ICR TREATMENT STUDY ANALYSIS

Base Analysis and Data Review Comments

Treatment Study ID 1045

Study Protocol GAC RSSCT treatment study

Plant ICR Number 658

PWS Name Wichita Falls

City, State, Zip Wichita Falls, TX 76307

These are general comments that do not need to be responded to directly.

Major comments:

1. RSSCT schematic (Figure 3-2) shows influent sampling point located prior to inline filtration by 0.1 µm Teflon filter. Therefore, GAC influent water quality analysis was conducted on settled but not filtered water. Bench-scale pretreatment included decantation but no filtration prior to inline filtration during RSSCT testing.

General Comments:

1. GAC influent was filtered through 0.1 µm pore size filter, a tighter filter than that required by the *Treatment Studies Manual* (about 1.0 µm).

2. Report states that influent "turbidity was relatively high in the 2nd Quarter and especially the 4th Quarter." Turbidity ranged from 0.2 to 1.6 ntu during the two sessions. Note that based on Figure 3-2, sampling was conducted on settled water, instead of filtered water, and relatively high (and somewhat variable) turbidity measurements would be expected.

3. Constant temperature of 20 or 21°C reported for influent B samples during all 4 quarters.

4. SDS target incubation times varied from 2.0 to 7.0 hours during different quarters. Incubation time was chosen to match that reported by the water treatment plant on the sampling date (page 17).

5. Quarter 1: GAC effluent SDS-TOX levels exceeded GAC influent levels.

Outlier Data:

One outlier removed.

Cell: A1
Comment: 1045-SAS.xls 2/7/00 21:14

All curve fits reviewed and approved. See below for log of refit datasets.

Cell: C6
Comment: 1045-10-01 - Run 1 (CHCl3) 2/7/00 20:54
Original value (CoefA0) = 0 New value = -0.2138
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D6
Comment: 1045-10-01 - Run 1 (CHCl3) 2/7/00 20:54
Original value (CoefAf) = 0 New value = 3.5112
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E6
Comment: 1045-10-01 - Run 1 (CHCl3) 2/7/00 20:54
Original value (CoefB) = 0 New value = 26.5032
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F6
Comment: 1045-10-01 - Run 1 (CHCl3) 2/7/00 20:54
Original value (CoefD) = 0 New value = 0.0652
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J6
Comment: 1045-10-01 - Run 1 (CHCl3) 2/7/00 20:54
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C15
Comment: 1045-10-01 - Run 1 (MBAA) 2/7/00 20:36
Original value (CoefA0) = 0 New value = 1
Fewer than 6 points above MRL. Step function applied.

1045-10-01 - Run 1 (MBAA) 2/7/00 20:37
Original value (CoefA0) = 1 New value = 1.3064
Fewer than 6 points above MRL. Step function applied.

Cell: D15
Comment: 1045-10-01 - Run 1 (MBAA) 2/7/00 20:36
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

1045-10-01 - Run 1 (MBAA) 2/7/00 20:37
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E15
Comment: 1045-10-01 - Run 1 (MBAA) 2/7/00 20:36
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

1045-10-01 - Run 1 (MBAA) 2/7/00 20:37
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F15
Comment: 1045-10-01 - Run 1 (MBAA) 2/7/00 20:36
Original value (CoefD) = 0 New value = 0

Fewer than 6 points above MRL. Step function applied.

1045-10-01 - Run 1 (MBAA) 2/7/00 20:37
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J15
Comment: 1045-10-01 - Run 1 (MBAA) 2/7/00 20:36
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

1045-10-01 - Run 1 (MBAA) 2/7/00 20:37
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K15
Comment: 1045-10-01 - Run 1 (MBAA) 2/7/00 20:36
Original value (t0) = 0 New value = 9.4173
Fewer than 6 points above MRL. Step function applied.

1045-10-01 - Run 1 (MBAA) 2/7/00 20:37
Original value (t0) = 9.4173 New value = 9.4173
Fewer than 6 points above MRL. Step function applied.

Cell: C37
Comment: 1045-10-02 - Run 3 (MBAA) 2/7/00 21:02
Original value (CoefA0) = 0.0117 New value = -0.4794
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: D37
Comment: 1045-10-02 - Run 3 (MBAA) 2/7/00 21:02
Original value (CoefAf) = 2.7204 New value = 3.5405
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: E37
Comment: 1045-10-02 - Run 3 (MBAA) 2/7/00 21:02
Original value (CoefB) = 8112942.25207281 New value = 20.7915
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: F37
Comment: 1045-10-02 - Run 3 (MBAA) 2/7/00 21:02
Original value (CoefD) = 2.2125 New value = 0.4645
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: J37
Comment: 1045-10-02 - Run 3 (MBAA) 2/7/00 21:02
Original value (S) = 0 New value = 0
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: C40
Comment: 1045-10-02 - Run 3 (TCAA) 2/7/00 21:03
Original value (CoefA0) = 0 New value = -0.4509
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D40
Comment: 1045-10-02 - Run 3 (TCAA) 2/7/00 21:03
Original value (CoefAf) = 0 New value = 4.7672
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E40
Comment: 1045-10-02 - Run 3 (TCAA) 2/7/00 21:03
Original value (CoefB) = 0 New value = 20.5136

Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F40
Comment: 1045-10-02 - Run 3 (TCAA) 2/7/00 21:03
Original value (CoefD) = 0 New value = 0.0443
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J40
Comment: 1045-10-02 - Run 3 (TCAA) 2/7/00 21:03
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C44
Comment: 1045-10-02 - Run 3 (TSUVA) 2/7/00 21:00
Original value (CoefA0) = -0.8602 New value = 1.42
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: D44
Comment: 1045-10-02 - Run 3 (TSUVA) 2/7/00 21:00
Original value (CoefAf) = 2.5806 New value = 1.45
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: E44
Comment: 1045-10-02 - Run 3 (TSUVA) 2/7/00 21:00
Original value (CoefB) = 2.1542 New value = 55
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: F44
Comment: 1045-10-02 - Run 3 (TSUVA) 2/7/00 21:00
Original value (CoefD) = 0.5192 New value = 0.033
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: J44
Comment: 1045-10-02 - Run 3 (TSUVA) 2/7/00 21:00
Original value (S) = 0 New value = 0
Poor type -1 or 1 curve fit. Data was refit by iterative curve fit procedure.

Cell: C50
Comment: 1045-10-03 - Run 5 (CHCl3) 2/7/00 21:05
Original value (CoefA0) = 0 New value = -0.1065
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D50
Comment: 1045-10-03 - Run 5 (CHCl3) 2/7/00 21:05
Original value (CoefAf) = 0 New value = 2.2975
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E50
Comment: 1045-10-03 - Run 5 (CHCl3) 2/7/00 21:05
Original value (CoefB) = 0 New value = 144.2733
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F50
Comment: 1045-10-03 - Run 5 (CHCl3) 2/7/00 21:05
Original value (CoefD) = 0 New value = 0.1083
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J50
Comment: 1045-10-03 - Run 5 (CHCl3) 2/7/00 21:05
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C72
Comment: 1045-10-04 - Run 7 (CHCl3) 2/7/00 21:06
Original value (CoefA0) = 0 New value = -0.2111
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D72
Comment: 1045-10-04 - Run 7 (CHCl3) 2/7/00 21:06
Original value (CoefAf) = 0 New value = 2.099
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E72
Comment: 1045-10-04 - Run 7 (CHCl3) 2/7/00 21:06
Original value (CoefB) = 0 New value = 43.9981
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F72
Comment: 1045-10-04 - Run 7 (CHCl3) 2/7/00 21:06
Original value (CoefD) = 0 New value = 0.103
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J72
Comment: 1045-10-04 - Run 7 (CHCl3) 2/7/00 21:06
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C76
Comment: 1045-10-04 - Run 7 (DCAA) 2/7/00 20:44
Original value (CoefA0) = 0 New value = 1.1967
Fewer than 6 points above MRL. Step function applied.

