

## Work Plan: Additional Testing for Chlorine DBP Kinetics



### UMass treatment protocol

This task will use a semi-factorial design. It is factorial in time and orthogonal in the remaining variables (see table below). This is to be repeated every three months for 1 year.

Raw water is collected from Kensico and transported to UMass:

- Half from the Catskill side, half from the Delaware side
- Either by H&S or UMass research team

### Summary of UMass treatment protocol

- Bring samples to desired temperature and pH
- Addition of sodium hypochlorite
  - Variable doses
  - Hold for 2-72 hours
- Measure residual and quench
  - Analyze for chlorine DBPs

Protocol for Additional Kinetic Testing of Kensico Water

Test #	Chlorine Dose (mg/L)	pH	Temp (°C)	Times (hr)
1	2	7	2	2, 8, 24, 72
2	2	7	12	2, 8, 24, 72
3	2	7	22	2, 8, 24, 72
4	1.2	7	2	2, 8, 24, 72
5	1.2	7	12	2, 8, 24, 72
6	1.2	7	22	2, 8, 24, 72
7	3.2	7	2	2, 8, 24, 72
8	3.2	7	12	2, 8, 24, 72
9	3.2	7	22	2, 8, 24, 72
10	2	6	2	2, 8, 24, 72
11	2	8	2	2, 8, 24, 72
12	2	6	22	2, 8, 24, 72
13	2	8	22	2, 8, 24, 72

Based on the above table, UMass will run 13 separate sets of chlorination tests resulting in 52 separate sets of DBP analyses of each type for each bimonthly period. The DBP analyses to be conducted on each of the 52 quarterly samples include:

- THMs
- Haloacetic acids

In addition, combined and free chlorine residuals are to be measured on all.

DBP formation models will be selected and calibrated based on these data. This will involve work by the PhD student under close supervision of the lead PI (Reckhow).

#### Schedule (tentative):

1 <sup>st</sup> Run	13 Mar 07
2 <sup>nd</sup> Run	7 June 07
3 <sup>rd</sup> Run	17 Oct 07
4 <sup>th</sup> Run	Dec 07 or Jan 08?