

# ICR TREATMENT STUDY ANALYSIS

## Base Analysis and Data Review Comments

<b>Treatment Study ID</b>	1081
<b>Study Protocol</b>	GAC RSSCT treatment study
<b>Plant ICR Number</b>	281
<b>PWS Name</b>	Jacksonville Electric Authority
<b>City, State, Zip</b>	Jacksonville, FL 32225

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

### Major comments:

1. Since this study was conducted on a Florida ground water, other parameters were evaluated in lieu of seasonal variability. Specifically, EBCTs of 5, 7.5, 10, 15 and 20-minutes were evaluated, and influent pH values of 7.0, 7.4 and 7.8 were evaluated at an EBCT of 10-minutes. Batch water sampling occurred on three dates and showed little variability across the three batches, as shown in Table 5 of the Summary Report. Also note that the same target SDS chlorination conditions were used for all RSSCT runs.
2. During the 7.5, 15 and 20 minute EBCT runs, and during the pH 7.4 run (conducted during the pH study), chlorine demand in the GAC effluent decreased over the course of the run. During one run, the inorganic chlorine demand was monitored over the course of the run (see Section 8.1 of the Summary Report). The results of this monitoring showed that the increasing chlorine demand was due to a decrease in the inorganic demand (the organic demand increased as suspected). This is not entirely unexpected, since the full-scale plant utilizes aeration to remove hydrogen sulfide. It is possible that residual hydrogen sulfide or ammonia volatilized over the course of the run resulting in a decrease in the total chlorine demand. SDS-chlorine demand should NOT be modeled for these runs since it does not represent the breakthrough of chlorine demand that would be observed for a water with a relatively stable inorganic demand.

### General Comments:

1. In Table 41 of the report, please verify the RPD data for the field duplicates. The following SDS-DBPs all have a count of 6, but values of 0 for the RPD (average and percentiles:

CHCl<sub>3</sub>, MCAA, DCAA, TCAA, MBAA, TBAA and CDBAA. It is unlikely that the RPD would be zero in all of these cases.

*Response: Due to a systematic error, QA/QC data reported in Table 41 of the Treatment Study Summary Report were incorrect. The values have been corrected, and the updated version of Table 41 has been added to the hard copy and to the electronic version (PDF) of the report.*

2. The MRL for UV-254 is reported at 0.009 1/cm, but values as low as 0.001 1/cm are reported in the Data Collection Spreadsheets. The MRL for TOC is reported as 0.5 mg/L, but values as low as 0.25 are reported in Data Collection Spreadsheets. The MRL for TOX is reported as 25 ug/L, but values as low as 13 ug/L are reported in Data Collection Spreadsheets. It is acceptable to use these measured values below the MRL, but comments should be included that indicate these values are BMRL. Alternatively, the MRL could be revised if it was determined according to acceptable procedures.

*Response: Values below the MRL in the Data Collection Spreadsheets are estimates. A comment indicating this has been added to the Data Collection Spreadsheets.*

3. Note that the cartridge filtration process used during pretreatment was not used to simulate full-scale media filtration (which is not used at the plant); rather, it was a preventive measure against head-loss buildup in the RSSCT columns.
4. The formation of HAAs in the influent and effluent was very low (average SDS-HAA6 formed in the influent <15 mg/L across all runs). However, SDS-THM4 formation did exceed the Stage 2 D/DBP placeholder. Bromoform was the dominant THM present in the GAC effluent.

## **Outlier Data:**

No outliers were removed.

**Cell:** A1

**Comment:** 1081-SAS.xls 2/8/00 10:23

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

**Cell:** C2

**Comment:** 1081-10-01 - Run 1 (BCAA) 2/8/00 09:31  
Original value (CoefA0) = 0 New value = 1.0538  
Fewer than 6 points above MRL. Step function applied.

**Cell:** D2

**Comment:** 1081-10-01 - Run 1 (BCAA) 2/8/00 09:31  
Original value (CoefAf) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** E2

**Comment:** 1081-10-01 - Run 1 (BCAA) 2/8/00 09:31  
Original value (CoefB) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** F2

**Comment:** 1081-10-01 - Run 1 (BCAA) 2/8/00 09:31  
Original value (CoefD) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** J2

**Comment:** 1081-10-01 - Run 1 (BCAA) 2/8/00 09:31  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** K2

**Comment:** 1081-10-01 - Run 1 (BCAA) 2/8/00 09:31  
Original value (t0) = 0 New value = 91.6475  
Fewer than 6 points above MRL. Step function applied.

**Cell:** C24

**Comment:** 1081-05-02 - Run 3 (BCAA) 2/8/00 09:46  
Original value (CoefA0) = 0 New value = -0.2369  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** D24

**Comment:** 1081-05-02 - Run 3 (BCAA) 2/8/00 09:46  
Original value (CoefAf) = 0 New value = 1.9029  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** E24

**Comment:** 1081-05-02 - Run 3 (BCAA) 2/8/00 09:46  
Original value (CoefB) = 0 New value = 72.0433  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** F24

**Comment:** 1081-05-02 - Run 3 (BCAA) 2/8/00 09:46  
Original value (CoefD) = 0 New value = 0.1243  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** J24

**Comment:** 1081-05-02 - Run 3 (BCAA) 2/8/00 09:46  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** C28

**Comment:** 1081-05-02 - Run 3 (CHCl3) 2/8/00 09:34  
Original value (CoefA0) = 0 New value = 1.1913  
Fewer than 6 points above MRL. Step function applied.

**Cell:** D28

**Comment:** 1081-05-02 - Run 3 (CHCl3) 2/8/00 09:34  
Original value (CoefAf) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** E28

**Comment:** 1081-05-02 - Run 3 (CHCl3) 2/8/00 09:34  
Original value (CoefB) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** F28

**Comment:** 1081-05-02 - Run 3 (CHCl3) 2/8/00 09:34  
Original value (CoefD) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** J28

**Comment:** 1081-05-02 - Run 3 (CHCl3) 2/8/00 09:34  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** K28

**Comment:** 1081-05-02 - Run 3 (CHCl3) 2/8/00 09:34  
Original value (t0) = 0 New value = 51.7989  
Fewer than 6 points above MRL. Step function applied.

**Cell:** C33

**Comment:** 1081-05-02 - Run 3 (DCBAA) 2/8/00 09:47  
Original value (CoefA0) = 0 New value = -0.4082  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** D33

**Comment:** 1081-05-02 - Run 3 (DCBAA) 2/8/00 09:47  
Original value (CoefAf) = 0 New value = 2.1603  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** E33

**Comment:** 1081-05-02 - Run 3 (DCBAA) 2/8/00 09:47  
Original value (CoefB) = 0 New value = 20.0857  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** F33

**Comment:** 1081-05-02 - Run 3 (DCBAA) 2/8/00 09:47  
Original value (CoefD) = 0 New value = 0.0764  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** J33

**Comment:** 1081-05-02 - Run 3 (DCBAA) 2/8/00 09:47  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** C46

**Comment:** 1081-15-03 - Run 5 (BCAA) 2/8/00 09:37  
Original value (CoefA0) = 0 New value = 1.1921  
Fewer than 6 points above MRL. Step function applied.

**Cell:** D46

**Comment:** 1081-15-03 - Run 5 (BCAA) 2/8/00 09:37  
Original value (CoefAf) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** E46

**Comment:** 1081-15-03 - Run 5 (BCAA) 2/8/00 09:37  
Original value (CoefB) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** F46

**Comment:** 1081-15-03 - Run 5 (BCAA) 2/8/00 09:37  
Original value (CoefD) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** J46

**Comment:** 1081-15-03 - Run 5 (BCAA) 2/8/00 09:37  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** K46

**Comment:** 1081-15-03 - Run 5 (BCAA) 2/8/00 09:37  
Original value (t0) = 0 New value = 217.5134  
Fewer than 6 points above MRL. Step function applied.