Cell: D76
Comment: 1045-10-04 - Run 7 (DCAA) 2/7/00 20:44
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E76
Comment: 1045-10-04 - Run 7 (DCAA) 2/7/00 20:44
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F76
Comment: 1045-10-04 - Run 7 (DCAA) 2/7/00 20:44
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J76
Comment: 1045-10-04 - Run 7 (DCAA) 2/7/00 20:44
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K76
Comment: 1045-10-04 - Run 7 (DCAA) 2/7/00 20:44
Original value (t0) = 0 New value = 48.9748
Fewer than 6 points above MRL. Step function applied.

Cell: C77
Comment: 1045-10-04 - Run 7 (DCBAA) 2/7/00 21:07
Original value (CoefA0) = 0 New value = -0.2676
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D77
Comment: 1045-10-04 - Run 7 (DCBAA) 2/7/00 21:07

Original value (CoefAf) = 0 New value = 2.3826
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E77
Comment: 1045-10-04 - Run 7 (DCBAA) 2/7/00 21:07
Original value (CoefB) = 0 New value = 35.1935
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F77
Comment: 1045-10-04 - Run 7 (DCBAA) 2/7/00 21:07
Original value (CoefD) = 0 New value = 0.0935
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J77
Comment: 1045-10-04 - Run 7 (DCBAA) 2/7/00 21:07
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C94
Comment: 1045-20-01 - Run 2 (CHCl3) 2/7/00 20:38
Original value (CoefA0) = 0 New value = 1.64
Fewer than 6 points above MRL. Step function applied.

Cell: D94
Comment: 1045-20-01 - Run 2 (CHCl3) 2/7/00 20:38
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E94
Comment: 1045-20-01 - Run 2 (CHCl3) 2/7/00 20:38
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F94
Comment: 1045-20-01 - Run 2 (CHCl3) 2/7/00 20:38
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J94
Comment: 1045-20-01 - Run 2 (CHCl3) 2/7/00 20:38
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K94
Comment: 1045-20-01 - Run 2 (CHCl3) 2/7/00 20:38
Original value (t0) = 0 New value = 102.2113
Fewer than 6 points above MRL. Step function applied.

Cell: C98
Comment: 1045-20-01 - Run 2 (DCAA) 2/7/00 20:39
Original value (CoefA0) = 0 New value = 1.5733
Fewer than 6 points above MRL. Step function applied.

Cell: D98
Comment: 1045-20-01 - Run 2 (DCAA) 2/7/00 20:39
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E98
Comment: 1045-20-01 - Run 2 (DCAA) 2/7/00 20:39
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F98
Comment: 1045-20-01 - Run 2 (DCAA) 2/7/00 20:39
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J98
Comment: 1045-20-01 - Run 2 (DCAA) 2/7/00 20:39
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K98
Comment: 1045-20-01 - Run 2 (DCAA) 2/7/00 20:39
Original value (t0) = 0 New value = 102.2113
Fewer than 6 points above MRL. Step function applied.

Cell: C106
Comment: 1045-20-01 - Run 2 (TCAA) 2/7/00 20:39
Original value (CoefA0) = 0 New value = 1.0575
Fewer than 6 points above MRL. Step function applied.

Cell: D106
Comment: 1045-20-01 - Run 2 (TCAA) 2/7/00 20:39
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E106
Comment: 1045-20-01 - Run 2 (TCAA) 2/7/00 20:39
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F106
Comment: 1045-20-01 - Run 2 (TCAA) 2/7/00 20:39
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J106
Comment: 1045-20-01 - Run 2 (TCAA) 2/7/00 20:39
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K106
Comment: 1045-20-01 - Run 2 (TCAA) 2/7/00 20:39
Original value (t0) = 0 New value = 53.8508
Fewer than 6 points above MRL. Step function applied.

Cell: C138
Comment: 1045-20-03 - Run 6 (CHCl3) 2/7/00 21:06
Original value (CoefA0) = 0 New value = -0.1232
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D138
Comment: 1045-20-03 - Run 6 (CHCl3) 2/7/00 21:06
Original value (CoefAf) = 0 New value = 1.7116
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E138
Comment: 1045-20-03 - Run 6 (CHCl3) 2/7/00 21:06
Original value (CoefB) = 0 New value = 58.8558
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F138
Comment: 1045-20-03 - Run 6 (CHCl3) 2/7/00 21:06

Original value (CoefD) = 0 New value = 0.0495
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J138
Comment: 1045-20-03 - Run 6 (CHCl3) 2/7/00 21:06
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C142
Comment: 1045-20-03 - Run 6 (DCAA) 2/7/00 20:43
Original value (CoefA0) = 0 New value = 1.2397
Fewer than 6 points above MRL. Step function applied.

Cell: D142
Comment: 1045-20-03 - Run 6 (DCAA) 2/7/00 20:43
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E142
Comment: 1045-20-03 - Run 6 (DCAA) 2/7/00 20:43
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F142
Comment: 1045-20-03 - Run 6 (DCAA) 2/7/00 20:43
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J142
Comment: 1045-20-03 - Run 6 (DCAA) 2/7/00 20:43
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K142
Comment: 1045-20-03 - Run 6 (DCAA) 2/7/00 20:43
Original value (t0) = 0 New value = 118.2542
Fewer than 6 points above MRL. Step function applied.

Cell: C160
Comment: 1045-20-04 - Run 8 (CHCl3) 2/7/00 21:08
Original value (CoefA0) = 0 New value = -0.3853
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D160
Comment: 1045-20-04 - Run 8 (CHCl3) 2/7/00 21:08
Original value (CoefAf) = 0 New value = 4.3669
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E160
Comment: 1045-20-04 - Run 8 (CHCl3) 2/7/00 21:08
Original value (CoefB) = 0 New value = 24.8695
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F160
Comment: 1045-20-04 - Run 8 (CHCl3) 2/7/00 21:08
Original value (CoefD) = 0 New value = 0.0241
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J160
Comment: 1045-20-04 - Run 8 (CHCl3) 2/7/00 21:08
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: C164
Comment: 1045-20-04 - Run 8 (DCAA) 2/7/00 20:45
Original value (CoefA0) = 0 New value = 1.1685
Fewer than 6 points above MRL. Step function applied.

Cell: D164
Comment: 1045-20-04 - Run 8 (DCAA) 2/7/00 20:45
Original value (CoefAf) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: E164
Comment: 1045-20-04 - Run 8 (DCAA) 2/7/00 20:45
Original value (CoefB) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: F164
Comment: 1045-20-04 - Run 8 (DCAA) 2/7/00 20:45
Original value (CoefD) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: J164
Comment: 1045-20-04 - Run 8 (DCAA) 2/7/00 20:45
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Step function applied.

Cell: K164
Comment: 1045-20-04 - Run 8 (DCAA) 2/7/00 20:45
Original value (t0) = 0 New value = 124.9467
Fewer than 6 points above MRL. Step function applied.

Cell: C165
Comment: 1045-20-04 - Run 8 (DCBAA) 2/7/00 21:10
Original value (CoefA0) = 0 New value = -0.1433
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: D165
Comment: 1045-20-04 - Run 8 (DCBAA) 2/7/00 21:10
Original value (CoefAf) = 0 New value = 2.242
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: E165
Comment: 1045-20-04 - Run 8 (DCBAA) 2/7/00 21:10
Original value (CoefB) = 0 New value = 73.2976
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: F165
Comment: 1045-20-04 - Run 8 (DCBAA) 2/7/00 21:10
Original value (CoefD) = 0 New value = 0.0639
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Cell: J165
Comment: 1045-20-04 - Run 8 (DCBAA) 2/7/00 21:10
Original value (S) = 0 New value = 0
Fewer than 6 points above MRL. Logistic function (type 1) applied.

