg DOC.
- **NY** - Regress the reservoir average growing season Chl-*a* vs DOC



Colorado Process

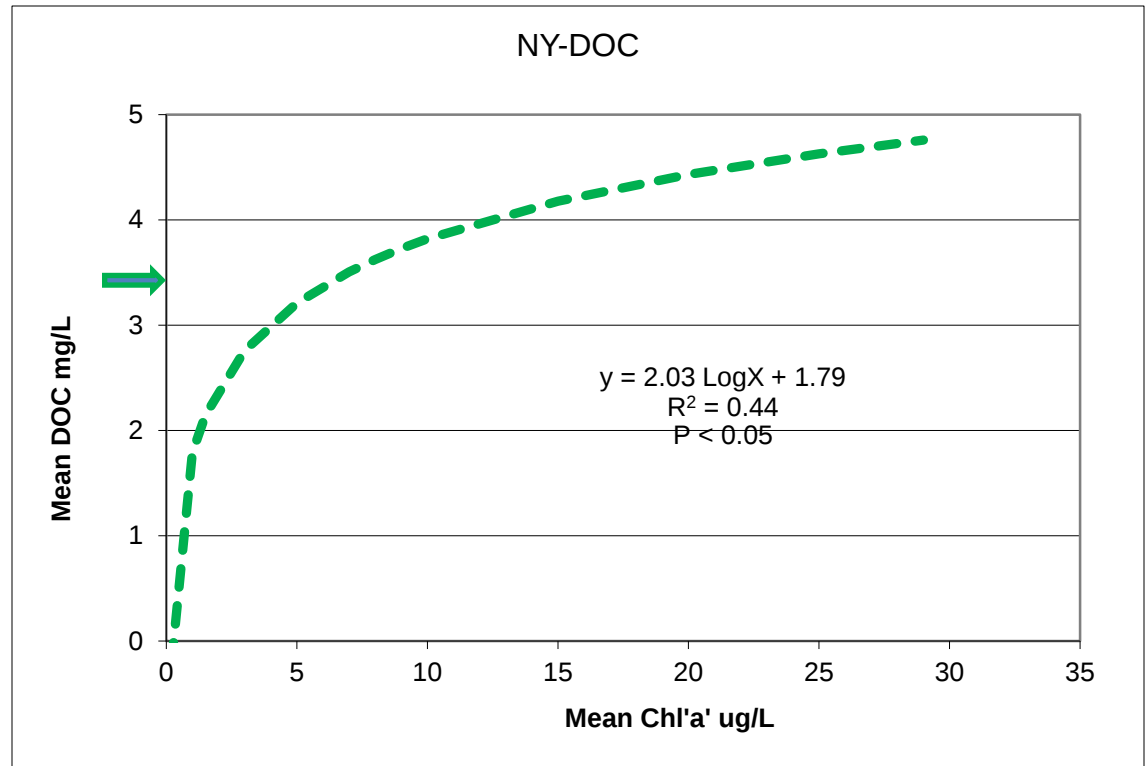


Colorexas Process



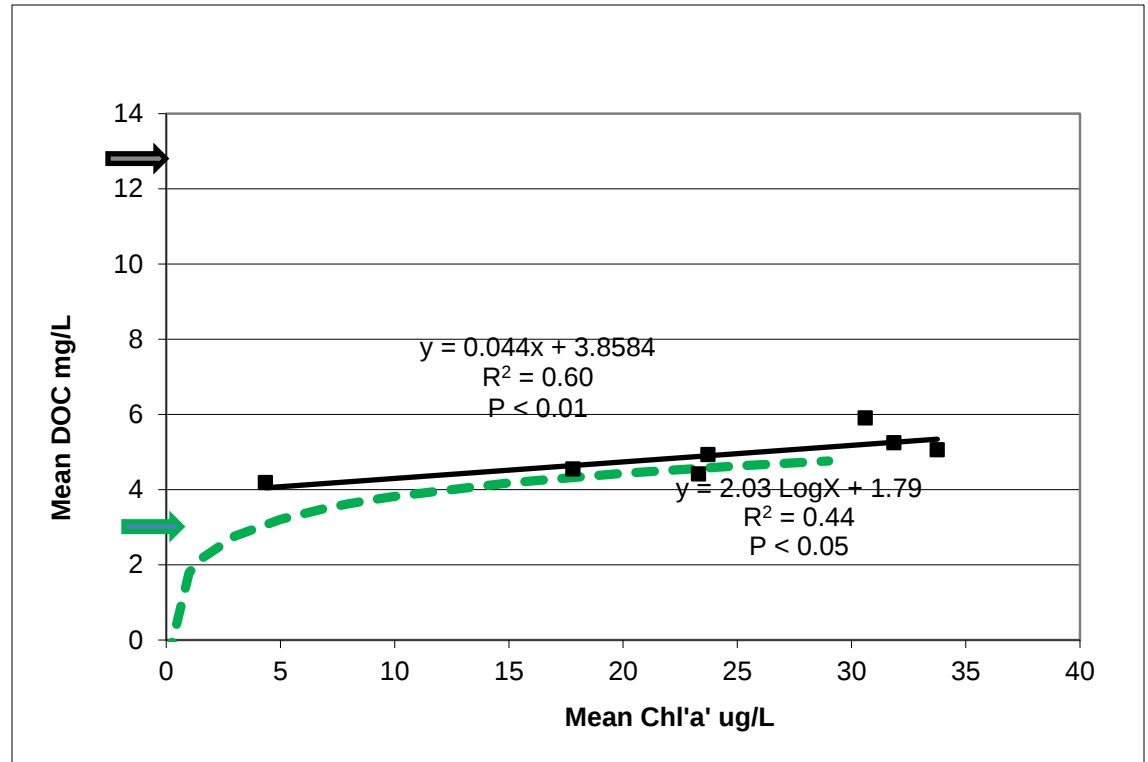
New York Process

- Critical DOC 3.3 mg/L for raw water



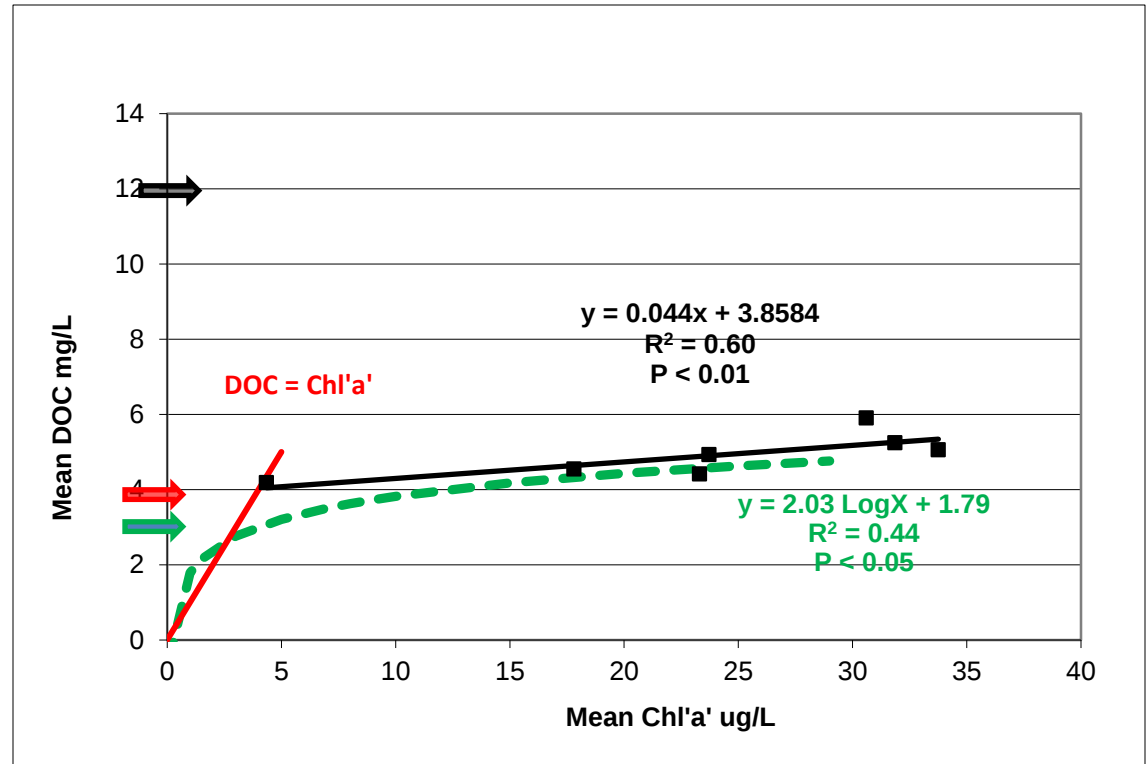
New Texas Process

- Critical DOC 3.3 mg/L
- Critical DOC 13 mg/L



New Colorexas Process

- NY Critical DOC 3.3 mg/L
- TX Critical DOC 12 mg/L
- CO Critical DOC 4 mg/L



Conclusion

- In Texas the use of DOC-THMs-Chl-a relationships do not seem to be useful for reservoir criteria development, or a focus of watershed management because:
 - Advanced water treatment and the use of chloramines minimizes THM problems
 - The critical DOC concentrations used in CO and NY are below even our best reservoirs
 - The response of DOC to Chl-a is very minimal above 7 ug/L Chl-a making a change in Chl-a of 20 ug/L result in only a change in DOC of 1 mg/L.

The End

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