**Cell:** C51

**Comment:** 1081-15-03 - Run 5 (CI2-D) 2/8/00 09:57  
Original value (CoefA0) = 0.895 New value = 1.79  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** D51

**Comment:** 1081-15-03 - Run 5 (CI2-D) 2/8/00 09:57

Original value (CoefAf) = 1.79 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** E51

**Comment:** 1081-15-03 - Run 5 (CI2-D) 2/8/00 09:57  
Original value (CoefB) = 10 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** F51

**Comment:** 1081-15-03 - Run 5 (CI2-D) 2/8/00 09:57  
Original value (CoefD) = 0.15 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** J51

**Comment:** 1081-15-03 - Run 5 (CI2-D) 2/8/00 09:57  
Original value (S) = -0.003 New value = -0.0056  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** C53

**Comment:** 1081-15-03 - Run 5 (DBCM) 2/8/00 09:53  
Original value (CoefA0) = 0 New value = -0.6619  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** D53

**Comment:** 1081-15-03 - Run 5 (DBCM) 2/8/00 09:53  
Original value (CoefAf) = 0 New value = 4.2434  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** E53

**Comment:** 1081-15-03 - Run 5 (DBCM) 2/8/00 09:53  
Original value (CoefB) = 0 New value = 20.9545  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** F53

**Comment:** 1081-15-03 - Run 5 (DBCM) 2/8/00 09:53  
Original value (CoefD) = 0 New value = 0.019  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** J53

**Comment:** 1081-15-03 - Run 5 (DBCM) 2/8/00 09:53  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** C55

**Comment:** 1081-15-03 - Run 5 (DCBAA) 2/8/00 09:38  
Original value (CoefA0) = 0 New value = 1.1372  
Fewer than 6 points above MRL. Step function applied.

**Cell:** D55

**Comment:** 1081-15-03 - Run 5 (DCBAA) 2/8/00 09:38  
Original value (CoefAf) = 0 New value = 0

Fewer than 6 points above MRL. Step function applied.

**Cell:** E55

**Comment:** 1081-15-03 - Run 5 (DCBAA) 2/8/00 09:38

Original value (CoefB) = 0 New value = 0

Fewer than 6 points above MRL. Step function applied.

**Cell:** F55

**Comment:** 1081-15-03 - Run 5 (DCBAA) 2/8/00 09:38

Original value (CoefD) = 0 New value = 0

Fewer than 6 points above MRL. Step function applied.

**Cell:** J55

**Comment:** 1081-15-03 - Run 5 (DCBAA) 2/8/00 09:38

Original value (S) = 0 New value = 0

Fewer than 6 points above MRL. Step function applied.

**Cell:** K55

**Comment:** 1081-15-03 - Run 5 (DCBAA) 2/8/00 09:38

Original value (t0) = 0 New value = 217.5134

Fewer than 6 points above MRL. Step function applied.

**Cell:** C68

**Comment:** 1081-10-04 - Run 7 (BCAA) 2/8/00 09:59

Original value (CoefA0) = 0 New value = -0.4994

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

**Cell:** D68

**Comment:** 1081-10-04 - Run 7 (BCAA) 2/8/00 09:59

Original value (CoefAf) = 0 New value = 4.2762

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

**Cell:** E68

**Comment:** 1081-10-04 - Run 7 (BCAA) 2/8/00 09:59

Original value (CoefB) = 0 New value = 24.5344

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

**Cell:** F68

**Comment:** 1081-10-04 - Run 7 (BCAA) 2/8/00 09:59

Original value (CoefD) = 0 New value = 0.0219

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

**Cell:** J68

**Comment:** 1081-10-04 - Run 7 (BCAA) 2/8/00 09:59

Original value (S) = 0 New value = 0

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

**Cell:** C95

**Comment:** 1081-20-01 - Run 2 (CI2-D) 2/8/00 09:44

Original value (CoefA0) = 0.875 New value = 1.75

Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** D95

**Comment:** 1081-20-01 - Run 2 (CI2-D) 2/8/00 09:44  
Original value (CoefAf) = 1.75 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** E95

**Comment:** 1081-20-01 - Run 2 (CI2-D) 2/8/00 09:44  
Original value (CoefB) = 10 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** F95

**Comment:** 1081-20-01 - Run 2 (CI2-D) 2/8/00 09:44  
Original value (CoefD) = 0.15 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** J95

**Comment:** 1081-20-01 - Run 2 (CI2-D) 2/8/00 09:44  
Original value (S) = -0.0019 New value = -0.0036  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** C97

**Comment:** 1081-20-01 - Run 2 (DBCM) 2/8/00 09:32  
Original value (CoefA0) = 0 New value = 1.9616  
Fewer than 6 points above MRL. Step function applied.

**Cell:** D97

**Comment:** 1081-20-01 - Run 2 (DBCM) 2/8/00 09:32  
Original value (CoefAf) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** E97

**Comment:** 1081-20-01 - Run 2 (DBCM) 2/8/00 09:32  
Original value (CoefB) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** F97

**Comment:** 1081-20-01 - Run 2 (DBCM) 2/8/00 09:32  
Original value (CoefD) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** J97

**Comment:** 1081-20-01 - Run 2 (DBCM) 2/8/00 09:32  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** K97

**Comment:** 1081-20-01 - Run 2 (DBCM) 2/8/00 09:32  
Original value (t0) = 0 New value = 229.5509  
Fewer than 6 points above MRL. Step function applied.

**Cell:** C117



**Comment:** 1081-075-02 - Run 4 (CI2-D) 2/8/00 09:49  
Original value (CoefA0) = 0.77 New value = 1.54  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** D117

**Comment:** 1081-075-02 - Run 4 (CI2-D) 2/8/00 09:49  
Original value (CoefAf) = 1.54 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** E117

**Comment:** 1081-075-02 - Run 4 (CI2-D) 2/8/00 09:49  
Original value (CoefB) = 10 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** F117

**Comment:** 1081-075-02 - Run 4 (CI2-D) 2/8/00 09:49  
Original value (CoefD) = 0.15 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** J117

**Comment:** 1081-075-02 - Run 4 (CI2-D) 2/8/00 09:49  
Original value (S) = -0.0033 New value = -0.0043  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** C119

**Comment:** 1081-075-02 - Run 4 (DBCM) 2/8/00 09:47  
Original value (CoefA0) = 0 New value = -0.6993  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** D119

**Comment:** 1081-075-02 - Run 4 (DBCM) 2/8/00 09:47  
Original value (CoefAf) = 0 New value = 4.239  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** E119

**Comment:** 1081-075-02 - Run 4 (DBCM) 2/8/00 09:47  
Original value (CoefB) = 0 New value = 20.4478  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** F119

**Comment:** 1081-075-02 - Run 4 (DBCM) 2/8/00 09:47  
Original value (CoefD) = 0 New value = 0.0535  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** J119

**Comment:** 1081-075-02 - Run 4 (DBCM) 2/8/00 09:47  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** C141

**Comment:** 1081-10-03 - Run 6 (DBCM) 2/8/00 09:58

Original value (CoefA0) = 0 New value = -0.2778  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** D141

**Comment:** 1081-10-03 - Run 6 (DBCM) 2/8/00 09:58  
Original value (CoefAf) = 0 New value = 2.1081  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** E141

**Comment:** 1081-10-03 - Run 6 (DBCM) 2/8/00 09:58  
Original value (CoefB) = 0 New value = 89.2808  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** F141

**Comment:** 1081-10-03 - Run 6 (DBCM) 2/8/00 09:58  
Original value (CoefD) = 0 New value = 0.0676  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** J141

**Comment:** 1081-10-03 - Run 6 (DBCM) 2/8/00 09:58  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Logistic function (type 1) applied.