Wichita Falls | **Bench-Scale RSSCT Treatment Study Summary** | **Quarter:** 1

ICR Information

ID / ICR#:	TX2430001 / 658
ICR Contact:	Daniel Nix
Phone No.:	940-691-1153
Period:	3/25/98 - 4/17/98 (22 B-S days)

Design Information

Design TOC:	3.8 mg/L	**Full-Scale GAC Size:**	8x30 Bituminous
Col Diameter:	8.0 mm	**Bench-Scale GAC Size:**	60x80
Min Reynolds#:	0.50	**Scaling Factor:**	6.88
Full-Scale Temp:	8.0 C	**Meas Dry Bed Density:**	0.56 g/cm3

Water Quality Summary

	Influent				Influent			
Influent	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max
TOC	3.9	0.4	3	3.6 - 4.4				
pH	9.4	0.2	3	9.2 - 9.5				
UV254	0.067	0.000	3	0.067 - 0.067				
SUVA	1.72	0.17	3	1.53 - 1.85				
Bromide	369	31	2	353 - 384				
SDS-TOX	92	1	3	91 - 94				
SDS-THM4	77	1	3	76 - 78				
SDS-HAA6	27	1	3	27 - 28				
Effluent	**10 Min EBCT**			(13 B-S days)	**20 Min EBCT**			(23 B-S days)
Effluent pH	9.3	0.1	12	9.1 - 9.5	9.3	0.1	12	8.9 - 9.5
Effluent Temp	21.0	0.0	12	21.0 - 21.0	21.0	0.0	12	21.0 - 21.0

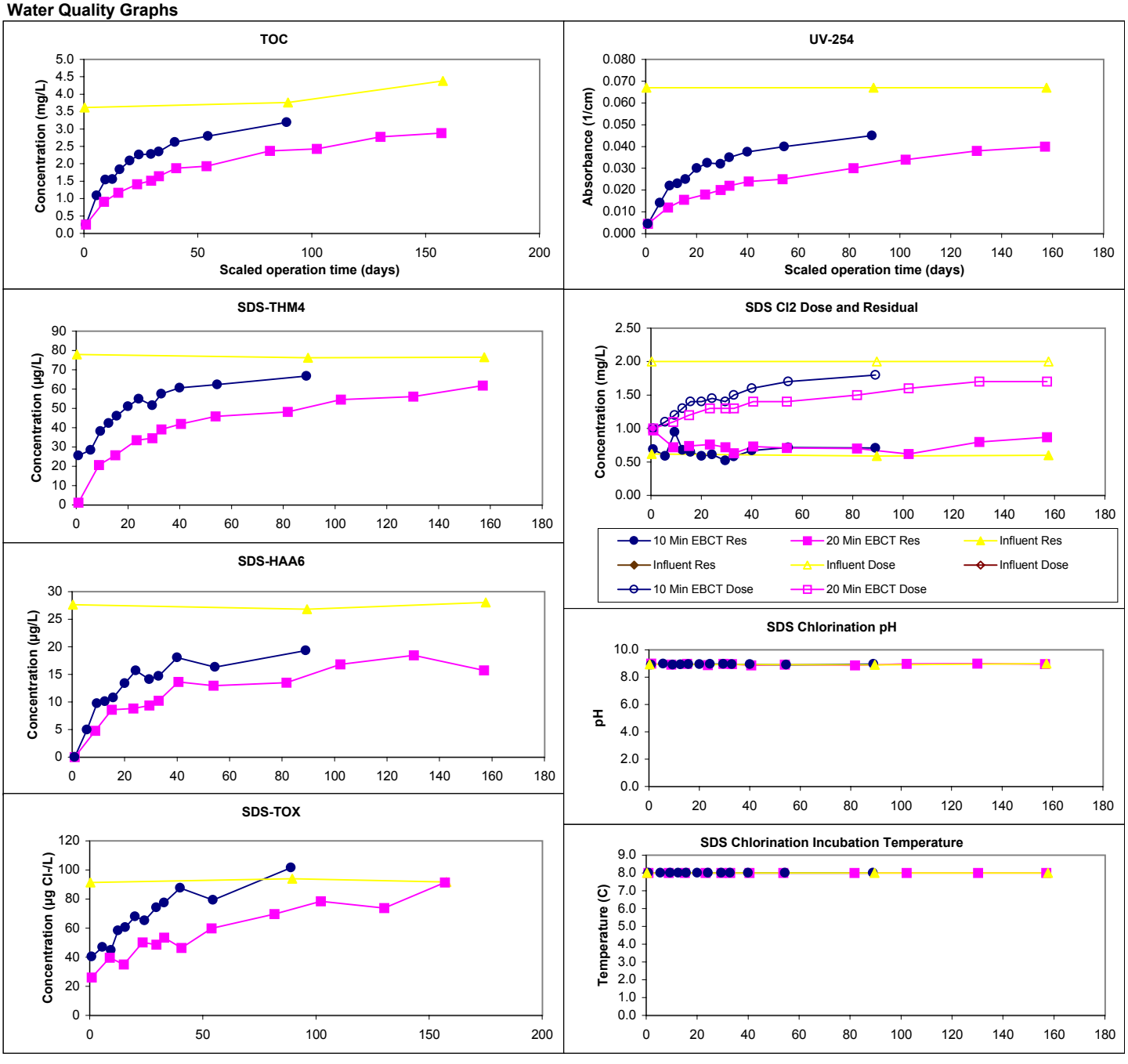
Cumulative SDS Conditions

	Mean	SD	Count	Min/Max
Res (0)	0.69	0.11	27	0.52 - 0.97
Temp	8.0	0.0	27	8.0 - 8.0
pH	8.9	0.0	27	8.9 - 9.0
Time	7.1	0.1	27	6.8 - 7.4

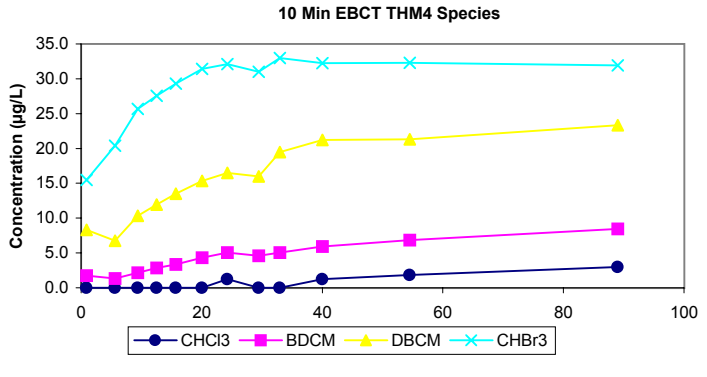
Comments:

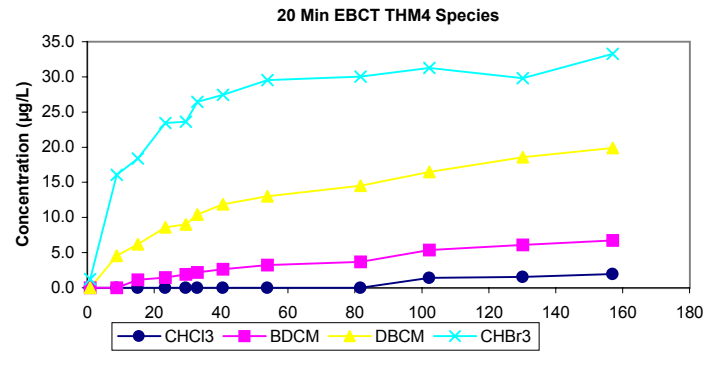
Chart Legend: 10 Min EBCT; 20 Min EBCT; Influent; Influent

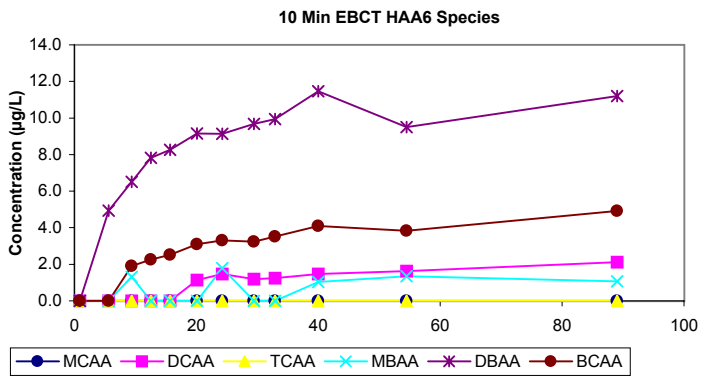
Water Quality Graphs

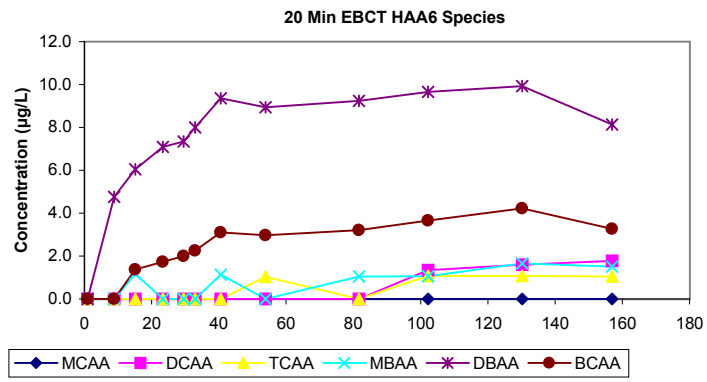


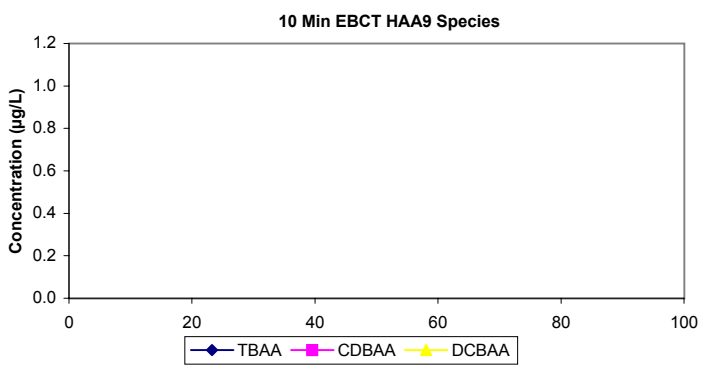
Water Quality Graphs (Continued)

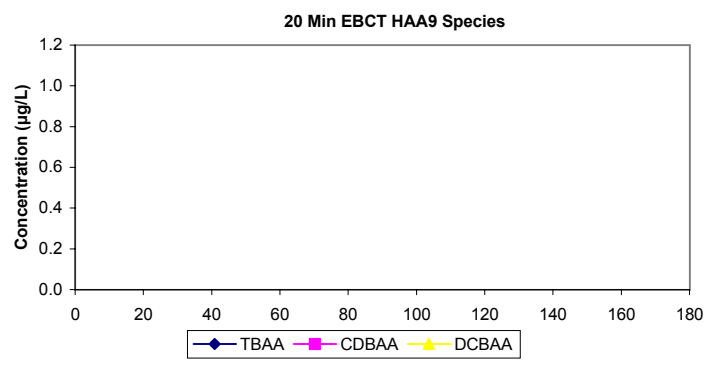


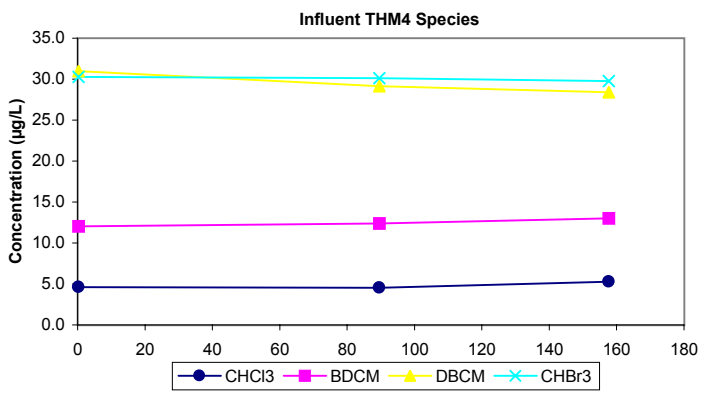


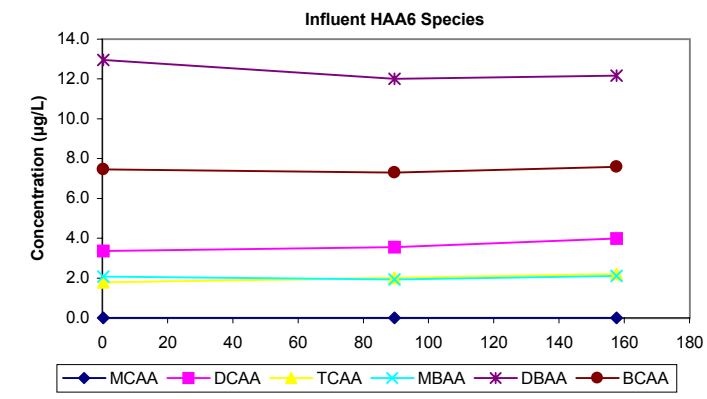












Wichita Falls | **Bench-Scale RSSCT Treatment Study Summary** | **Quarter:** 2

ICR Information

ID / ICR#:	TX2430001 / 658
ICR Contact:	Daniel Nix
Phone No.:	940-691-1153
Period:	6/18/98 - 7/8/98 (19 B-S days)

Design Information

Design TOC:	4.8 mg/L	**Full-Scale GAC Size:**	8x30 Bituminous
Col Diameter:	8.0 mm	**Bench-Scale GAC Size:**	60x80
Min Reynolds#:	0.50	**Scaling Factor:**	6.88
Full-Scale Temp:	26.0 C	**Meas Dry Bed Density:**	0.46 g/cm3

Water Quality Summary

	Influent				Influent			
Influent	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max
TOC	4.8	0.1	3	4.7 - 4.9				
pH	9.4	0.5	3	9.1 - 10.0				
UV254	0.092	0.003	3	0.089 - 0.094				
SUVA	1.92	0.10	3	1.83 - 2.02				
Bromide	478	10	2	473 - 483				
SDS-TOX	223	40	3	177 - 247				
SDS-THM4	125	4	3	122 - 129				
SDS-HAA6	50	3	3	47 - 52				
Effluent	**10 Min EBCT**			(11 B-S days)	**20 Min EBCT**			(20 B-S days)
Effluent pH	9.6	0.2	14	9.2 - 9.9	9.4	0.2	13	9.0 - 9.9
Effluent Temp	20.0	0.0	14	20.0 - 20.0	20.0	0.0	13	20.0 - 20.0