**Cell:** C161

**Comment:** 1081-20-04 - Run 8 (CI2-D) 2/8/00 10:01  
Original value (CoefA0) = 0.855 New value = 1.455  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** D161

**Comment:** 1081-20-04 - Run 8 (CI2-D) 2/8/00 10:01  
Original value (CoefAf) = 0.0627 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** E161

**Comment:** 1081-20-04 - Run 8 (CI2-D) 2/8/00 10:01  
Original value (CoefB) = 0.7506 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** F161

**Comment:** 1081-20-04 - Run 8 (CI2-D) 2/8/00 10:01  
Original value (CoefD) = 0 New value = 0  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** J161

**Comment:** 1081-20-04 - Run 8 (CI2-D) 2/8/00 10:01  
Original value (S) = 0 New value = -0.0118  
Poor peak curve fit. Data was refit by iterative curve fit procedure.

**Cell:** C163

**Comment:** 1081-20-04 - Run 8 (DBCM) 2/8/00 09:40  
Original value (CoefA0) = 0 New value = 1.3449

Fewer than 6 points above MRL. Step function applied.

**Cell:** D163

**Comment:** 1081-20-04 - Run 8 (DBCM) 2/8/00 09:40  
Original value (CoefAf) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** E163

**Comment:** 1081-20-04 - Run 8 (DBCM) 2/8/00 09:40  
Original value (CoefB) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** F163

**Comment:** 1081-20-04 - Run 8 (DBCM) 2/8/00 09:40  
Original value (CoefD) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** J163

**Comment:** 1081-20-04 - Run 8 (DBCM) 2/8/00 09:40  
Original value (S) = 0 New value = 0  
Fewer than 6 points above MRL. Step function applied.

**Cell:** K163

**Comment:** 1081-20-04 - Run 8 (DBCM) 2/8/00 09:40  
Original value (t0) = 0 New value = 70.6626  
Fewer than 6 points above MRL. Step function applied.

## ICR Information

ID / ICR#: FL2161328 / 281  
 ICR Contact: Sibyl Carley  
 Phone No.: (904) 665-4503  
 Period: 4/13/98 - 5/5/98 (21 B-S days)

## Design Information

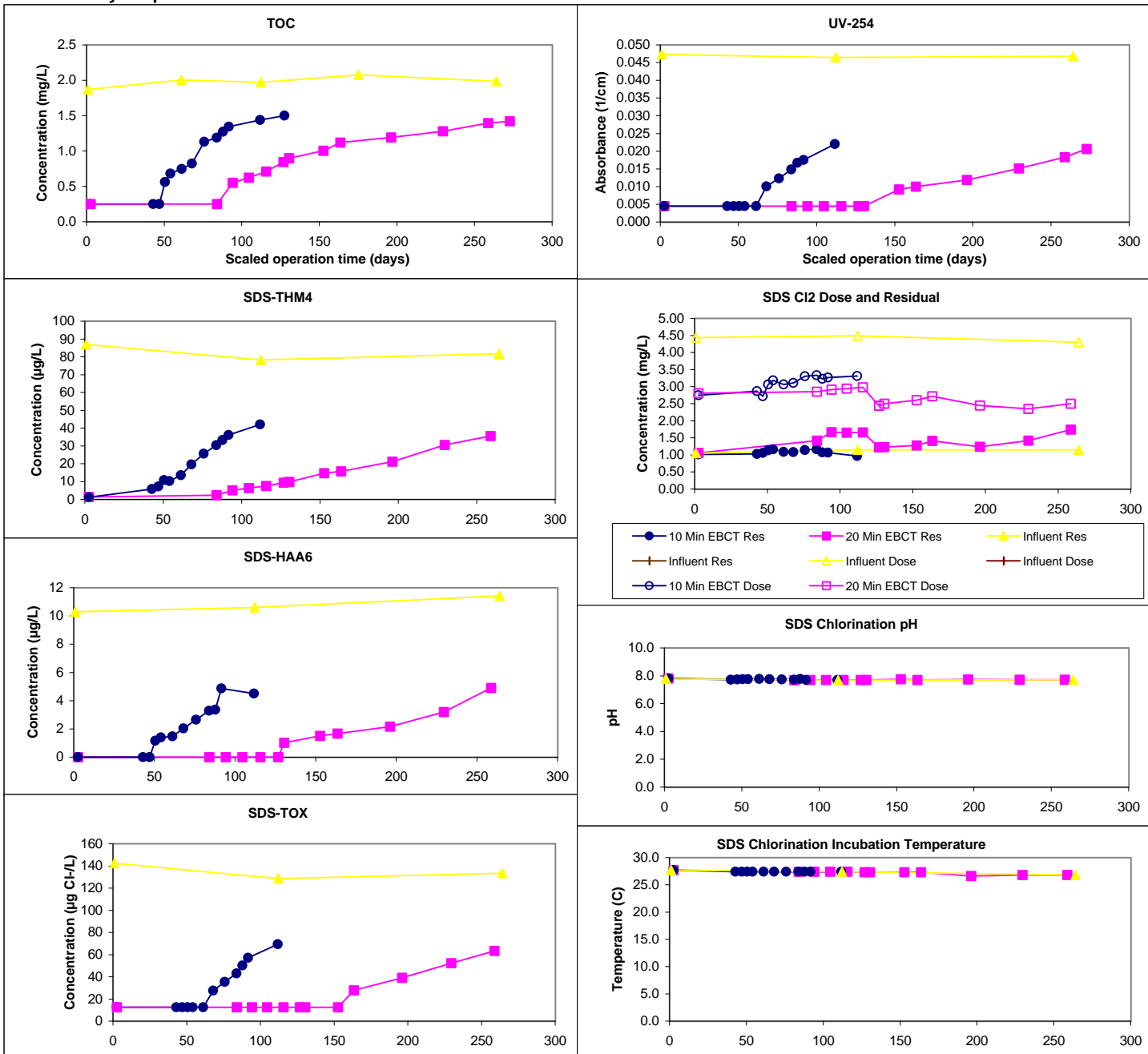
Design TOC: 2.0 mg/L  
 Col Diameter: 8.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 27.0 C

Full-Scale GAC Size: 12x40 Bituminous  
 Bench-Scale GAC Size: 140x230  
 Scaling Factor: 12.57  
 Meas Dry Bed Density: 0.50 g/cm3