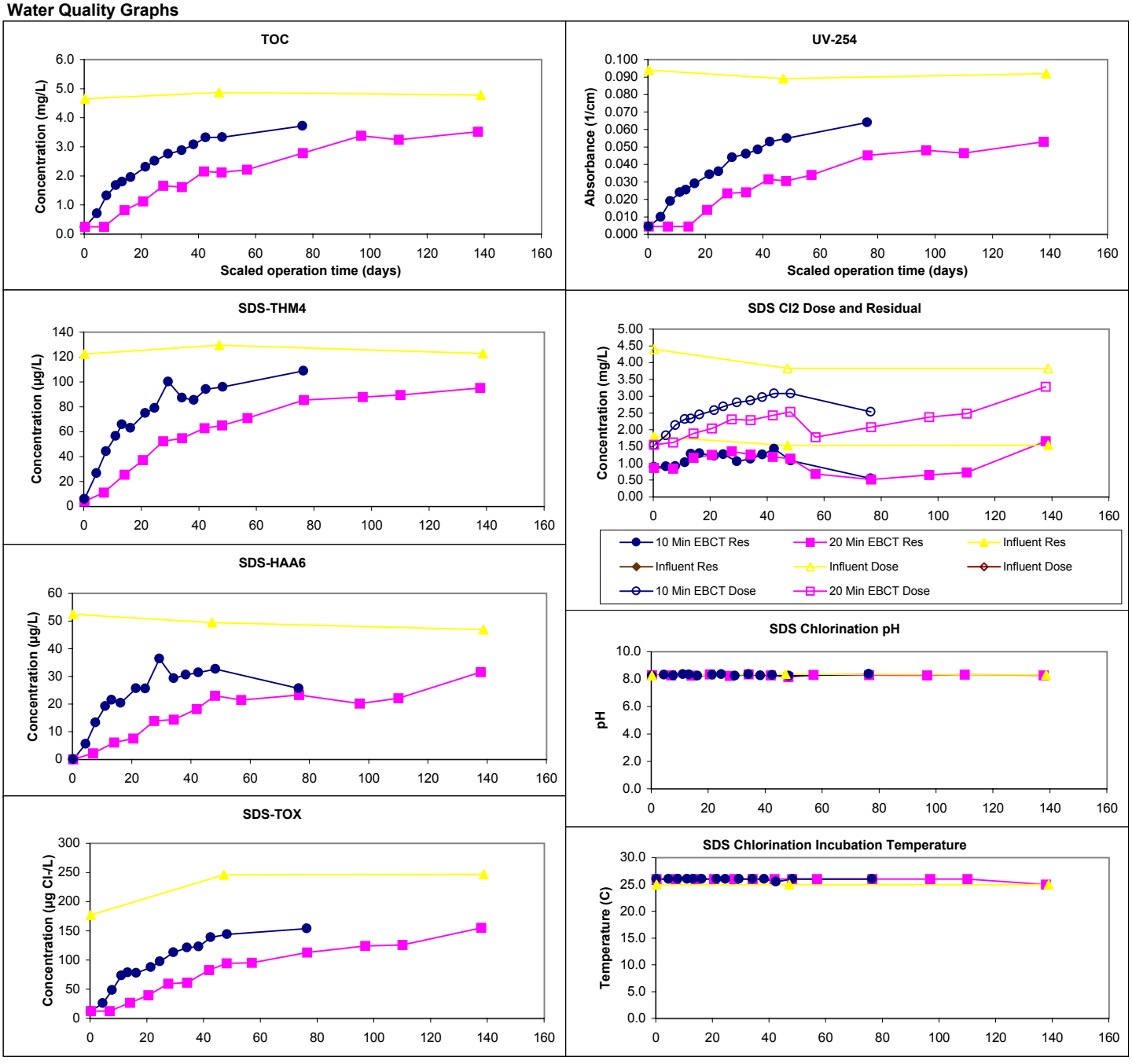
Cumulative SDS Conditions

	Mean	SD	Count	Min/Max
Res (0)	1.12	0.32	30	0.52 - 1.80
Temp	25.9	0.4	30	25.0 - 26.0
pH	8.3	0.1	30	8.2 - 8.4
Time	4.2	0.1	30	3.9 - 4.4

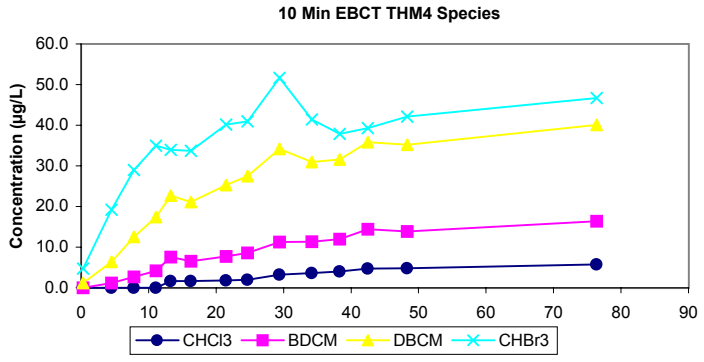
Comments:

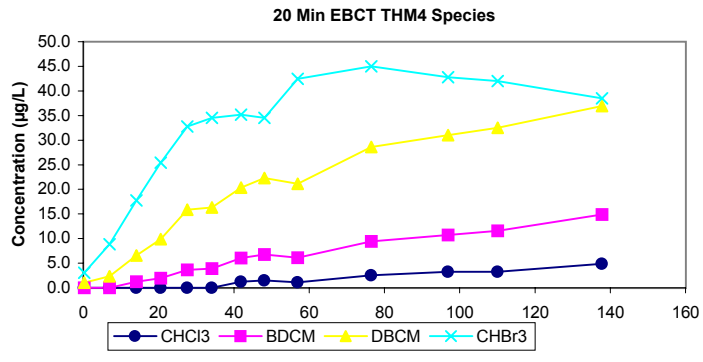
Chart Legend: 10 Min EBCT; 20 Min EBCT; Influent; Influent

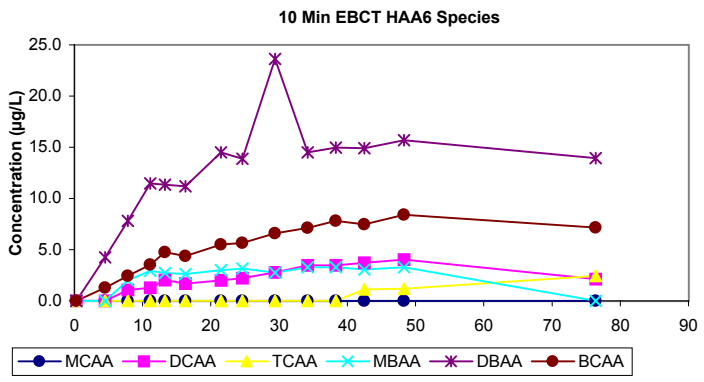
Water Quality Graphs

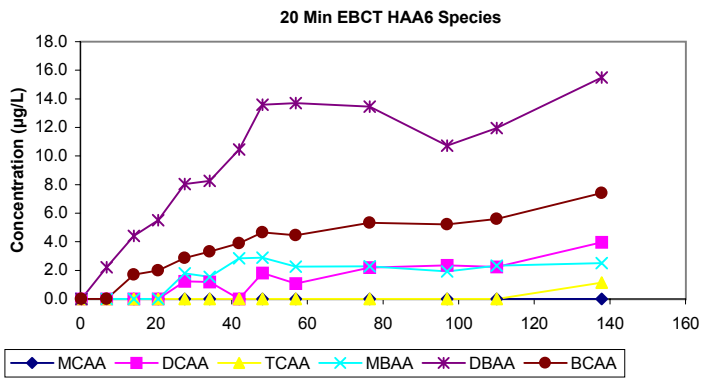


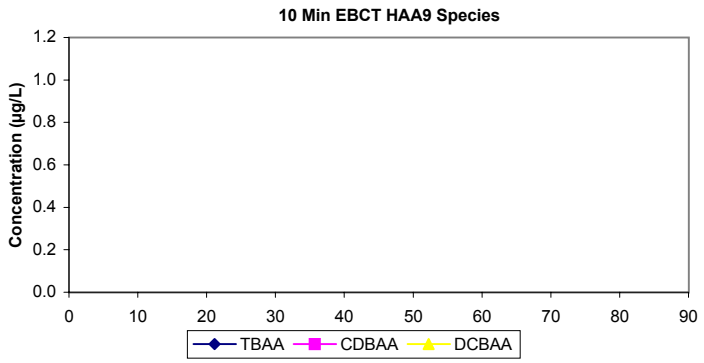
Water Quality Graphs (Continued)