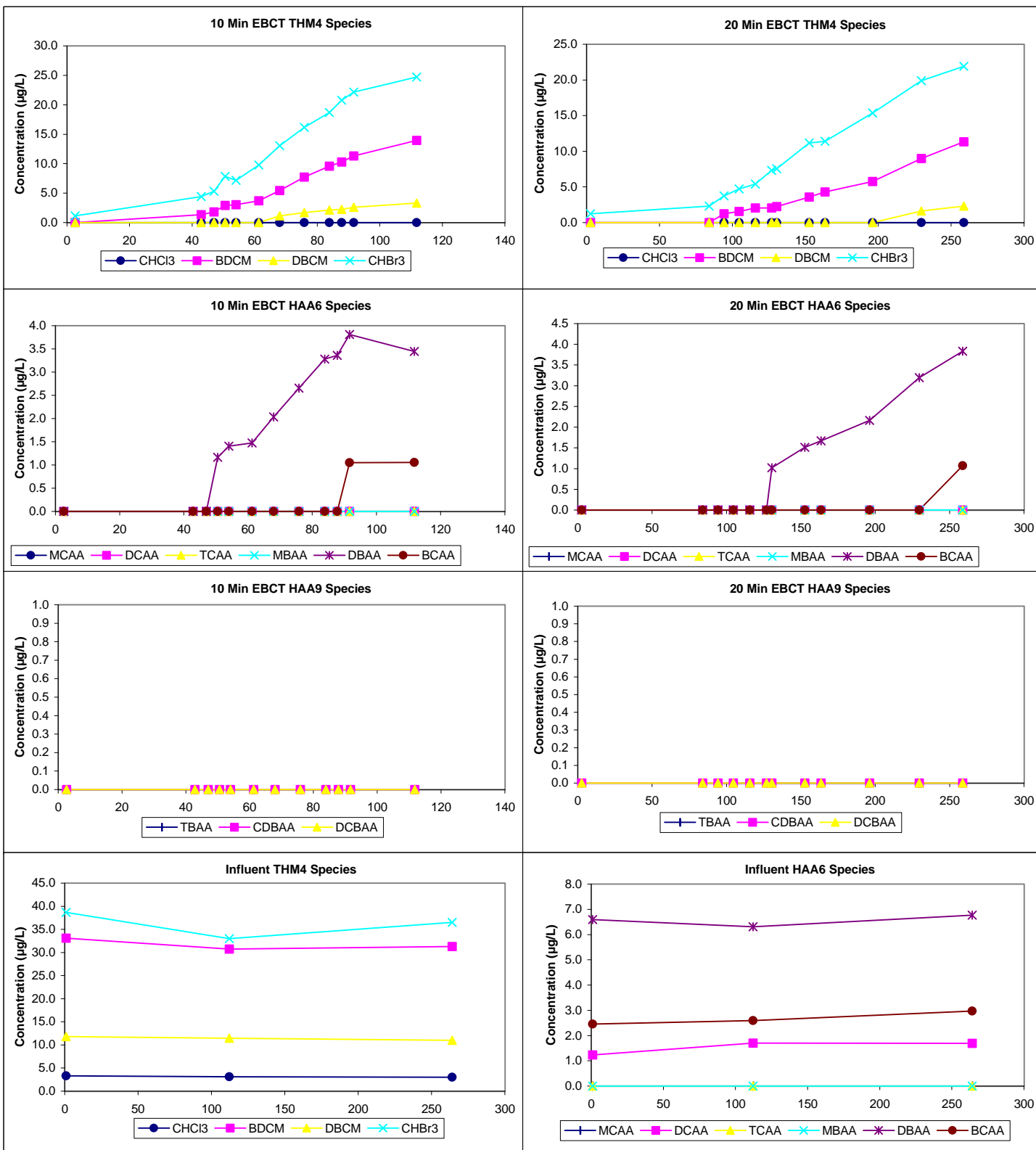
## Water Quality Summary

Influent	Influent					Influent								
	Mean	SD/RD	Count	Min/Max		Mean	SD/RD	Count	Min/Max			Mean	SD	Count
TOC	2.0	0.1	5	1.9 - 2.1						Res (0)	1.23	0.22	27	0.97 - 1.74
pH	7.4	0.0	5	7.4 - 7.4						Temp	27.3	0.3	27	26.6 - 27.7
UV254	0.047	0.000	3	0.046 - 0.047						pH	7.7	0.0	27	7.7 - 7.8
SUVA	2.42	0.10	3	2.36 - 2.53						Time	7.3	0.1	27	7.2 - 7.5
Bromide	450	20	2	440 - 460		Comments:								
SDS-TOX	135	7	3	129 - 143		<div><div></div>10 Min EBCT</div> <div><div></div>20 Min EBCT</div> <div><div></div>Influent</div> <div><div></div>Influent</div>								
SDS-THM4	82	4	3	78 - 87										
SDS-HAA6	11	1	3	10 - 11										
Effluent	10 Min EBCT (10 B-S days)				20 Min EBCT (22 B-S days)				Chart Legend:					
Effluent pH	7.9	0.1	13	7.8 - 8.1	7.9	0.3	13	7.3 - 8.2						
Effluent Temp	22.5	1.0	13	20.5 - 23.8	21.7	0.8	13	20.2 - 23.4						

## Water Quality Graphs



## Water Quality Graphs (Continued)



## ICR Information

ID / ICR#: FL2161328 / 281  
 ICR Contact: Sibyl Carley  
 Phone No.: (904) 665-4503  
 Period: 6/18/98 - 7/10/98 (21 B-S days)

## Design Information

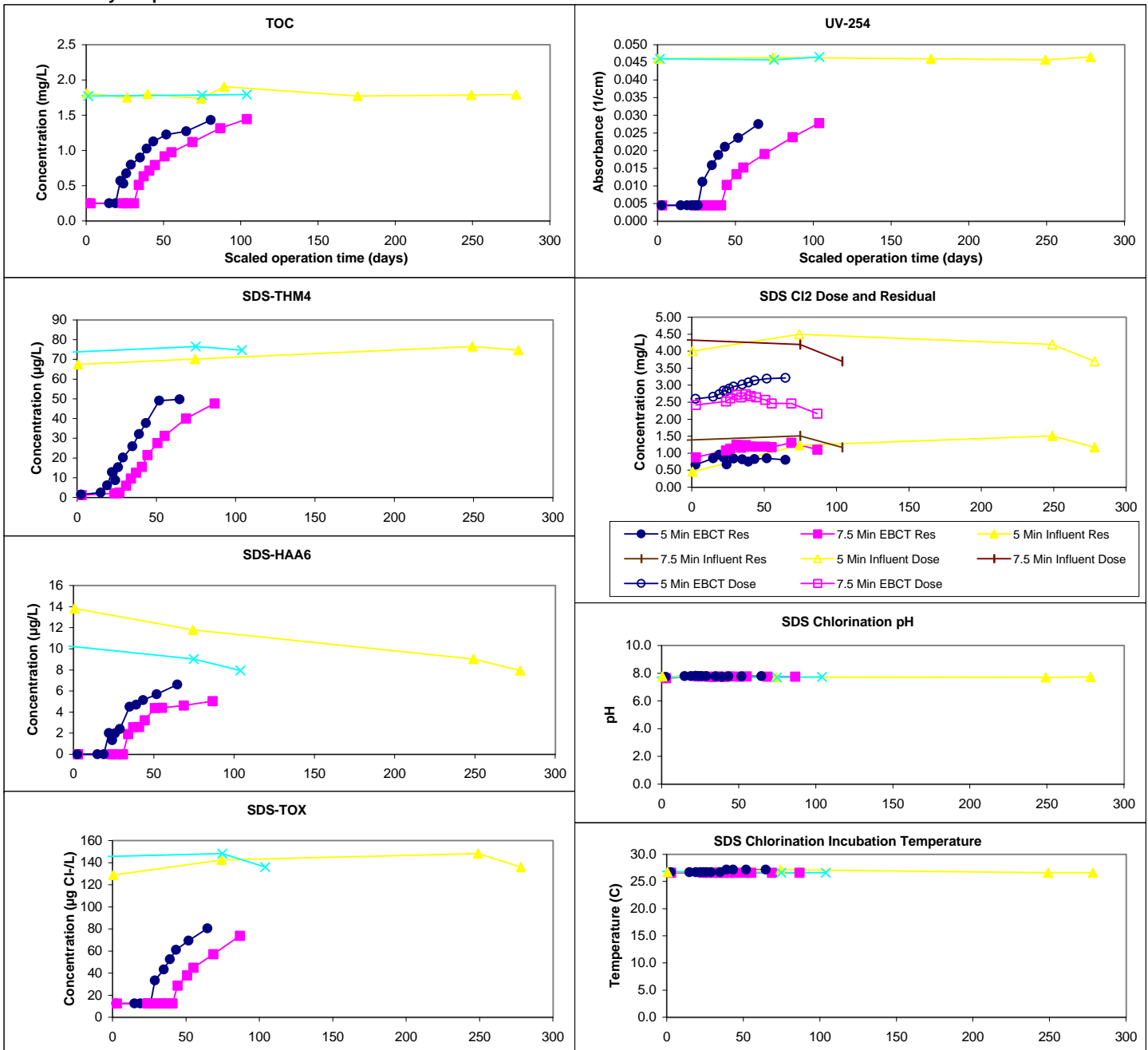
Design TOC: 1.9 mg/L  
 Col Diameter: 8.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 27.0 C

Full-Scale GAC Size: 12x40 Bituminous  
 Bench-Scale GAC Size: 140x230  
 Scaling Factor: 12.57  
 Meas Dry Bed Density: 0.46 g/cm3

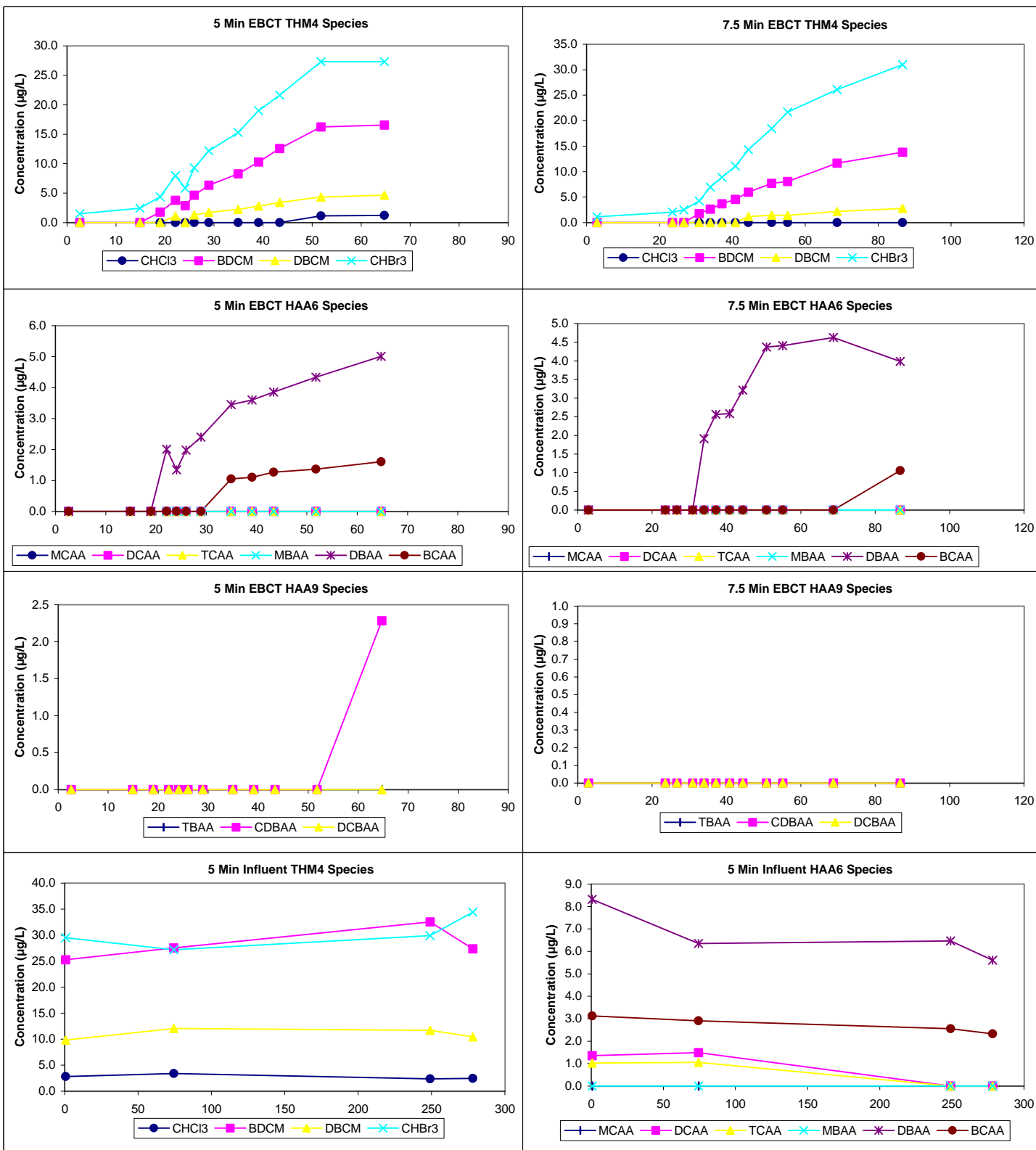
## Water Quality Summary

Influent	5 Min Influent				7.5 Min Influent				Cumulative SDS Conditions			
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max				
TOC	1.8	0.1	8	1.7 - 1.9	1.8	0.1	8	1.7 - 1.9	Res (0)	1.02	0.26	32 0.46 - 1.51
pH	7.4	0.0	8	7.4 - 7.5	7.4	0.0	8	7.4 - 7.5	Temp	26.7	0.2	32 26.6 - 27.2
UV254	0.046	0.000	5	0.046 - 0.047	0.046	0.000	5	0.046 - 0.047	pH	7.8	0.0	32 7.6 - 7.8
SUVA	2.59	0.05	5	2.54 - 2.67	2.59	0.05	5	2.54 - 2.67	Time	7.2	0.3	32 6.3 - 7.4
Bromide	395	10	2	390 - 400	395	10	2	390 - 400	Comments:			
SDS-TOX	139	8	4	129 - 148	139	8	4	129 - 148				
SDS-THM4	72	4	4	67 - 76	72	4	4	67 - 76	Chart Legend:			
SDS-HAA6	11	3	4	8 - 14	11	3	4	8 - 14				
Effluent	5 Min EBCT (6 B-S days)				7.5 Min EBCT (8 B-S days)				5 Min EBCT 7.5 Min EBCT 5 Min Influent 7.5 Min Influent			
Effluent pH	8.1	0.0	13	8.0 - 8.2	8.1	0.1	13	7.9 - 8.2				
Effluent Temp	23.7	0.9	13	21.8 - 25.2	23.3	0.4	13	22.7 - 24.1				

## Water Quality Graphs



## Water Quality Graphs (Continued)



## ICR Information

ID / ICR#: FL2161328 / 281  
 ICR Contact: Sibyl Carley  
 Phone No.: (904) 665-4503  
 Period: 6/18/98 - 7/9/98 (20 B-S days)