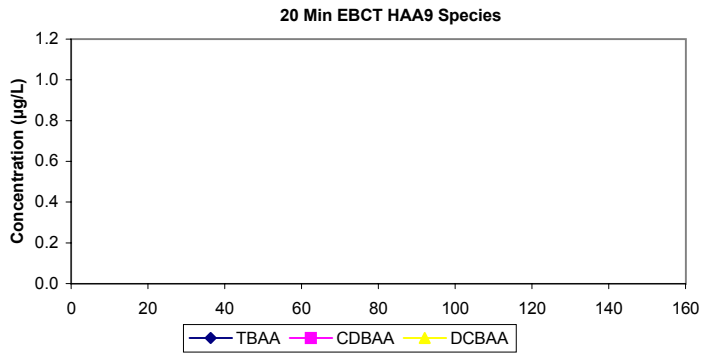


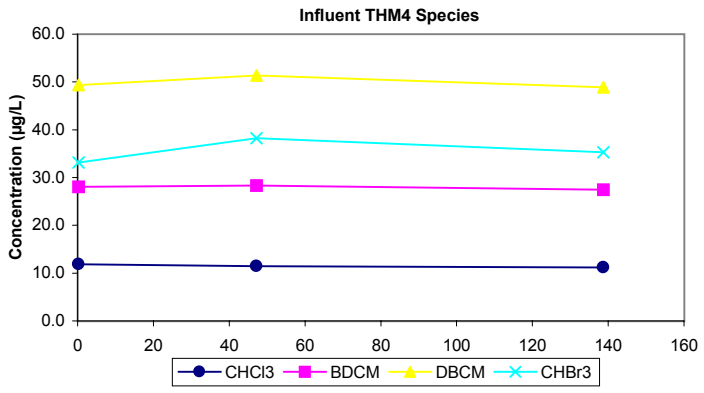


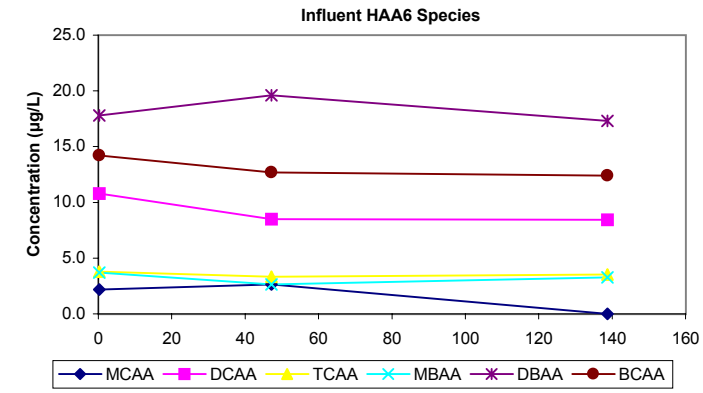












Wichita Falls | **Bench-Scale RSSCT Treatment Study Summary** | **Quarter:** 3

ICR Information

ID / ICR#:	TX2430001 / 658
ICR Contact:	Daniel Nix
Phone No.:	940-691-1153
Period:	8/17/98 - 9/9/98 (23 B-S days)

Design Information

Design TOC:	4.9 mg/L	**Full-Scale GAC Size:**	8x30 Bituminous
Col Diameter:	8.0 mm	**Bench-Scale GAC Size:**	60x80
Min Reynolds#:	0.50	**Scaling Factor:**	6.88
Full-Scale Temp:	27.0 C	**Meas Dry Bed Density:**	0.44 g/cm3

Water Quality Summary

	Influent				Influent			
Influent	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max
TOC	4.5	0.4	3	4.2 - 4.9				
pH	8.1	0.3	3	7.8 - 8.4				
UV254	0.085	0.002	3	0.083 - 0.087				
SUVA	1.90	0.16	3	1.73 - 2.06				
Bromide	504	0	1	504 - 504				
SDS-TOX	163	32	3	136 - 199				
SDS-THM4	95	7	3	90 - 103				
SDS-HAA6	29	5	2	26 - 32				
Effluent	**10 Min EBCT**			(13 B-S days)	**20 Min EBCT**			(23 B-S days)
Effluent pH	8.1	0.3	12	7.3 - 8.4	8.1	0.3	12	7.7 - 8.7
Effluent Temp	20.0	0.0	12	20.0 - 20.0	20.0	0.0	12	20.0 - 20.0