## Design Information

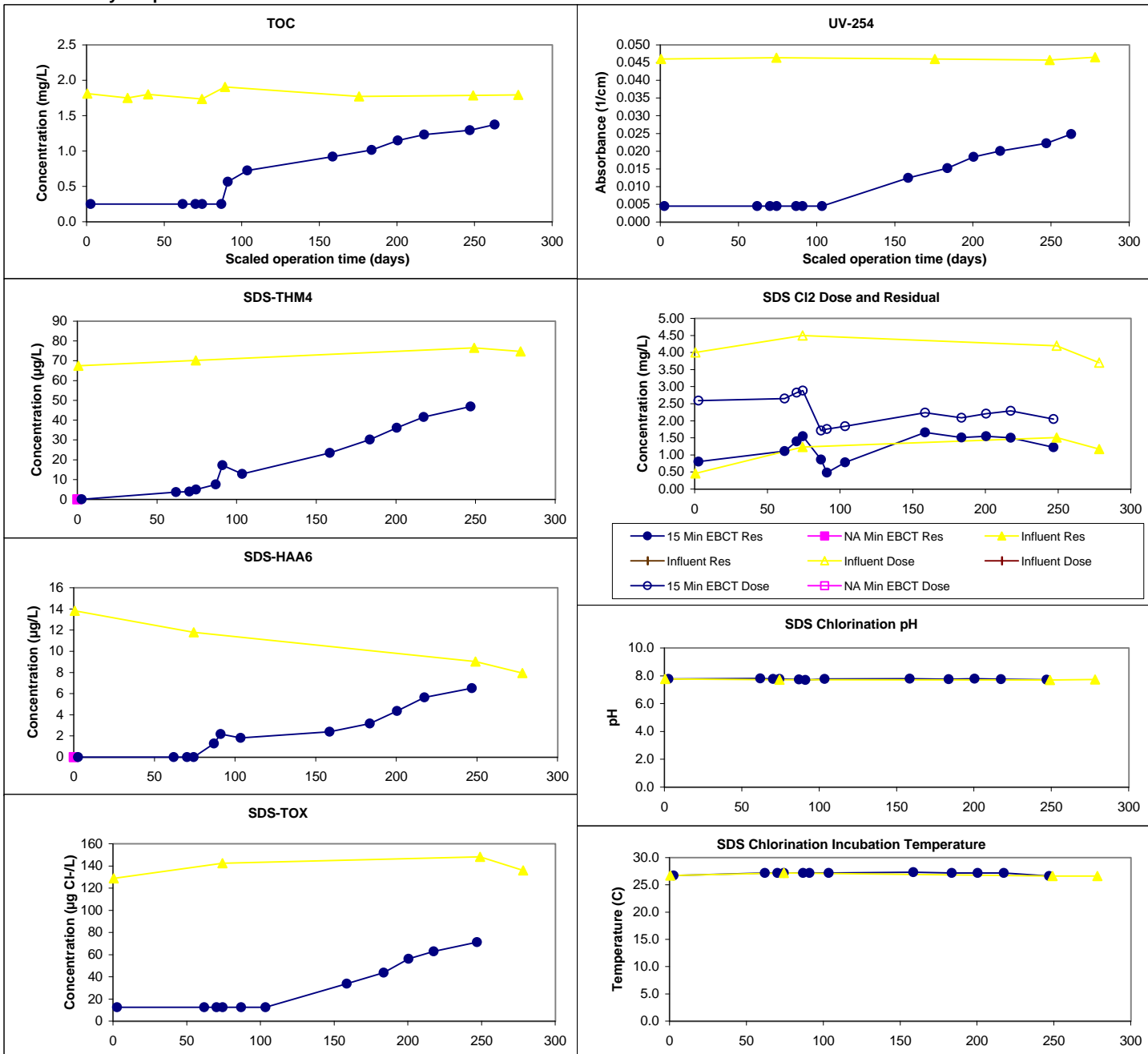
Design TOC: 1.9 mg/L  
 Col Diameter: 8.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 27.0 C

Full-Scale GAC Size: 12x40 Bituminous  
 Bench-Scale GAC Size: 140x230  
 Scaling Factor: 12.57  
 Meas Dry Bed Density: 0.46 g/cm3

## Water Quality Summary

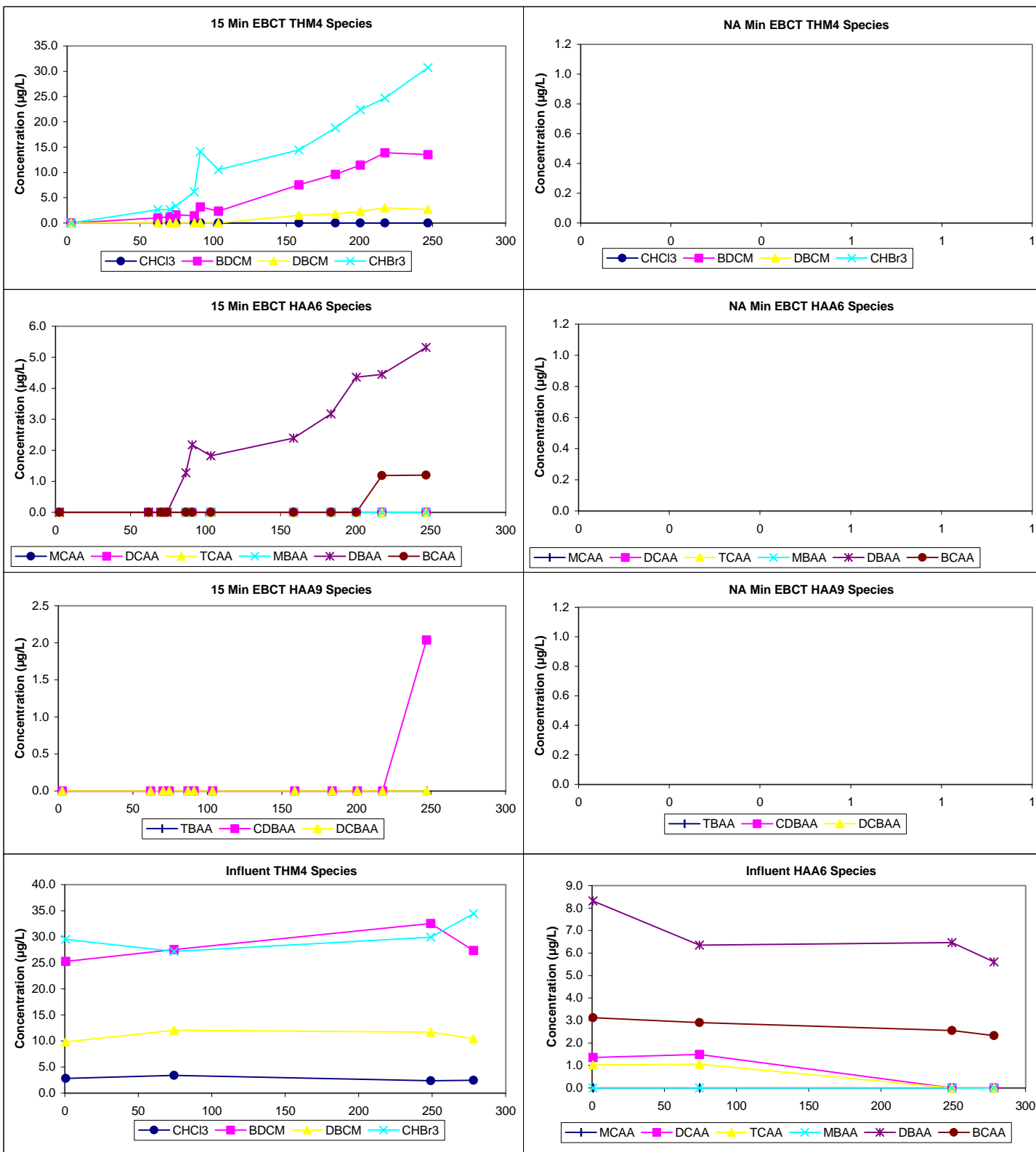
Influent	Influent				Influent				Res (0)	Mean	SD	Count	Min/Max
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max					
TOC	1.8	0.1	8	1.7 - 1.9									
pH	7.4	0.0	8	7.4 - 7.5									
UV254	0.046	0.000	5	0.046 - 0.047									
SUVA	2.59	0.05	5	2.54 - 2.67									
Bromide	395	10	2	390 - 400									
SDS-TOX	139	8	4	129 - 148									
SDS-THM4	72	4	4	67 - 76									
SDS-HAA6	11	3	4	8 - 14									
Effluent	15 Min EBCT (21 B-S days)				NA Min EBCT (0 B-S days)				Chart Legend:	<div><div><div></div><div>15 Min EBCT</div></div><div><div></div><div>NA Min EBCT</div></div><div><div></div><div>Influent</div></div><div><div></div><div>Influent</div></div></div>			
Effluent pH	8.1	0.1	13	8.0 - 8.2	NA	NA	0	0.0 - 0.0					
Effluent Temp	23.6	1.5	13	21.5 - 27.1	NA	NA	0	0.0 - 0.0					

## Water Quality Graphs





## Water Quality Graphs (Continued)



## ICR Information

ID / ICR#: FL2161328 / 281  
 ICR Contact: Sibyl Carley  
 Phone No.: (904) 665-4503  
 Period: 7/16/98 - 7/28/98 (12 B-S days)

## Design Information

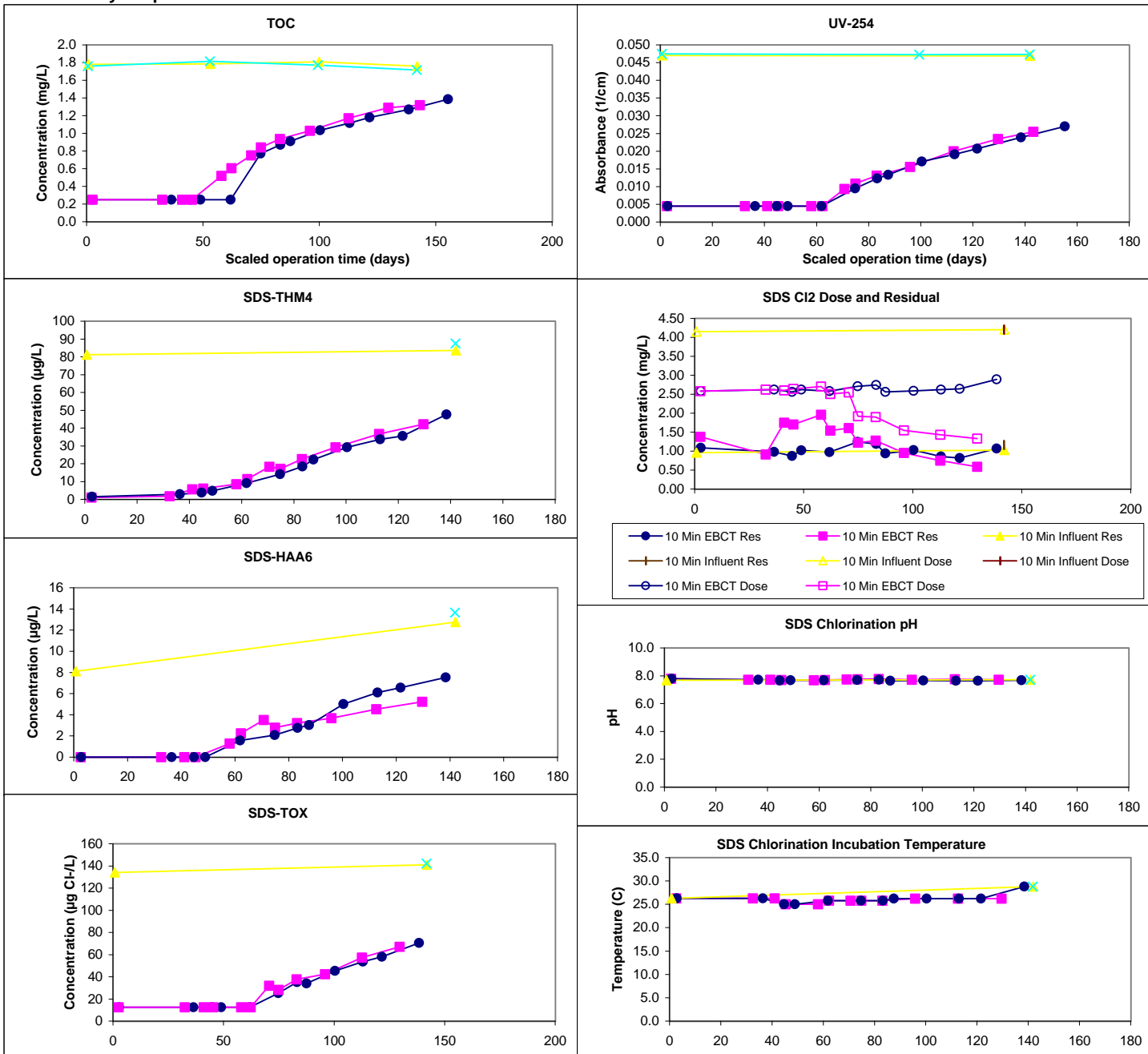
Design TOC: 1.8 mg/L  
 Col Diameter: 8.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 27.0 C

Full-Scale GAC Size: 12x40 Bituminous  
 Bench-Scale GAC Size: 140x230  
 Scaling Factor: 12.57  
 Meas Dry Bed Density: 0.49 g/cm3