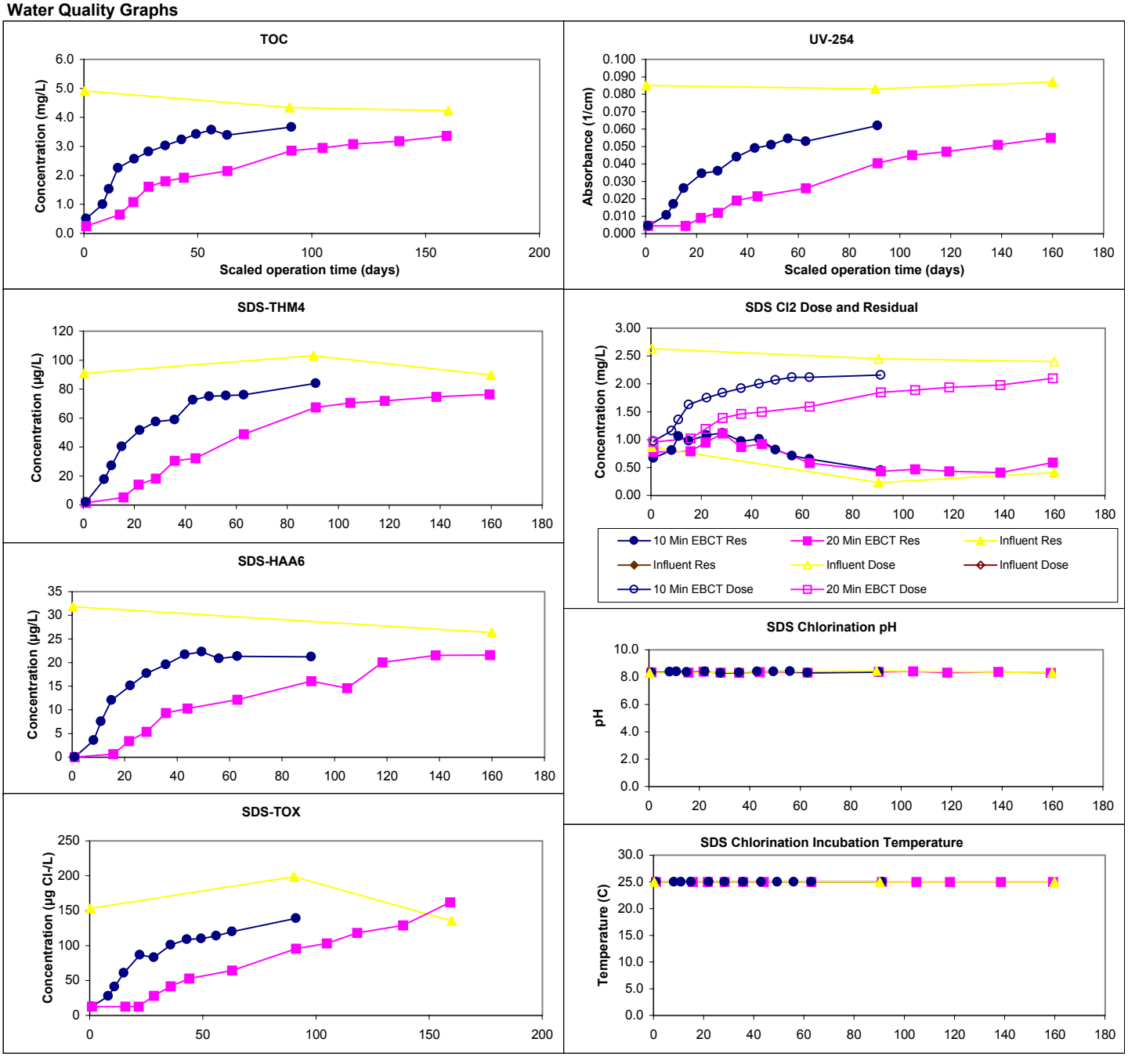
Cumulative SDS Conditions

	Mean	SD	Count	Min/Max
Res (0)	0.75	0.26	27	0.23 - 1.12
Temp	25.0	0.0	27	25.0 - 25.0
pH	8.4	0.0	27	8.3 - 8.5
Time	2.0	0.1	27	1.8 - 2.2

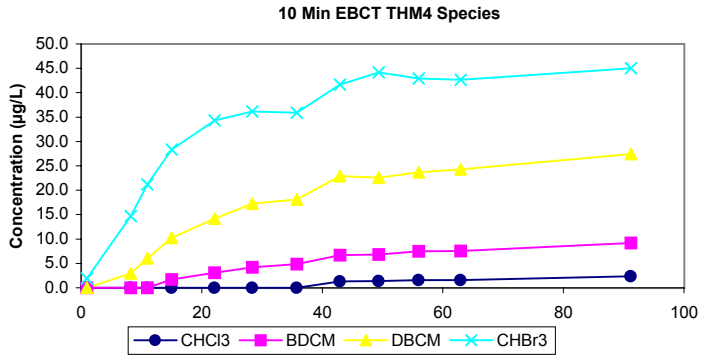
Comments:

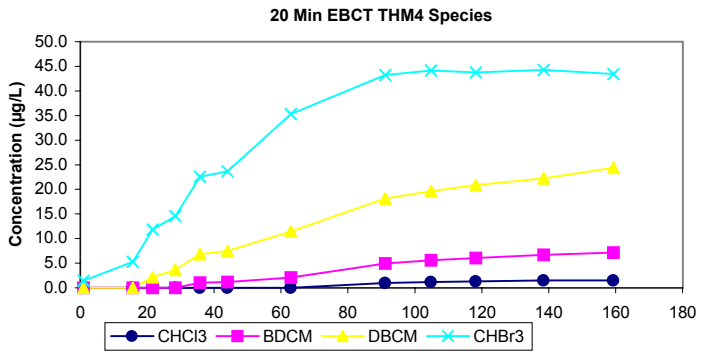
Chart Legend: 10 Min EBCT; 20 Min EBCT; Influent; Influent

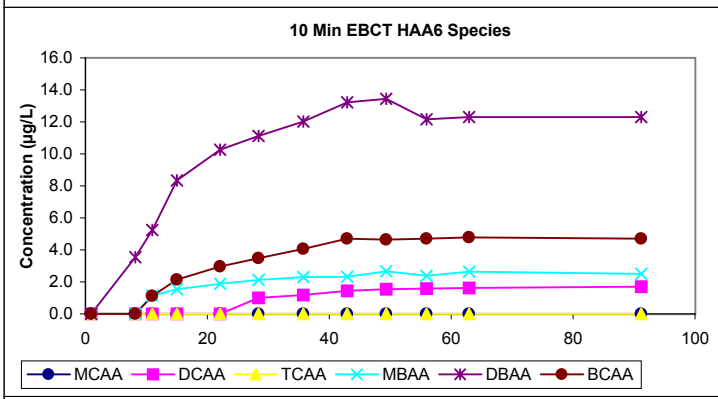
Water Quality Graphs

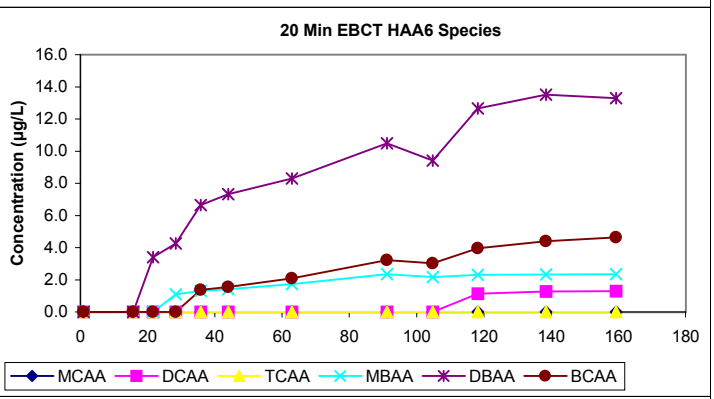


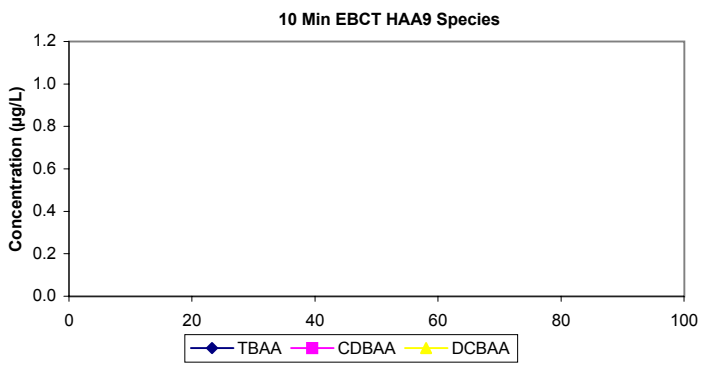
Water Quality Graphs (Continued)