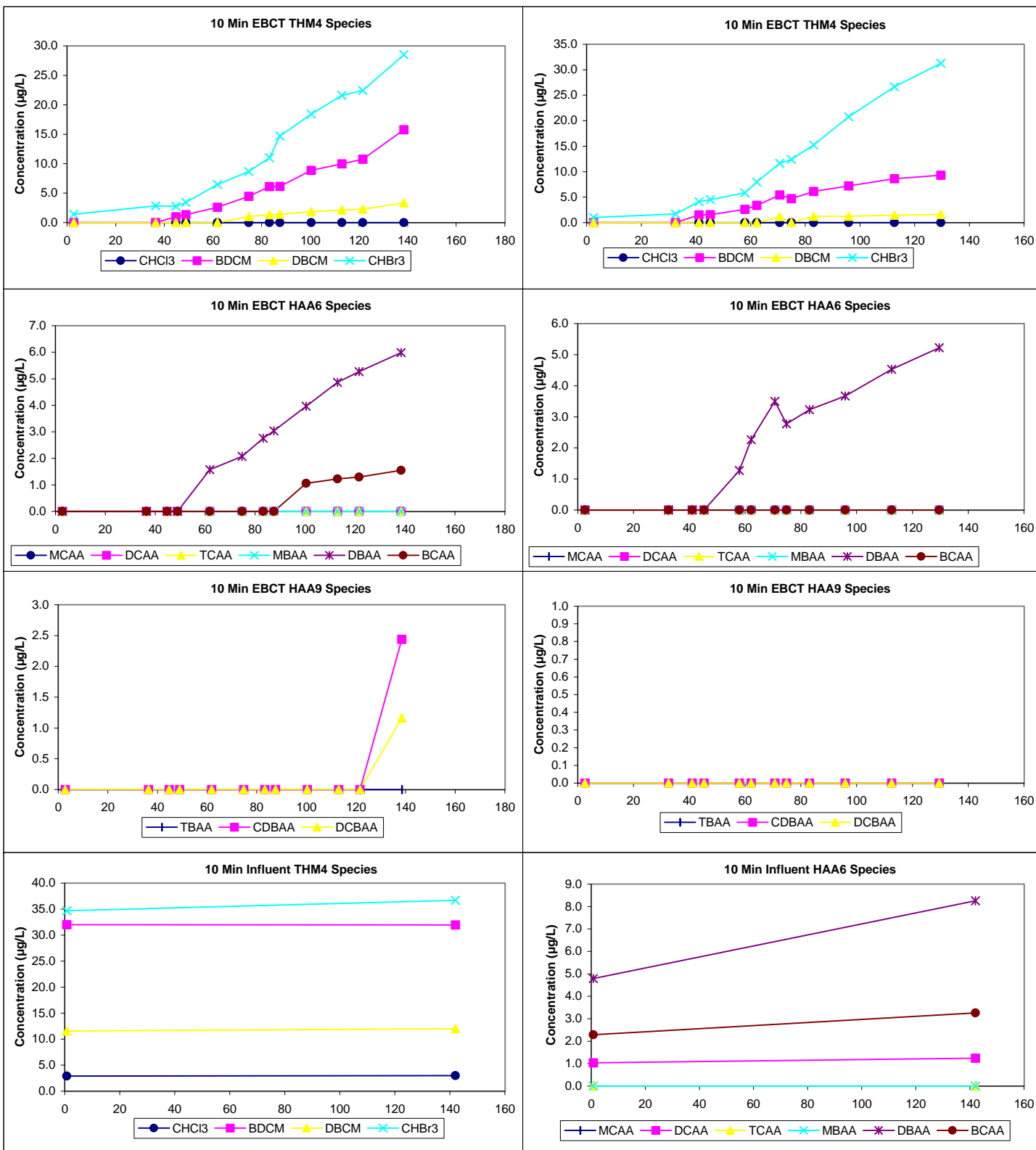
## Water Quality Summary

Influent	10 Min Influent				10 Min Influent				Res (0)	Mean	SD	Count	Min/Max
	Mean	SD/RD	Count	Min/Max	Mean	SD/RD	Count	Min/Max					
TOC	1.8	0.0	4	1.8 - 1.8	1.8	0.0	4	1.7 - 1.8		1.14	0.33	27	0.59 - 1.96
pH	7.0	0.1	4	7.0 - 7.1	7.5	0.0	4	7.4 - 7.5	Temp	26.2	1.0	27	25.0 - 28.8
UV254	0.047	0.000	2	0.047 - 0.047	0.047	0.000	3	0.047 - 0.048	pH	7.7	0.0	27	7.6 - 7.8
SUVA	2.65	0.02	2	2.64 - 2.66	2.71	0.05	3	2.67 - 2.76	Time	7.2	0.2	27	7.0 - 7.7
Bromide	500	20	2	490 - 510	500	0	2	500 - 500	Comments:				
SDS-TOX	138	7	2	134 - 141	142	0	1	142 - 142					
SDS-THM4	82	2	2	81 - 84	87	0	1	87 - 87					
SDS-HAA6	10	5	2	8 - 13	14	0	1	14 - 14	<div><div></div>10 Min EBCT</div> <div><div></div>10 Min EBCT</div> <div><div></div>10 Min Influent</div> <div><div></div>10 Min Influent</div>				
Effluent	10 Min EBCT (12 B-S days)				10 Min EBCT (11 B-S days)								
Effluent pH	7.7	0.1	13	7.4 - 7.9	8.1	0.1	13	7.9 - 8.3					
Effluent Temp	23.3	0.4	13	22.7 - 24.1	23.0	0.5	13	22.5 - 24.1	Chart Legend:				

## Water Quality Graphs



## Water Quality Graphs (Continued)



## ICR Information

ID / ICR#: FL2161328 / 281  
 ICR Contact: Sibyl Carley  
 Phone No.: (904) 665-4503  
 Period: 7/16/98 - 7/27/98 (11 B-S days)

## Design Information

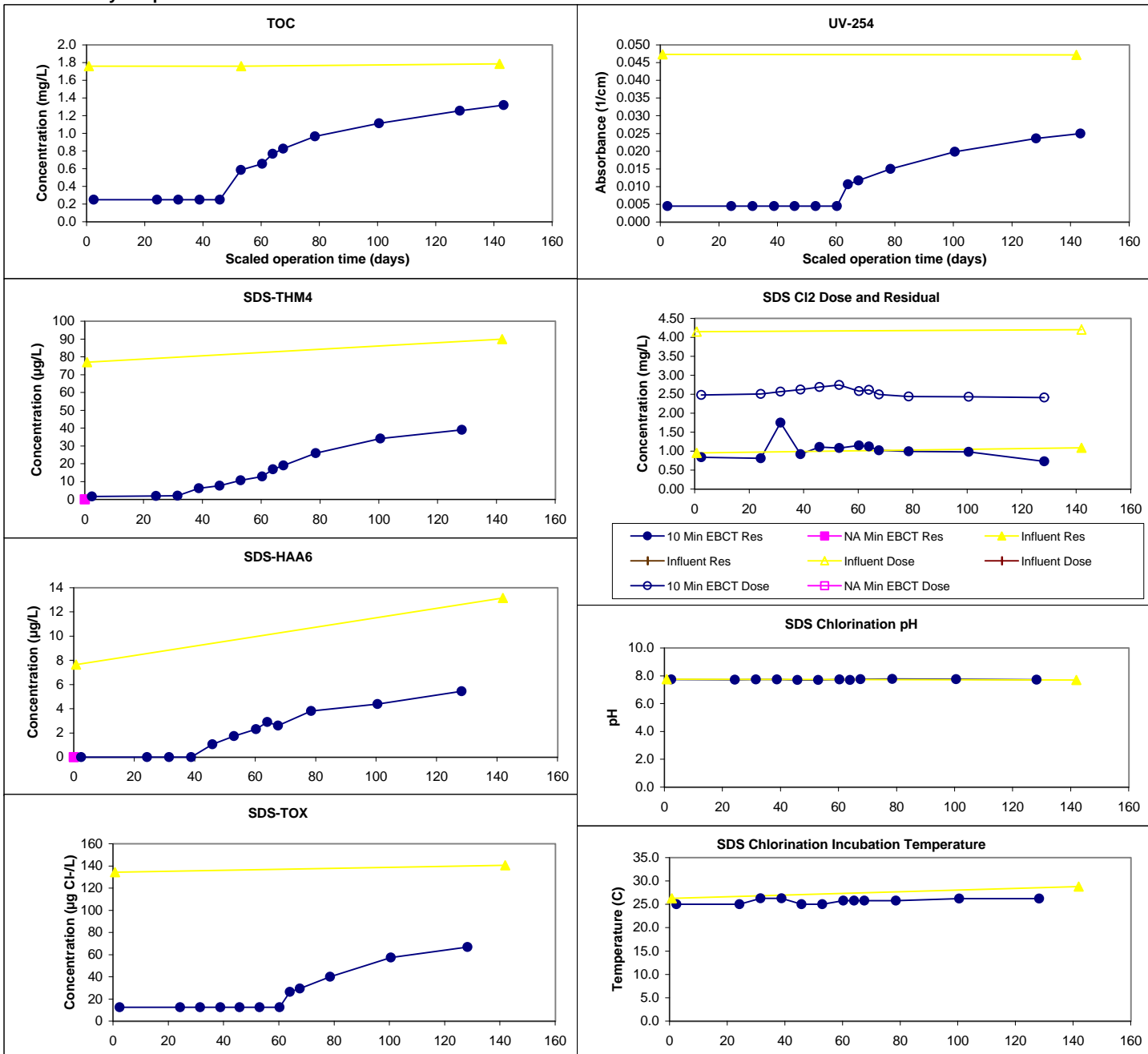
Design TOC: 1.8 mg/L  
 Col Diameter: 8.0 mm  
 Min Reynolds#: 0.50  
 Full-Scale Temp: 27.0 C

Full-Scale GAC Size: 12x40 Bituminous  
 Bench-Scale GAC Size: 140x230  
 Scaling Factor: 12.57  
 Meas Dry Bed Density: 0.49 g/cm3

## Water Quality Summary

Influent	Influent				Influent	Mean	SD/RD	Count	Min/Max	Cumulative SDS Conditions			
	Mean	SD/RD	Count	Min/Max						Mean	SD	Count	Min/Max
TOC	1.8	0.0	3	1.8 - 1.8						Res (0)	1.04	0.24	14 0.73 - 1.75
pH	7.8	0.0	4	7.8 - 7.8						Temp	26.0	1.0	14 25.0 - 28.8
UV254	0.047	0.000	2	0.047 - 0.047						pH	7.7	0.0	14 7.7 - 7.8
SUVA	2.67	0.05	2	2.64 - 2.69						Time	7.3	0.1	14 7.1 - 7.6
Bromide	495	10	2	490 - 500						Comments:			
SDS-TOX	138	6	2	134 - 141									
SDS-THM4	83	13	2	77 - 90						Chart Legend:			
SDS-HAA6	10	6	2	8 - 13									
Effluent	10 Min EBCT (11 B-S days)				NA Min EBCT (0 B-S days)					10 Min EBCT NA Min EBCT Influent Influent			
Effluent pH	8.3	0.0	13	8.2 - 8.3	NA	NA	0	0.0 - 0.0	NA				
Effluent Temp	23.3	0.5	13	22.4 - 24.1	NA	NA	0	0.0 - 0.0	NA				

## Water Quality Graphs



## Water Quality Graphs (Continued)