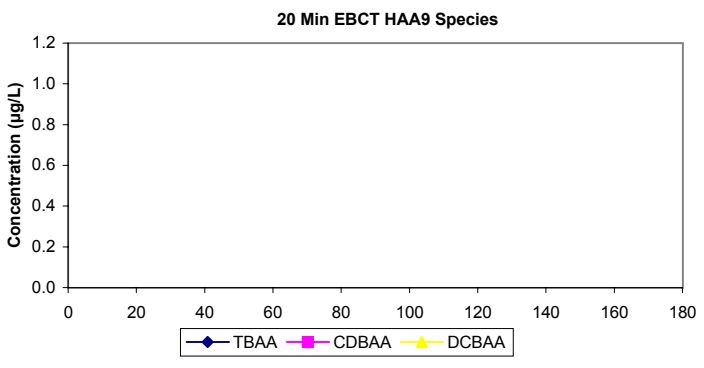


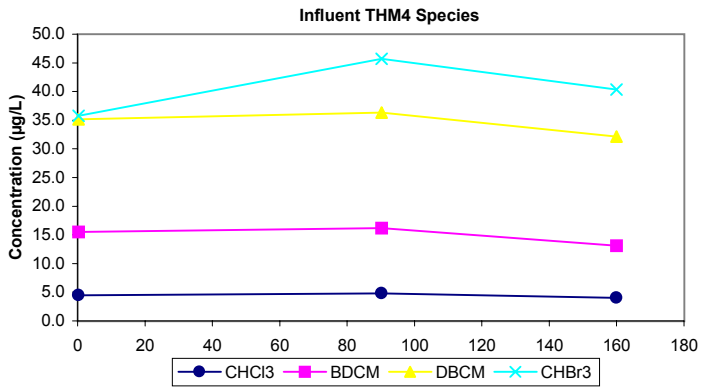


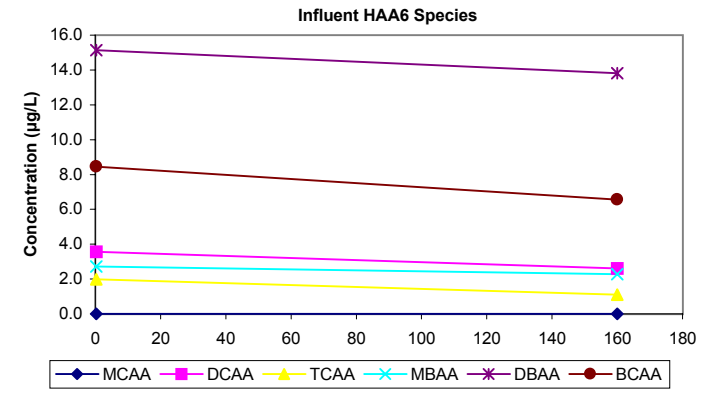












Wichita Falls | **Bench-Scale RSSCT Treatment Study Summary** | **Quarter:** 4

ICR Information

ID / ICR#: TX2430001 / 658
ICR Contact: Daniel Nix
Phone No.: 940-691-1153
Period: 12/15/98 - 1/4/99 (20 B-S days)

Design Information

Design TOC: 4.9 mg/L
Col Diameter: 8.0 mm
Min Reynolds#: 0.50
Full-Scale Temp: 16.0 C

Full-Scale GAC Size: 8x30 Bituminous
Bench-Scale GAC Size: 60x80
Scaling Factor: 6.88
Meas Dry Bed Density: 0.44 g/cm3

Water Quality Summary

Influent	Influent Mean	SD/RD	Count	Min/Max	Influent Mean	SD/RD	Count	Min/Max
TOC	5.0	0.2	3	4.8 - 5.2				
pH	8.2	0.0	3	8.2 - 8.3				
UV254	0.084	0.001	3	0.083 - 0.084				
SUVA	1.67	0.06	3	1.62 - 1.75				
Bromide	541	3	2	539 - 542				
SDS-TOX	155	12	3	142 - 164				
SDS-THM4	94	6	3	87 - 100				
SDS-HAA6	25	1	3	24 - 26				
Effluent	**10 Min EBCT**			(11 B-S days)	**20 Min EBCT**			(20 B-S days)
Effluent pH	7.9	0.4	12	7.2 - 9.0	8.0	0.6	12	6.4 - 8.9
Effluent Temp	20.0	0.0	12	20.0 - 20.0	20.0	0.0	12	20.0 - 20.0

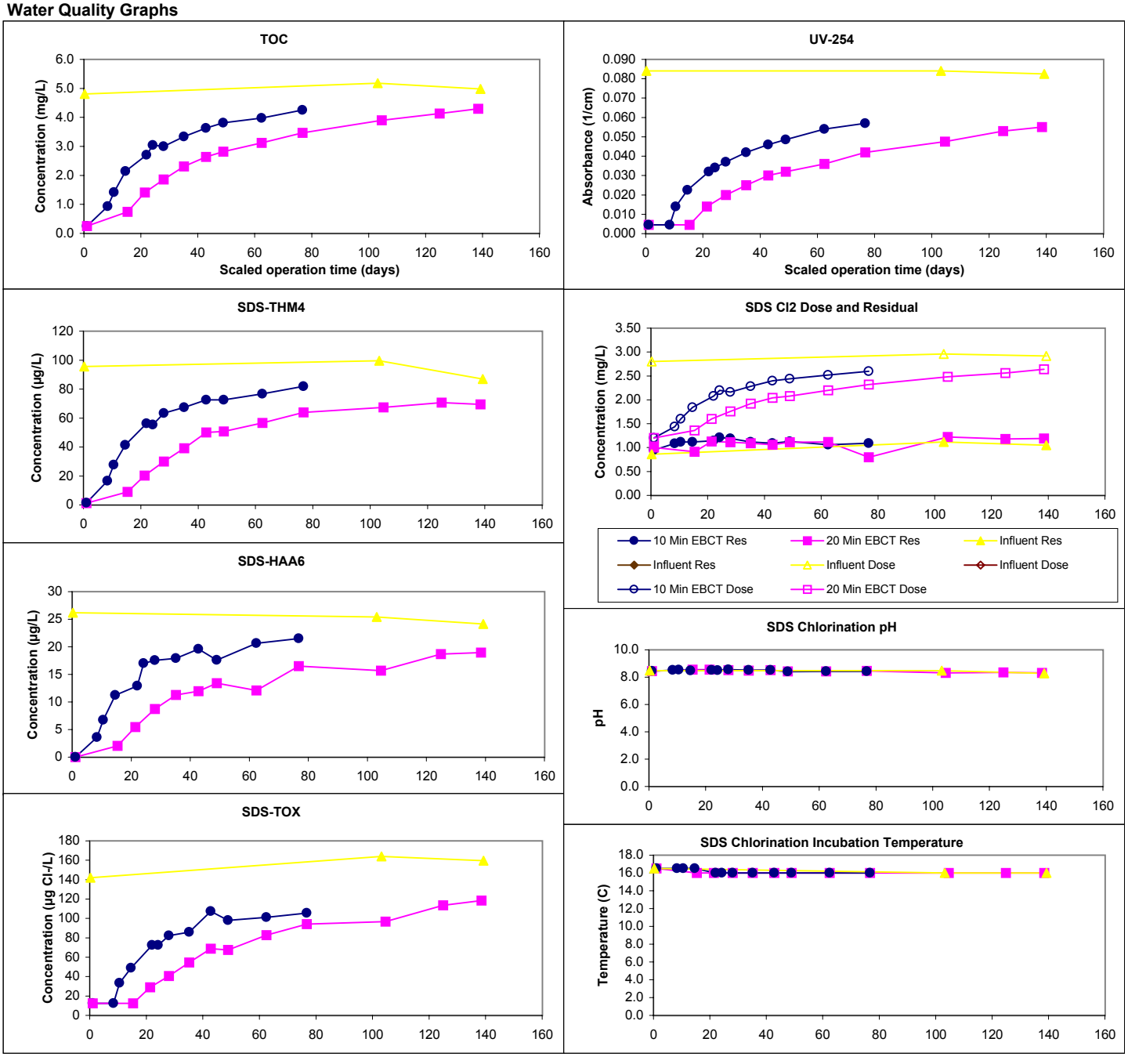
Cumulative SDS Conditions

	Mean	SD	Count	Min/Max
Res (0)	1.08	0.10	27	0.80 - 1.23
Temp	16.1	0.2	27	16.0 - 16.5
pH	8.5	0.1	27	8.3 - 8.6
Time	4.4	0.1	27	4.3 - 4.5

Comments:

Chart Legend: 10 Min EBCT; 20 Min EBCT; Influent; Influent

Water Quality Graphs



Water Quality Graphs (Continued)